

# DEVELOPMENTS IN ATTACHMENT RESEARCH



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OXFORD

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# Preface

This book represents the summation of my studies in the history of attachment research. Based on 12 years of research, it is also informed by other work undertaken in the meantime:

- In *Cornerstones of Attachment Research* (free to download), I examined the emergence of attachment as an empirical area of study in developmental and social psychology.<sup>1</sup> This included attention to the work of John Bowlby elaborating attachment theory, and the early observational studies by Mary Ainsworth. *Cornerstones* also examined the contributions of three foundational research groups across developmental and social psychology that helped establish attachment research as an empirical paradigm.<sup>2</sup>
- In *Trauma and Loss*, Kate White and I collected unpublished papers by John Bowlby which expand and alter the established image of his work and contributions.<sup>3</sup>
- In *Mentalisation and Epistemic Trust* (free to download), Sarah Foster and I explored the work of Fonagy and colleagues at the Anna Freud Centre, where the empirical findings and ideas of classical attachment theory have been integrated and subsumed within a broader theory of mentalizing.<sup>4</sup>
- With Judith Solomon, one of the originators of the disorganized attachment classification, I examined the history of the construct in a series of articles.<sup>5</sup> I have also explored debates about it, including the work of Crittenden and colleagues.<sup>6</sup>
- With Erik Hesse and colleagues, I co-edited Mary Main's 1986 book on methods in attachment research for publication, as well as a 1995 essay by Main on the philosophy of science.<sup>7</sup>
- In *Attachment Theory and Research: A Reader*, Tommie Forslund and I collected important but otherwise hard-to-access papers (e.g., unpublished, out of print) that

<sup>1</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press.

<sup>2</sup> Ruan Spies and I also interviewed contemporary attachment researchers about their perspectives on the work of Mary Ainsworth. Spies, R. & Duschinsky, R. (2021) Inheriting Mary Ainsworth and the strange situation: Questions of legacy, authority, and methodology for contemporary developmental attachment researchers. *Sage Open*, 11(3), 21582440211047577.

<sup>3</sup> Duschinsky, R. & White, K. (2019) *Trauma and Loss: Key Texts from the John Bowlby Archive*. London: Routledge.

<sup>4</sup> Duschinsky, R. & Foster, S. (2021) *Mentalising and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press.

<sup>5</sup> Duschinsky, R. & Solomon, J. (2017) Infant disorganized attachment: Clarifying levels of analysis. *Clinical Child Psychology and Psychiatry*, 22(4), 524–538; Solomon, J., Duschinsky, R., Bakum, L., & Schuengel, C. (2021) Issues of method in the assessment of disorganized attachment. In E. Waters, B. E. Vaughn, & H. S. Waters (eds), *Measuring Attachment: Developmental Assessments across the Lifespan* (pp. 170–193). New York: Guilford.

<sup>6</sup> For example, Landa, S. & Duschinsky, R. (2013). Letters from Ainsworth: Contesting the 'organization' of attachment. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 22(2), 172–177; Landa, S. & Duschinsky, R. (2013). Crittenden's dynamic-maturational model of attachment and adaptation. *Review of General Psychology*, 17(3), 326–338.

<sup>7</sup> Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds). London: Routledge; Main, M. ([1995] 2025) Attachment and psychoanalysis: Implications for the hermeneutic controversy in psychoanalysis. *Psychoanalytic Inquiry*, forthcoming.

interrupt common assumptions about attachment theory and research.<sup>8</sup> Our goal was to make more available the richness of attachment theory and research, as well as its diversity and current limitations.

- In *The Psychology of Attachment*, Pehr Granqvist, Tommie Forslund, and I offered an introduction to attachment theory and research aimed at a general audience, giving central place to the dependable findings supported by convergent evidence, and identifying myths that have developed about attachment and caregiving.<sup>9</sup>
- Colleagues and I have also interviewed leading developmental and clinical scientists about what they perceive as the strengths and weaknesses of attachment research.<sup>10</sup>

Bringing this work to completion, the present book, *Developments in Attachment Research*, explores the contributions of several research groups in developmental science that have shaped the study of attachment and caregiving in recent decades, each with a different image of the history of attachment research, of the nature of attachment, and why and how attachment research might be valuable. My focus on research groups acknowledges that systems of publication and reward often give prominence to specific leaders, though the scientific activity and thinking entails layers of collaboration and collective efforts.<sup>11</sup> Where the textual record has permitted, I have highlighted the role of these collaborations, including the contributions of students; though I acknowledge, and have discussed elsewhere,<sup>12</sup> that there is a considerable life and contribution to science beyond what is reflected in the textual record. (I can attest to this myself in offering the reader an apparently single-authored book, which nonetheless has received feedback, sometimes multiple rounds, from over 40 colleagues.)

Stories about attachment research have often tended to monumentalize founding figures, affirming or decrying them, without seeing them in the round. My intention has been to present an account mindful of both the specific strengths and limitations of the approaches under discussion. This includes documenting the development of scientific evidence and breakthroughs. However, the book also investigates attachment research within developmental psychology as a culture, considering its leadership, kinship structures, symbols, conflicts, points of entry or exit, and the pressures and opportunities to which it has responded or failed to respond. Indeed, part of what originally motivated my interest in the history of attachment research was the peculiar discrepancy between the small, relatively cohesive community of active researchers and the diversity and extent of their audiences. This predicament raises questions about the circulation and consumption of the products of research into attachment and caregiving. In considering the concepts used by attachment researchers, the book asks what they mean (and to whom),

<sup>8</sup> Forslund, T. & Duschinsky, R. (eds) (2021) *Attachment Theory and Research: A Reader*. New York: John Wiley & Sons.

<sup>9</sup> Duschinsky, R., Granqvist, P., & Forslund, T. (2024) *The Psychology of Attachment*. London: Routledge.

<sup>10</sup> Mann, A., Thompson, M., Foster, S., Beckwith, H., Madigan, S., Fearon, R. P., & Duschinsky, R. (2023) The Perspectives of Senior Researchers in Applied Disciplines on the Current State of Developmental Attachment Research: An Interview Study. *Sage Open*, 13(2), 21582440231179204.

<sup>11</sup> Duschinsky, R. & Foster, S. (2021) *Mentalising and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press: 'In a sense, "Fonagy", like the Crown in medieval legal and constitutional theory, has both individual and corporate identities. "Fonagy" refers to an individual person, Peter Fonagy, who holds certain attitudes and has pursued certain actions. Yet, "Fonagy" also refers to the embodiment of the assemblage of theoretical work occurring under his aegis. In this book, the phrase "Fonagy and colleagues" is an attempt to signal the corporate identity, and "Peter Fonagy" is invoked to refer to the individual person. However, there is inevitable instability: this division does not always hold.' (3)

<sup>12</sup> For example, Reijman, S., Foster, S., & Duschinsky, R. (2018) The infant disorganised attachment classification: 'Patterning within the disturbance of coherence'. *Social Science & Medicine*, 200, 52–58.

but also what they do, why, and when they are valued, and also what they can conceal—to researchers themselves and their knowledge stakeholders.

In [Chapter 1](#), I examine the reception of the ideas of Bowlby and Ainsworth by the next generation of developmental scientists, and their debates about how to take these ideas forward. I characterize the strengths and limitations of the proposals put forward by two of Ainsworth's students, Mary Main and Everett Waters and their teams. In [Chapter 2](#), I describe the work of Karlen Lyons-Ruth and her collaborators, who further developed attachment theory and methods in seeking to apply them to a high-risk sample, which she and collaborators have followed up over decades. [Chapter 3](#) engages with the work of Jay Belsky, which has explored the context of attachment relationships, and brought attachment research into dialogue with developments in evolutionary and biological science. [Chapter 4](#) examines the work by Marinus van IJzendoorn and Marian Bakermans-Kranenburg and collaborators across varied areas including the cross-national applicability of attachment research, institutional care and adoption, the neurobiology of attachment, and improving positive parenting through video-feedback. [Chapter 5](#) looks at the contributions of one of the new generation of attachment research groups, led by Sheri Madigan. The Epilogue considers the future of research on attachment and caregiving within developmental science.

Such evolution in attachment theory is precisely in line with Bowlby's hopes for the paradigm: he named it 'attachment theory' rather than 'Bowlby theory' in anticipation that his own ideas would be superseded.<sup>13</sup> However, in a 2011 seminar, Waters reflected that Bowlby's strategy has largely backfired. There are now numerous mini-theories jammed into the box of 'attachment theory', making it incredibly difficult for anyone to sort through or find what they need.<sup>14</sup> The assumption that all the different mini-theories are part of an overarching perspective has insulated them against progress. These mini-theories have not needed to clarify:

- Their exact premises;
- Their respective agreements or disagreements with Bowlby, or perceptions of the strengths or weaknesses of his ideas;
- Their respective agreements or disagreements with one another;
- Their specific implications for practice.<sup>15</sup>

Waters felt that researchers studying attachment and caregiving should 'indicate specifically which parts of Bowlby's theory they find useful, and what specifically they think it means—because they won't all agree on these things—and try to flesh out their theories in detail'.<sup>16</sup> The alternative was complacency, confusion about what anyone actually agreed or disagreed on, and a lack of pressure for progress in the field.<sup>17</sup> If they are unassailable, the

<sup>13</sup> SRCD Oral History Project (2020) Richard Bowlby interviewed by Everett Waters: 'John Bowlby and Attachment Theory', YouTube, [https://www.youtube.com/watch?v=Exf\\_r1NnNs&t=1028s](https://www.youtube.com/watch?v=Exf_r1NnNs&t=1028s).

<sup>14</sup> See also Keller, H. (2021) Attachment theory: Fact or fancy? In Thompson, R. A., Simpson, J. A., & Berlin, L. J. (eds), *Attachment: The Fundamental Questions* (pp. 229–236). New York: Guilford.

<sup>15</sup> Waters, E. (2011) The positive sides of secure base use, 4/23/2011. Unpublished manuscript. Everett Waters personal archive: 'We may be getting to the point at which the term "attachment", which Bowlby introduced to distinguish his perspective from the object relation psychoanalytic perspective ... no longer identifies a specific alternative point of view'.

<sup>16</sup> Ibid. 'Bowlby used psychoanalytic ideas to caulk up gaps that he didn't handle very well. Modern attachment theorists use a lot of Bowlby and psychoanalysis to caulk up gaps in what they're doing.'

<sup>17</sup> Ibid. 'By making people develop their ideas as freestanding theories, you require a certain completeness of them. Whereas, most of these perspectives survive today as subsets of attachment theory—as extensions of some larger attachment theory. The idea is, "Whatever I emphasize, I emphasize. And whatever I don't account for or

ideas of attachment theory cannot be killed. However, Waters worried that it also meant that they could also not effectively live and contribute, helping to shape genuine progress.<sup>18</sup>

*Developments in Attachment Research* is not a book retelling the canned story of how attachment theory and research developed, holding out an image of coherence and unity from Bowlby to the present. It traces different strata of ideas and methods, and maps lines of change and dissension. This is a defamiliarizing story. This has bearing for how it might be read. In the encounter with diversity and disagreement, a ‘wild reading’ is invited, one which invites the reader to make things personal, to register complexity, to weigh up or rethink connections at their own pace, and to express their individuality in how they read and discuss with others.<sup>19</sup> My aim is to use history to prompt joint attention and discussion among readers of how an area of scientific practice has decided its objects, priorities, and tools, with the hope of refreshing awareness of their past and present qualities, achievements, and elements of ill-fit or contradiction.

### The Approach of This Book

Work towards *Developments in Attachment Research* has been underway for 12 years. In general, when approaching work in the history of science, my first step is to get a full set of published papers and doctoral theses, and rough out translations for works not in English, consulting with a native speaker when necessary. This set is routinely updated, given that my study is of a live research paradigm.

A next step is to read all works by the developmental psychologists under discussion, and then attempt to loosely memorize those texts where they were first or lead author. In work on the history of psychoanalysis, it is not uncommon for scholars to have at least some of Freud’s corpus of writings committed to memory. I was introduced to this technique by the late John Forrester at Cambridge, though researchers in other humanities disciplines have also found it beneficial.<sup>20</sup> It may seem bizarre to adopt this approach when studying more formalized scientific texts. For my part, I have found it helpful for understanding the development and deployment of concepts and terms, and I have discussed my use of it more elsewhere.<sup>21</sup>

With that done, I then read articles cited by and citing the researchers I was studying. I focused my energies on those that took forward their ideas or findings in a concerted way, and those that offered critical discussion. This included a sustained attempt to examine lines of convergence and divergence between statements across different texts on the same topic, as well as lines of convergence and divergence with other developmental scientists of the period. A further separate document was kept to keep track of my own impressions of relative strengths and weaknesses of the work.

In *Cornerstones* this approach helped me identify two completely different concepts of ‘attachment’ in the work of John Bowlby, and to trace the legacy of this for subsequent theory and research. In *Mentalisation and Epistemic Trust*, Sarah Foster and I documented

discuss is covered by the other stuff implicitly. Nobody has to detail what it is the other stuff is doing for me. I emphasize this, and I emphasize that, and the other guys are handling the other parts of what I’m doing.” Well, they’re not. *They don’t even agree with you.*

<sup>18</sup> Ibid. ‘I’ve referred sometimes to what happens after attachment theory is over, and people look at you like you’ve just lost your mind. It’s incomprehensible to them that this would ever be off the scene. But everything else has always served its purpose and passed away. The question is whether it’s foundational to what comes after.’

<sup>19</sup> Andrews, B. (1996) *Paradise & Method: Poetics & Praxis*. Evanston: Northwestern University Press.

<sup>20</sup> For example, Vendler, H. (1997) *The Art of Shakespeare’s Sonnets*, Cambridge, MA: Harvard University Press.

<sup>21</sup> Duschinsky, R. (2019) Attachment and the archive: Barriers and facilitators to the use of historical sociology as complementary developmental science. *Science in Context*, 32(3), 309–326.

28 distinct definitions of mentalization in the work of Fonagy and colleagues. Through scrutiny of their meaning and subsequent uptake we were able to identify sources of confusion among readers (e.g., whether non-mentalizing was the opposite or the absence of mentalizing). Elsewhere I have discussed how these analyses have been received by the attachment research community and reflected on issues of dependence and independence in my relationship with developmental psychology.<sup>22</sup>

For *Developments in Attachment Research*, there would probably have been no book at all had I adopted a different approach. By 2017, after five years of work, the outlines were complete for *Cornerstones*, *Mentalization and Epistemic Trust*, and the present book. However, the process of writing the three books was progressively hampered by family bereavements and health problems. This culminated in the birth of our daughter, Abigail, who soon became seriously unwell, coinciding with the Covid pandemic. Abigail was in pain for much of her first few years, and she requires round-the-clock monitoring for daily seizures, as well as hours a day of tube feeding as she is not strong enough to eat or drink. Large sections of *Developments in Attachment Research* were written on my mobile while Abigail slept, working from my outline and memory. Direct quotations have naturally been checked, and much of the text subsequently revised, but this book still bears the marks of the conditions of its composition in heartache and a fight with despair, monitoring my daughter in pain that I could do nothing about. Our second daughter, Lucy, was born in 2021. She has been healthy and hilarious. With Abigail having started school recently, this has allowed me to write [Chapter 5](#), the Preface and Epilogue, and generally bring this book to completion.

I have set out my perspective on writing the history of attachment research in the introduction to *Cornerstones*. Here I would add that, in my writing, I have tried to follow the following principles. Each represents a choice in how to respond to a dilemma, and with awareness of the ethical and methodological risks entailed by these decisions.

A first principle has been to appreciate both history and the present for the kinds of knowledge they can offer. This is something of a minority position in the history of science, where researchers generally maintain agnosticism about the truth of the science under discussion, and to avoid applying the standards of the present to the science of the past.<sup>23</sup> In my view, both history and the present have their truths to contribute. So, for instance, close and critical historical analysis of the details of methodology can shed new light on what attachment researchers have been measuring for decades, without dismissing the value of those measurements. On the other hand, I have noted to the reader where conclusions drawn by researchers are based on analytical procedures that would be regarded by contemporary statistics as dicey.<sup>24</sup> I have written this book both for a reader interested in advances in developmental science and a reader interested in the history of science, without seeing a contradiction between the needs of these readers.

A second principle has been to pay particular attention to texts in which it can be inferred that the intended audience is rich in tacit knowledge of the matter in hand; and to pursue ongoing comparison with texts in which the author does not appear to expect much knowledge from the audience. This is a valuable source of clues regarding the nature of this tacit knowledge. Again, this approach may be controversial. Many developmental scientists, and some historians, would presume that greater weight should be given to texts in which clear

<sup>22</sup> Ibid.

<sup>23</sup> Oreskes, N. (2013) Why I am a presentist. *Science in Context*, 26(4), 595–609; Loison, L. (2016) Forms of presentism in the history of science: Rethinking the project of historical epistemology. *Studies in History and Philosophy of Science Part A*, 60, 29–37.

<sup>24</sup> Cf. Shan, Y. (ed.) (2022) *New Philosophical Perspectives on Scientific Progress*. London: Routledge.

summaries are given of propositions or evidence, in which statements are made for travel with ease and without distortion. So, for instance, scientific papers would be given priority, only supplemented occasionally with unpublished seminars or correspondence. I think matters are more complicated. Certainly, the relationship between published and unpublished statements should be investigated. Yet the skills and knowledge for making full sense of apparently freely available propositions or evidence may not be freely available. Indeed, in attachment research, access to them can be hard, including for members of the research community themselves. So, claims made to others anticipated to be able to decode them have special interest. This has contributed, for example, to the particular attention given to unpublished doctoral theses in this book, as a 'backstage' space away from the public platforms of attachment research, and one that makes a knowledge culture more visible as the student learns to use it.

A third principle has been to remain close to textual sources, not least for the sake of transparency, but without feeling pressure to necessarily minimise interpretation of those sources. For instance, there is a necessary element of extrapolation entailed in considering how van IJzendoorn's childhood experiences or his interpretation of the philosophy of science may have influenced his empirical studies. Or the relationship between Madigan's decision to leave attachment research for clinical work, and her later decision to take on a leadership role within the attachment research community. The strategy runs the risk of overinterpreting coherence, finding a pattern where there was really only contingency. It is also an approach that goes beyond what some may regard as a historian's remit. However, it is an interpretive strategy that, in my view, helps make sense of some of the inner clockwork that shapes the research under discussion. Where possible, I have tried my best to telegraph what is exposition and what claims are my appraisal. Inevitably, this line is not always clear. I am especially grateful for the feedback I have received from the researchers under discussion in this regard.

A last principle has been to learn my own perspective through learning the perspectives of others, and vice versa. My experience of this has been as follows: I set my boat sailing on the sea of different accounts, contending with but also using the various forces of current and wind. I certainly have choices available: following along the logic of one discourse I can move one way; facing the logic of another I can drift another. With a sharp intensity especially over the past five years, I have been learning about attachment and caregiving from the lessons taught by my wife's care for me, mine for her, and our teamwork to get through days. I have tried to listen closely to the lessons my girls have had for me personally, as well as for this book. Engaging with the different perspectives in *Developments in Attachment Research* over many years, including having their daily company through my own periods of depression and of happiness as a parent, has allowed me some flexibility of movement in considering their respective strengths and limitations. In this sense *Developments in Attachment Research* is a kind of novel, in the sense of a story driven in its movement by the interplay of different viewpoints and visions.

### Reflexivity and Acknowledgements

By way of preface, I should also make a further remark about reflexivity, as someone who has been involved in attachment research as well as studying its history. One consequence of this involvement with attachment research has been friendships with several of the researchers mentioned in this book.

My interpretation of attachment research was shaped by friendships and writing together with Mary Main, Erik Hesse, and Judith Solomon from 2012,<sup>25</sup> as well as access to Mary and Erik's papers. As discussed elsewhere, in the context of their trust, I have felt emboldened in offering criticism of their ideas and methods. I benefited from opportunities to discuss these criticisms with them and get feedback. I was also honoured to be asked by Mary to write her obituary when the time came.<sup>26</sup> Much of the history of attachment research since the late 1990s makes a great deal more sense in light of Mary's experience of Alzheimer's disease. Knowing this to be the case, Mary explicitly encouraged me to mention this in writing about her work, after she died, and I have made reference to it here when relevant. A great gift from Mary and Erik was introductions to their students, many of whom have become close friends. This includes Pehr Granqvist and Kazuko Behrens, who have been presences in my mind and conversation partners throughout writing this book.

I have had the great fortune of being able to spend time with Marinus van IJzendoorn and Marian Bakermans-Kranenburg during their visiting professorships at Cambridge between 2017 and 2020. I doubt I would have been capable of thinking with their work, rather than just about it, were it not for the time they generously gave to answering my questions, explaining their ideas, and—with patience and thoughtfulness—addressing misunderstandings. These experiences have helped me understand the shape and contours of their work in a way that would not have otherwise been possible. I am grateful for their feedback on drafts of this book. I know Karlen Lyons-Ruth and Jay Belsky less well, though I have appreciated every piece of feedback they gave in reviewing the chapters about their work. In these chapters, I suspect there was a gain in independence, and reduced strengths in understanding, which the reader might hold in mind.

My knowledge of attachment methods and measures has also been deepened through training in specific assessments, including three trainings in the infant Strange Situation (with Alan Sroufe and Betty Carlson, with Judith Solomon, and with Patricia Crittenden). With thanks to Jessica Opie, I have also reviewed her notes from Strange Situation trainings provided by Bob Mavin and Everett Waters, as well as Sroufe, Carlson, and Solomon. I have trained in the Adult Attachment Interview, the Friends and Family Interview, and the Pre-School Assessment of Attachment. A limitation to this book is that my knowledge of assessments of attachment in middle childhood is weaker. My understanding of attachment theory and meta-analytic methods has also been deepened by involvement in the Collaboration on Attachment Transmission Synthesis with Schuengel, Verhage, and colleagues, and in meta-analytic research by Madigan, Fearon, and collaborators. The reader might hold in mind these collaborations in appraising my impressions of the work of these researchers. I am also grateful for the valuable feedback from Schuengel and Madigan on sections of the present book.

As a result of these collaborations, I am an author on a number of the papers cited in this book. In honesty I suspect almost all would still exist without my input, even if some aspects might have been different. One set of exceptions is work by my doctoral students on challenges in bridging research and practice,<sup>27</sup> which I am pleased has in turn

<sup>25</sup> For example, Rozga, A., Hesse, E., Main, M., Duschinsky, R., Beckwith, L., & Sigman, M. (2018) A short-term longitudinal study of correlates and sequelae of attachment security in autism. *Attachment & Human Development*, 20(2), 160–180.

<sup>26</sup> Duschinsky, R. (2024) Mary Main: Portrait and tribute. *Attachment & Human Development*, Early view.

<sup>27</sup> Beckwith, H., van IJzendoorn, M., Freeston, M., Woolgar, M., Stenner, P., & Duschinsky, R. (2022) A 'transmission gap' between research and practice? A Q-methodology study of perceptions of the application of attachment theory among clinicians working with children and among attachment researchers. *Attachment*



prompted greater attention to this issue.<sup>28</sup> The other set of exceptions are three consensus papers: on disorganized attachment; on attachment theory and measures in family court practice; and attachment in the social work curriculum. In each case I co-wrote the first draft.<sup>29</sup> For instance, the family court paper began from a symposium at the 2019 Vancouver International Attachment Conference with Pehr Granqvist, Miriam Steele, Marinus van IJzendoorn, and Danya Glaser. Avi Sagi-Schwartz then spent time in London, and we worked together for long, enjoyable days on a first draft, before round after round of input from international colleagues.

*Developments in Attachment Research* has benefited from insightful, genuinely propulsive reflections on sections of the book from many attachment researchers. Time and again feedback from colleagues brought me back to what I wanted to achieve when I got lost. In addition to those mentioned above, I wish to also thank Lianne Bakkum, Kazuko Behrens, Guy Bosmans, Jean-François Bureau, Stefanella Costa Cordella, Or Dagan, the late Nino Dazzi, Audrey-Ann Deneault, Peter Fonagy, Tommie Forslund, Danya Glaser, Pehr Granqvist, Ben Grey, Karin and Klaus Grossmann, J. D. Haltigan, Nancy Hazen, Erik Hesse, Debby Jacobvitz, Michael Lamb, Bob Marvin, Serena Messina, Viv Prior, Glenn Roisman, Sophie Reijman, Anne Rifkin-Graboi, Avi Sagi-Schwartz, Ruan Spies, Alan Sroufe, Anne Tharner, Ross Thompson, Everett Waters, and Theo Waters.

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& *Human Development*, 24(6), 661–689; Coughlan, B., van IJzendoorn, M. H., Woolgar, M., Weisblatt, E. J., & Duschinsky, R. (2022) Differentiating ‘attachment difficulties’ from autism spectrum disorders and attention deficit hyperactivity disorder: Qualitative interviews with experienced health care professionals. *Frontiers in Psychology*, 12, 780128; Foster, S. L. (2023) Attachment and reflective functioning in child welfare assessment: A mixed methods study. Unpublished doctoral dissertation, Northumbria University.

<sup>28</sup> Hammarlund, M., Granqvist, P., Elfvik, S., Andram, C., & Forslund, T. (2022) Concepts travel faster than thought: An empirical study of the use of attachment classifications in child protection investigations. *Attachment & Human Development*, 24(6), 712–731; Verhage, M. L., Tharner, A., Duschinsky, R., Bosmans, G., & Fearon, R. P. (2023) On the need for clarity about attachment terminology. *Journal of Child Psychology and Psychiatry*, 64(5), 839–843.

<sup>29</sup> Granqvist, P., Sroufe, L. A., Dozier, M., Hesse, E., Steele, M., van IJzendoorn, M., & Duschinsky, R. (2017) Disorganized attachment in infancy: A review of the phenomenon and its implications for clinicians and policy-makers. *Attachment & Human Development*, 19(6), 534–558; Forslund, T., Granqvist, P., van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M., & Duschinsky, R. (2022). Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52; Foster, S., Schofield, G. L., Geoghegan, L., Hood, R., Sagi-Schwartz, A., Bakkum, L. ... Duschinsky, R. (2025) Attachment theory and research: What should be on the core curriculum for children and families social workers? Under review.

Skinner, Fabienne Dos Santos Sousa, Connie Tang, Yubing Xu, Yeosun Yoon, David Young, Salma Yusuf, as well as others affiliated with my group.

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# List of Abbreviations

|                    |                                                                                                          |
|--------------------|----------------------------------------------------------------------------------------------------------|
| AAI                | Adult Attachment Interview                                                                               |
| AMBIANCE           | Atypical Maternal Behavior Instrument for Assessment and Classification                                  |
| AQS                | Attachment Q-Sort                                                                                        |
| CARE Collaboration | Caregiving and Attachment Research and Education Collaboration                                           |
| MBQS               | Maternal Behavior Q-Sort                                                                                 |
| MCDC               | Middle Childhood Disorganization and Control scales                                                      |
| MIND               | The Mother–Infant Neurobiological Development study                                                      |
| NICHHD study       | National Institute of Child Health and Human Development study of early child care and youth development |
| GPACS              | Goal-Corrected Partnership in Adolescence Coding Scales                                                  |
| RISE               | Rating of Infant-Strange Engagement                                                                      |
| WMCI               | Working Model of the Child Interview                                                                     |



# 1

## A Coming-of-Age Story

### Attachment Research in the 1980s

#### Introduction

Today, we are familiar with the often-repeated story of the origins of attachment research in the theorizing of John Bowlby and the empirical work of Mary Ainsworth and her students. Yet this story often contains assumptions petrified into cliché. It misrepresents the contributions of these researchers, the points of difference and discontinuity between them, and fails to attend to their specific strengths and weaknesses. In *Cornerstones of Attachment Research*, I offered a relatively comprehensive overview and appraisal of their ideas. The focus of the present chapter will be the interpretation and evaluation of these theorists by early empirical attachment researchers, especially in the period of the 1980s and early 1990s.

Whereas Bowlby and Ainsworth represented a first generation of attachment researchers, a new set of researchers—sometimes adopting the metaphor of a dynastic family in referring to itself as the ‘second generation’<sup>1</sup>—was formed both by their direct students and by developmental psychologists entering attachment research without direct links to the founders. For a reader unfamiliar with attachment research, this chapter will serve as a general introduction and background. For a reader already familiar with the topic, it is hoped that this chapter will offer a chance to understand attachment research from new angles, and to consider some lines of diversity within the attachment research community.

One group of early empirical attachment researchers was Ainsworth’s talented group of students, among them Inge Bretherton, Jude Cassidy, Patricia Crittenden, Michael Lamb, Alicia Lieberman, Mary Main, Bob Marvin, and Everett Waters. Important allies in Ainsworth’s circle included Alan Sroufe at Minnesota and Klaus and Karin Grossmann at Regensburg, Germany. This group can be distinguished from developmental psychologists entering attachment research in the 1980s without immediate links to Ainsworth, for instance Jay Belsky, Karlen Lyons-Ruth, Susan Goldberg, Avi Sagi-Schwartz, Sue Spieker, Ross Thompson, and Marinus van IJzendoorn.

The distinction is not hard and fast, and in themselves these are diverse groupings. Ainsworth’s students experienced varying degrees of exposure to her ideas, and in different periods (e.g., during her time at Johns Hopkins or Virginia), and varied in their openness to this exposure. In both groups, there are differences between the clinicians and the non-clinicians in priorities and orientation. Nonetheless, some relatively distinct priorities and approaches can be identified that distinguish Ainsworth’s circle from early attachment researchers coming to the field without direct links to Ainsworth.

<sup>1</sup> For example, Lyons-Ruth, K. (1991) Rapprochement or approchement: Mahler’s theory reconsidered from the vantage point of recent research on early attachment relationships. *Psychoanalytic Psychology*, 8(1), 1–23, p. 3.



Consideration of attachment theory and research from the perspective of the reception of Bowlby and Ainsworth in the 1980s and early 1990s offers several benefits. It provides an opportunity to demonstrate some of the serious misapprehensions that have been sedimented into the story of continuity that is frequently told about the development of attachment theory, including by attachment researchers themselves. With the departure of Bowlby and Ainsworth, and the emergence of new scientific leadership, the 1980s and early 1990s were a period of ‘changing of the guard’ for attachment research. Attention to the reception of foundational attachment theories in this period provides a chance to perceive attachment research as genuinely mutable and mortal in a way that is more difficult now after half a century of scholarship and apparent continuity.

Much work in the history of attachment research has looked backwards from Bowlby and Ainsworth in the 1970s to their predecessors and social context.<sup>2</sup> There appears to be a peculiar assumption in less careful work that statements by Bowlby and Ainsworth still represent attachment theory today.<sup>3</sup> Many commentators seem unaware of the revolutions or the important incremental transformations that have taken place in the paradigm since then, or the lines of dissension among contemporary researchers.

Furthermore, Bowlby and Ainsworth were writing with students and future researchers in mind: their intellectual conversation was with both contemporaries and with those who would come after them. It is therefore critical for understanding these theorists and their projects to consider the future they imagined for their research, not just where they stood but where they were going.<sup>4</sup> This includes the dialogue Bowlby and Ainsworth began with the researchers their ideas helped inspire.

It is also of interest to see how this second generation of attachment researchers sought to sift those elements of the work of Bowlby and Ainsworth that appeared unhelpful and those that appeared progressive and living. Consideration of the sifting process enacted by the second generation has particular timeliness and urgency, since a younger generation of research leaders are today pursuing a renewed effort of such sifting, including of the legacies of the second generation themselves (Chapter 5).

Bowlby died in 1990, and Ainsworth was not able to do further work after the early 1990s due to age and Alzheimer’s disease. However, the 1980s was a curious period, with a young generation of researchers embarking on studies of attachment, in active conversation with the ideas of Bowlby and Ainsworth. The study of attachment was internationalizing, including developments in Germany, the Netherlands, and Israel. My focus here will be on the state of the thinking of Bowlby and Ainsworth by the 1980s, and aspects of their work that prompted discussion and debate during the ‘changing of the guard’ in this period, in particular Bowlby’s concept of attachment and Ainsworth’s Strange Situation Procedure. I will also examine how these discussions and debates shaped the emergent field of attachment research within developmental psychology.

<sup>2</sup> For example, Van Dijken, S. (1998) *John Bowlby: His Early Life: A Biographical Journey into the Roots of Attachment Theory*. London: Free Association Books; Van der Horst, F. (2011) *John Bowlby—From Psychoanalysis to Ethology: Unravelling the Roots of Attachment Theory*. Oxford: Blackwell; Van Rosmalen, L., Van der Veer, R., & Van der Horst, F. (2015) Ainsworth’s strange situation procedure: The origin of an instrument. *Journal of the History of the Behavioral Sciences*, 51(3), 261–284.

<sup>3</sup> For example, Vicedo, M. (2020) Putting attachment in its place: Disciplinary and cultural contexts. In Willem Koops & Frank Kessel (eds), *Historical Developmental Psychology* (pp. 56–71). Abingdon: Routledge. Garrett, P. M. (2023) Bowlby, attachment and the potency of a ‘received idea’. *The British Journal of Social Work*, 53(1), 100–117. Cf. Duschinsky, R., Van IJzendoorn, M., Foster, S., Reijman, S., & Lionetti, F. (2020) Attachment histories and futures: Reply to Vicedo’s ‘Putting attachment in its place’. *European Journal of Developmental Psychology*, 17(1), 138–146.

<sup>4</sup> Koselleck, R. (2004) *Futures Past: On the Semantics of Historical Time*. New York: Columbia University Press.

The chapter will begin by summarizing the central ideas from the work of Bowlby that would be developed by subsequent researchers. I will leave aside for now the many potentially relevant aspect of his work that did not get taken up in this way:<sup>5</sup> my focus will be on his reception by early empirical researchers in developmental psychology. I will then offer an account of Ainsworth's central contributions, and how these were taken up and appraised by her students and other developmental psychologists in the 1980s. While summaries of Bowlby and Ainsworth are familiar, indeed overfamiliar, I believe quite a different and helpful angle is offered by viewing them through the eyes of their followers in the period in which attachment research was getting established as a field of inquiry. Whereas standard accounts of Bowlby and Ainsworth emphasize continuity, we shall see that considerable challenges and differences of opinion were important in shaping the early attachment research community. This perspective highlights the contingency in the directions taken by attachment research, important for understanding the new paths taken by the researchers discussed in the subsequent chapters.

I will then introduce the work of Mary Main, one of Ainsworth's doctoral students, and generally treated as her primary successor in shaping attachment theory and methodology. Main's work represented a major revolution: it fundamentally shaped the environment within which subsequent attachment research took place, and was seen to address important limitations in the contributions of Bowlby and Ainsworth. Even so, I will argue that Main's key ideas have generally been at most partially understood, in part due to mental and physical health challenges that made it difficult for her to communicate her position. I will begin by outlining her concept of conditional strategies within attachment relationships as underpinned by individual differences in the allocation of attentional processes. Awareness of this account of attentional processes is critical for understanding Main's conceptualization of disorganized attachment, and indeed how it is measured. I will then describe Main and Hesse's account of alarming caregiver behaviour, acknowledging limitations on this work imposed by Main's ill health. The chapter will close by discussing the Adult Attachment Interview, addressing prevailing misunderstandings about what it actually measures.

Main's ideas and methods came to dominate attachment research for many years. Meanwhile, an alternative, rather subterranean, set of ideas continued to develop in the work of other students of Ainsworth, who developed ideas from Ainsworth neglected by Main. Drawing on archival materials, this section of the chapter will begin by discussing the concerns Ainsworth's other students had about Main's theory and methods. I will consider the Attachment Q-Sort measure, introduced by Waters and colleagues, and situate it in the context of debates in the 1990s around what is at stake in attachment relationships and the legacy of Ainsworth. I will then trace the further elaboration of this approach to attachment research over the subsequent years, ultimately culminating in measures of secure base scripts in the 2010s. The chapter will close by taking stock of the position of attachment research in developmental psychology by the end of the 1980s, emphasizing the lines of transition and transformation set in motion, setting the scene for the subsequent chapters.

<sup>5</sup> Solomon, J., Duschinsky, R., Bakkum, L., & Schuengel, C. (2017) Toward an architecture of attachment disorganization: John Bowlby's published and unpublished reflections. *Clinical Child Psychology and Psychiatry*, 22(4), 539–560; Duschinsky, R. & White, K. (2019) *Trauma and Loss: Key Texts from the John Bowlby Archive*. Abingdon: Routledge; Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, [chapter 1](#).

## Bowlby, Ainsworth, and Their Reception

### The Concept of Attachment

The term ‘attachment’ was drawn by Bowlby from the work of Anna Freud. Burlingham and Freud observed that children ‘will cling even to mothers who are continually cross and sometimes cruel to them,’ concluding that some form of ‘attachment of the small child to his mother’ seemed ‘to a large degree independent of her personal qualities.’ These observations appealed to Bowlby.<sup>6</sup> He was amazed by their congruence with observations made by researchers in a new discipline, ‘ethology.’ Ethology represented a revolutionary approach to the study of animal behaviour. The central premise was that observable behavioural sequences—not just biological structures—could be the consequence of evolution through natural selection.<sup>7</sup>

In the 1950s, Bowlby began a close collaboration with the ethologist Robert Hinde. Hinde’s distinctive contribution was a theory of motivation. Other ethologists in his own discipline, in agreement with Freud and most psychoanalytic theorists, tended to think of motivation as powered by a kind of psychological energy or drive. Hinde, however, argued that in the study of animals and humans it would be better to focus on particular behavioural sequences, the conditions that activated and terminated them, and the specific behaviour used as part of the sequence.<sup>8</sup> In conceptualizing these sequences, Hinde emphasized the distinction between *observable behaviour* and the underlying *motivational system* (which he called the ‘behavioural system’).<sup>9</sup> A motivational system could be conceptualized as evolved through natural selection to contribute in some way to survival or reproduction. Each system might have certain characteristic behaviours, but would be flexible in response to an individual’s specific environment.

Hinde was particularly interested in the behaviour of animal offspring towards their parents. He theorized the existence of a motivational system in juveniles that would prompt behaviours to ensure that the caregiver remained available, particularly under conditions of perceived threat. This was what Hinde’s colleague, the US ethologist Harry Harlow, called the use of the caregiver as a ‘safe haven.’<sup>10</sup> Hinde characterized the motivational system that led offspring to ensure the availability of a caregiver as a safe haven the ‘following response,’ though he acknowledged that other behaviours besides following, such as calling, might be used to achieve proximity depending on circumstances.<sup>11</sup> Hinde conducted ingenious experimental studies that demonstrated that though an infant’s following response might be primed by the nervous system, it required social interaction with a caregiver for its

<sup>6</sup> Annotations by John Bowlby dated 1942 on Burlingham, D. & Freud, A. (1942) *Young Children in War-time*. Oxford: Allen & Unwin, p. 10 and p. 47; copy held in the library of Human Development Scotland.

<sup>7</sup> Burkhardt Jr, R. W. (2014) Tribute to Tinbergen: Putting Niko Tinbergen’s ‘Four Questions’ in historical context. *Ethology*, 120(3), 215–223.

<sup>8</sup> Hinde, R. (1956) Ethological models and the concept of ‘drive’. *British Journal for the Philosophy of Science*, 6(24), 321–331.

<sup>9</sup> Baerends, G. P. (1976) The functional organization of behaviour. *Animal Behaviour*, 24, 726–738. The movement of the concept from ethology to attachment theory is discussed further in Grossmann, K. & Grossmann, K. (2012) *Bindungen—das Gefüge psychischer Sicherheit Gebundenen*. Stuttgart: Klett-Cotta. Given the history of confusion between behaviour and behavioural systems in the reception of Bowlby’s work, I have preferred to use the term ‘motivational system’.

<sup>10</sup> Harlow, H. F. & Zimmermann, R. R. (1958) The development of affectional responses in infant monkeys. *Proceedings of the American Philosophical Society*, 102(5), 501–509.

<sup>11</sup> Hinde, R. A., Thorpe, W. H., & Vince, M. A. (1956) The following response of young coots and moorhens. *Behaviour*, 11: 214–242; Hinde, R. A. (1961) The establishment of the parent-offspring relation in birds, with some mammalian analogies. In W. H. Thorpe & O. L. Zangwill (eds), *Current Problems in Animal Behaviour*, pp. 175–193, Cambridge University Press.

elaboration. This included elaboration of which behaviours would be used in expressing the motivational system, and the extent to which physical contact is sought by offspring when alarmed.

Bowlby had previously written about the child's 'love' for the caregiver or the child's 'tie' to their caregiver. However, he wanted a more technical term, to capture the clinging behaviour human children showed when alarmed. So from 1961 onwards he adopted Burlingham and Freud's term 'attachment'. Yet the term was more a staging post than a designation of a single discrete phenomenon. It may be characterized as a kind of *cataphoric reference*, a concept from linguistics to refer to a word that appeals for its meaning to a more specific characterization available in the future. Basically, a placeholder. The difference between a cataphoric reference and simply an ambiguous concept is that the former is intentional and expects the reader's cooperation in reading it against the future specification.

However, Bowlby's use of the term 'attachment', by both intellectual descendents and by critics, has been described as leaving 'a trail of confusion and conjecture', among researchers, clinicians and other audiences of his ideas across the world.<sup>12</sup> A fundamental problem was that, during the 1960s, Bowlby used the term in two different ways, which he sought to bring together:

1. On the one hand, Bowlby wanted to draw on the ideas of Hinde and observations of animal behaviour. He therefore used 'attachment' to mean *an evolutionary-based disposition for infants to monitor access to and, especially when alarmed, seek proximity with their familiar caregiver or caregivers*. The caregiver is physically sought as a safe haven.
2. On the other hand, Bowlby wanted to draw on the work of Anna Freud and the psychoanalytic tradition, as well as the connotations of the word 'attachment' in ordinary language, in appealing to clinical and popular audiences. He also used the term more broadly, to mean *an emotionally invested relationship that serves a symbolic source of comfort and protection*. The relationship is experienced as representing a safe haven.

Essentially, Bowlby wanted what he saw as the best of both worlds: the scientific concepts addressing motivational processes available from the study of animal behaviour, alongside the clinical relevance and emotive resonance offered by psychoanalytic discourse. His profound, uncanny experience of the two disciplines was that following a line of inquiry in one would lead him to the other. For him, ethology and psychoanalysis could be cut and glued together to form a Möbius strip: any path could lead back to the point of origin but would leave the walker turned upside down. In 1963, he organized a conference on the idea of conflict in ethology and psychoanalysis, reflecting in his opening remarks that each discipline could help the other examine their most familiar topics in remarkable new ways. He spoke of the value he had found as a clinician of observing the conflict behaviour

<sup>12</sup> Allen, B. (2023) The science and clinical practice of attachment theory: A guide from infancy to adulthood. *American Psychological Association*, p.14; see also Rutter, M. (1995) Clinical implications of attachment concepts: Retrospect and prospect. *Journal of Child Psychology and Psychiatry*, 36(4), 549–571; Hithaler-Wagner, P. (2023) Gebunden an die Bindungstheorie? Die Entwicklung einer Infragestellung. *Zeitschrift für Individualpsychologie*, 48(2), 127–140; Pace, C. S. (2023) Teoria dell'attaccamento: definizione dei costrutti e utilizzo clinico degli strumenti in ambito di tutela dei minori. *Psicologia clinica dello sviluppo*, 27(1), 129–132.

of patients, such as scratching behind an ear, as signals of stress, and comparing this with the degree of stress acknowledged by the patient's speech.<sup>13</sup>

Yet in seeking to overlay ethology and psychoanalysis, there was fallout for Bowlby's terminology, especially in his use of the concept of attachment. His struggle with the ambiguities produced for the concept are evident across his unpublished writings and correspondence. He would sometimes find himself using the term to mean observable proximity-seeking behaviour and sometimes to mean the desire for closeness, physical or symbolic, within emotionally invested relationships. Bowlby knew that most child-caregiver relationships after toddlerhood would have elements of the basic motivational system and of its symbolic elaboration: 'A child separated from his mother comes to crave both for her love and for its accompanying symbols.'<sup>14</sup> Yet he rarely addressed the issue in print as he saw no way to resolve the ambiguity without sacrificing the advantages of ethology or psychoanalysis.

As a consequence, Bowlby made two very different kinds of claims about the relative consequences of early attachment relationships. Sometimes 'attachment' was used to mean a child's emotionally invested relationships generally. Bowlby would make strident claims in print for the consequences of early attachment for 'a person's whole emotional life' in adulthood, including adult mental health.<sup>15</sup> In *Loss* he would claim that 'attachments to other human beings are the hub around which a person's life revolves.... From these intimate attachments a person draws his strength and enjoyment of life.'<sup>16</sup> Here attachment is being used broadly to refer to emotionally invested relationships.

When 'attachment' was understood narrowly as a specific motivational system, Bowlby's stance was rather different, and he tended towards much more qualified claims, especially from the 1970s. He emphasized the multiple factors that shape human development, within which any single factor is likely to play no more than a moderate role. Among these factors, attachment as a motivational system might have special importance because 'the period when they are most active is also the period when patterns of control and of regulating conflict are being laid down.'<sup>17</sup> It may therefore have a particular significance for socio-emotional development. And indeed subsequent research has documented continuing relevance for development of infant relationships, especially, as Bowlby predicted, for problems with aggression (Chapter 4). Bowlby was especially concerned about the effects of major separations between children and their caregivers, as potentially disrupting children's trust in their caregivers' availability in times of need, in turn hindering their development.<sup>18</sup> He and colleagues undertook a study of the effects on young children of

<sup>13</sup> MRC Ethology Meeting organized by Bowlby, 23 May 1963, John Bowlby Archive, Wellcome Collections, PP/Bow/D.6/5: 'Tentative application of this approach to Man. Use of observed behaviour, e.g. "clenched fists", redirected attack, scratching behind ear etc. compared with information reported by subject'; 'Indications that conflicts similar to those observed in lower species can, if sustained, give rise to lasting changes in behaviour ("experimental neurosis") and to psychosomatic effects'. See also Bowlby, J. (1969/1982) *Attachment*. London: Penguin, pp. 98–101.

<sup>14</sup> Bowlby, J. (1944) Forty-four juvenile thieves: Their characters and home-life (II) *International Journal of Psycho-Analysis*, 25, 107–128, p. 121.

<sup>15</sup> For example, Bowlby, J. (1984) Violence in the family as a disorder of the attachment and caregiving systems. *American Journal of Psychoanalysis*, 44, 9–27, p. 11.

<sup>16</sup> Bowlby, J. (1980) *Loss*. London: Pimlico, p. 44.

<sup>17</sup> Bowlby, J. (1960) Separation anxiety. *International Journal of Psycho-Analysis*, 41, 89–113, p. 105.

<sup>18</sup> van der Horst, F. C. & van der Veer, R. (2010) The ontogeny of an idea: John Bowlby and contemporaries on mother-child separation. *History of Psychology*, 13(1), 25–45.

hospitalization without their parents,<sup>19</sup> and campaigned for changes in hospital policy to allow parents and children to remain together.<sup>20</sup>

Yet Bowlby fully acknowledged that even children who have had especially adverse experiences in childhood or major separations may not show subsequent problems with mental health or social relationships. He addressed this directly in a televised interview in 1986:

I'm often accused of exaggerating and various people point out that not every child who has had these sorts of experience comes to grief.... First of all, maybe he'll be vulnerable if things go wrong in his life.... Another point is that, supposing it's true that some children having had some pretty ghastly experiences nonetheless develop favourably.... But then the question arises, what percentage of people who contract polio are left with long term paralysis? The answer is less than 1 per cent. The fact is 99 per cent get by. Now in the case of severe maternal deprivation—first of all I think that much more than 1 per cent suffer. I think the percentage is way up in the 20s or 30s. And the other thing is that crippling of personality is much more serious.<sup>21</sup>

Furthermore, Bowlby anticipated that those who show severe problems are often those who have experienced combinations of adversities, rather than disruptions of attachment alone. In a letter to Michael Rutter, he likewise used the analogy with polio to characterize the consequences of very adverse or absent early attachment relationships. He also emphasized that 'the more serious effects of experiences of the type we are discussing are when there are certain special combinations of variables present'.<sup>22</sup>

The problem lay in the confusion between the broad and narrow meanings of attachment and their associated claims. Ainsworth and her circle, and above all Waters, tended to make this distinction, and focus on the narrow meaning.<sup>23</sup> By contrast, the Minnesota group had some difficulty in communicating this distinction: the assumption that the broad and narrow meanings would go together contributed to some ambiguous claims. Sroufe would sometimes use the terms 'attachment' and 'relationship' interchangeably, giving the impression that he thought that they were synonymous.<sup>24</sup> More broadly, a muddle between broad and narrow ideas of attachment led many other readers to assume that Bowlby held that individual differences in early attachment are fixed for life and shape all subsequent access to social and symbolic forms of comfort.

Certainly this impression was not helped by Bowlby's strident tone in his academic writing in the 1950s about the dangers of all and any child-mother separations. From the late 1960s he focused his energies away from polemical writings on the dangers of separation, and focused on the development of attachment theory as a paradigm for scientific work.<sup>25</sup> Ultimately he felt 'we are just floundering around, until we get the science right'.<sup>26</sup> His

<sup>19</sup> Bowlby, J., Ainsworth, M., Boston, M., & Rosenbluth, D. (1956) The effects of mother-child separation: A follow-up study. *British Journal of Medical Psychology*, 29, 211–247.

<sup>20</sup> Bowlby, J., Robertson, J., & Rosenbluth, D. (1952) A two-year-old goes to hospital. *Psychoanalytic Study of the Child*, 7, 82–94.

<sup>21</sup> Bowlby, J. (1986) Interview with the BBC. John Bowlby Archive, Wellcome Collections, PP/Bow/F.5/8.

<sup>22</sup> Bowlby, J. (1971) Letter to Michael Rutter, 6 October 1971. John Bowlby Archive, Wellcome Collections, PP/Bow/J.9/161.

<sup>23</sup> Ainsworth, M. D. (1985) Attachments across the life span. *Bulletin of the New York Academy of Medicine*, 61(9), 792–812.

<sup>24</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, [chapter 4](#).

<sup>25</sup> Bowlby, J. (1976) Bowlby on latch-key kids: Interviews with Dr Nicholas Tucker. *Psychology Today*, Autumn 1976, 37–41.

<sup>26</sup> Bowlby, J. (1986) Interview with the BBC. John Bowlby Archive, Wellcome Collections, PP/Bow/F.5/8.

ambition was to create a framework of propositions and concepts that could be developed, tested and refined by empirical research.<sup>27</sup>

Drawing ideas from the philosopher of science Karl Popper (Chapter 4), Bowlby argued that science has two stages. In the first stage, the task is to frame hypotheses, what Popper termed the 'context of discovery'. In this regard, 'the art and practice of science is to abstract certain salient dimensions from this hideously buzzing confusion.'<sup>28</sup> Where possible, this process benefits from 'detailed and first-hand knowledge of the problem is required, together with a dose of intuition and imagination.'<sup>29</sup> With hypotheses developed, 'the second phase of science is to examine the idea, consider its implications, match it against other observations.'<sup>30</sup> Popper termed this the 'context of justification'. Looking back over his long career, Bowlby offered the self-criticism that his work had displayed an 'absence of a follow-through', remaining in the first stage of hypothesis-generation and quite general claims.<sup>31</sup>

Superseding his early simplistic claims about causal processes in child development, in his later work Bowlby emphasized that clinicians and researchers should note the importance of 'developmental pathways', self-reinforcing patterns in children's trajectories towards or away from mental health. Bowlby reflected that, with human development conceptualized in terms of pathways, we can expect 'adverse childhood experiences [to] have effects of at least two kinds. First they make the individual more vulnerable to later adverse experiences. Secondly they make it more likely that he or she will meet with further such experiences.'<sup>32</sup> This pathways metaphor suggested a nuanced model of continuities over time:

All pathways are thought to start close together so that, initially, an individual has access to a large range of pathways along any one of which he might travel. The one chosen, it is held, turns at each and every stage of the journey on an interaction between the organism as it has developed up to that moment and the environment in which it then finds itself. Thus at conception development turns on interaction between the newly formed genome and the intrauterine environment; at birth it turns on interaction between the physiological constitution, including germinal mental structure, of the neonate and the family, or non-family, into which he is born; and at each age successively it turns on the personality structure then present and the family and, later, the wider social environments then current.... As development proceeds and structures progressively differentiate, the number of pathways that remain open diminishes.<sup>33</sup>

In such reflections Bowlby was seeking to advance beyond simplistic expectations in which early attachment will determine later outcomes. While Ainsworth and her associates appreciated the metaphor of developmental pathways, they felt that the term 'attachment' was confusing matters. The way Bowlby used the term attachment risked the implication that

<sup>27</sup> Bowlby, J. (1982) Letter to Mary Main, 18 December 1982, Mary Main and Erik Hesse personal archive: 'The value of my contribution is only manifest when exploited by people like you!'

<sup>28</sup> Bowlby, J. (1976) Bowlby on latch-key kids: Interviews with Dr Nicholas Tucker. *Psychology Today*, Autumn 1976, 37–41, p. 39. See also Bowlby, J. (c.1982) Popper's evolutionary epistemology. John Bowlby Archive, Wellcome Collections, PP/Bow/H.98.

<sup>29</sup> Bowlby, J. (1988) Where science and humanism meet. *Group Analysis*, 21, 81–88, p. 81.

<sup>30</sup> Ibid.

<sup>31</sup> Ibid.

<sup>32</sup> Bowlby, J. (1988) *A Secure Base*. London: Routledge, p. 41.

<sup>33</sup> Bowlby, J. (1973) *Separation*. London: Pimlico, p. 412.

strong direct effects from individual differences in early relationships to later outcomes would be expected, overriding the idea of developmental pathways.<sup>34</sup>

Waters reported from conversations with Bowlby that the latter fully accepted this point: the concept of 'attachment' was used by Bowlby as a placeholder, awaiting more fine-grained conceptual work on the basis of better evidence.<sup>35</sup> Indeed, Bowlby came to regret that he had used the term 'attachment' at all, since so many people got confused between the broad and narrow meanings. He wished that he had used the term 'care-seeking' instead. That term would at least have clearly referred to behaviour and kept open the question of the underpinning psychological mechanism or mechanisms.<sup>36</sup> It would have clarified the distinction between (i) parenting behaviours responsive to children's care-seeking in times of need and (ii) behaviours supportive of children's exploratory behaviour, and helped to maintain attention to both. It would have also helped avoid the discussion, which remains confused today, about what is, or is not, an 'attachment relationship'.<sup>37</sup>

Nonetheless, Bowlby's use of the term 'attachment' continued. No doubt one reason was the capacity of the term to resonate with different audiences—popular, clinical, and academic—even if there was only partial overlap in what these audiences *actually* understood by Bowlby's use of the term. The concept of 'attachment' had become the banner for a general theoretical perspective, and so was difficult to put down. Likewise Ainsworth and her students continued to use the term as a shorthand for children's expectations about caregiver availability.

If Bowlby had achieved his synthesis of ethology and psychoanalysis, but had communicated only in the language of these two disciplines, his ideas would have had a very limited audience. Bowlby's appeals to ordinary language and cultural stereotypes in writing for popular forums helped set his theory alight; it glowed to widespread visibility, even as its qualifications and technical subtlety burned away as fuel. The result are highly charged, instigating images, built to travel and to attract and absorb attention, more than produce an exact characterization.<sup>38</sup>

As I argued in *Cornerstones*, Bowlby's popular writings and framing of his scientific work helped create what Bourdieu termed 'allodoxia': a 'light', commodified version of a more complex cultural form. The attraction and advantage of allodoxia is that it can appeal to a wider base of constituents without the skills or knowledge to access and understand the original.<sup>39</sup> Allodoxia differs from forms of popularization that attempt to convey the intricacy and technical quality of the original (e.g., unpacking terms; adopting an accessible

<sup>34</sup> For example, Waters, E., Posada, G., Crowell, J., & Lay, K. L. (1993) Is attachment theory ready to contribute to our understanding of disruptive behavior problems. *Development and Psychopathology*, 5(1–2), 215–224. A similar point was made by other commentators. See e.g. Rutter, M. (1995) Clinical implications of attachment concepts: Retrospect and prospect. *Journal of Child Psychology and Psychiatry*, 36(4), 549–571.

<sup>35</sup> Waters, E., Corcoran, D., & Anafarta, M. (2005) Attachment, other relationships, and the theory that all good things go together. *Human Development*, 48(1–2), 80–84, p. 82.

<sup>36</sup> From the 1970s onwards, Bowlby tested out referring to 'care-seeking' rather than 'attachment behaviour', e.g. Bowlby, J. (1986) *Attachment, Life-Span and Old Age*, eds. Joep Munnichs & Bére Miesen. Utrecht: Van Loghum, p. 11.

<sup>37</sup> Fearon, P. F. & Schuengel, C. (2021) What kinds of relationships count as attachment relationships? In R. Thomson & L. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 24–30). New York: Guilford: 'The term attachment relationship is potentially misleading, even though it is a widely used and useful shorthand. Rather, it is probably more accurate to describe attachment as a domain within a relationship—that domain of interactions concerned with the seeking and provision of comfort and feelings of safety' (25).

<sup>38</sup> Cf. Sorel, G. ([1908] 1961) *Reflections on Violence*, trans. T. E. Hulme, New York: Dover: 'We do nothing great without warmly coloured and clearly defined images, which absorb the whole of our attention' (148).

<sup>39</sup> Bourdieu, P. ([1979] 1984) *Distinction*, trans. R. Nice, Cambridge, MA: Harvard University Press. See also Keesing, R. M. (2012) On not understanding symbols: Toward an anthropology of incomprehension. *HAU: Journal of Ethnographic Theory* 2(2), 406–430.



style; using stories to keep the audience engaged).<sup>40</sup> By no means are all works of popular science allodoxia; I would strongly contest that position. Rather, what characterizes allodoxia in psychology is the circulation of a simplified account *as if it had the same meaning* as the technical account of empirical researchers. It is like treating the recounting of a dream and a dream itself as if they were the same thing, not recognizing—or wanting to acknowledge—the decisive cut that separates the terms under which their sense occurs.

All science has a ‘price for full entry’ in terms of theoretical and technical competence and commitment.<sup>41</sup> This price may be paid by specialists through their training as part of formal qualifications or accreditation. Some or all access may also be gained by non-specialists, for instance through reading, depending on the structural barriers to entry and how much socialization in tacit skills is required.<sup>42</sup> In both cases there remains some recognition of the distinction between technical and non-technical use of concepts. Conversely, the accessibility of elements of Bowlby’s popularizing discourses from the 1950s and 1960s offered cut-price tickets to attachment theory, even though these only granted access to a fairly antiquated portion of the fairground, and—the source of much later trouble—looked much the same as full entry tickets. The cut-price popular discourse of attachment was evocative and underdetermined, as well as having the appearance of scientific credibility. This gave it flexibility, urgency and reach for these diverse constituents concerned to speak about the nature of family relationships and child development.

The language of attachment theory can be experienced as running towards us, calling our name. Much like ‘the people’ for democratic discourse, attachment theory offers floating labels (e.g., ‘attachment’, ‘separation’), available for and drawing in various possible meanings, then masking this diversity.<sup>43</sup> Such terms offer an emotionally resonant rallying cry, with considerable additional work required for anyone trying to work out what exactly is being said. Somewhat weightless, but feeling full of personally-relevant meaning, they can be used in the service of a genuinely astonishing variety of interests, with barely any resemblance between them besides appeal to the child’s relational welfare and development.<sup>44</sup> Considered in historical perspective, both the circulation of half-truths about attachment and their rhetorical insistence can be regarded, in part, as a byproduct of Bowlby’s populist marketing strategy for his scholarly thinking.<sup>45</sup>

<sup>40</sup> Bucchi, M. (2013) Style in science communication. *Public Understanding of Science*, 22(8), 904–915.

<sup>41</sup> Bourdieu, P. (2004) *The Science of Science and Reflexivity*, R. Nice, trans., Chicago, IL: University of Chicago Press, pp. 53–54.

<sup>42</sup> Collins, H. & Evans, R. (2018) A sociological/philosophical perspective on expertise: The acquisition of expertise through socialization. In K. A. Ericsson, R. R. Hoffman, A. Kozbelt, & A. Mark Williams (Eds.) *The Cambridge Handbook of Expertise and Expert Performance* (pp. 21–32). Cambridge: Cambridge University Press.

<sup>43</sup> Cf. Jameson, F. (1980) *The Political Unconscious: Narrative as a Socially Symbolic Act*. London: Routledge; Laclau, E. (2005) *On Populist Reason*. New York: Verso; Alexander, J. C. (2016) Dramatic intellectuals. *International Journal of Politics, Culture, and Society*, 29(4), 341–358.

<sup>44</sup> For example, Aamodt, H. A. & Hennum, N. (2024) The child welfare service’s ignorance: The use of attachment theory in Norwegian child welfare. In Helder Ferreira do Vale (ed.), *Social Welfare—Policies, Services, and Institutions for the Poor, the Sick, and the Elderly*, <https://www.intechopen.com/online-first/1192410>: ‘Attachment theory does not provide concrete instructions for action. Rather, it depends on the observer. In this case, the attachment theory is used as a reason for the girl to move into a foster home and as a reason for her to move home to her mother. When it is decided that she should move into a foster home, there is more focus on creating an attachment to the foster parents than the girl’s already attachment to the mother. When the girl is to be returned, there is more focus on creating or restoring attachment to the mother than on maintaining the attachment to the foster parents.’ See also White, S., Gibson, M., Wastall, D., & Walsh, P. (2019) *Reassessing Attachment Theory in Child Welfare: A Critical Appraisal*. Bristol: Policy Press.

<sup>45</sup> Riley, D. (1983) *War in the Nursery: Theories of the Child and Mother*. London: Virago; Vicedo, M. (2011) The social nature of the mother’s tie to her child: John Bowlby’s theory of attachment in post-war America. *The British Journal for the History of Science*, 44(3), 401–426; Duniec, E. & Raz, M. (2011) Vitamins for the soul: John Bowlby’s thesis of maternal deprivation, biomedical metaphors and the deficiency model of disease. *History*

## Reception of Bowlby among Attachment Researchers in the 1980s

In a 1979 article, Van IJzendoorn was highly critical of Bowlby, based in large part on contemporary discussions of his ideas in the context of debates around daycare.<sup>46</sup> However, as he read further, Van IJzendoorn began to dig through the allodoxic version of Bowlby's ideas. He caught sight of a scientific model that thrilled him. In their book on Bowlby from 1982, Van IJzendoorn and colleagues expressed admiration for 'the courage and erudition of John Bowlby, addressing the fruitless tradition of the mini theorists in psychiatry and the social sciences, who dared breaking through with a large-scale theoretical construction and thereby knowingly and willingly faced the inevitable criticism of details to which his theory was exposed.'<sup>47</sup>

If empirical research in developmental science needs to be oriented by a theoretical perspective to guide the generation of research questions and the interpretation of findings, Bowlby's attachment theory appeared to be 'the most fertile and comprehensive theory going forward.'<sup>48</sup> The value of this theory stood out especially in the context of what Van IJzendoorn and colleagues perceived as a growing tendency towards atheoretical research in psychology, hindering the cumulative construction of knowledge. Attachment theory promised a framework within which to articulate, elaborate and test ideas about child development in a systematic way, in contrast to the 'jungle of occasional theories and hypotheses' that was coming to dominate psychology.<sup>49</sup>

Yet Van IJzendoorn and colleagues were highly critical of Bowlby's tendency towards populism, including the way his terminology left itself open to multiple meanings, and therefore to being 'easily abused' in discussions of policy and practice.<sup>50</sup> Above all, Van IJzendoorn and colleagues were concerned with the way that Bowlby frequently elided the differences between the narrow and broad meanings of attachment. Bowlby could give the impression that he held that individual differences in early attachment are fixed for life and shape all subsequent access to social and symbolic forms of comfort. Van IJzendoorn and colleagues characterized this position as 'somewhat ridiculous'<sup>51</sup> and as an unfortunate legacy of the psychoanalytic tendency to imagine the adult mind through the metaphor of the young child.

While sceptical of some of the legacy of psychoanalytic theory for Bowlby's work, Van IJzendoorn and other researchers in developmental psychology entering attachment research praised the strengths of Bowlby's ideas granted by their roots in ethology. In particular, they headlined three strengths granted by ethology to attachment theory when describing to other developmental scientists why they found attachment theory exciting, drawing contrasts with psychoanalytic theory.

Firstly, whereas both Freud and many psychoanalysts of Bowlby's day tended to ask questions about child development by looking back from adulthood based on adult recall, ethology was essentially prospective and observational, looking at a parent's care of their

of *Psychiatry*, 22(1), 93–107; Símónardóttir, S. (2016) Constructing the attached mother in the 'world's most feminist country'. *Women's Studies International Forum*, 56, 103–112.

<sup>46</sup> Van IJzendoorn, M. H. (1979) Operationaliseringsproblemen bij onderzoek naar de affectieve relatie tussen ouder en kind. *Pedagogische Studien*, 56, 358–368, p. 358.

<sup>47</sup> Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., & Vergeer, M. M. (1982) *Opvoeden in geborgenheid: Een kritische analyse van Bowlby's attachmenttheorie*. Amsterdam: Van Loghum Slaterus, p. 150.

<sup>48</sup> *Ibid.*, 10.

<sup>49</sup> Van IJzendoorn, M. & van der Veer, R. ([1981] 1984) *Main Currents of Critical Psychology*, trans. M. Schoen. New York: Irvington Publishers, p. 10; see also K. E. Grossmann (1990) *Laudatio für John Bowlby*. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, Band XXII, Heft 2, 166–174.

<sup>50</sup> Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., & Vergeer, M. M. (1982) *Opvoeden in geborgenheid: Een kritische analyse van Bowlby's attachmenttheorie*. Amsterdam: Van Loghum Slaterus, p. 151.

<sup>51</sup> *Ibid.*, 59.

offspring and the subsequent health and behaviour of these offspring. This was essential for the adoption of scientific methods such as hypothesis-testing and inter-rater reliability. This contributed to Bowlby's expectation that children's beliefs about the availability of others to serve as a safe haven would tolerably reflect their experiences of care, rather than primarily reflecting fantasy.<sup>52</sup> This was a position that appealed to developmental science, concerned with integrating behaviourist and cognitive perspectives on development, in emphasizing both the importance of concrete, observable caregiving behaviour and children's beliefs and expectations about their families.<sup>53</sup>

Bowlby characterized these expectations about care as 'internal working models.' Through the 1970s, as an explicit alternative to psychoanalytic concepts of defence, he developed an account of individual differences in these models in terms of the identification and processing of attachment-relevant information, culminating in his 1980 book *Loss*. Both Ainsworth's students and other developmental researchers interested in attachment praised Bowlby's concern with the cognitive and symbolic processes that guide or obstruct children's care-seeking behaviour. They regarded it an major contribution—especially Ainsworth's students of the 1980s at Virginia, inspired by *Loss*<sup>54</sup>—albeit they regarded the concept of 'internal working models' as essentially a placeholder.

Part of the trouble with the concept is that it reflects, but does not stabilize at all well, the Moebius strip between ethology and psychoanalysis in Bowlby's work, in suggesting both (i) behavioural plans and (ii) information about being worthy or not worthy of love.<sup>55</sup> Bretherton characterized the idea of the 'internal working model' as, essentially, a metaphor, one that allowed Bowlby above all to stress in a general and encompassing way that children's expectations about care should be regarded as tolerably accurate encapsulations of the history of past experiences, and that these expectations would shape children's behaviour and outcomes.<sup>56</sup> Indeed, both Ainsworth's students and researchers outside her circle regarded Bowlby's position as implying it was these *expectations* about care, not the care itself, that would predict a child's later outcomes.<sup>57</sup> The effects of care itself on child development were assumed to be fully mediated by the child's expectations, understood as qualitative differences in (or the 'quality' of) the attachment relationship.

Connell and Goldsmith called this the hour-glass model of attachment theory:

- there may be various determinants at the top that affect caregiver sensitivity (to be elaborated by future research);
- caregiver sensitivity in turn determines the small bottleneck of the Strange Situation Procedure in the middle;

<sup>52</sup> Bowlby, J. (1981) Psychoanalysis as a natural science. *International Review of Psycho-Analysis*, 8, 243–256.

<sup>53</sup> Sroufe, L. A. (1986) Bowlby's contribution to psychoanalytic theory and developmental psychopathology. *Journal of Child Psychology and Psychiatry*, 27, 841–849; Grossmann, K. E. (1986) From idiographic approaches to nomothetic hypotheses: Stern, Allport, and the biology of knowledge, exemplified by an exploration of sibling relationships. In J. Valsiner (ed.), *The Individual Subject and Scientific Psychology* (pp. 37–69). London: Plenum.

<sup>54</sup> For example, Kobak, R. R. (1985) The transition to college: Attitudes toward attachment and social competence. Unpublished doctoral dissertation, University of Virginia; Crittenden, P. M. (1990) Internal representational models of attachment relationships. *Infant mental health journal*, 11(3), 259–277.

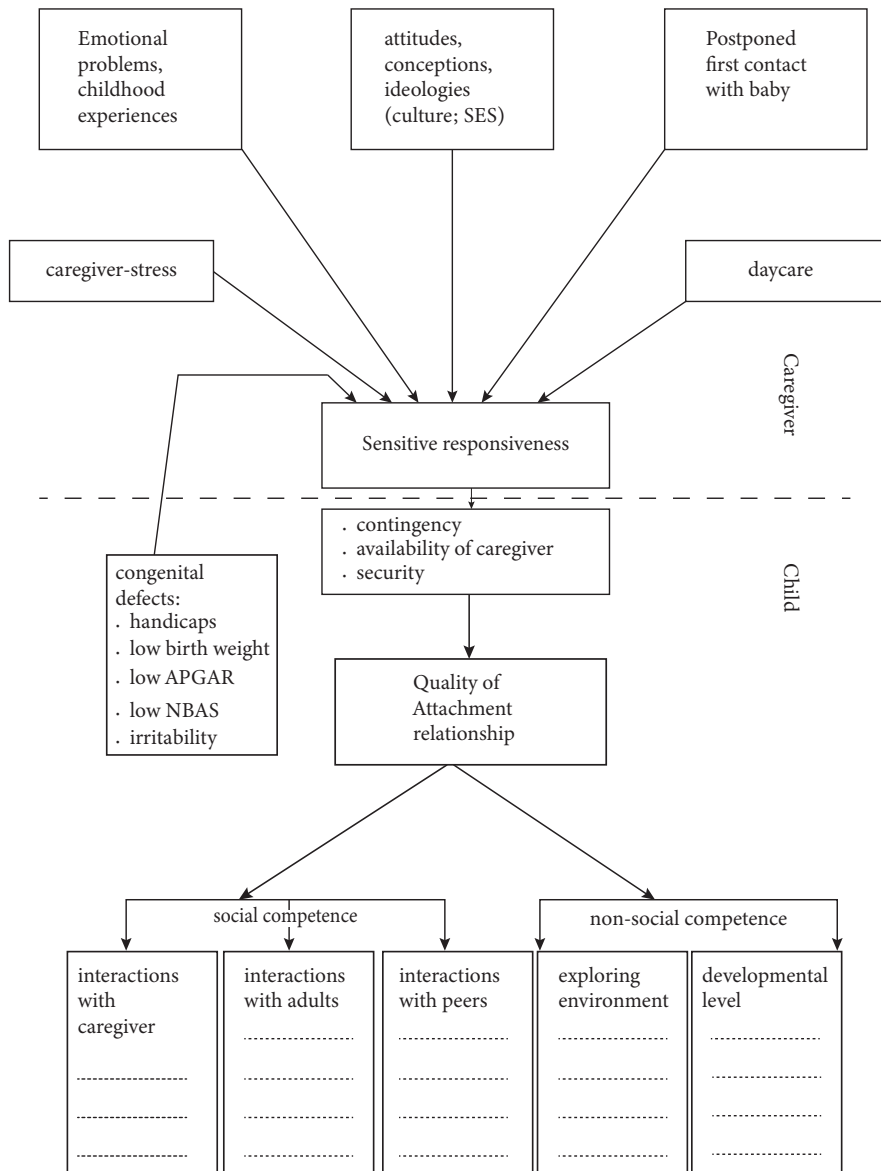
<sup>55</sup> This issue was raised directly with Bowlby by Hinde, R. (1967) Letter to John Bowlby, 28 June 1967 PP/Bow/K.4/11.

<sup>56</sup> Bretherton, I. (1998) Internal working models and communication in attachment relationships. In A. Braconnier & J. Sipo (eds), *Le Béb  et les interactions précoces* (pp. 79–90). Paris: Presses Universitaires de France.

<sup>57</sup> Belsky and Cassidy situated this as one of the defining propositions, and limitations, of Bowlby's attachment theory: 'Distinctive to attachment theory ... is the notion of what it is that mediates the influence of early relationship experience upon later psychological development—the internal working model.' Belsky, J. & Cassidy, J. (1994) Attachment: Theory and evidence. In M. Rutter & D. Hay (eds), *Development Through Life: A Handbook for Clinicians* (pp. 373–402). Oxford: Blackwell, p. 381. See also Steele, M. N. (1990) Intergenerational patterns of attachment. Unpublished doctoral thesis, University College London.

- the child's expectations about care in turn determine various later consequences at the bottom (to be elaborated by future research).<sup>58</sup>

This could be sketched as a diagram:<sup>59</sup>



Second, whereas Freud had a tendency to treat pathology as residing within the individual, developmental psychologists coming to attachment research admired Bowlby's theory

<sup>58</sup> Connel, J. P. & Goldsmith, H. H. (1982) A structural modelling approach to the study of attachment and strange situation behaviors. In R. N. Emde & R. J. Harmon (eds), *The Development of Attachment and Affiliative Systems* (pp. 67–83). New York: Plenum Press. See also Riksen-Walraven, J. M. A. (1983) Mogelijke oorzaken en gevolgen van een (on)-veilige eerste gehechtheidsrelatie. *Kind en Adolescent*, 4, 23–44.

<sup>59</sup> Riksen-Walraven, J. M. A. (1983) Mogelijke oorzaken en gevolgen van een (on)-veilige eerste gehechtheidsrelatie. *Kind en Adolescent*, 4, 23–44; Kooops, W., Hoeksma, J. B., & van den Boom, D. (1996) Stagnation and progress in research of early mother–child interaction and attachment. In W. Kooops, J. Hoeksma, D. V. D. Boom (eds), *Development of Interaction and Attachment: Traditional and Non-traditional Approaches* (pp. 1–23). Amsterdam: North-Holland.

for placing emphasis, following ethology, more resolutely on 'pathogenic situations'.<sup>60</sup> Such situations might lead to engrained responses in the individual over the course of development, but begin within a child's environment and relationships. Following ethology, the ultimate emphasis in Bowlby's attachment theory was on interactions, and the expectations that stem from them, which in turn could have a variety of consequences. The starting point for attachment was attention to forms of interaction, not types of people or types of pathology. This was central to the attraction of Bowlby's work for many developmentalists: it suggested that what might appear to be the problems of individual adults, might better be studied as downstream effects of early experiences of family life, which aligned well with the ambitions of developmental science as a discipline. Yet there was also considerable tension, felt especially by Ainsworth's students, between this theoretical focus on pathogenic situations, and a methodological focus on individual differences in attachment.<sup>61</sup> Over time a number of Ainsworth's former students were prompted to seek resolutions to this tension, whether by developing models for how individual differences express pathogenic situations,<sup>62</sup> or through developing new dyadic-focused coding measures.<sup>63</sup>

Third, whereas psychoanalytic theory tended to reach for explanations that depend upon symbolic capacities in children, ethology had documented behaviours common between human children and animals, and considered these behaviours from the perspective of both individual responsiveness to the environment and species-level evolution. Bowlby's ethological approach to behaviour was perceived by early empirical attachment researchers as having inherited the strengths of evolutionary theory. Van IJzendoorn and colleagues praised Hinde and Bowlby for their differentiation of behavioural responses in contrast to psychoanalytic ideas of generalized libido, and for their replacement of the idea of drive with a characterization of behavioural responses as preprogrammed but dependent on elaboration through experience for their full expression.<sup>64</sup>

This point was echoed by other early attachment researchers. In fact, some felt Bowlby had not gone far enough in this regard. For instance, Lyons-Ruth characterized Bowlby's focus on pathogenic situations as a tremendous contribution to developmental and clinical science. That said, she regretted that Bowlby had left out of his work ideas from ethology about how the moment-to-moment, day-to-day interaction of offspring with their caregiver contributes to physiological regulation or dysregulation, and through this to their

<sup>60</sup> Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., & Vergeer, M. M. (1982) *Opvoeden in geborgenheid: Een kritische analyse van Bowlby's attachmenttheorie*. Amsterdam: Van Loghum Slaterus, p. 25. See also Goldberg, S. (1993) Early attachment: A passing fancy or a long term affair. *Canadian Psychology/Psychologie canadienne*, 34(3), 307.

<sup>61</sup> Sroufe, L. A. (2007) The place of development in developmental psychopathology. In A. Masten (ed.), *Multilevel Dynamics in Developmental Psychopathology: Pathways to the Future. The Minnesota Symposia on Child Psychology*, Vol. 34 (pp. 285–299). Mahwah, NJ: Lawrence Erlbaum Associates: 'We readily slip into describing cause in terms of individual traits rather than developmental systems. At the outset I want to adopt the curved finger of accusation and say that attachment theorists, such as myself, are equally vulnerable to this problem. Frequently, we slip into using terms such as "securely attached child" when we know that attachment is really a relationship term, and the proper description would be "a child with a history of a secure relationship with the primary caregiver"' (291).

<sup>62</sup> For example, Kobak, R. & Bosmans, G. (2018) Attachment and psychopathology: A dynamic model of the insecure cycle. *Current Opinion in Psychology*, 25, 76–80.

<sup>63</sup> For example, Crittenden, P. M. (1992) *Preschool Assessment of Attachment*, Miami: Family Relations Institute; Britner, P. A., Marvin, R. S., & Pianta, R. C. (2005) Development and preliminary validation of the caregiving behavior system: Association with child attachment classification in the preschool Strange Situation. *Attachment & Human Development*, 7(1), 83–102.

<sup>64</sup> Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., & Vergeer, M. M. (1982) *Opvoeden in geborgenheid: Een kritische analyse van Bowlby's attachmenttheorie*. Amsterdam: Van Loghum Slaterus, pp. 25–27.

expectations about safety, danger, and the availability of care.<sup>65</sup> In correspondence, Bowlby accepted this point wholeheartedly,<sup>66</sup> but he did not know how to integrate it. In his theory, attachment expectations tended to be treated as cognitions about interaction under conditions of alarm, and he was not sure how to think about how such cognitions relate to physiological processes under non-alarming conditions, and whether or not these should be considered as part of 'internal working models.'<sup>67</sup> Researchers in Ainsworth's circle, such as Sroufe and Waters, highlighted this already in the 1970s,<sup>68</sup> as did other developmental psychologists engaging with attachment research.<sup>69</sup>

A critique of Bowlby presented by most second generation attachment researchers, in agreement with feminist commentators, was his emphasis on a child's attachment to the mother as the most important caregiver. Belsky and Cassidy regarded this as an unfortunate matter of emphasis, a legacy of psychoanalytic theory, rather than an especially important feature of Bowlby's position requiring any adjustment to attachment theory.<sup>70</sup> By contrast, Van IJzendoorn and colleagues lambasted Bowlby's 'undue idolatry of "mother love"'.<sup>71</sup> This critique would later be developed into the theory of attachment networks, which Van IJzendoorn and colleagues would oppose to Bowlby's theory of monotropy. Yet on this point Van IJzendoorn and other critics revealed a misunderstanding of Bowlby's position, one that stems from the priority they appear to give through their analysis to statements made in Bowlby's books over statements made in his articles.

As I documented in *Cornerstones of Attachment Research*, the term 'monotropy' was first used and defined by Bowlby in a 1958 paper as 'the tendency for instinctual responses to be directed towards a particular individual or group of individuals and not promiscuously towards many'.<sup>72</sup> In a footnote Bowlby clarifies that the meaning is the same as William James's concept of 'the law of inhibition of instincts by habits', which is the observation that 'when objects of a certain class elicit from an animal a certain sort of reaction, it often happens that the animal becomes partial to the first specimen of the class on which it has reacted'.<sup>73</sup> There is no implication that attachment is limited to one person, or that it is fixed regardless of later experiences. However, this was certainly not the impression of Bowlby's readers, including Van IJzendoorn and other second generation researchers without personal relationships with Bowlby or Ainsworth.

<sup>65</sup> Lyons-Ruth, K. (1998) Commentary on Steele and Steele: Lexicons, eyes, and videotape. *Social Development*, 7(1), 127–131; Schuder, M. & Lyons-Ruth, K. (2004) 'Hidden trauma' in infancy: Attachment, fearful arousal, and early dysfunction of the stress response system. In J. Osofsky (ed.), *Young Children and Trauma* (pp. 69–104). New York: Guilford Press.

<sup>66</sup> Bowlby, J. (1983) Letter to Myron Hofer, 29 July 1983, John Bowlby Archive, Wellcome Collections, PP/Bow/J.9/102.

<sup>67</sup> See e.g. Bowlby, J. ([1969] 2021) Anxiety, stress and homeostasis. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 34–45), New York: Wiley; Bowlby, J. (not dated, c.1955) Thought, conceptualization, language, psycho-analysis. John Bowlby Archive, Wellcome Collections, PP/BOW/H.115.

<sup>68</sup> Sroufe, L. A. & Waters, E. (1977) Attachment as an organizational construct. *Child Development*, 48(4), 1184–1199. See also Grossmann, K. E. (1995) The evolution and history of attachment research and theory. In S. Goldberg, R. Muir, & J. Kerr (eds), *Attachment Theory: Social, Developmental and Clinical Perspectives* (pp. 85–102). Hillsdale, NJ: The Analytic Press.

<sup>69</sup> Belsky, J. & Cassidy, J. (1994) Attachment: Theory and evidence. In M. Rutter & D. Hay (eds), *Development through Life: A Handbook for Clinicians* (pp. 373–402). Oxford: Blackwell.

<sup>70</sup> Ibid. See also Grossmann, K. E. & Spangler, G. (1990) Frühkindliche Umwelt. In L. Kruse, C. F. Graumann, & E. D. Lantermann (eds), *Ökologische Psychologie. Ein Handbuch in Schlüsselbegriffen* (pp. 349–355). München: Psychologie Verlags Union.

<sup>71</sup> Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., & Vergeer, M. M. (1982) *Opvoeden in geborgenheid: Een kritische analyse van Bowlby's attachmenttheorie*. Amsterdam: Van Loghum Slaterus, p. 17.

<sup>72</sup> Bowlby, J. (1958) The nature of the child's tie to his mother. *The International Journal of Psycho-analysis*, 39(5), 350–373, p. 370.

<sup>73</sup> James, W. ([1890] 2003) *Psychology: The Briefer Course*. Toronto: Dover Books, p. 266.

The reasons for this seem clear. In *Attachment, Volume 1* from 1969, the term appears only once: Bowlby referred his reader back to this 1958 discussion for the meaning of this term, but summarized this earlier account of monotropy briefly—and inaccurately—as ‘the bias of a child to attach himself especially to one figure.’<sup>74</sup> In fact, ‘monotropy’ was intended by Bowlby as a technical term for the way that experience leads a response to become oriented towards particular targets. He wanted to refer to relationships established with a particular ‘person or place or thing’ that is personally significant, based on a felt sense of need, and not superficial or interchangeable. The term ‘discrimination’ captures Bowlby’s intention better than monotropy in fact—and indeed would be preferred by his closest collaborators.<sup>75</sup>

For those researchers more distant from Bowlby but committed to his ideas, in particular Sagi-Schwartz and Van IJzendoorn, misunderstanding of the concept of monotropy nonetheless proved constructive in galvanizing concerted efforts to explicitly develop the idea of attachment networks (Chapters 3 and 4). This interest in the boundaries of monotropy also prompted the important studies of overnight care by Sagi-Schwartz, Van IJzendoorn, and colleagues, which documented that routine communal overnight care by unfamiliar adults was significantly associated with increased infant–parent insecurity, showing the importance of caregiver overnight care for children’s expectations about caregiver availability.<sup>76</sup>

### The Strange Situation

During the mid-1960s, Bowlby’s colleague Mary Ainsworth, based in the United States, developed a standardized laboratory procedure known as the Strange Situation, as a supplement to her extensive observational study of infants and mothers at home.<sup>77</sup> She worried that her observational study would not be publishable without some laboratory-based assessment to validate it in the eyes of reviewers. In the Ainsworth Strange Situation the infant and caregiver enter a laboratory space with toys set out a little way away from a chair for the caregiver. After a few minutes to get used to the room, a stranger enters. The stranger begins by sitting quietly and observing the dyad; the stranger then speaks with the caregiver, which conveys to the infant that the caregiver does not regard the stranger as a threat; finally, the stranger then attempts interaction with the infant. This was expected to activate the attachment motivational system by another increment. The caregiver then takes leave of and returns to the infant twice. These separations, in turn, ratchet up the activation of the attachment behavioural system further. With the behaviour of the caregiver partially standardized, and the attachment behavioural system activated by careful increments, Ainsworth aimed to activate the infant’s expectations based on what happened when he or she has felt anxiety in the past about the availability of the attachment figure, and allow a viewer to interpret these expectations from observed behaviour. The

<sup>74</sup> Bowlby, J. (1969/1982) *Attachment*, London: Penguin, p. 249.

<sup>75</sup> For example, Ainsworth, M. (1964) Patterns of attachment behavior shown by the infant in interaction with his mother. *Merrill-Palmer* 10(1), 51–58, p. 56.

<sup>76</sup> Aviezer, O., Van IJzendoorn, M. H., Sagi, A., & Schuengel, C. (1994) ‘Children of the dream’ revisited: 70 years of collective early child care in Israeli kibbutzim. *Psychological Bulletin*, 116(1), 99–116.

<sup>77</sup> Van Rosmalen, L., Van der Veer, R., & Van der Horst, F. (2015) Ainsworth’s strange situation procedure: The origin of an instrument. *Journal of the History of the Behavioral Sciences*, 51(3), 261–284; Waters, E., Vaughn, B., & Bernard, K. (2021) The Strange Situation paradigm, practice, and FAQs. In E. Waters, B. E. Vaughn, & H. S. Waters (eds), *Measuring Attachment: Developmental Assessment across the Lifespan* (pp. 87–140), New York: Guilford.

two separations and reunions offer a built-in replication, helping strengthen the signal of the observation to contribute to coder confidence in what they are seeing.<sup>78</sup>

In his 1979 article, Van IJzendoorn criticized the Strange Situation as perhaps too ‘artificial and unnatural’ to be fully valid as an assessment of child attachment. He expressed frustration that ‘the lack of the other family members, such as the father and any brothers and sisters is a disadvantage for validity.... The “Strange Situation” isolates the mother–child couple, instead of the embedding of the child in the total family system.’<sup>79</sup> By the time of *Opvoeden in Geborgenheid* in 1982, Van IJzendoorn had changed his mind, as he came to understand more about what the procedure sought to measure. Ainsworth named her book *Patterns of Attachment: A Psychological Study of the Strange Situation*.<sup>80</sup> In *Opvoeden in Geborgenheid* Van IJzendoorn and colleagues astutely discerned that this was a misnomer. Based on careful reading of Ainsworth’s writings, Van IJzendoorn and colleagues recognized that the Strange Situation was *never regarded by Ainsworth as an assessment of a thing called ‘attachment’*, or as an assessment of individual infants. This was a shorthand at best, and misleading at worst. (This is important for understanding his later claims about the ‘transmission gap’, Chapter 4.)

In fact, Ainsworth’s Strange Situation sought to mobilize the infant’s expectations based on what happened when he or she has felt anxiety in the past about the availability of the attachment figure, and allow a viewer to interpret these expectations from observed behaviour. The function of the artificial and unnatural, laboratory-based procedure was to dramatize an everyday issue in the lives of infants: the question of the extent to which their experiences had led them to believe that the caregiver was available when needed. The function of the two separations and reunions was to pose this question first at a low level, and then at a moderate level. As responses to this question, the infant’s behaviours are allocated heightened and interpretable meaning, as tangible vehicles for their expectations about the caregiver’s availability. The infant’s behaviours are made into a registering apparatus for this aspect of the history of their relationship.

Most infants responded to the Strange Situation exactly as Bowlby had anticipated: at least by the second separation they sought the availability of their caregiver, and on reunions they could be comforted and return to play. Various attachment behaviours were shown by these infants: they could crawl or waddle to their caregiver on reunion, lift their arms to be picked up, signal with a directed cry, or clamber up onto the caregiver. Closeness with the caregiver was regained when needed, a goal that could be achieved through various means. The infant’s behaviour appeared to reflect the expectation that the caregiver would be available when needed.

However, a group of children did not show more attachment behaviour as the separations and reunions progressed, and instead directed their attention and their movements away from their caregiver. These children would concentrate their attention on toys or

<sup>78</sup> Kroonenberg, P. M., Dam, M. V., IJzendoorn, M. V., & Mooijart, A. (1997) Dynamics of behaviour in the strange situation: A structural equation approach. *British Journal of Psychology*, 88(2), 311–332: ‘The second sequence does not add qualitatively new information to what is observed in the first sequence but merely intensifies the behavioural pattern. The replicated nature of the Strange Situation procedure may be one of the reasons for its robustness and its validity despite its relatively short duration’ (327–328).

<sup>79</sup> Van IJzendoorn, M. H. (1979) Operationaliseringsproblemen bij onderzoek naar de affectieve relatie tussen ouder en kind. *Pedagogische Studien*, 56, 358–368, p. 358. For a recent return by Van IJzendoorn to these themes, see Dagan, O., Schuengel, C., Verhage, M. L., Van IJzendoorn, M. H., Sagi-Schwartz, A., Madigan, S., ... & Collaboration on Attachment to Multiple Parents and Outcomes Synthesis (2021) Configurations of mother-child and father-child attachment as predictors of internalizing and externalizing behavioral problems: An individual participant data (IPD) meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 67–94.

<sup>80</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press.



other aspects of the room just at the moment when other infants would show distress. Yet the quality of this attention to the toys was poor—mostly just banging them about. It seemed that the toys were being used as a distraction to avoid attending to the caregiver and other cues for the activation of the attachment system. A third group of infants seemed less able to use the caregiver as a safe base from which to explore the novel environment, and were difficult to comfort on reunion with the caregiver. They often showed frustration with the caregiver, even to the point that anger would interrupt displays of attachment behaviour.

Early studies by Bowlby and his group had focused on counting individual behaviours, such as the number of directed cries or reaches to the caregiver, to index differences in attachment relationships.<sup>81</sup> This was also adopted in some of Ainsworth's early work, including her first attempts at coding her home observation data. Yet Ainsworth was uneasy with this approach, with growing certainty that a child unsure about the availability of their attachment figure may intensify their attachment behaviours, and a child who has learnt that attachment behaviours will be ignored or punished by an attachment figure may show fewer. She developed four scales for coding infant behaviour in the Strange Situation: proximity-seeking, contact-maintenance, avoidance, and resistance. These scales characterize infant behaviour in terms of (i) the extent to which the child initiates the behaviour, (ii) how promptly they display it, (iii) frequency of the behaviour, and (iv) its duration.

These scales were used to help place infants into one of three categories. Where infant behaviour seemed to demonstrate confidence in the caregiver's availability through low avoidance or resistance and moderate or strong proximity-seeking on reunion, Ainsworth labelled these infant-caregiver dyads as showing 'secure' attachment (Group B). Where children directed their attention and their movements away from their caregiver on reunion, Ainsworth came to label these infant-caregiver dyads as showing insecure 'avoidant' attachment (Group A). And where infants seemed less able to use the caregiver as a safe base from which to explore the environment, and were frustrated and difficult to comfort on reunion, Ainsworth came to label these infant-caregiver dyads as showing insecure 'resistant' attachment (Group C).<sup>82</sup>

Ainsworth found that a child's display of secure or insecure behaviour in the Strange Situation could be predicted by observations of the dyads at home: a child's relative confidence in their caregiver's availability when alarmed appeared linked to a particular kind of caregiver behaviour. Ainsworth used the concept of 'secure base' to refer to the way that an infant—or, indeed, humans in general—can feel free to explore the world with confidence, as he or she knows that protection and care is available if needed. The idea came from her teacher William Blatz, whose 'security theory' had proposed that confidence and an appropriate level of self-reliance would grow out of experiences of being able to rely and rest our weight upon others, and of their availability to help us as needed.<sup>83</sup> As such, in early life, parents who are able to give children confidence in their availability to meet their needs in

<sup>81</sup> For example, Schaffer, H. R. & Emerson, P. E. (1964) The development of social attachments in infancy. *Monographs of the Society for Research in Child Development*, 29(3), 1–77.

<sup>82</sup> This terminology is used throughout this book for consistency, though it is acknowledged that the patterns have received different names in different contexts, and their meaning may change depending on how they are coded. Prior, V., Glaser, D., Sumner, J., & Wright, B. (2024) Inconsistency of nomenclature in classifying attachment patterns of infants and preschool children observed in the Strange Situation Procedure. Manuscript under review.

<sup>83</sup> Van Rosmalen, L., Van IJzendoorn, M. H., & Van der Veer, R. (2015) Measuring attachment: The Ainsworth Security Questionnaires revisited. In Lenny van Rosmalen (2015) From security to attachment. Mary Ainsworth's contribution to attachment theory. Unpublished doctoral thesis, Leiden University, <https://scholarlypublications.universiteitleiden.nl/handle/1887/33739>; Van Rosmalen, L., Van Der Horst, F. C., & Van der Veer, R. (2016) From

general will offer security to explore the world without the need for excessive caution or control.

Whereas Bowlby had focused on the child's expectations about caregiver help in times of need, Ainsworth was inspired by Blatz to draw attention to the importance of ordinary interactions and the capacity of the caregiver to support the child's capacity to remain focused on engaging with the environment and not disrupted by worries. She anticipated that both would contribute to a child's feeling of confidence in the availability of others to support them, as might other experiences in childhood or adulthood. The idea of security in the use of the caregiver as a secure base and safe haven was, for Ainsworth, a particular form of a broader concept of security.<sup>84</sup>

Infants' use of their caregiver as a secure base and safe haven in the Strange Situation was strongly associated with Ainsworth's home observation data; though these observations were not by independent observers. The caregivers in secure dyads were more likely to be cooperative rather than interfere with the infant's behaviour; they were more likely to attend to their child rather than ignore them; and they were more likely to accept rather than reject their baby's signals about their needs. Ainsworth developed scales for each of these responses.<sup>85</sup> The caregivers in avoidant dyads were the most rejecting and interfering, whereas the caregivers in resistant dyads were more likely to ignore their infant's signals.<sup>86</sup> However all three scales were highly intercorrelated with a further factor, which Ainsworth felt was decisive: the ability of the caregiver to 'perceive and to interpret accurately the signals and communications implicit in her infant's behavior, and given this understanding, to respond to them appropriately and promptly.'<sup>87</sup> Ainsworth termed this quality 'sensitivity', and developed a scale for coding this aspect of caregiving.

Contrary to frequent misinterpretations, a sensitive response need *not* be to follow the child's apparent wishes; rather the caregiver 'acknowledges the baby's wishes even though she does not unconditionally accede to them', since much of what is 'for the baby's own good is done contrary to his wishes.'<sup>88</sup> 'Insensitive' caregiving was characterized by the

secure dependency to attachment: Mary Ainsworth's integration of Blatz's security theory into Bowlby's attachment theory. *History of Psychology*, 19(1), 22–39; Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 2.

<sup>84</sup> Ainsworth, M. ([1990] 2010) Security and attachment. In Volpe, R. (ed.), *The Secure Child: Timeless Lessons in Parenting and Childhood Education* (pp. 43–53). Charlotte, North Carolina: Information Age Publishing: 'By focusing so closely on intimacies some attachment researchers have come to conceive of them as the only source of security—which is a pity' (49). In notes shared with Ainsworth and close colleagues in 1987, Waters can be seen worrying about this: 'Definitional issues related to the concept of security. A) Ainsworth notes etymology of the term security—Latin "without care". But is security an emotion or is the emotion a consequence or epiphenomenon of what is primarily a cognitive appraisal. Bowlby finesses this by saying that the feeling is a phase of the appraisal. What specifically does that mean? Is he finessing too much here? B) How about defining security in terms of ability to use adult as secure base and/or confidence in adult's availability and responsiveness? Same definition ok for infancy and adulthood relationships? C.) How about making the term "security" refer specifically to something derived from attachment relationship? This way we can accommodate the idea that there are many sources of security. Also avoid implying that security from various sources is equivalent.' Waters, E. (1987) Outline for Winter Attachment Project: Compiled from written briefs (12/87). Unpublished manuscript. Everett Waters personal archive.

<sup>85</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) Appendix: Maternal caregiving and interaction scales. In *Patterns of Attachment: A Psychological Study of the Strange Situation* (pp. 356–379). Bristol: Psychology Press.

<sup>86</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press, Table 27.

<sup>87</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) Appendix: Maternal caregiving and interaction scales. In *Patterns of Attachment: A Psychological Study of the Strange Situation* (pp. 356–379). Bristol: Psychology Press.

<sup>88</sup> Ibid. Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) Appendix: Maternal caregiving and interaction scales. In *Patterns of Attachment: A Psychological Study of the Strange Situation* (pp. 356–379). Bristol: Psychology Press.

same four components in reverse: less awareness of the child's signals; inaccuracies in interpreting them; inappropriate responses to the signals; and a lack of timeliness in these responses. Ainsworth and colleagues reported an astonishingly strong association between the secure classification and caregiver sensitivity:  $r(21) = 0.78$ . Such a strong association is teetering on the edge of impossible when calculating associations between a continuous variable (sensitivity) and a discrete variable (security) (indeed, the finding would be subsequently shown to be an outlier; Chapter 4). It suggests that observed sensitivity and the Strange Situation are essentially measuring the same thing. Ainsworth found that caregiver sensitivity in her Baltimore data predicted children's cooperativeness, distress, and aggression on brief everyday separations within the home, and other aspects of their home behaviour.

As her student Everett Waters has observed, in ordinary language, 'sensitivity suggests warmth, tenderness, and attention to detail'.<sup>89</sup> These are qualities prized by many Western societies, but are by no means important to every culture around the world.<sup>90</sup> In using the term, Ainsworth opened her work up to considerable misunderstanding, contributing to an allodoxic image of her position as emphasizing the critical importance of maternal warmth. The problem is that this was, by no means, what Ainsworth intended by 'sensitivity'. In fact, observed maternal warmth was not significantly associated with behaviour by children suggesting the expectation of caregiver availability in either her Uganda or her Baltimore observations. In Ainsworth's Baltimore data, kissing the infant was in fact significantly associated with avoidance, as several caregivers seemed to use kissing as an alternative to, rather than as a component of, close contact with their child.<sup>91</sup> The distinct correlates of sensitivity compared to warmth were supported by other studies in the early 1980s.<sup>92</sup> Ainsworth's concept of sensitivity considered the form, not the content, of interactions.<sup>93</sup>

Though caregivers in avoidant and resistant dyads were observed to show less sensitivity at home, Ainsworth was less certain of what distinguished the expectations about care underpinning the two forms of insecure attachment. Caregivers in avoidant dyads were more likely to pick their child up in an abrupt and interfering manner, and were less likely to cuddle them. They were also more likely to show anger towards their infant. Ainsworth concluded that for avoidant infant-caregiver dyads, the attachment motivational system was being activated by the Strange Situation, but its expression was being suppressed by the infant. In terms of resistant dyads, Ainsworth had the qualitative impression that the caregivers of these infants were more inconsistent in their attention to their child. This was

<sup>89</sup> Waters, E., Petters, D., & Facompre, C. (2013) Epilogue: reflections on a Special Issue of *Attachment & Human Development* in Mary Ainsworth's 100th year, *Attachment & Human Development*, 15(5–6), 673–681, p. 676.

<sup>90</sup> For example, LeVine, R. A. (2004) Challenging expert knowledge: Findings from an African study of infant care and development. In U. P. Gielen & J. L. Roopnarine (eds), *Childhood and Adolescence: Cross-Cultural Perspectives and Applications* (pp. 149–65). Westport, CT: Greenwood Publishing

<sup>91</sup> Tracy, R. L. & Ainsworth, M. D. S. (1981) Maternal affectionate behavior and infant-mother attachment patterns. *Child Development*, 52, 1341–1343.

<sup>92</sup> For example, Egeland, B. & Farber, E. A. (1984) Infant-mother attachment: Factors related to its development and changes over time. *Child Development*, 55(3), 753–771.

<sup>93</sup> Bretherton I. (1987) New perspectives on attachment relations: Security, communication, and internal working models. In Osofsky J. D. (ed.), *Handbook of Infant Development* (2nd ed., pp. 1061–1100). New York: Wiley: 'It is often overlooked that insensitivity as understood by Ainsworth is not necessarily indexed by unpleasant, rejecting, mean, or nasty behaviour. Insensitivity means that the caregiver is not reading and/or supportively responding to the infant's states or goals, thereby teaching the infant that its signals are irrelevant or counter-productive. It is insensitive to deny a distressed or fearful infant the solace of bodily contact (rejection), but it is equally insensitive behaviour to insist on affectionate physical contact when the infant is deeply engrossed in some exploratory task (interference). Ainsworth proposed that insensitivity results from mothers' inability to take the baby's perspective' (1089).

often repeated by Ainsworth's students, including in an influential article by Cassidy and Berlin,<sup>94</sup> such that it has become an accepted truth.<sup>95</sup> Ainsworth's ally Sroufe advocated to other researchers for the interpretation of resistance as reflecting inconsistent or unpredictable care, for instance persuading Belsky of this account.<sup>96</sup> These ideas would find echo in later work by Belsky and colleagues on harshness and unpredictability as the two basic forms of childhood adversity (Chapter 3).

In fact, Ainsworth could not support this observation through her data, and in her final account of the classification made no mention of inconsistent or unpredictable care.<sup>97</sup> Rather than inconsistency, what Ainsworth's data actually showed was that infants from resistant dyads were more likely to cry when the caregiver left the room at home. Their care was distinguished by greater 'delay in responding to cry signals and occupying the time when holding the baby with routines.'<sup>98</sup> Put together with their behaviour in the Strange Situation, from this Ainsworth inferred that these infants' experiences had made them concerned about the availability of their caregiver, causing the infants to increase the intensity of care-seeking signals. Unpredictability might be one contributing factor, but was not the heart of the matter. This interpretation of the resistant category has been rather more frequent among researchers from outside of Ainsworth's immediate circle, such as Sagi-Schwartz, Goldberg, Van IJzendoorn, and Lyons-Ruth.<sup>99</sup> Sagi-Schwartz and Van IJzendoorn found supportive evidence in their observation that communal overnight care for infants by strangers on Israeli kibbutzim caused insecure resistant attachment. The caregivers were not unpredictable or inconsistent in their behaviour towards their infants, but were predictably unavailable when the infants became distressed at night.<sup>100</sup> Other studies, all by researchers outside of Ainsworth's circle, and generally outside the United States, have repeatedly supported the conclusion that resistance is associated with consistently disengaged caregiver behaviour observed during interaction,<sup>101</sup> not unpredictability.<sup>102</sup>

<sup>94</sup> Cassidy, J. & Berlin, L. J. (1994) The insecure/ambivalent pattern of attachment: Theory and research. *Child Development*, 65(4), 971–991.

<sup>95</sup> For example, Colin, V. (1996) *Human Attachment*. Philadelphia: Temple University Press.

<sup>96</sup> Belsky, J., Rovine, M., & Taylor, D. G. (1984) The Pennsylvania Infant and Family Development Project, III: The origins of individual differences in infant-mother attachment: Maternal and infant contributions. *Child Development*, 55(3), 718–728: 'Sroufe himself considers inconsistency in responsiveness to be the hallmark of care leading to resistance rather than unresponsiveness per se. To the extent that he is correct, it may be the case that when caregivers are exceedingly inconsistent in their tendency to respond to their babies, overall levels of both stimulation and responsiveness become especially low' (726), citing Sroufe, L. A. personal communication, November 15, 1982.

<sup>97</sup> Ainsworth, M. D. S. & Eichberg, C. G. (1991) Effects on infant-mother attachment of mother's experience related to loss of an attachment figure. In C. M. Parkes, J. Stevenson-Hinde, & P. Marris (eds), *Attachment Across the Life Cycle* (pp.160–183). London: Routledge, p. 162.

<sup>98</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press, p. 245.

<sup>99</sup> The issue is discussed at some length in a doctoral study supervised by Lyons-Ruth. Griffin, M. E. (1997) Understanding mothers' contribution to disorganized attachment: A behavioral analysis of mother-child interaction in a naturalistic setting. Unpublished doctoral dissertation, Northwestern University.

<sup>100</sup> Sagi, A., Van IJzendoorn, M. H., Aviezer, O., Donnell, F., & Mayseless, O. (1994) Sleeping out of home in a kibbutz communal arrangement: It makes a difference for infant-mother attachment. *Child Development*, 65(4), 992–1004.

<sup>101</sup> Smith, P. B. & Pederson, D. R. (1988) Maternal sensitivity and patterns of infant-mother attachment. *Child Development*, 59(4), 1097–1101; Lewis, M. & Feiring, C. (1989) Infant, mother, and mother-infant interaction behavior and subsequent attachment. *Child Development*, 60(4), 831–837; Cantero, M. J. & Cerezo, M. Á. (2001) Interacción madre-hijo como predictora de conductas de apego: evaluación de dos modelos causales. *Infancia y aprendizaje*, 24, 113–132; Fuertes, M., Lopes-dos-Santos, P., Beeghly, M., & Tronick, E. (2009) Infant coping and maternal interactive behavior predict attachment in a Portuguese sample of healthy preterm infants. *European Psychologist*, 14(4), 320–331; Beebe, B. & Lachmann, F. M. (2014) *The Origins of Attachment*. London: Routledge.

<sup>102</sup> The role of disengaged caregiving in predicting resistance, disorganisation, or both (and potential moderators) remains a current issue—see Chapter 2.

## Reception of Ainsworth among Attachment Researchers in the 1980s

Bowlby had been keen to use television, radio, magazine articles, and books published by popular presses to influence clinicians, policy-makers, and the wider public, putting into circulation a cut-down commodified version of his ideas.<sup>103</sup> These methods were not pursued by Ainsworth and they were not generally adopted by the subsequent generation of attachment researchers, with exceptions such as Patricia Crittenden and Peter Fonagy. In fact, Ainsworth's correspondence time and again reveals her deep discomfort when she was approached with requests for prescriptive advice. Though they entered into public discourse to an extent regardless, the eschewal of popular media by Ainsworth, her circle, and developmental psychologists entering attachment research stands out as unusual among their peers.<sup>104</sup> Child development researchers, in general, have been among the most active in public engagement among psychological researchers, in part due to the ready public and practitioner audience for knowledge in this area, and the growing policy problematization of child development. Ainsworth could have adopted the role, like Bowlby, of public intellectual; it was not a role she trusted. She was mindful of the attendant risks: already in 1968 she wrote to Bowlby with concern that 'attachment has become a bandwagon'.<sup>105</sup>

Beyond the model provided by Ainsworth, several further reasons might be identified for the neglect of public engagement by the second generation of attachment researchers. One would surely be the lack of incentives for public engagement within American academic life in the 1980s and 1990s. Additionally, the second generation had seen directly the problems and misunderstandings caused by Bowlby's popularizing texts; there may have been a sense of wanted to seal themselves off from what they felt unable to mend. As Goldberg observed, after Bowlby 'many attachment researchers (myself included) have been reluctant to take on this responsibility' for knowledge exchange with non-researchers.<sup>106</sup> Beyond this, a further reason for the lack of public engagement activities by Ainsworth and most of her successors is likely to have been the urgent priority felt for the development of attachment as a distinct and differentiated scientific paradigm, a 'field' for attachment research.<sup>107</sup> This was understood to entail efforts to test and secure the main aspects of what were judged Ainsworth's legacy: the Strange Situation and its expectable caregiving and behavioural correlates.

These contributions were regarded as a revolution for the empirical study of child development. Whereas Bowlby had conceptualized the attachment system in the limited terms of a child's proximity-seeking, Ainsworth had resituated proximity-seeking within

<sup>103</sup> The disjuncture between the willingness to engage with public media between Bowlby and Ainsworth was already remarked upon by Karen, R. (1990) *Becoming attached*. *The Atlantic*, February 1990: 'Ainsworth is all but unknown to the public (and to many psychoanalysts and psychiatrists, who tend to be unfamiliar with trends in developmental psychology), and yet her fame in the world of infant development exceeds that of John Bowlby himself.... Unlike Bowlby, who holds the light as if he were born to it, she doesn't seem at home.'

<sup>104</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press.

<sup>105</sup> Ainsworth, M. (1968) Letter to John Bowlby, 27 April 1968. John Bowlby Archive, Wellcome Collections, PP/Bow/K.4/12. See also Isaacson, K. L. (2006) *Mary Ainsworth and John Bowlby: The Development of Attachment Theory*. Davis: University of California.

<sup>106</sup> Goldberg, S. (2000) *Attachment and Development*, London: Routledge, p. 248. By way of comparison, consider the use of popular forums even for scholarly debates in evolutionary psychology in the 1990s. Cassidy, A. (2005) Popular evolutionary psychology in the UK: An unusual case of science in the media? *Public Understanding of Science*, 14(2), 115–141. The marked contrast between attachment research and evolutionary psychology in this regard has been noted by Granqvist, P. (2020) *Attachment, Religion, and Spirituality: A Wider View*. New York: Guilford.

<sup>107</sup> Bourdieu, P. (1975) The specificity of the scientific field and the social conditions of the progress of reason. *Social Science Information*, 14(6), 19–47.

the broader frame of the child's expectations about the availability of the caregiver as a secure base and safe haven. This opened the question of individual differences in these expectations and their origins. The Strange Situation promised a way to study family life and children's expectations about their caregivers' availability within a laboratory-based, replicable observational setting.

Ainsworth later recalled that 'the fact that the Strange Situation was not in the home environment, that it was in the lab, really helped. I only did it as an adjunct to my naturalistic research, but it was the thing that everyone could accept somehow. It was so demonstrable.'<sup>108</sup> She would have preferred to have written a book about sensitivity, but there was so much enthusiasm for the Strange Situation from others that she felt forced to make this the focus of her book. Karin and Klaus Grossmann found that whereas they struggled to find funding for naturalistic observational research with parents, the Strange Situation more readily appealed to funders as, ostensibly, a more scientific procedure.<sup>109</sup> They nonetheless persevered, and refused what they saw as the 'tunnel vision' of many attachment researchers, overfocused on the Strange Situation at the expense of observation of caregiving.<sup>110</sup> They conducted observational assessment of caregiving every time they recalled participants in a longitudinal sample. Such an approach was reinforced as, in their work, observations of both maternal and paternal sensitivity each proved a considerably more enduring predictor of later child outcomes, across numerous measures, than the Strange Situation.

The Grossmanns originally came to attachment research via ethology (specifically, observational research on honey bees), and continued to think about human behaviour in terms of motivational systems, even after this fell out of fashion with other attachment researchers.<sup>111</sup> They had trained in the naturalistic observation of animal behaviour in Freiburg with Bernhard Hassenstein, learning from discussions and seminars with Konrad Lorenz and his coworkers. From an ethological perspective, the greater predictive success of sensitivity than the Strange Situation actually made considerable sense. For the Grossmanns, sensitivity did not mean that mothers should be assessed against an imperative to take the infant's cue, though this may understandably be taken as the implication of some of the wording of the sensitivity scale.

Ainsworth's sensitivity scale, as it was written, headlined responsiveness to a child's signals not their motivations or needs. Indeed, the term 'need' appears only once in the Ainsworth sensitivity scale, but referring to the mother's attention to the infant's signals in a manner not distorted by her own needs or defences. Yet a focus on motivations or need was already present in the tone and imagery of Ainsworth's scale, if not its overt wording: Ainsworth's concern throughout was on the caregiver's ability to identify and accurately interpret the motivation or need implicit in their child's signals. This motivation or need

<sup>108</sup> Interview with Mary Ainsworth by Robert Karen cited in Karen, R. (1998) *Becoming Attached: First Relationships and How They Shape Our Capacity to Love*. Oxford: Oxford University Press, p. 163.

<sup>109</sup> Grossmann, K. & Grossmann, K. (2012) *Bindungen—das Gefüge psychischer Sicherheit*. Stuttgart: Klett-Cotta, p. 22.

<sup>110</sup> *Ibid.*, 357. The Grossmanns supervised several doctoral studies in the 1980s looking at caregiving, e.g. Blaimberger, I. (1984) *Beziehungsaspekte im Spiel von Müttern mit ihren zweijährigen Kindern: Versuche einer sich auf die Interaktionsdynamik gründenden heuristischen Ordnung*. Unpublished doctoral thesis, Regensburg University; Angerer, E. (1984) *Eine Analyse von Beziehungsaspekten während eines Spiels von 47 Vätern mit ihren zweijährigen Kindern*. Unpublished doctoral thesis, Regensburg University; Loher, I. (1988) *Intellektuelle und soziale Erfahrungen im vierten Lebensjahr und ihre Beziehung zur Kompetenz im Alltag und in einer Belastungssituation*. Unpublished doctoral thesis, Regensburg University; Spangler, G. (1990) *Mother, child, and situational correlates of toddlers' social competence*. *Infant Behavior and Development*, 13(4), 405–419.

<sup>111</sup> Grossmann, K. E. & Grossmann, K. (1999) Mary Ainsworth: Our guide to attachment research. *Attachment and Human Development*, 1(2), 224–228.

might be the motivation or need for comfort, but it could be exploration, or wariness, affiliation, hunger, sleep, or others. As such, the caregiver should not necessarily follow the child's lead, or any given signal taken at face value. The sensitive caregiver, Ainsworth proposed, 'acknowledges the baby's wishes even though she does not unconditionally accede to them', since much of what is 'for the baby's own good is done contrary to his wishes'.<sup>112</sup> Babies' apparent wishes may miscue their caregivers as to their implicit motivations or their needs.

Informed by many conversations with Ainsworth, to the Grossmanns 'sensitivity' meant *being interested in and responsive to a child's various motivations or needs*, as may be *inferred* from their signals.<sup>113</sup> Consider:

- A caregiver who can recognize and accurately interpret the meaning of signals for when their child is hungry or full may contribute to the child learning about interoception and self-regulatory skills, and preempt distress.
- A caregiver who can recognize and accurately interpret the meaning of signals for when their child is feeling sociable may contribute to supporting the child's skills in modulating and capitalizing on social relationships.
- Most critically for the Grossmanns, a caregiver who can recognize and accurately interpret a child's signals around exploration will contribute to their learning and development. The Grossmanns termed this 'secure exploration'.<sup>114</sup>

By contrast, the Strange Situation primarily serves to assess a child's expectations about safe haven availability. Bowlby characterized the effects of sensitivity on development as entirely mediated by children's expectations about safe haven availability (reflected in the Strange Situation), and this was the mainstream position in US attachment research in the 1980s. For their part, the Grossmanns were sceptical, and felt that this restricted and underplayed the significance of sensitivity. Through the 1980s and 1990s, they offered this perspective in public in conference talks, but not in print.<sup>115</sup> Ultimately in a 2005 chapter, they presented their ideas backed up by data from their longitudinal studies, which showed impressive prediction of later development by caregiver sensitivity, not the Strange Situation. The chapter was, to their dismay, roundly ignored by other attachment researchers: it was too far outside the orthodoxy of the US-dominated attachment research community.<sup>116</sup> The Grossmanns subsequently limited their claims about the priority of sensitivity

<sup>112</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) Appendix: Maternal caregiving and interaction scales. In *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press.

<sup>113</sup> This interpretation shaped the wording choices of their translation of the Ainsworth sensitivity scale into German. See Ainsworth, M. D. S. (1977) Skalen zur Erfassung mütterlichen Verhaltens: Feinfühligkeit versus Unempfindlichkeit gegenüber den Signalen des Babys. In K. E. Grossmann (ed.), *Entwicklung der Lernfähigkeit* (pp. 96–107). München: Kindler.

<sup>114</sup> Grossmann, K. E., Grossmann, K., & Zimmermann, P. (1999) A wider view of attachment and exploration: Stability and change during the years of immaturity. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (pp. 760–786). New York: Guilford Press.

<sup>115</sup> For example, Grossmann, K. E. & Escher-Graub, D. (1984) The status of Ainsworth's Strange Situation in north and south German attachment research. Paper presented to the International Conference on Infant Studies, New York; Grossmann, K. E. (1987) The relevance of attachment theory in different cultures. Paper presented at the biennial meeting of the Society for Research in Child Development, Baltimore MD. See also Sagi's defence of the attractiveness of the Strange Situation against the Grossmanns' criticisms, Sagi, A. (1990) Attachment theory and research from a cross-cultural perspective. *Human Development*, 33(1), 10–22.

<sup>116</sup> Grossmann, K., Grossmann, K. E., & Kindler, H. (2005) Early care and the roots of attachment and partnership representation in the Bielefeld and Regensburg Longitudinal studies. In K. E. Grossmann, K. Grossmann, & E. Waters (eds), *Attachment from Infancy to Adulthood: The Major Longitudinal Studies* (pp. 98–136). New York: Guilford Press.



to German-language publications, having given up on trying to inform the anglophone attachment community.<sup>117</sup>

A few attachment researchers, like the Grossmanns and Marvin, predominantly students or colleagues of Ainsworth, kept a concern with naturalistic observations of child–caregiver interaction.<sup>118</sup> For instance, Mark Greenberg was Marvin’s first doctoral student, and retained a concern with naturalistic observation using Ainsworth’s sensitivity scale. Greenberg, Booth-LaForce and University of Washington colleagues remained an outpost for such research.<sup>119</sup> The tradition of coding caregiver sensitivity was preserved, like a rock that still holds some of the day’s heat, and would later be able to inform the development of a number of attachment-based interventions (Chapter 4). Ultimately, though, in the 1980s most developmental scientists interested in attachment leapt upon the Strange Situation procedure. What naturalistic studies were conducted by developmentalists on child–caregiver interaction were generally conducted by researchers without a core interest in child–caregiver attachment.<sup>120</sup> Ainsworth and Bowlby reflected that the Strange Situation had ‘quite overshadowed the findings of the research project that gave rise to it’, which had been focused on naturalistic observations in the home.<sup>121</sup> Instead, the Strange Situation careened into circulation, especially in US developmental psychology, as a proxy for naturalistic observations. During a visit to Charlottesville in 1985, Ainsworth reported to Karin Grossmann that she felt sad for all the attention that could have gone to naturalistic observation, which got sucked away by the Strange Situation.<sup>122</sup>

Developmental psychologists were excited by the measure, and the possibility of a window into children’s experiences of care, achievable with a standardized 30-minute measure.<sup>123</sup> In holding out the prospect of such a window into experiences of care, the smallest behaviour in this setting was felt as fateful, loaded, and alive, interpretable as a symptom of the qualities of the broader child–caregiver relationship. Precedent was set by Sroufe and the Minnesota group who sought to investigate the contribution of early relationships to development, and establish discriminant validity for empirical measures of these relationships. For this, they needed a sizeable sample, and extensive measures of other potential covariates such as maternal personality, maternal IQ, child temperament. For each of their 267 child participants, 11 observational assessments were conducted in the first 18 months alone. This was an astronomical amount of labour. While home observations of caregiving

<sup>117</sup> Grossmann, K. & Grossmann, K. (2012) *Bindungen—das Gefüge psychischer Sicherheit*. Stuttgart: Klett-Cotta.

<sup>118</sup> For example, Waters, E. and Deane, K. E. (1985) Defining and assessing individual differences in attachment relationships: Q-methodology and the organization of behavior in infancy and early childhood. *Monographs of the Society for Research in Child Development*, 50(1/2), 41–65; Pederson, D. R., Moran, G., Sitko, C., Campbell, K., Ghesquire, K., & Acton, H. (1990) Maternal sensitivity and the security of infant–mother attachment: A Q-sort study. *Child Development*, 61(6), 1974–1983.

<sup>119</sup> Greenberg, M. T. & Crnic, K. A. (1988) Longitudinal predictors of developmental status and social interaction in premature and full-term infants at age two. *Child Development*, 59(3), 554–570; Kelly, J. F., Morisset, C. E., Barnard, K. E., Hammond, M. A., & Booth, C. L. (1996) The influence of early mother–child interaction on preschool cognitive/linguistic outcomes in a high-social-risk group. *Infant Mental Health Journal*, 17(4), 310–321.

<sup>120</sup> For example, Bee, H. L., Barnard, K. E., Eyres, S. J., Gray, C. A., Hammond, M. A., Spietz, A. L., ... & Clark, B. (1982) Prediction of IQ and language skill from perinatal status, child performance, family characteristics, and mother–infant interaction. *Child Development*, 53(5), 1134–1156; Podmore, V. N. (1988) Mothers’ interactive behaviours and their children’s pre-school assessments: Relationships and issues. *New Zealand Journal of Educational Studies*, 23(2), 165–174.

<sup>121</sup> Ainsworth, M. & Bowlby, J. (1991) 1989 APA Award Recipient Addresses: An ethological approach to personality development. *American Psychologist*, 46(4), 333–341, p. 338.

<sup>122</sup> K. Grossmann, personal communication, November 17, 2023.

<sup>123</sup> For example, Weinraub, M. (1979) Standardized attachment: Bags packed, where are we going? *PsycCRITIQUES* 24(12), 990–991.



behaviour were conducted at six, 24, and 42 months, these had to be kept short.<sup>124</sup> The Strange Situation was therefore essential for the Minnesota group as a proxy for longer observation, which would not have been possible to do at scale given available resources.

Van IJzendoorn and Tavecchio emphasized the importance of the Strange Situation as offering a standardized assessment. They characterized the development of the Strange Situation as the basis for attachment as a field of empirical inquiry within academic developmental psychology:

The Strange Situation procedure (Ainsworth & Wittig, 1969) can be regarded as the proximate cause for the growth of attachment theory towards a full-fledged research program. In learning to apply this procedure, many young and competent behavioral scientists were drawn to and initiated in attachment theory.... Parallel to established natural scientific traditions, a standard measurement procedure for attachment provided the common basis for exchange of experiences and for carrying out cooperative research.<sup>125</sup>

For Ainsworth's students and allies, the Strange Situation offered attachment theory a foothold within developmental science, permitting the testing and elaboration of hypotheses about the antecedents and sequelae of attachment security and insecurity.<sup>126</sup> This work generated considerable respect from other developmentalists: a survey by Dixon of developmental scientists found that they ranked Ainsworth's work on the Strange Situation as the most revolutionary, the most important, and the second most fascinating empirical study in the history of the discipline.<sup>127</sup>

From the early 1980s, Ainsworth's students and collaborators could report that the Strange Situation was able to predict children's later socioemotional development, in line with the expectations of attachment theory.<sup>128</sup> For instance, doctoral studies supervised by the Grossmanns documented that a secure classification in the Strange Situation in infancy was associated with renewed efforts after failure at a building task at age two, whereas insecure attachment was associated with a decrease in efforts; and that secure attachment was also associated with better adaptation to kindergarten and preschool, including cooperation, concentration, dealing with conflicts, and engagement with learning.<sup>129</sup> Such

<sup>124</sup> Pianta, R. C., Sroufe, L. A., & Egeland, B. (1989) Continuity and discontinuity in maternal sensitivity at 6, 24, and 42 months in a high-risk sample. *Child Development*, 60(2), 481–487.

<sup>125</sup> Van IJzendoorn, M. H. & Tavecchio, L. W. C. (1987) The development of attachment theory as a Lakatosian research program: In L. W. C. Tavecchio & Van IJzendoorn, M. H. (eds), *Attachment in Social Networks. Contributions to the Bowlby–Ainsworth Attachment Theory* (pp. 3–31). New York: Elsevier Science Publishers, p. 4.

<sup>126</sup> Waters, E. (1978) The reliability and stability of individual differences in infant–mother attachment. *Child Development*, 483–494; Sroufe, L. A. (1985) Attachment classification from the perspective of infant–caregiver relationships and infant temperament. *Child Development* 56(1), 1–14; Grossmann, K., August, P., Fremmer-Bombik, E., Friedl, A., Grossmann, K., Scheuerer-Engelisch, H., Spangler, G., Stephan, C., & Suess, G. (1989) Die Bindungstheorie: Modell und entwicklungspsychologische Forschung. In H. Keller (Hrsg.) *Handbuch der Kleinkindforschung* (pp. 31–55). Berlin: Springer.

<sup>127</sup> Dixon, W. E., Jr. (2016) *Twenty Studies that Revolutionized Child Psychology* (2nd ed.). Saddle River, NJ: Pearson.

<sup>128</sup> Londerville, S. & Main, M. (1981) Security of attachment, compliance, and maternal training methods in the second year of life. *Developmental Psychology*, 17(3), 289; Erickson, M., Sroufe, L. A., & Egeland, B. (1985) The relationship of quality of attachment and behavior problems in preschool in a high risk sample. *Monographs of the Society for Research in Child Development*, 50(1–2), 147–186.

<sup>129</sup> Lütkenhaus, P., Grossmann, K. E., & Grossmann, K. (1985) Infant–mother attachment at twelve months and style of interaction with a stranger at the age of three years. *Child Development*, 56, 1538–1542; Suess, G. J. (1987) Auswirkungen frühkindlicher Bindungserfahrungen auf die Kompetenz im Kindergarten. Unpublished doctoral thesis, Regensburg University; Roth, R. (1987) Spielqualität und Konfliktverhalten bei 5jährigen im Kindergarten als Folge unterschiedlicher Eltern-Kind-Beziehung im Kleinkindalter. Diplomarbeit, Universität Regensburg; Grossmann, K. (1995) Kontinuität und Konsequenzen der frühen Bindungsqualität während des

findings indicated that secure attachment relationships could prove an asset for children, supporting their resilience and development.

For those entering the field without direct links to Bowlby or Ainsworth in the 1980s, among the chief attractions of the Strange Situation was its promise to be able to distinguish more or less positive experiences of care, and to predict more or less positive developmental outcomes.<sup>130</sup> As such, it offered a means for inquiry into the effects of particular kinds of family circumstances and caregiving practices, with relevance for clinical work with families and for family policies.<sup>131</sup>

These researchers were also impressed by the Strange Situation as an observational measure of dyadic processes. It was perceived as offering an alternative to the arid behavioural empiricism of the 1960s, which developmental psychology was beginning to shake off. Academic psychology to date had tended to study already largely formed adult humans, and influences on their attitudes and practices. Humans were registered at the point that they can act independently, even if, in social psychology, the concern was then with how they ultimately live together.<sup>132</sup> By comparison, one of the defining features of developmental psychology as an emergent subdiscipline in the period, shaped by and shaping attachment research, was the idea that relationships have a primacy in shaping who children are and who they become.<sup>133</sup> Developmental psychologists coming to attachment research were enthusiastic about the Strange Situation as an observational measure attentive to the interdependence of human beings, our vulnerability to one another, and the emergence of individual agency out of a relational context.<sup>134</sup>

Developmental psychologists coming to attachment research with no direct links to Ainsworth particularly praised the distinction between secure and avoidant classifications.<sup>135</sup> The phenomenon of avoidance was visible and predictable evidence of an inner inhibition: the attachment motivational system was being *activated* by the Strange Situation, but its *expression* was being suppressed as a consequence of the child's expectations about their caregiver. At a time when speculations about motivation and inner processes were still anathema in much of American psychology, in the context of a backlash against the speculative and untestable mechanisms posited by psychoanalysis, the observation of avoidant behaviour among infants who had received less sensitive care was an electrifying finding. The priority given to scientific prediction, feedback, and passively learnt

Vorschulalters. In G. Spangler & P. Zimmermann (eds), *Die Bindungstheorie. Grundlagen, Forschung und Anwendung*. Stuttgart: Klett-Cotta, S. 191–202.

<sup>130</sup> Lewis, J. M., Owen, M. T., & Cox, M. J. (1988) The transition to parenthood: III. Incorporation of the child into the family. *Family Process*, 27(4), 411–421; Van IJzendoorn, M. H. (1990) Developments in crosscultural research on attachment: Some methodological notes. *Human Development*, 33, 3–9.

<sup>131</sup> Belsky, J. & Nezworski, T. M. (eds) (1987) *Clinical Implications of Attachment*. London: Routledge; Lyons-Ruth, K., Connell, D. B., Zoll, D., & Stahl, J. (1987) Infants at social risk: Relations among infant maltreatment, maternal behavior, and infant attachment behavior. *Developmental Psychology*, 23(2), 223; Goldberg, S. (1990) Attachment in infants at risk: Theory, research, and practice. *Infants & Young Children*, 2(4), 11–20; Cicchetti, D. & Barnett, D. (1991) Attachment organization in maltreated preschoolers. *Development and Psychopathology*, 3(4), 397–411.

<sup>132</sup> Stainton Rogers, R., Stenner, P., Gleeson, K., & Stainton Rogers, W. (1995) *Social Psychology: A Critical Agenda*. Cambridge: Polity Press; Danziger, K. (1992) The project of an experimental social psychology: Historical perspectives. *Science in Context*, 5, 309–328.

<sup>133</sup> See, e.g. Sameroff, A. J. & Emde, R. N. (eds) (1991), *Relationship Disturbances in Early Childhood: A Developmental Approach*. New York: Basic Books.

<sup>134</sup> See e.g. Belsky, J., Rovine, M., & Fish, M. (1989) The developing family system. In M. Gunnar & E. Thelen (eds), *Minnesota Symposia of Child Psychology*, Vol. 22, *Systems and Development* (pp. 119–166). Hillsdale, NJ: Erlbaum.

<sup>135</sup> For example, Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., & Vergeer, M. M. (1982) *Opvoeden in geborgenheid: Een kritische analyse van Bowlby's attachmenttheorie*. Amsterdam: Van Loghum Slaterus; Lyons-Ruth, K. (1991) Rapprochement or approachement: Mahler's theory reconsidered from the vantage point of recent research on early attachment relationships. *Psychoanalytic Psychology*, 8(1), 1–23.

behaviour in behaviourism were achieved precisely through the characteristic concerns of psychoanalysis on family context, internal conflict, the active defensive strategies of the individual, and the role of invisible motivations in prompting and inhibiting behaviour. For developmental psychologists joining attachment research in the 1980s, Ainsworth's distinction between security and avoidance integrated apparently irreconcilable trends within academic psychology: she was studying family context and defensive strategies precisely through a laboratory-based, replicable observational study.<sup>136</sup>

Entry into attachment research for outsiders, trying to break into the conversation, was potentially challenging. Attachment researchers often used terms from everyday language contributing to the generation of allodoxic characterizations of what they meant. However, in fact, their work contained numerous subtle, technical distinctions. For example, the term 'sensitivity' was often used with Ainsworth's technical meaning, and coded on the basis of her system that circulated only in manuscript form (besides a German translation in 1977; the English original was finally published as an appendix to the 2015 Psychology Press edition of *Patterns of Attachment*). Except, sometimes, the term 'sensitivity' was actually not used by researchers with this technical meaning, and instead used to mean quality of care or caregiver warmth (Chapter 3).

While basic ideas and allodoxia could be accessed much more readily, actual entry into the community and their shared implicit knowledge and discussions was rather harder (though not impossible; Chapter 3). Considerable efforts were made by Ainsworth's circle to bridge this gap through teaching and mentorship, and the gifts of time and encouragement. Many important later attachment researchers trained with Alan Sroufe and colleagues at Minnesota, pursuing research on child maltreatment and adversity within the Institute of Child Development.<sup>137</sup> Growing recognition of child maltreatment as a social problem helped the group attract the initial funding to conduct measures of attachment on a large sample, as well as naturalistic observations of caregiver–child interaction. The status of the Institute of Child Development also helped subsequently attract a sufficiently steady stream of hard-working graduate students for longitudinal follow-up.

Slade has called Sroufe the 'father of American attachment research'.<sup>138</sup> Sroufe was widely regarded as an inspiring mentor, squaring forcefulness with affection in his encouragement of graduate students, who have described feeling stimulated and well-supported, in turn contributing to their loyalty to attachment research.<sup>139</sup> In Sroufe's work attachment theory

<sup>136</sup> There was less interest in the resistance category, which rather came along for the ride; the category was given more attention by Ainsworth's students, curious about how the infant's dysregulation seemed to regulate the dyad's interactions. For example, Cassidy, J., & Berlin, L. J. (1994) The insecure/ambivalent pattern of attachment: Theory and research. *Child Development*, 65(4), 971–991; Crittenden, P. M. (1994) Peering into the black box: An exploratory treatise on the development of self in young children. In D. Cicchetti & S. L. Toth (eds), *Disorders and Dysfunctions of the Self* (pp. 79–148). Rochester, New York: University of Rochester. There was also, somewhat later, discussions of the category among Israeli researchers, no doubt prompted in part by its prevalence. See e.g. Mayseless, O. (1998) Maternal caregiving strategy—A distinction between the ambivalent and the disorganized profile. *Infant Mental Health Journal*, 19(1), 20–33.

<sup>137</sup> For example, Jacobvitz, D. B. (1988) The early caregiver–child relationship and attention deficit hyperactivity disorder in school children. University of Minnesota; Ward, M. J., Vaughn, B. E., & Robb, M. D. (1988) Social-emotional adaptation and infant–mother attachment in siblings: Role of the mother in cross-sibling consistency. *Child Development*, 643–651.

<sup>138</sup> Discussant remarks by Arietta Slade at the MindinMind Legacy Interview with Alan Sroufe, 28/3/2024, [www.mindinmind.org.uk](http://www.mindinmind.org.uk).

<sup>139</sup> Cicchetti, D. & Roisman, G. I. (eds) (2011), *The Origins and Organization of Adaptation and Maladaptation: Minnesota Symposia on Child Psychology*, Vol. 36, Hoboken, NJ: Wiley. Mary Jo Ward would later recall this period: 'My fondest memories of Alan are from the year of the preschool project. He was in his element: choosing just the right subjects to compose a class, working daily with some very gifted teachers, supervising grad students, planning assessments and coming up with methods to capture the richness of what we were observing each day. But he was most happy about getting to know each of the precious children. His insights into each child's coping,

and research was characterized as the exemplar and leading edge of a demand made to academic psychology to respect early relationships and their observational measurement. His advocacy for attachment research symbolically anchored the relational, humanistic vanguard of developmental psychology in the 1980s and 1990s in a ‘war of position’ against dominant approaches such as behaviourism, until relational perspectives and measures ultimately became mainstream.<sup>140</sup>

Several significant researchers trained with other members of Ainsworth’s circle such as Everett Waters at Stony Brook. In notes prepared for Ainsworth and close collaborators in 1987, Waters wrote: ‘Characterization of the traditional Bowlby/Ainsworth group as cliquish or parochial has been unfair. Competitive, enthusiastic, cohesive—sure, maybe to a fault. Point: Anyone not convinced by now, never will be; but we want to help newcomers get interested and make it easy for them to make key contributions.’<sup>141</sup> As in other areas of complex study, whether clinical psychology or psychiatry, behavioural biology or non-verbal communication, Waters felt that newcomers needed support to get up and running with attachment theory and methods.

Recognizing the difficulty for outsiders to access the nuances of theory and methods to undertake attachment research, Waters dedicated considerable time to supporting and mentoring researchers outside of his group. As but one example, Guy Bosmans (Leuven) reports that ‘Everett invited me to Stony Brook and took me out with his car for two weeks on daily trips as he patiently introduced me to the field and those nuances. He knew it was hard for newcomers to enter the attachment research and he wanted to open up the field.’<sup>142</sup> Waters also organized a biennial meeting of attachment researchers in the days before the Society for Research in Child Development conference. This biennial meeting was an important occasion for in-depth discussions and for affirmation of attachment research as a community: ‘upholding and reaffirming at regular intervals the collective sentiments and the collective ideas that make its unity’ as Durkheim would say.<sup>143</sup>

Klaus and Karin Grossmann turned Regensburg into ‘the “Mecca” of European attachment research,’<sup>144</sup> conducting major longitudinal studies, supporting the entry into attachment research of many able researchers in Germany, and hosting other attachment researchers for visits including Inge Bretherton and Avi Sagi-Schwartz as Humboldt Fellows, and Mary Main and Erik Hesse for numerous visits in the 1990s. Like Waters, keen to increase access to attachment research for interested scholars, Karin Grossman conducted

his joy in their accomplishments, his concern for their trials gave us an amazing opportunity to experience the human side of developmental science. It’s an example that we’ll never forget.’ Ward, M. J. (2009) Tribute to L. Alan Sroufe on the occasion of his retirement. 17 October 2009, Minneapolis, MN USA. Unpublished manuscript shared by the author.

<sup>140</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 4; see also Sroufe, L. A. (2021) A compelling idea: How we become the persons we are. Brandon, VT: Safer Society Press. On war of position, see Egan, D. (2024) War of maneuver and war of position: Gramsci and the dialectic of revolution. In William K. Carroll (ed.), *The Elgar Companion to Antonio Gramsci* (pp. 189–203). Cheltenham: Edward Elgar Publishing. On the role of symbols in giving meanings to the particular, and giving substance to the general, see Rehberg, K.-S. (2001) Weltrepräsentanz und Verkörperung. Institutionelle Analyse und Symboltheorien: Eine Einführung in systematischer Absicht. In Melville, G. (ed.), *Institutionalität und Symbolisierung. Verfestigungen kultureller Ordnungsmuster in Vergangenheit und Gegenwart* (pp. 3–49). Cologne: Böhlau Verlag.

<sup>141</sup> Waters, E. (1987) Outline for Winter Attachment Project: Compiled from written briefs (12/87). Unpublished manuscript. Everett Waters personal archive.

<sup>142</sup> G. Bosmans, personal communication, September 9, 2024.

<sup>143</sup> Durkheim, E. ([1912] 1965) *Elementary Forms of Religious Life*, trans. J. W. Swain, New York: Humanities Press: ‘There can be no society that does not feel the need of upholding and reaffirming at regular intervals the collective sentiments and the collective ideas that make its unity and its personality. Now this moral remaking cannot be achieved except by means of reunions’ (474).

<sup>144</sup> Ahnert, L. (2016) Thematic issue: New insights into current attachment research—in honor of the 80th birthday of Klaus Grossmann. *International Journal of Developmental Science*, 10(3–4), 85–87, p. 86.

many Strange Situation training institutes outside of Germany, including in Hungary in 1995, Portugal in 1996, and Poland in 2005.<sup>145</sup>

Looking back on the 1980s and 1990s, Waters acknowledged that:

If you've ever encountered attachment theorists in a group, or submitted a paper to a journal and had some of them review it, most of us are overenthusiastic. We love this stuff, and if you don't get something just right, we're all over you. I mean like Alan Sroufe, or me when I was younger (Not Mary Ainsworth, she would let you publish anything.) I've come to realise that it's offputting If people are not understanding ... their shortcomings are on us.<sup>146</sup>

One such shortcoming was regarding access to and understanding of Ainsworth's sensitivity scale. Waters is right that this was in large part the responsibility of the attachment research community as the Ainsworth sensitivity scale was not published, and circulated only privately (until the 2015 reprint of *Patterns of Attachment*). In the 1980s, sensitivity was generally downplayed by attachment researchers compared to the Strange Situation—to Ainsworth's growing regret.<sup>147</sup> For those researchers able to secure inter-laboratory reliability and use the Strange Situation in research, it was possible gain ritual entry into the attachment research community without insider mentorship. This entry was facilitated, albeit in a regulated way, by annual trainings in coding the Strange Situation at Minnesota, beginning in 1983.<sup>148</sup> Over the years, these have provided an opportunity for enculturation in the craft of attachment theory and research, helping initiates learn to interpret and evaluate like members of the attachment research community and feel a sense of belonging.<sup>149</sup>

Thus a new generation of attachment researchers emerged as a cohort—among them Belsky, Fonagy, Lyons-Ruth, Goldberg, Sagi-Schwartz, Spieker, Van IJzendoorn—through their use of the Strange Situation as a research tool and entryway into the field. Yet dependence on the Strange Situation for ritual entry had side-effects for this cohort of researchers. One consequence was that it contributed to a concern with individual differences in infant attachment. The centrality of the Strange Situation for early attachment researchers also critically shaped attachment theory itself, giving much greater prominence to Bowlby's emphasis on children's distress and caregivers' safe haven availability, at the expense of the priority given by Ainsworth to attention to everyday interactions and caregivers' secure base provision.<sup>150</sup>

The symbolic position of the Strange Situation was at stake in an important controversy in the early 1980s, regarded at the time as a mortal threat to the emerging paradigm. A high-profile review by Masters and Wellman had underscored the inability of developmental researchers to identify reliable measures of individual differences in infant social

<sup>145</sup> Klaus and Karin Grossman, personal communication, September 11, 2024.

<sup>146</sup> Waters, E. (2017) The secure base script in attachment theory and research. Presentation to the Rapaport-Klein Study Group, [https://www.psychomedia.it/rapaport-klein/Waters-2017\\_Talk+Slides\\_1-Intro.mp4](https://www.psychomedia.it/rapaport-klein/Waters-2017_Talk+Slides_1-Intro.mp4).

<sup>147</sup> Ainsworth M. D. S. & Marvin R. S. (1995) On the shaping of attachment theory and research: An interview with Mary D. S. Ainsworth (Fall 1994) *Monographs of the Society for Research in Child Development*, 60(2/3), 2–21.

<sup>148</sup> Waters, E. (1983) The stability of individual differences in infant attachment: Comments on the Thompson, Lamb, and Estes contribution, *Child Development*, 50(2), 516–520.

<sup>149</sup> Many major future leaders in attachment research found their entry into the field through attendance at these trainings. See e.g. Pederson, D. (2005) SRCD Oral History Interview, [https://www.srcc.org/sites/default/files/file-attachments/pederson\\_interview.pdf](https://www.srcc.org/sites/default/files/file-attachments/pederson_interview.pdf).

<sup>150</sup> Grossmann, K. E., Grossmann, K., & Zimmermann, P. (1999) A wider view of attachment and exploration. In J. Cassidy & P. Shaver (eds), *Handbook of Attachment Theory and Research: Theory, Research, and Clinical Applications* (pp. 760–786). New York: Guilford Press.

behaviour.<sup>151</sup> The approaches reviewed by Masters and Wellman focused on the study of individual behaviours. A central difference, as Sroufe and Waters emphasized, was that attachment research was concerned with the *organization* of behaviours in the service of the attachment motivational system.<sup>152</sup> While the particular behaviours used by a child to seek the availability of their caregiver might differ between settings and across development, the position of attachment researchers was that different behaviours might serve equivalent functions. If reaching works quickly to achieve contact with the caregiver, there might be no need to then engage crawling towards the caregiver. If fussing works, there might be no need to use crying. So reliable differences could be expected not between the individual forms of behaviour, but between the organization of behaviour shown by children in secure and insecure relationships.

Supporting this position, doctoral studies by Connell and Waters found near-total stability in Strange Situation classifications when infants were assessed again using the procedure.<sup>153</sup> Extensive stability was likewise documented by Main and Weston, with 80% of infant-caregiver dyads retaining the same classification across uses of the Strange Situation.<sup>154</sup> Though it should be noted that the same coders were used at both time-points in these studies: in retrospect, the overlap in coders appears to have reduced the independence of their assessments and elevated the stability of the classifications.<sup>155</sup>

Even in the high-risk Minnesota poverty sample, with families experiencing considerable adversity and chaos in their lives, Vaughn, Egeland, Sroufe, and Waters reported 62% stability in the secure classification between 12 and 18 months. This set of findings as a whole, and Waters' doctoral study in particular, were taken as crucial evidence to support Bowlby's theory that expectations about attachment relationships would be relatively stable over time.<sup>156</sup> In a period where few constructs in developmental science were showing stability over time, what Main called the 'extraordinary stability' of the Strange Situation classifications<sup>157</sup> was a source of status and credibility for the field of attachment research.<sup>158</sup> Indeed, a potential contributing factor to the birth of the social psychological tradition of attachment research in the 1980s was the impression from Waters' findings that individual differences in attachment would function as stable trait-like variables right the way through to adulthood.<sup>159</sup>

<sup>151</sup> Masters, J. C. & Wellman, H. M. (1974) The study of human infant attachment: A procedural critique. *Psychological Bulletin*, 81(4), 218–237.

<sup>152</sup> Sroufe, L. A. & Waters, E. (1977) Attachment as an organizational construct. *Child Development*, 1184–1199. See also Joffe, L. S. & Vaughn, B. E. (1982) Infant–mother attachment: Theory, assessment, and implications for development. In B. Wolman (ed.), *Handbook of Developmental Psychology* (pp. 181–199). Englewood Cliffs, NJ: Prentice Hall; Goldberg, S. (2000) Attachment and Development, London: Routledge. 'Ainsworth's work was also subjected to heated criticism and, until the publication of Sroufe and Waters' 1977 paper on "attachment as an organisational construct" and the emergence of supporting data from other laboratories, it was neither understood nor accepted by the larger community of developmental psychologists' (236).

<sup>153</sup> Connell, D. (1977) Individual differences in attachment behavior: Long-term stability and relationships to language development, Unpublished doctoral dissertation, Syracuse University; Waters, E. (1978) The reliability and stability of individual differences in infant–mother attachment. *Child Development*, 49(2), 483–494.

<sup>154</sup> Main, M. & Weston, D. (1981) The quality of the toddler's relationship to mother and father: Related to conflict behavior and the readiness to establish new relationships. *Child Development*, 52, 932–940.

<sup>155</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*, Oxford: Oxford University Press, [chapter 2](#).

<sup>156</sup> See, e.g. Sroufe, L. A. (1979) The coherence of individual development: Early care, attachment, and subsequent developmental issues. *American Psychologist*, 34(10), 834.

<sup>157</sup> Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds), London: Routledge.

<sup>158</sup> Sroufe, L. A. & Waters, E. (1977) Attachment as an organizational construct. *Child Development*, 48, 1184–1199.

<sup>159</sup> Baldwin, M. W. & Fehr, B. (1995) On the instability of attachment style ratings. *Personal Relationships*, 2(3), 247–261.

Michael Lamb was a student with Ainsworth for a year at Johns Hopkins, before Ainsworth left for Virginia. He was inspired by Ainsworth's work, and undertook several lines of research using the Strange Situation. Yet the results of these studies were not encouraging. A study led by Lamb in Sweden found no material associations between the Strange Situation categories and any other variable, whether caregiving behaviour or child development, with the exception of a link between father–infant attachment and the child's sociability.<sup>160</sup> Furthermore, a doctoral project by Ross Thompson, supervised by Lamb, found moderate stability of the Strange Situation over time, more for children initially classified secure, and less for children classified as insecure.

Change over time was by no means random. Thompson, Lamb, and colleagues reported that both continuity and discontinuity in attachment classifications was predictable in light of changes in care. Most salient was the finding that over half of infants changed attachment classification with their mother when she entered full-time employment.<sup>161</sup> It is not unusual in exploratory research for a rapid early sequence of extreme, opposite results to appear, as initial over-strong reported effects attract the interest of other researchers who then fail to replicate such decisive findings. This has been termed the Proteus phenomenon by Ioannidis and Trikalinos.<sup>162</sup> In the case of stability of the Strange Situation, the Thompson findings are in retrospect much closer to subsequent norms from recent meta-analytic examination of data from across 79 studies, especially with evidence of considerable publication bias taken into account.<sup>163</sup> At the time, though, the moderate stability of the Strange Situation surprised Thompson, Lamb, and colleagues since what they found was far more change than the earlier studies by Connell and Waters.

A first paper reporting on the findings was published in *Child Development* in 1983. The reviewers were from outside the attachment research community, and made no comment on the findings about stability. Instead, they were more concerned with the weak measurement of factors associated with instability, which was a fair criticism: Thompson and Lamb had not expected to find instability, so had not designed their study to measure relevant contextual factors. The editor wrote to Ainsworth to check that the study had been reliably coded, Ainsworth replied to say that though there was no formal training process or certification, she personally did not regard Lamb as sufficiently trained in coding the Strange Situation.<sup>164</sup> This appears not to have been decisive, and the paper was published. However, the editor agreed to publish a response from Ainsworth's student Waters. This response cast doubt on Lamb's coding of the Strange Situation, arguing that the findings disagreed with the well-replicated results of earlier studies, collected in different laboratories. Waters observed that Lamb's coding of the Strange Situation was not backed up

<sup>160</sup> Lamb, M. E., Hwang, C. P., Frodi, A. M., & Frodi, M. (1982) Security of mother-and- father–infant attachment and its relation to sociability with strangers in traditional and nontraditional Swedish families. *Infant Behavior and Development*, 5(2–4), 355–367.

<sup>161</sup> Thompson, R. A., Lamb, M. E., & Estes, D. (1982) Stability of infant–mother attachment and its relationship to changing life circumstances in an unselected middle-class sample. 53(1), *Child Development*, 144–148.

<sup>162</sup> Ioannidis, J. P. & Trikalinos, T. A. (2005) Early extreme contradictory estimates may appear in published research: The Proteus phenomenon in molecular genetics research and randomized trials. *Journal of Clinical Epidemiology*, 58(6), 543–549. See also Molendijk, M. L., Bus, B. A. A., Spinoven, P., Kaimatzoglou, A., Oude Voshaar, R. C., Penninx, B. W. J. H., Van IJzendoorn, M. H., & Elzinga, B. M. (2012) A systematic review and meta-analysis on the association between BDNF val66met and hippocampal volume—a genuine effect or a winners curse? *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, 159b, 731–740.

<sup>163</sup> Opie, J. E., McIntosh, J. E., Esler, T. B., Duschinsky, R., George, C., Schore, A., ... & Olsson, C. A. (2021) Early childhood attachment stability and change: A meta-analysis. *Attachment & Human Development*, 23(6), 897–930.

<sup>164</sup> Ainsworth, M. (1982) Letter to John Bowlby, 25 April 1982, John Bowlby Archive, Wellcome Collections, PP/BOW/B.3/7.

by home observational data, which would have supported their validity in capturing the child's expectations of caregiver availability.<sup>165</sup>

A second paper from Thompson's doctoral thesis sought to examine whether infants' interaction with a stranger was associated with security in the Strange Situation, and explore whether stability of security over time was associated with stability of sociability with a stranger. The paper was submitted to the journal *Developmental Psychology*, where it was passed to Alan Sroufe to handle as associate editor. The paper was rejected. Sroufe wrote to Thompson and Lamb that 'the reviewers raise a number of serious concerns', especially regarding the dependability of the coding of the Strange Situation:

The matter of assuring that your classifications are accurate is very serious. There are two ways to do this. One is to have training by Ainsworth or someone whose codings have been shown to agree with her and to show that codings you do agree with a criterion coder. If this is done significant stability should be found, especially with a sample such as yours. The second alternative is to show that your classifications predict attachment/exploration balance in the home.... This is not a matter of an in-group or private club. Anyone can be trained to do these assessments and many have been. At any time you could send tapes for coding to criterion coders or you could visit someone who is a criterion coder.... You would certainly be welcome to visit me or send tapes here. And I am sure that Mary Main or Everett Waters would do it too. Michael would be welcome as well. We might as well get this all cleared up.<sup>166</sup>

Lamb recognized that the stability of the Strange Situation classifications might have strategic importance for attachment research, and align with claims by Bowlby. However, he was worried that overemphasis on stability risked presenting a misleading image, in which attachment was interpreted as a property of a child, rather than a feature of children's relationships with their caregivers and responsive to changes in those relationships. Thompson and Lamb asked for a reconsideration of the paper by the journal, which was ultimately published in 1983.<sup>167</sup>

In composing a rejoinder to Waters' claim that extensive stability was a well-replicated result, Lamb and Thompson undertook a careful study of the papers by Connell, Waters, and Main and Weston.<sup>168</sup> This developed into a broader review of literature using the Strange Situation.<sup>169</sup> In a series of papers including a long article in *Behavioral and Brain Sciences* in 1984, and then a book in 1985, Lamb, Thompson, and colleagues criticized the centrality given by attachment research to the Strange Situation Procedure and the way that researchers used the measure as if 'attachment' were a property of a child, shaped by early maternal care, then fixed and highly stable over time, and predictive in itself of later outcomes.

The 1984 article by Lamb, Thompson, and colleagues was followed in the journal by responses from numerous researchers, many of which expressed delight at the criticisms

<sup>165</sup> Waters, E. (1983) The stability of individual differences in infant attachment: Comments on the Thompson, Lamb, and Estes contribution. *Child Development*, 54(2), 516–520.

<sup>166</sup> Sroufe, L. A. (1981) Letter to Ross Thompson, 10 March 1981. Ross Thompson personal archive.

<sup>167</sup> Thompson, R. A. & Lamb, M. E. (1983) Security of attachment and stranger sociability in infancy. *Developmental Psychology*, 19(2), 184–191.

<sup>168</sup> Thompson, R. A., Lamb, M. E., & Estes, D. (1983) Harmonizing discordant notes: A reply to Waters. *Child Development*, 54(2), 521–524.

<sup>169</sup> Lamb's earlier critical review of the literature on prenatal bonding provided a precursor and model for this subsequent critical review of the Strange Situation and attachment research. In both cases, Lamb sought to hold up to empirical and methodological scrutiny ideas that were plausible, and claimed a basis in research evidence. See Lamb, M. E. (1982) Early contact and maternal-infant bonding: One decade later. *Pediatrics*, 70(5), 763–768.



of the Strange Situation procedure and attachment theory in general: 'If Lamb et al.'s critique of the Strange Situation is on target—and it seems to be—then it will probably contribute to curtailing this line of research.'<sup>170</sup> Indeed the observations of Lamb, Thompson, and colleagues are still cited today as clinching the 'methodological shortcomings and unsupported assumptions' of Ainsworth's research, showing the attachment paradigm to be wholly untenable.<sup>171</sup> Given the criticisms of Lamb, Thompson, and colleagues already decades ago, 'we should have known better than to take the Bowlby–Ainsworth paradigm as seriously as we have, and it's a stain on the reputation of developmental psychology that attachment theory is still seen as credible.'<sup>172</sup>

Klaus and Karin Grossmann wrote a polite reply to the 1984 paper, arguing that the criticisms offered by Lamb and colleagues were too harsh for a research programme still getting started. But otherwise Ainsworth's circle offered no response. Ainsworth did not understand why Lamb had not spoken to her first, to work these matters out initially in conversation and check for any misunderstandings, rather than immediately jump to publication. Klaus and Karin Grossmann report that Ainsworth spoke to them on the phone, and explained that she wrote no reply to Lamb and colleagues as she did not want to leap in to defend the Strange Situation as if it were the heart of her research programme.<sup>173</sup> From her perspective, the Strange Situation was ancillary to her research on child–caregiver interaction, in particular observation of caregiver sensitivity, and so it was misguided for Lamb and colleagues to make it such a target. That said, she acknowledged that her students had made the Strange Situation central to their work. She continued to publicly cite the other work of Lamb, Thompson, and colleagues, including respectful references to Lamb's expertise on father–child attachment and child maltreatment.<sup>174</sup> She sincerely wanted to be judicious and professional, in the face of challenges to her work.

Likewise Bowlby continued to cite Lamb's empirical work.<sup>175</sup> He did not engage with Lamb and Thompson's criticisms of the Strange Situation. Albeit there is implicit acceptance of one of their central points in Bowlby's 1988 claim that 'evidence shows that during the first two or three years the pattern of attachment is a property of the relationship, for example child to mother or child to father, and that if the parent treats the child differently the pattern will change accordingly.'<sup>176</sup> In his doctoral thesis in 1991, Howard Steele, then a mentee of Bowlby, characterized Lamb's criticisms of the Strange Situation as 'not wholly misplaced' but 'superficial'.<sup>177</sup>

<sup>170</sup> Freedman, D. G. (1984) Asking the right questions. *Behavioral and Brain Sciences*, 7(1), 153–153. Other critics of attachment research also showed delight at the critique of the Strange Situation provided by Lamb, Thompson, and colleagues, e.g. Kagan, J. (1987) Perspectives on infancy. In J. D. Osofsky (ed.), *Handbook of Infant Development* (2nd ed., pp. 1150–1198). New York: Wiley.

<sup>171</sup> Vicedo, M. (2020) On the history, present, and future of attachment theory. *European Journal of Developmental Psychology*, 17(1), 147–155, p. 150.

<sup>172</sup> LeVine, R. A. (2021) *The Cultural Psyche*, Charlotte, NC: Information Age Publishing, p. 323.

<sup>173</sup> Klaus and Karin Grossmann, personal communication, November 17, 2023.

<sup>174</sup> Ainsworth, M. D. (1985) Attachments across the life span. *Bulletin of the New York Academy of Medicine*, 61(9), 792–812; Crittenden, P. M. & Ainsworth, M. D. (1989) Child maltreatment and attachment theory. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 432–463). Cambridge: Cambridge University Press. The same pattern of citations can be seen in Ainsworth's graduate students of the period, where Lamb, Thompson, and colleagues criticisms of the Strange Situation are not mentioned, but their other work cited and often warmly.

<sup>175</sup> For example, Bowlby, J. (1984) Violence in the family as a disorder of the attachment and caregiving systems. *American journal of psychoanalysis*, 44(1), 9–27.

<sup>176</sup> Bowlby, J. (1988) *Secure Base*, New York: Basic Books, p. 127.

<sup>177</sup> Steele, H. L. (1991) Adult personality characteristics and family relationships: The development and validation of an interview-based assessment technique. Unpublished doctoral thesis, University College London, pp. 24–25.

A much more positive stance towards the work of Lamb, Thompson, and colleagues can be seen among developmental scientists starting to engage with attachment research from outside the networks of Ainsworth or Bowlby. Cicchetti stated that 'Lamb and his colleagues are to be highly commended for their comprehensive and critical review'.<sup>178</sup> Canadian researchers such as Susan Goldberg regarded the criticisms offered by Lamb, Thompson, and colleagues as constructive, recommended them to students learning about attachment research, and—in retrospect—was surprised by how little engagement with them there was from the major attachment researchers of the time.<sup>179</sup> Sagi-Schwartz in Israel regarded many of their points as completely convincing,<sup>180</sup> and sought Lamb out as a collaborator.<sup>181</sup>

A study by Van IJzendoorn and colleagues in 1983 found 100% stability of Strange Situation classifications when the procedure was completed again after a month, and scored by independent coders.<sup>182</sup> Yet this did not lead Van IJzendoorn to argue against Lamb and Thompson. In implicit retort to criticisms of Lamb's Strange Situation coding, he and colleagues undertook the creation of the first pooled dataset of attachment research to compare the coding of several samples including Lamb's Swedish sample. They found no relevant differences in how the coding protocols had been interpreted (Chapter 4).<sup>183</sup>

Belsky cited work by Lamb and/or Thompson in nearly every paper about attachment for the next ten years, situating these contributions as raising important questions that he sought to address in his own work. A doctoral study by Taylor, supervised by Belsky, offered a positive review of the points made by Lamb, Thompson, and colleagues. The study reported findings from analysis of data from the first cohort of the Pennsylvania State Child and Family Development Project (Chapter 3). Taylor found no statistically significant continuity between security in infancy and at 3½ years old. She showed that children tended to retain a secure classification from infancy to 3½ years primarily if their caregivers experienced few disruptive life events, and tended to retain an insecure classification primarily if their caregivers experienced many disruptive life events.<sup>184</sup> Maternal reported life events also moderated associations between infant security and the quality of children's play and their cognitive functioning at 3½.

Belsky and colleagues later published evidence from two of the largest samples with Strange Situations in the period: the University of Pittsburgh (90 families); and the second and third cohorts of the Pennsylvania Infant and Family Development Project (125 families). Both studies reported similar rates of stability in the Strange Situation to those reported in Thompson's doctoral thesis.<sup>185</sup> The coders of the Pittsburgh sample had been trained and assessed as reliable by Doug Teti, and the coders for the Pennsylvania sample

<sup>178</sup> Cicchetti, D. V. (1984) On a model for assessing the security of infantile attachment: Issues of observer reliability and validity. *Behavioral and Brain Sciences*, 7(1), 149–150.

<sup>179</sup> Goldberg, S. (1991) Recent developments in attachment theory and research. *The Canadian Journal of Psychiatry*, 36(6), 393–400; Goldberg, S. (2000) *Attachment and Development*. Routledge, p. 250.

<sup>180</sup> Sagi, A. (1990) Attachment theory and research from a cross-cultural perspective. *Human Development*, 33(1), 10–22.

<sup>181</sup> Sagi, A., Lamb, M. E., & Gardner, W. (1986) Relationship between Strange Situation behavior and stranger sociability among infants on Israeli kibbutzim. *Infant Behavior and Development*, 2, 271–282.

<sup>182</sup> Goossens, F. A., Van IJzendoorn, M. H., Tavecchio, L. W. C., & Kroonenberg, P. M. (1986) Stability of attachment across time and context in a Dutch sample. *Psychological Reports*, 58(1), 23–32.

<sup>183</sup> Van IJzendoorn, M. H. & Kroonenberg, P. M. (1990) Cross-cultural consistency of coding the strange situation. *Infant Behavior and Development*, 13(4), 469–485.

<sup>184</sup> Taylor, D. G. (1989) Coherence in individual development: Early attachment, intervening experience, and attachment, exploration and cognition in 3½-year-olds. Unpublished doctoral thesis, Pennsylvania State University.

<sup>185</sup> Belsky, J., Campbell, S. B., Cohn, J. F., & Moore, G. (1996) Instability of infant–parent attachment security. *Developmental Psychology*, 32(5), 921–924.

were trained and assessed as reliable by Jude Cassidy and Donna Weston; all these trainers were regarded as authoritative coders. Belsky and colleagues concluded that ‘on the basis of the results reported here, it now seems inappropriate to assume that stability rather than instability is the norm when it comes to the measurement of attachment security using the Strange Situation.’<sup>186</sup>

The diversity of responses to the work of Lamb, Thompson, and colleagues reflects, in part, the diversity of registers in their writings. At times they tended towards polemics, making negative and sweeping evaluations about the value and tenability of claims made for attachment as a research paradigm (e.g., in the abstract to the 1984 article).<sup>187</sup> Their writing had a pugnacious tone at times, occasionally scornful, giving the impression of a rejection of attachment research. As Hay noted at the time, ‘the critical tone of the essay makes it seem more controversial than it really is.’<sup>188</sup>

Indeed, writing in a more careful and tempered register, Lamb, Thompson, and colleagues offered reflections on theory and method in a manner committed to the value of attachment research generally, but concerned about claims made about the Strange Situation specifically. Lamb, Thompson, and colleagues characterized the Ainsworth system for coding the Strange Situation as a remarkable instrument, offering an astonishing feeling of clarity. But so might a kaleidoscope—the quality of the instrument does not mean that it has picked out a determinate piece of reality. It should be noted that criticism of the Strange Situation in the name of attachment research was not controversial in itself: such claims were made variously by the Grossmanns, by Waters, and by Ainsworth herself towards the end of her life.<sup>189</sup>

Already in 1984, Lamb, Thompson, and colleagues sought to contest the impression that they disregarded the value of the Strange Situation: ‘Imperfect as it may be ... the Ainsworth system has been remarkably successful in many respects—most notably, in research on the ontogenetic stability of individual differences. Now 20 years old, Ainsworth’s system has shown strengths that make the development of a better system a challenging task.’<sup>190</sup> More broadly, and especially in their 1985 book, the authors stated considerable respect for attachment theory and research, and its actual and potential contribution. Seemingly regretful of the frustrated tone of some of the 1984 paper, in the 1985 book Lamb, Thompson, and colleagues wrote that ‘as progenitors of this powerful theoretical framework,

<sup>186</sup> Ibid., 924. For later meta-analytic support, see Opie, J. E., McIntosh, J. E., Esler, T. B., Duschinsky, R., George, C., Schore, A., ... & Olsson, C. A. (2021) Early childhood attachment stability and change: A meta-analysis. *Attachment & Human Development*, 23(6), 897–930.

<sup>187</sup> Lamb, M. E., Thompson, R. A., Gardner, W. P., Charnov, E. L., & Estes, D. (1984) Security of infantile attachment as assessed in the ‘Strange Situation’: Its study and biological interpretation. *Behavioral and Brain Sciences*, 7(1), 127–147: ‘Popular claims are empirically unsupported in their strong form, and that the interpretations in terms of biological adaptation are misguided. There is little reliable evidence about the specific dimensions of parental behavior that affect Strange Situation behavior, although there does appear to be some relationship between these constructs. Temporal stability in security of attachment is high only when there is stability in family and caretaking circumstances. Likewise, patterns of Strange Situation behavior only have substantial predictive validity in similarly stable families’ (127).

<sup>188</sup> Hay, D. F. (1984) The evolution of ethological attachment theory. *Behavioral and Brain Sciences*, 7(1), 155–156, p. 156.

<sup>189</sup> Grossmann, K., Grossmann, K. E., Spangler, G., Suess, G., & Unzner, L. (1985) Maternal sensitivity and newborns’ orientation responses as related to quality of attachment in northern Germany. *Monographs of the Society for Research in Child Development*, 233–256; Vaughn, B. E. & Waters, E. (1990) Attachment behavior at home and in the laboratory: Q-sort observations and strange situation classifications of one-year-olds. *Child Development*, 61(6), 1965–1973; Ainsworth M. D. S. & Marvin R. S. (1995) On the shaping of attachment theory and research: An interview with Mary D. S. Ainsworth (Fall 1994) *Monographs of the Society for Research in Child Development*, 60(2/3), 2–21.

<sup>190</sup> Lamb, M. E., Gardner, W. P., Charnov, E. L., Thompson, R. A., & Estes, D. (1984) Studying the security of infant–adult attachment: A reprise. *Behavioral and Brain Sciences*, 7(1), 163–171, p. 164.

Ainsworth and Bowlby deserve our deep gratitude, and we hope that they will view our efforts as an attempt to evaluate and build constructively upon their influential work and orientation.<sup>191</sup>

Lamb, Thompson, and colleagues did not characterize the concerns they raised as fatal: they were challenges.<sup>192</sup> The first task was to face them squarely. While some criticisms were uncharitable or did not hit the mark, among the concerns raised by Lamb, Thompson, and colleagues were a number that would resonate with developmental scientists entering attachment research and seeking to negotiate and build from the legacy of Bowlby and Ainsworth. Fundamentally, Lamb, Thompson, and colleagues were criticizing the image of ‘attachment’ as a property of a child, shaped by early maternal care, then fixed and undynamic over time, and predictive of later outcomes. If not an explicit theoretical position, Lamb, Thompson, and colleagues saw this image as implicit in how Ainsworth’s circle were writing, thinking, designing studies, and speaking to practitioner audiences. With this image brought into question, a host of questions tumbled out, with fundamental importance for both research and practice. This historical controversy is important to revisit because several of the issues raised by Lamb, Thompson, and colleagues would either foreshadow or prompt questions that would occupy the second generation of attachment researchers, and form progressive elements in the advancement of attachment as a research paradigm. Some have been resolved, but others remain live questions for attachment research (Chapter 6).

First, Lamb, Thompson, and colleagues criticized Ainsworth and her allies for overconfident claims about the available evidence for sensitivity in the first year as the basis for child security. Ainsworth’s original study ‘must be viewed solely as a hypothesis-generating pilot study—not as a hypothesis-testing investigation’, given methodological limitations such as the post hoc development of scales, the lack of inter-observer reliability estimates, and the small sample, and the vast number of tests for significance conducted.<sup>193</sup> Lamb, Thompson, and colleagues observed that Ainsworth’s study had tremendous pioneering value, but that they suspected that the strength of associations between caregiver sensitivity and security in the Strange Situation would be weaker in future studies. This was an important claim for Van IJzendoorn, who would often cite Lamb and colleagues approvingly on the dangers of overreliance on single studies, especially hypothesis-generating work such as Ainsworth’s.

Second, Lamb, Thompson, and colleagues observed that many of the studies to date had limited attention just to mothers, following the assumed interpretation of Bowlby’s concept of monotropy, as well as reflecting wider cultural values of the day regarding parenting. Ainsworth only examined mother-child interaction at home and in the Strange

<sup>191</sup> Lamb, M., Thompson, R. A., Gardner, W., & Charnov, E. L. (1985) *Infant–Mother Attachment: The Origins and Developmental Significance of Individual Differences in the Strange Situation*. Hillsdale, NJ: Lawrence Erlbaum, p. xi.

<sup>192</sup> Lamb would largely throw up his hands after the mid-1980s, despairing of achieving change in the dominant model organizing attachment research. He would subsequently prioritize research on child maltreatment and forensic interviewing. By contrast, Thompson would remain highly engaged with attachment research, and continued to present and elaborate criticisms of the reification of attachment as a stable, undynamic property of the child across subsequent publications, especially in numerous book chapters. See, e.g. Thompson, R. A. (1991) Construction and reconstruction of early attachments: Taking perspective on attachment theory and research. In D. P. Keating & H. Rosen (eds), *Constructivist Perspectives on Atypical Development and Developmental Psychopathology* (pp. 41–67). Hillsdale, NJ: Erlbaum; Thompson, R. A. (1996). Attachment and emotional development—From clinic to research to policy. In M. R. Merrens & G. G. Brannigan (eds), *The Developmental Psychologists: Research across the Lifespan* (pp. 69–87). New York: McGraw-Hill.

<sup>193</sup> Lamb, M. E., Thompson, R. A., Gardner, W. P., Charnov, E. L., & Estes, D. (1984). Security of infantile attachment as assessed in the ‘strange situation’: Its study and biological interpretation. *Behavioral and Brain Sciences*, 7(1), 127–147, p. 131.

Situation. Sroufe and the Minnesota group collected minimal data on fathers, and almost exclusively from maternal report. Only a small fraction of fathers were still in their child's life at 18 months in the study, and they were very hard to engage in the research.<sup>194</sup> Besides Main's Berkeley study and the Grossmanns' work,<sup>195</sup> none of Ainsworth's other immediate students or associates included fathers in their research design. Lamb's criticisms of the state of attachment research, and his own empirical studies with fathers, helped encourage attention to non-maternal care among researchers from outside Ainsworth's circle, such as Belsky, Sagi-Schwartz, and Van IJzendoorn (Chapter 3).

Third, Lamb, Thompson, and colleagues criticized the way that Ainsworth and allies could often be found referring to the Strange Situation as measuring 'attachment'. According to Ainsworth, what was ultimately measured by the Strange Situation was children's expectations about the availability of their caregiver under conditions of distress, made visible through infants' displays of different repertoires of behaviour in communicating or not communicating about their needs. Lamb, Thompson, and colleagues felt that Ainsworth and her allies were misleading in sometimes calling this 'attachment'—as in the title of her book *Patterns of Attachment*—since such usage of the term fed a number of unwarranted assumptions.<sup>196</sup> It reinforced the impression, stemming from Bowlby's oscillation between narrow and broad meanings of the term 'attachment', that children's expectations about the availability of their caregiver(s) would be very stable over time. Additionally, the characterization of the Strange Situation as measuring 'attachment' reinforced the impression given by Bowlby that the child's expectations about caregiving would mediate, perhaps exhaustively, associations between early care and a child's later outcomes.<sup>197</sup>

Lamb, Thompson, and colleagues acknowledged that there was growing evidence that the Strange Situation classifications were associated with children's later socioemotional outcomes. But they regarded Ainsworth and her followers as hasty and overconfident in assuming that this was due to the causal effects of children's expectations about their caregivers' availability in times of need. Later outcomes might well be best predicted by the child's ongoing experiences of care, rather than any psychological quality of the child, such as their expectations about caregiver availability. They argued that it might be caregiver sensitivity that was predicting *both* Strange Situation behaviour and children's later outcomes. They criticized the overreliance of Ainsworth and allies on statistical tests that included only two variables (in particular, one-way ANOVAs), and urged the adoption of structural equation modelling to examine the respective contribution of caregiver behaviour and children's expectations to later outcomes (Chapter 5).

<sup>194</sup> Sroufe, L. A. & Pierce, S. (1999) Men in the family: Associations with juvenile conduct. In G. Cunningham (ed.), *Just in Time Research: Children, Youth and Families* (pp. 19–26). Minneapolis: University of Minnesota Extension Service.

<sup>195</sup> Grossmann, K. E., Grossmann, K., Huber, F., & Wartner, U. (1981) German children's behavior towards their mothers at 12 months and their fathers at 18 months in Ainsworth's Strange Situation. *International Journal of Behavioral Development*, 4(2), 157–181; Wutz, C. (1985). *Die Vater–Kind Beziehung im ersten Lebensjahr: Trost–Spiel–Pflege*. Unpublished doctoral thesis, Regensburg University; Grossmann, K., Grossmann, K. E., Fremmer-Bombik, E., Kindler, H., Scheuerer-Engelsch, H., & Zimmermann, A. P. (2002) The uniqueness of the child–father attachment relationship: Fathers' sensitive and challenging play as a pivotal variable in a 16-year longitudinal study. *Social Development*, 11(3), 301–337.

<sup>196</sup> Citing Lamb and colleagues as a precursor, this point would later be elaborated in Ziv, Y. & Hotam, Y. (2015) Theory and measure in the psychological field: The case of attachment theory and the strange situation procedure. *Theory & Psychology*, 25(3), 274–291.

<sup>197</sup> Lamb, Thompson, and colleagues pointed to contrasting statements in Bowlby's writings, where he had made more cautious and careful claims. For instance, 'Thus, too much of prognostic significance must not be read into the statement that at the first birthday a couple is likely to have established a characteristic pattern of interaction. All that it means is that for the most couples a pattern that is likely to persist is by that time present.' Bowlby, J. (1969/1982) *Attachment*, London: Penguin, p. 349.

Several attachment researchers found this argument persuasive. Writing in 1991, Lyons-Ruth agreed that ‘continuity may be partly or largely a function of continuity in the caregiver’s emotional responses’, a finding that would later be supported by her own cohort research (Chapter 2).<sup>198</sup> In 1991, Waters also ultimately accepted that ‘we need to pay more attention to the possibility that consistency in parental behavior and supervision can explain predictive/correlational results in attachment research ... the fact that Infant Behavior A predicts Child Behavior B is likely to reflect the fact that parenting is consistent.’<sup>199</sup> In 1999, Thompson was invited by Shaver and Cassidy to write a chapter on early care and later development, signalling that even if such a stance might not be orthodoxy, it was no longer heretical.<sup>200</sup> And a first examination of the respective contributions of sensitivity and the Strange Situation to later child outcomes would be offered by Belsky and Fearon a few years later.<sup>201</sup>

Fourth, Ainsworth had provided apparent evidence in favour of this assumption in the astonishing strength of the association she reported between caregiver sensitivity at home and children’s security in the Strange Situation. Lamb, Thompson, and colleagues were certain Ainsworth had identified factors of importance for child development, but were sceptical of the strength of this association, and even suspected that its implausibility might be bringing attachment research into disrepute.<sup>202</sup> De Wolff and Van IJzendoorn’s later meta-analysis of the association between caregiver sensitivity and the Strange Situation was situated as an attempt to respond to the ‘great controversy’ ‘sparked’ by Lamb, Thompson, and colleagues.<sup>203</sup> Whereas Ainsworth had reported an extreme association between sensitivity and the Strange Situation ( $r = 0.78$ ), De Wolff and Van IJzendoorn reported a more modest  $r = 0.24$  from analysis of 66 samples (Chapter 4; see also Chapter 5 for a later meta-analysis by Madigan and colleagues).

In their paper, De Wolff and Van IJzendoorn wondered whether sensitivity would always mean the same thing. Not least, caregiver sensitivity to a child’s distress might mean something different to sensitivity to a child’s play for the child’s relationships and development. This was a concern that Ross Thompson would elaborate in an important 1997 article, responding to work by the Leiden group.<sup>204</sup> Only with Thompson’s proposal that caregivers’ sensitivity to distress might be critical for children’s expectations of safe haven availability was a coherent account available to attachment theory as to why exactly sensitivity would be associated with children’s Strange Situation behaviour. The proposal to disaggregate the broader sensitivity construct, and examine sensitivity to child distress in particular, would become regarded as a critical contribution to attachment theory

<sup>198</sup> Lyons-Ruth, K. (1991) Rapprochement or approchement: Mahler’s theory reconsidered from the vantage point of recent research on early attachment relationships. *Psychoanalytic Psychology*, 8(1), 1–23, p. 16.

<sup>199</sup> Waters, E., Kondo-Ikemura, K., Posada, G., & Richters, J. E. (1991) Learning to love. In Megan, R. Gunnar & L. Alan Sroufe (eds), *Self Processes and Development* (pp. 217–255). New York: Psychology Press, p. 240.

<sup>200</sup> Thompson, R. A. (1999) Early attachment and later development. In J. Cassidy & P. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (pp. 265–286). New York: Guilford.

<sup>201</sup> Belsky, J. & Fearon, R. P. (2002) Early attachment security, subsequent maternal sensitivity, and later child development: Does continuity in development depend upon continuity of caregiving? *Attachment & Human Development*, 4(3), 361–387.

<sup>202</sup> See also Koops, W., Hoeksma, J. B., & van den Boom, D. (1996) Stagnation and progress in research of early mother–child interaction and attachment. In W. Koops, J. Hoeksma, & D. V. D. Boom (eds), *Development of Interaction and Attachment: Traditional and Non-traditional Approaches* (pp. 1–23). Amsterdam: North-Holland.

<sup>203</sup> De Wolff, M. S. & Van IJzendoorn, M. H. (1997) Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591, p. 571.

<sup>204</sup> Thompson, R. A. (1997) Sensitivity and security: New questions to ponder. *Child Development*, 68(4), 595–597.

and research.<sup>205</sup> Though, as we shall see, this conclusion would gain traction too late to influence the NICHD study (Chapter 3).

Fifth, Lamb, Thompson, and colleagues also argued that important variance might be accounted for by other factors besides sensitivity. In line with the general trend in the literature, Thompson's doctoral thesis had reported no association between Strange Situation classifications and parent-reported measures of temperament.<sup>206</sup> Yet Lamb, Thompson, and colleagues argued that parent-report measures of temperament may not be a dependable measure. Genetic factors could certainly shape both parent and child temperament.<sup>207</sup> Or genetic variance may contribute to liability to emotional dysregulation, and increase or decrease the likelihood of a particular form of insecure behaviour when faced with insensitive care. This proposal by Lamb and colleagues would influence Cicchetti's research on attachment among children with Down's Syndrome,<sup>208</sup> as well as foreshadow concepts of differential susceptibility (Chapter 3). On the other hand, Lamb and colleagues considered that other caregiver behaviours, besides sensitivity, might be especially important in samples across different contexts. This point would be echoed by anthropologist commentators.<sup>209</sup> It has also been echoed by clinicians: caregivers under acute strain might be insensitive in very different ways, and for very different reasons. This point would likewise be made by attachment researchers studying at-risk samples in the 1980s, including Cicchetti, Crittenden, Lyons-Ruth, and Spieker.<sup>210</sup>

Sixth, Lamb, Thompson, and colleagues identified potential limitations to the cross-national use of the Strange Situation. Such research could compare the distribution of classifications to Ainsworth's original work; or assess whether the classifications have the same correlates as US research. Nonetheless, Lamb and colleagues argued that the meaning of a similar or different distribution between countries was not straightforward to interpret. For instance, the Grossmanns' Bielefeld study had proportionately more avoidant infants than any other sample to date. But in this sample, avoidance was not significantly associated with insensitive care. Moreover, the distribution differed from subsequent German samples (Chapter 4). Lamb, Thompson, and colleagues agreed with the Grossmanns' interpretation of these findings, that there may be pathways to avoidant attachment besides insensitive care.<sup>211</sup> Lamb, Thompson, and colleagues reflected that cultural context may

<sup>205</sup> Goldberg, S., Grusec, J. E., & Jenkins, J. M. (1999) Confidence in protection: Arguments for a narrow definition of attachment. *Journal of Family Psychology*, 13(4), 475; Leerkes, E. M. (2011) Maternal sensitivity during distressing tasks: A unique predictor of attachment security. *Infant Behavior and Development*, 34(3), 443–446.

<sup>206</sup> Thompson, R. (1981) Continuity and change in socioemotional development during the second year. Unpublished doctoral thesis, University of Michigan.

<sup>207</sup> In this, Lamb and colleagues were engaging with an ongoing debate about the role of temperament. See Sroufe, L. A. & Waters, E. (1982) Issues of temperament and attachment. *American Journal of Orthopsychiatry*, 52(4), 743–746; Chess, S. (1984) What do we learn from the Strange Situation? *Behavioral and Brain Sciences*, 7(1), 148–149.

<sup>208</sup> Ganiban, J., Barnett, D., & Cicchetti, D. (2000) Negative reactivity and attachment: Down syndrome's contribution to the attachment–temperament debate. *Development and Psychopathology*, 12(1), 1–21.

<sup>209</sup> For example, Keller, H. (2021) *The Myth of Attachment Theory: A Critical Understanding for Multicultural Societies*. London: Routledge.

<sup>210</sup> For example, Schneider-Rosen, K., Braunwald, K. G., Carlson, V., & Cicchetti, D. (1985) Current perspectives in attachment theory: Illustration from the study of maltreated infants. *Monographs of the Society for Research in Child Development*, 194–210; Spieker, S. J. (1986) Patterns of very insecure attachment found in samples of high-risk infants and toddlers. *Topics in Early Childhood Special Education*, 6(3), 37–53; Lyons-Ruth, K., Connell, D., Zoll, D., & Stahl, J. (1987) Infants at social risk: Relationships among infant maltreatment, maternal behavior, and infant attachment behavior. *Developmental Psychology*, 23, 223–232; Crittenden, P. M. (1988) Families and dyadic patterns of functioning in maltreating families. In K. Browne, C. Davies, & P. Stratton (eds), *Early Prediction and Prevention of Child Abuse*, New York: Wiley.

<sup>211</sup> Grossmann, K. E. & Grossmann, K. (1985) Die Entwicklung von Konversationsstilen im ersten Lebensjahr und ihr Zusammenhang mit der mütterlichen Feinfühligkeit und der Beziehungsqualität zwischen Mutter und



shape the kinds of behaviours shown by caregivers to infants, or how familiar the infants would be with separations, but that this was difficult to judge without any studies measuring this cultural context. Lamb would later collaborate with Sagi-Schwartz and Van IJzendoorn in further cross-national research on attachment (Chapter 4).

Finally, Lamb, Thompson, and colleagues argued that evidence remained limited regarding the specific correlates of avoidance and resistance. On the one hand, they stressed that there was little evidence to date of distinct sequelae for avoidance and resistance. They claimed that 'there is no theoretical reason for distinguishing between these patterns, no evidence that the existing groups optimally represent the variance in Strange Situation behavior, and no evidence that any distinctions other than those between securely attached and insecurely attached infants have any validity.'<sup>212</sup> On the other hand, Ainsworth's research was exploratory, and found few discrete correlates of resistant attachment in caregiving behaviour. Lamb, Thompson, and colleagues praised work by Belsky's group as one of the few studies to provide evidence of differences in caregiving antecedents. But they ultimately concluded that 'the lack of consistency from study to study and from assessment to assessment precludes insight into the specific patterns of maternal behavior that are of formative significance.'<sup>213</sup>

In the 1980s, the concerns of Lamb, Thompson, and colleagues regarding the meaning of the difference between the insecure classifications were largely put aside by the field, except among those on the clinically-focused wing such as Lyons-Ruth, Fonagy, and Crittenden.<sup>214</sup> It would take decades for these concerns to fully reemerge, and depended partly on an intervention from the social psychological tradition of attachment research.<sup>215</sup> More broadly, in their 1985 book, Lamb, Thompson, and colleagues urged the 'need for revision of the existing taxonomy' developed by Ainsworth, to better capture forms of insecurity, and to attend to the possible role of attachment processes after infancy.<sup>216</sup> Various proposals for revision were put forward in the 1980s.<sup>217</sup> The approach that gained traction and became the dominant perspective in attachment research in the developmental tradition

Kind. In D. Albert (ed.), *Bericht über den 34. Kongress der Deutschen Gesellschaft für Psychologie in Wien, 1984*. Göttingen: Verlag für Psychologie, 394–397; Grossmann, K. E., Grossmann, K., & Schwan, A. (1986) Capturing the wider view of attachment: A reanalysis of Ainsworth's Strange Situation. In C. E. Izard & P. B. Read (eds), *Measuring Emotions in Infants and Children*, 2. New York: Cambridge University Press, 124–171.

<sup>212</sup> Lamb, M. E., Thompson, R. A., Gardner, W. P., Charnov, E. L., & Estes, D. (1984) Security of infantile attachment as assessed in the 'Strange Situation': Its study and biological interpretation. *Behavioral and Brain Sciences*, 7(1), 127–147, p. 146.

<sup>213</sup> *Ibid.*, 145.

<sup>214</sup> See, for example, Lyons-Ruth, K., Connell, D. B., & Zoll, D. (1989) Patterns of maternal behavior among infants at risk for abuse: Relations with infant attachment behavior and infant development at 12 months of age. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 464–493). New York: Cambridge University Press; Fonagy, P. (1999) Points of contact and divergence between psychoanalytic and attachment theories: Is psychoanalytic theory truly different? *Psychoanalytic Inquiry*, 19(4), 448–480; Crittenden, P. M. (2002) Attachment, information processing, and psychiatric disorder. *World Psychiatry*, 1(2), 72–75.

<sup>215</sup> Fraley, R. C. & Spieker, S. J. (2003) Are infant attachment patterns continuously or categorically distributed? A taxometric analysis of strange situation behavior. *Developmental Psychology*, 39(3), 387–404.

<sup>216</sup> Lamb, M. E., Thompson, R. A., Gardner, W., & Charnov, E. L. (1985) *Infant–Mother Attachment: The Origins and Developmental Significance of Individual Differences in Strange Situation Behavior*. London: Routledge, p. 40.

<sup>217</sup> For example, Radke-Yarrow, M., Cummings, E. M., Kuczynski, L., & Chapman, M. (1985) Patterns of attachment in two- and three-year-olds in normal families and families with parental depression. *Child Development*, 884–893; Crittenden, P. (1988) Family and dyadic patterns of functioning in maltreating families. In K. Browne, C. Davies, & P. Stratton (eds), *Early Prediction and Prevention of Child Abuse* (pp. 161–189). Oxford: John Wiley & Sons; Lyons-Ruth, K., Connell, D. B., & Zoll, D. (1989) Patterns of maternal behavior among infants at risk for abuse: Relations with infant attachment behavior and infant development at 12 months of age. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 464–493). New York: Cambridge University Press.



was that of Mary Main. In part this was due to the publication in 1985 of a hugely influential paper offering intriguing evidence of distinct antecedents and sequelae of forms of infant insecure attachment. This was a report by Main and colleagues from the six-year follow up from their Berkeley longitudinal study.<sup>218</sup>

### Rerouting Attachment Research: Mary Main

In 1968, Mary Main began graduate studies at The Johns Hopkins University, as part of the intake of Mary Ainsworth's first group of graduate students. Main's dissertation was the third study to use the Strange Situation, after Ainsworth and Sylvia Bell, and the results were part of the 106 cases analysed in *Patterns of Attachment*. Main completed her dissertation in 1973, reporting from a study of associations between the Strange Situation and children's play and social behaviour.<sup>219</sup> She also reanalysed Ainsworth's home observation data, finding that the mothers of infants classified as avoidant in the Strange Situation tended to discourage physical contact from their infants at home, even when the children were distressed.<sup>220</sup> In 1973 Main was appointed to a faculty position at University of California, Berkeley, where she led a team that undertook an important longitudinal study, which included the development of new measures for exploring child–caregiver relationships. While innovating on the contributions of Bowlby and Ainsworth, Main was steeped in their ideas, and engaged and re-engaged with their thinking at multiple points across her career.

Main's work has been cited many thousands of times by researchers across both basic and applied fields.<sup>221</sup> Yet Main had problems communicating her position. Additionally, escalating physical and mental health challenges, already serious by the mid-1990s, hindered her capacity to write to correct misunderstandings.<sup>222</sup> I have written about these challenges in detail in my recent obituary for Main.<sup>223</sup> The result has been that most attachment researchers, and the many audiences for attachment knowledge, have had an incomplete grasp of Main's groundbreaking ideas and their underpinning logic, in part due to difficulties in access to these ideas. This has made it hard for audiences to accurately locate and appraise the special strengths and the loose ends of Main's work. As the poet H. D. observed, 'if you do not even understand what words say, how can you expect to pass judgment on what words conceal?'<sup>224</sup>

In *Cornerstones*, I offered a detailed account of Main's work, which she approved. In the present chapter, I do give some overview, but my focus is especially on the reception of Main's work and its influence on the subsequent development of attachment research. Given its dominant role in shaping conceptualizations of attachment among researchers

<sup>218</sup> Main, M., Kaplan, N., & Cassidy, J. (1985) Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (eds), *Growing Points in Attachment Theory and Research. Monographs of the Society for Research in Child Development*, 50, 66–106.

<sup>219</sup> Main, M. (1983) Exploration, play, and cognitive functioning related to infant–mother attachment. *Infant Behavior and Development*, 6(2–3), 167–174.

<sup>220</sup> Main, M. & Stadtman, J. (1981) Infant response to rejection of physical contact by the mother. *Journal of the American Academy of Child Psychiatry*, 20(2), 292–307.

<sup>221</sup> Schuengel, C., Bakkum, L., Madigan, S., & Fearon, P. (2024) Mary Main's written legacy: A bibliometric analysis, *Attachment & Human Development*, early view.

<sup>222</sup> E. Hesse, personal communication, December 19, 2023.

<sup>223</sup> Duschinsky, R. (2024) Mary Main: Portrait and tribute. *Attachment & Human Development*, early view.

<sup>224</sup> H. D. [Hilda Doolittle] ([1944] 1998) The walls do not fall. In *Trilogy* (pp. 1–60), New York: New Directions, p. 14.

in the developmental tradition, one might refer to the reception of Main's ideas as 'main-stream' attachment research. However, it should be understood that this main-stream theory is well downriver from Main's own ideas and, as I shall show, is in many ways profoundly divergent from Main's hopes for her work.

### Conditional Strategies

Main spent September 1977 to May 1978 as a Fellow at the Centre for Interdisciplinary Research in Bielefeld, West Germany. The focus that year was on the application of biological principles to observable behaviour, and the other Fellows represented future leaders across a wide variety of disciplines. From discussions with Richard Dawkins and John Maynard Smith, Main came to conceptualize avoidance as a 'conditional strategy': a behavioural sequence, made available by a species' evolutionary history, that can be used to attain at least partial achievement of a goal, on the assumption that a direct strategy for achieving this is likely to be unsuccessful. That is to say: not just any alternative approach to achieving a goal, where a direct approach is not regarded as suitable. A conditional strategy is a response available to every member of a species, having been elaborated in the course of natural selection.

In the case of avoidant attachment, Main proposed that evolution had hard-wired humans with the capacity to turn attention away from attachment needs (avoidance), or focus on them vigilantly (resistance), if doing so would be anticipated to maximize the caregiver's availability. As she put it in a later formulation: the idea is that 'there exist species-wide abilities that are not part of the attachment system itself, but can, within limits, manipulate (either inhibit or increase) attachment behavior in response to differing environments'.<sup>225</sup>

This was a radical speculation. It was not merely a localized psychological theory to account for Strange Situation, but a bold *philosophy of human emotional experience in general*. It cannot be overstated the extent to which Main was soaked to the bone in Ainsworth's work. Even in the final years of her life, with so many other capacities progressively robbed from her by Alzheimer's disease, and even basic skills lost, Main could talk eloquently and insightfully about Ainsworth's ideas and methods, which must have been absorbed and been part of her mental life at an astoundingly deep level.<sup>226</sup> In the late 1970s, she made a daredevil theoretical leap: she attempted to see the world *through* the Ainsworth categories, identified from 23 middle-class infants in the mid-1960s in Baltimore.

For Main, the categories could be conceptualized as expressing the three basic ways that humans can respond to distressing and challenging situations. In the context of worries or other troubling feelings we can directly communicate about our feelings to someone we anticipate or hope might help us. Alternatively, we can keep our feelings to ourselves, minimizing and shuttering how much we notice and express them to avoid rejection from others; or we can make our distress and frustration someone else's problem, maximizing attention to indicators of whether this other will notice and respond.

As can be seen, one aspect of Main's account here was ethological and behavioural. She was interested in repertoires of behaviours that may have been selected for within human

<sup>225</sup> Main, M., Hesse, E., & Kaplan, N. (2005) Predictability of attachment behavior and representational processes at 1, 6, and 19 years of age: The Berkeley longitudinal study. In K. E. Grossmann, K. Grossmann, & E. Waters (eds), *Attachment from Infancy to Adulthood: The Major Longitudinal Studies* (pp. 245–304). New York: Guilford, p. 256.

<sup>226</sup> Duschinsky, R. (2024) Mary Main: Portrait and tribute. *Attachment & Human Development*, early view.

evolutionary history because they increase the odds of retaining attention and protection from caregivers. The focus is the behaviour's likely *function*. When referring to conditional strategies in this first aspect she wrote of '*adaptive strategies*'. Yet another aspect of Main's account here is intra-psychic and cognitive. She was also interested in the conditional strategies as different ways of processing information. The focus is on *perception*. The concept of conditional strategy laminated these two levels. When referring to conditional strategies in this second aspect she wrote of '*attentional strategies*'.

For Main, as well as forms of interpersonal relating, based on repertoires made available by our evolutionary history, the conditional strategies are ways of knowing the world.<sup>227</sup> They each hold on to real truths about our reliance on others, and bargain for care on this basis. An infant in an avoidant dyad directs attention away from potential information that might elicit alarm, distress, or a tendency to approach the caregiver for comfort. They see clearly, indeed with a reductive clarity, that as humans we are partly independent of our attachment figures. They likewise see the potential advantages to having control over negative feelings. An infant in an ambivalent/resistant dyad directs attention away from potential information that might suggest that the environment is unthreatening and that the caregiver is available. This infant therefore sees clearly, indeed overclearly, the human predicament that attachment figures are independent of us in potentially worrying ways. They also see the potential advantages to letting negative feelings hold sway.

Each of the conditional strategies is acutely and effectively attentive to some aspect of reality, and in this way enacts a way of responding to alarm that may be of survival value under conditions where that aspect is of special importance. The conditional strategies may be anticipated to offer some access to the feelings of comfort and protection, unsatisfying but tolerable, and on the condition that hope of more than this is left aside. Yet for Main, each conditional strategy must depend upon selective exclusion of another aspect of reality. There will be, she predicted, a price to be paid for the conditional strategy in the long-run, to the degree that this information about attachment relationships and about their own affective life remains relatively opaque to the individual.

Main went to visit Bowlby in London in March 1978. In the course of these discussions Bowlby was persuaded that the attachment system may have evolved with a repertoire of strategies for minimizing or maximizing its output.<sup>228</sup> Main's ideas also dovetailed well with his own thinking about differences in information-processing as underpinning individual differences in attachment, which would find expression in his book *Loss*.<sup>229</sup> Main

<sup>227</sup> Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds), London: Routledge: 'The individual differences in attachment organization, first discovered by Ainsworth in infant reactions to the parent in a stressful environment, are confined neither to infancy nor to behavioral reactions to the leavetaking and return of an attachment figure. Rather, what is classified in terms of the infant's non-verbal response to the parent within the Ainsworth Strange Situation can be classified equally well when the adult speaks of and evaluates her autobiographical memories of attachment-related events, or as the six-year-old constructs a drawing of her family. Indeed, it seems that what is being identified through these classification systems—whether they deal with spoken autobiographies, drawings, infant behavior, or discourse—is nothing less than a set of general, relatively stable, and coherent categories of mental organization.'

<sup>228</sup> Bowlby, J. (1978) Notes following discussion with Mary Main in March 1978 about the draft of Vol. 3 *Loss*. John Bowlby Archive, Wellcome Collections, PP/Bow/H.78

<sup>229</sup> Bowlby, J. (1979) The ten books which have most influenced my thought, 24th October 1979, John Bowlby Archive, Wellcome Collections, PP/Bow/A.1/8: 'M.H. Erdelyi (1974) A new look at the new look: perceptual defence and vigilance, *Psychological Review*. I read this soon after its appearance. It provided me with an account of current ideas on information processing which was just what I was looking for in order to sketch the theory of defensive processes that I have outlined in Chapter 4 of *Loss*. Bowlby's take-up of Erdelyi's ideas is visible already in Bowlby, J. ([1974] 2019) Psychological processes evoked by a major psycho-social transition. In R. Duschinsky & K. White (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 178–181). London: Routledge. See also Bowlby, J. (1980) *Loss*. London: Pimlico, chapter 4.

and Bowlby could agree that real experiences shape development, that we can have variable awareness of these experiences in memory and perception, and that one outcome of negative real experiences can be certain systematic obstructions in processing memory and perception. Bowlby encouraged Main, in the strongest terms, to publish her ideas. Heartened by Bowlby's response, Main put her ideas forward in a short 1979 paper and a long 1981 chapter. Her proposal was that individual differences in the Strange Situation specifically, and human experiences in relationships generally, were structured by conditional strategies, minimizing and maximizing attention to information that would prompt our behavioural responses. It turned the infant Strange Situation categories from a specific empirical tool for understanding the impact of caregiving into the core of the field's research imagination.

Ainsworth was, understandably, rather astonished that Main had transformed her categories for the Strange Situation into an encompassing philosophy of existence, applicable to all motivational systems. In a letter to John Bowlby in March 1984 (embarrassingly posted by accident, in fact, to Mary Main), Ainsworth expressed 'unease' with Main's ambitious and universalizing proposals:

She is convinced that I have discovered the three patterns of attachment—that she believes to hold not only for one-year-olds but throughout the life span. This is very flattering. Also I must confess I think that they are indeed the three major patterns. But ... I cannot quite believe that apart from the groups and subgroups I have identified there are [not] other less frequent occurring patterns that may be impossible to comprehend within these three major groups (A/B/C). To say nothing of cross-cultural variations.<sup>230</sup>

Yet as she learned about Main's theories over the course of 1985, Ainsworth came to regard the perspective as ingenious and generative, albeit still speculative. She remarked to Bowlby: 'I am in a sense a student of Mary Main's.'<sup>231</sup> She was especially enthusiastic about Main's lamination of function and perception, as were her Virginia graduate students of the period. As I have written about elsewhere, together with Bowlby's work on the exclusion of certain classes of processing, Main's concept of adaptive strategies would form an initial basis for Crittenden's work.<sup>232</sup> It would also be of decisive importance for other Virginia students of the period such as Kobak, Colin, Wartner, Cohn, and Cassidy.<sup>233</sup>

In their 1985 book, Lamb and colleagues criticized Main's proposals, arguing that evolution will have given human infants various ways of responding to different caregiving

<sup>230</sup> Ainsworth, M. (1984) Letter to John Bowlby, 10 March 1984, John Bowlby Archive, Wellcome Collections, PP/BOW/B.3/7.

<sup>231</sup> Ainsworth, M. (1985) Letter to John Bowlby, 23 December 1985, John Bowlby Archive, Wellcome Collections, PP/BOW/B.3/8.

<sup>232</sup> Crittenden, P. M. (1983) Mother and infant patterns of attachment. Unpublished doctoral dissertation, University of Virginia, Charlottesville; Crittenden, P. M. (1999). Danger and development: The organization of self-protective strategies. *Monographs of the Society for Research in Child Development*, 64(3), 145–171. See also Landa, S. & Duschinsky, R. (2013) Letters from Ainsworth: Contesting the 'organization' of attachment. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 22(2), 172–177; Landa, S. & Duschinsky, R. (2013) Crittenden's dynamic-maturational model of attachment and adaptation. *Review of General Psychology*, 17(3), 326–338.

<sup>233</sup> For example, Kobak, R. R. (1985) The transition to college: Attitudes toward attachment and social competence. Unpublished doctoral dissertation, University of Virginia; Colin, V. L. (1985) Hierarchies and patterns of infants' attachments to parents and day caregivers: An exploration. Unpublished doctoral dissertation, University of Virginia; Wartner, U. G. (1987) Attachment in infancy and at age six, and children's self-concept: A followup of a German longitudinal study. University of Virginia; Cohn, D. A. (1988). Security of attachment at 6 years of age and peer social competence in first grade. Unpublished doctoral dissertation, University of Virginia; Cassidy, J. (1988) The self as related to child-mother attachment at six. *Child Development*, 59(1), 121–134. See also Colin, V. (1996) *Human Attachment*. Philadelphia: Temple University Press.

environments, not just three, none of which should be regarded as primary as they may each contribute to survival and reproduction in certain ecological niches.<sup>234</sup> Additionally, Lamb and colleagues were concerned by Main's generalization of the Strange Situation categories into the three basic ways that humans can respond to distressing and challenging situations. They felt that this model would make it difficult to account for the further possible strategies that might be available to older children, thanks to greater developmental capabilities.

The concern of Lamb and colleagues with Main's generalization of three basic forms of human emotion regulation found purchase with anthropologists.<sup>235</sup> However, the idea of individual differences in attachment as strategies was felt by attachment researchers in the 1980s to be very generative and elegant, offering an ambitious and organizing approach to interpreting insecurity.<sup>236</sup> The lamination of function and perception also had the advantage of allowing attachment researchers to incorporate and give a settled place to Bowlby's uncanny experience of ethology and psychoanalysis as a Möbius strip, in which any path could lead back to the point of origin but would leave the walker turned upside down. Discussion of minimizing and maximizing information-processing strategies could also serve as a discussion of kinds of close relationship, and vice versa. Unfortunately, from 1985 onwards, Main's concern with function dropped away, in part due to the inspiration and support provided by Bowlby for a focus on information-processing, and in part due to her growing interest in adult autobiographical discourse. Ainsworth had also criticized use of the term 'adaptive' as vague, so Main generally stopped using the term.<sup>237</sup> Function became the silent underside of the concept of conditional strategy, and got lost from view except for Ainsworth and a few of her students. This was noted with regret by Ainsworth, Crittenden, and Marvin at the time.<sup>238</sup> A decade later, the same point would be raised by Thompson,<sup>239</sup> Belsky (Chapter 3), and by Fonagy.<sup>240</sup>

The interpretation of individual differences as minimizing/maximizing information-processing strategies (and, with varying degrees of explicitness, ways of responding within attachment relationships) remains central to research design, measurement, and interpretation in attachment research. As we shall see, it underpinned the creation of the Adult

<sup>234</sup> Lamb, M. E., Thompson, R. A., Gardner, W., & Charnov, E. L. (1985) Infant–mother attachment: The origins and developmental significance of individual differences in strange situation behavior. London: Routledge, chapter 4. See also Chisholm, J. S. (1996) The evolutionary ecology of attachment organization. *Human Nature*, 7(1), 1–37. Despite her recognition of alternative or “conditional” attachment strategies, in referring to insecure attachment as a “secondary” strategy, Main (1990) may be clinging to the view that because secure attachment is “primary” it must also be “normal” (24).

<sup>235</sup> Gaskins, S. (2013) The puzzle of attachment. In N. Quinn & J. M. Mageo (eds), *Attachment Reconsidered: Cultural Perspectives on a Western Theory* (pp. 33–66). London: Palgrave.

<sup>236</sup> For example, Grossmann, K. E. & Grossmann, K. (1986) Phylogenetische und ontogenetische Aspekte der Entwicklung der Eltern-Kind Bindung und der kindlichen Sachkompetenz. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie*, 18, 287–315. For a recent example, see Groh, A. M., Xu, N., Patrick, M. M., Robinson, R., Hoeflerle, B., & Haydon, K. C. (2024) Deactivation, hyperactivation, and anomalous content in the attachment script assessment: Stability over time and significance for parenting behavior and physiology. *Attachment & Human Development*, 26(3), 233–252.

<sup>237</sup> Ainsworth, M. (1984) Attachment, adaptation and continuity. Paper presented at the International Conference on Infant Studies, April 1984, John Bowlby Archive, Wellcome Collections, PP/Bow/J.1/57.

<sup>238</sup> Crittenden, P. M. & Ainsworth, M. D. (1989) Child maltreatment and attachment theory. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 432–463). Cambridge: Cambridge University Press; Marvin, R. S. (1992) Attachment- and family systems-based intervention in developmental psychopathology. *Development and Psychopathology*, 4(4), 697–711.

<sup>239</sup> For example, Thompson, R. A., Flood, M. F., & Lundquist, L. (1995) Emotional regulation: Its relations to attachment and developmental psychopathology. In D. Cicchetti & S. L. Toth (eds), *Emotion, Cognition, and Representation* (pp. 261–299). New York: University of Rochester Press.

<sup>240</sup> Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press, chapter 7.

Attachment Interview. It also underpinned the coding systems for a majority of subsequent measures of attachment behaviour and narratives, no matter whether these measures were developed for infancy, childhood, adolescence, or adulthood, since it has been assumed by much of main-stream attachment research that Main's model captured all that needed to be known about individual differences across the lifespan.

Yet the reception of Main's ideas by contemporary researchers was obstructed by considerable challenges. A first was a lack of clarity on Main's part regarding what, indeed, was *actually being minimized or maximized*. Her 1979 and 1981 works are brilliant. But there is an 'artist's sketch' quality to them. Main used the term 'attention' in a variety of ways. At times this usage included perception and memory, to the degree that these processes are scaffolded by attention. Here attention might encompass all aspects of how humans engage or disengage with what we perceive, both internally and externally. At other times and foremost, attention meant for Mary the prioritization of information within working memory, and perception of the environment and memory fall out of the definition of attention. So the boundaries of what exactly Mary meant by 'attention' remained somewhat ambiguous, and, as such, likewise the relationship between attention and conditional strategies.

It is unfortunate that the primary paper in which Main set out the attentional account, her 1981 chapter, was very rambling. Instead, for the concept readers have tended to turn to Main's 1990 paper in an issue of *Human Development*, edited by Van IJzendoorn.<sup>241</sup> A problem is that here Main assumed that readers were already familiar with her 1981 chapter, and so did not explain her attentional model. Matters were further confused by an important and widely read 1994 paper by Jude Cassidy, who offered an interpretation of avoidance and resistance in terms of emotion regulation, as 'minimizing' or 'maximizing' the attachment behavioural system itself. This paper reaffirmed the central relationship between function and perception that had been at the heart of the concept of conditional strategies when it was developed. However Cassidy seems unsure about how to square these two components. As a result, the paper asserts that the conditional strategies function to increase caregiver availability, but without giving detail on how. Furthermore, Cassidy leaves out Main's theory of attentional processes, and treats the attachment system as if it were something that could be minimized or maximized directly, without clarifying whether or not this was intended as a new theory or represented Main's position.<sup>242</sup>

For various reasons, then, it was left unclear to the main-stream attachment researchers what exactly was being minimized or maximized, or how these forms of information-processing related to achieving caregiver availability. The idea of minimizing and maximizing was simply absorbed and became part of the conceptual imagination of attachment research, in both the developmental and social psychological traditions of attachment research. As a result, one loose end was that—except among Main's students<sup>243</sup>—developmental psychologists generally failed to specify, test, or elaborate the theory that

<sup>241</sup> Main, M. (1990) Cross-cultural studies of attachment organization: Recent studies, changing methodologies, and the concept of conditional strategies. *Human Development*, 33(1), 48–61.

<sup>242</sup> Cassidy, J. (1994) Emotion regulation: Influences of attachment relationships. *Monographs of the Society for Research in Child Development*, 59(2–3), 228–249. In Berlin's doctoral thesis from 1994, supervised by Cassidy, Berlin attributes the idea of 'minimizing' or 'maximizing' the attachment behavioural system itself to Main rather than Cassidy, and there is no mention of Main's attentional theory. This suggests that Cassidy may have regarded her position as the same as Main's rather than representing an alternate model. Berlin, L. J. (1994) Attachment and emotions in preschool children. Unpublished doctoral dissertation, Pennsylvania State University. See also Cassidy, J. & Berlin, L. J. (1994) The insecure/ambivalent pattern of attachment: Theory and research. *Child Development*, 65(4), 971–991.

<sup>243</sup> Rifkin-Graboi A. (2008) Attachment status and salivary cortisol in a normal day and during simulated interpersonal stress in young men. *Stress*, 11(3), 210–224; Bahm, N. I. G., Main, M., & Hesse, E. (2016) Unresolved/disorganized responses to the death of important persons: Relations to frightening parental behavior and

attentional processes underpinned individual differences in attachment, or the role of these cognitive differences in the functioning of attachment relationships.

One contributing factor may have been antipathies between cognitive and developmental psychology in the period: when Bowlby delivered a paper in Dublin in the early 1980s discussing the cognitive underpinnings of the attachment motivational system, many developmental psychologists otherwise sympathetic to attachment research simply walked out.<sup>244</sup> In subsequent convergence between cognitive and developmental psychology, researchers have addressed relevant topics, such as attentional processes underpinning individual differences in regulation of fear and alarm, but not with Main's work in mind.<sup>245</sup>

Among the few empirical investigations of a potential attentional architecture for individual differences in attachment, Suess, Roth, and the Grossmanns documented that secure attachment in infancy was significantly associated with children's attention spans at kindergarten and preschool, and all the more for children with secure attachments with both parents.<sup>246</sup> Kirsh and Cassidy found a consistent pattern of results from three studies, showing that infant avoidant attachment in the Strange Situation was significantly associated with preschoolers looking or turning away from attachment-relevant stimuli, and poorer memory for stories in which a caregiver shows responsiveness to their child.<sup>247</sup> Secure attachment in the Strange Situation was significantly associated with greater attention to attachment-relevant stimuli, and better reported memory for stories about caregivers whether they ended positively or negatively. Yet there was no evidence of resistant attachment being associated, as expected, with higher attention to attachment-relevant stimuli or threats. This would prove one of many failures of resistant attachment in the Strange Situation to be associated with expectable correlates (Chapter 4).

Zeijlman van Emmichoven, Van IJzendoorn, and colleagues found some association between the Strange Situation and capacity to recall words connoting threat on a memory task, but only in their clinical subsample.<sup>248</sup> By contrast, the NICHD study (Chapter 3) found no association between early caregiving context and individual differences in children's attentional focus in first grade. Yet the measure of early caregiving composited a wide variety of assessments, including an assessment of the child's physical environment at home and mothers' provision of cognitive stimulation. There is no reason to assume

infant disorganization. In S. Gojman-de-Millan, C. Herreman, & L. A. Sroufe (eds), *Attachment across Clinical and Cultural Perspectives* (pp. 73–94). London: Routledge.

<sup>244</sup> Bowlby, J. (1982) Notes on 'discussion with Karin Grossmann, Dublin, Jul 1982'; correspondence, 1982; and notes by Bowlby on 'Dublin paper, 1982'. John Bowlby Archive, Wellcome Collections, PP/BOW/J.9/81. Grossmann, K. & Grossmann, K. (2012) *Bindungen—das Gefüge psychischer Sicherheit Gebundenen*, Stuttgart: Klett-Cotta, chapter II.1.2.

<sup>245</sup> For example, Humphreys, K. L., Kircanski, K., Colich, N. L., & Gotlib, I. H. (2016) Attentional avoidance of fearful facial expressions following early life stress is associated with impaired social functioning. *Journal of Child Psychology and Psychiatry*, 57(10), 1174–1182.

<sup>246</sup> Suess, G. J. (1987) Auswirkungen frühkindlicher Bindungserfahrungen auf die Kompetenz im Kindergarten. Unpublished doctoral thesis, Regensburg University; Roth, R. (1987) *Spielqualität und Konfliktverhalten bei 5jährigen im Kindergarten als Folge unterschiedlicher Eltern-Kind-Beziehung im Kleinkindalter*. Diplomarbeit, Universität Regensburg; Grossmann, K. (1995) Kontinuität und Konsequenzen der frühen Bindungsqualität während des Vorschulalters. In G. Spangler & P. Zimmermann (eds), *Die Bindungstheorie*. Grundlagen, Forschung und Anwendung. Stuttgart: Klett-Cotta, S. 191–202.

<sup>247</sup> Kirsh, S. J. & Cassidy, J. (1997) Preschoolers' attention to and memory for attachment-relevant information. *Child Development*, 68(6), 1143–1153. See also Dykas, M. J., Woodhouse, S. S., Ehrlich, K. B., & Cassidy, J. (2012) Attachment-related differences in perceptions of an initial peer interaction emerge over time: Evidence of reconstructive memory processes in adolescents. *Developmental Psychology*, 48(5), 1381–1389.

<sup>248</sup> Van Emmichoven, I. A. Z., Van IJzendoorn, M. H., De Ruiter, C., & Brosschot, J. F. (2003) Selective processing of threatening information: Effects of attachment representation and anxiety disorder on attention and memory. *Development and Psychopathology*, 15(1), 219–237.

that the NICHD assessment of the early caregiving context was addressing aspects of care relevant to individual differences in attachment.<sup>249</sup>

Belsky and colleagues also reported no evidence of a link between any attachment classification and attentional processes. As part of the three-year follow-up of Study IV of the Pennsylvania Child and Family Development Project (Chapter 3), participants were invited into the laboratory to watch a puppet show. Children with secure attachment histories remembered positive events more accurately than negative events in the puppet show, whereas children with insecure attachment histories had better memories for negative events. However there was no association between the Strange Situation and children's distractibility during the puppet show.<sup>250</sup> Belsky and colleagues therefore concluded that their findings clearly contradicted Main's claims about attentional processes. It is not clear this is a fair conclusion. Main's claim was that the conditional strategies entail attention directed towards or away from attachment-relevant information. The puppet shows were not narratives about secure base or safe haven availability, or anything much to do with attachment specifically: one puppet received a birthday present, and another spilled his juice.

There are other studies that have documented associations between the Strange Situation classifications and differences in social processing.<sup>251</sup> Additionally, there is considerable literature on attentional processes within the social psychological tradition of attachment research.<sup>252</sup> Yet Bosmans and colleagues have acknowledged that studies to date have ultimately been indirect rather than direct tests of Main's theory that the flexibility or inflexibility of attentional processes underpin individual differences in attachment, and that these generally help ensure caregiver availability: 'although Main's theory is generally accepted within the field of attachment theory, so far, this theory has not been directly tested'.<sup>253</sup> As Schuengel has observed, such future research may also need to further specify this theory, which remains somewhat impressionistic, in order to render it fully available for empirical testing.<sup>254</sup>

Another loose end was that Main provided no further theoretical elaboration for why there would be only two conditional strategies—others in principle could have been selected for during human evolutionary history. It was an idea which attachment researchers found readily usable, but not one easy to develop: little psychological theory developed the idea of conditional strategies, which also remained out of contact with, and

<sup>249</sup> NICHD Early Child Care Research Network (2005) Predicting individual differences in attention, memory, and planning in first graders from experiences at home, child care, and school. *Developmental Psychology*, 41(1), 99–114.

<sup>250</sup> Belsky, J., Spritz, B., & Crnic, K. (1996) Infant attachment security and affective-cognitive information processing at age 3. *Psychological Science*, 7(2), 111–114.

<sup>251</sup> For example, Ziv, Y., Oppenheim, D., & Sagi-Schwartz, A. (2004) Social information processing in middle childhood: Relations to infant–mother attachment. *Attachment & Human Development*, 6(3), 327–348; Gonçalves, J. L., Fuertes, M., Silva, S., Lopes-dos-Santos, P., & Ferreira-Santos, F. (2024) Differential effects of attachment security on visual fixation to facial expressions of emotion in 14-month-old infants: An eye-tracking study. *Frontiers in Psychology*, 15, 1302657. See also Zimmermann, P., & Iwanski, A. (2015) Attachment in middle childhood: Associations with information processing. *New Directions for Child and Adolescent Development*, 2015(148), 47–61.

<sup>252</sup> For example, Uccella, A., Mercante, B., Barone, L., & Enrico, P. (2022) Adult avoidant attachment, attention bias, and emotional regulation patterns: An eye-tracking study. *Behavioral Sciences*, 13(1), 11.

<sup>253</sup> Bosmans, G., Sanchez-Lopez, A., Finet, C., & De Raedt, R. (2019) Attachment-related attention bias plays a causal role in trust in maternal support. *Journal of Experimental Child Psychology*, 185, 176–190, p. 180.

<sup>254</sup> Schuengel, C. (2005) De gehechtheidstheorie als 'grand theory'? Grenzen en vooruitzichten van een theorie over sociale verbondenheid. *Kind en Adolescent*, 26(1), 4–14; While not a direct appraisal of Main's attentional model of differences between the attachment categories, see also Schneider, M., Obsuth, I., Szymanska, M., Mathieu, J., Nezelof, S., Lyons-Ruth, K., & Vulliez-Coady, L. (2022) Attachment-based parent–adolescent interaction linked to visual attention and autonomic arousal to distress and comfort stimuli. *BMC Psychology*, 10(1), 112.



inaccessible to further nourishment from, studies in ethology or evolutionary biology. Nor did Main conduct psychometric research to support her interpretation of individual differences in attachment in terms of two conditional strategies.<sup>255</sup> From examination of her publications, it would not seem she had the technical skills to undertake such work.<sup>256</sup> Subsequent researchers have not read Main's work closely enough to realize the need. Furthermore, her work after the 1990s on the elaboration and variegation of developmental capabilities after infancy was not placed back into conversation with her theory of conditional strategies. As Waters has reflected in a graduate seminar, Main's model was 'informal, loose, and speculative—*not intended to be challenged*.'<sup>257</sup>

An incomplete and uncritical impression of Main's theoretical proposal about the role of attentional processes in structuring individual differences had become, without empirical testing, a fundamental and taken-for-granted part of main-stream developmental attachment research. Colleagues such as Roger Kobak, noticed this, and urged Main to write to clarify her position.<sup>258</sup> In the 1990s and 2000s, Main tended to assume that people would understand her work should they, like Kobak, took the time to read it carefully. By the time she fully accepted, in the 2010s, that few actually knew of her attentional model of individual differences in attachment, and the divergences between her own views and those of researchers who thought they were following her, she was too unwell to address these issues.

### Disorganization

Main submitted a proposal to the William T. Grant Foundation for a much larger study than Ainsworth's original work, and including both mothers and fathers. The proposal was accepted and Mary was able to hire research assistants to support the recruitment of 189 families in 1976–1977. For this replication and extension of Ainsworth's study, Main's sample was selected precisely to be low-risk. All the families were middle or upper-middle class. No teenage mothers were included, and none of the parents were divorced. Only Caucasian or Asian ethnicity families were included, to exclude as a confound the adversities black families faced with stigma and oppression. Families were also screened out if the father was unemployed, or if infants were in more than 25 hours of daycare per week. Deliberately unrepresentative of US families, Main's sample was intended to be low-risk, as a point of comparison against which later studies addressing specific risks or particular populations could be compared. However, in fact Main did not have the funds to arrange coding for all 378 Strange Situation recordings, and only data from 92 were ever reported. How these were selected from the total 378 is unclear, and unlikely to have been at random.

Main was supported by Donna Weston, who held responsibility for day-to-day operations of this empirical research. A paper by Main and Weston from 1981 reported three

<sup>255</sup> Shaver and colleagues would later provide psychometric support for two dimensions of attachment styles, anxiety, and avoidance. However there are considerable disanalogies, for instance, between this construct of anxiety and Main's construct of resistance/preoccupation. Furthermore, more recent psychometric work has contested and qualified Shaver and colleagues' two factor model. For a review, see Duschinsky, R. (2020) *Cornerstones of Attachment Research*, Oxford: Oxford University Press, [chapter 5](#).

<sup>256</sup> Throughout her career, all Main's own statistical calculations were done by hand, and her data was only digitized by Kazuko Behrens in the 2000s. K. Behrens, personal communication, November 3, 2023.

<sup>257</sup> Waters, E. (2011) The positive sides of secure base use, 4/23/2011. Unpublished manuscript. Everett Waters personal archive.

<sup>258</sup> Kobak, R. R., Cole, H. E., Ferenz-Gillies, R., Fleming, W. S., & Gamble, W. (1993) Attachment and emotion regulation during mother-teen problem solving: A control theory analysis. *Child Development*, 64(1), 231–245.

important observations.<sup>259</sup> A first was the stability of the Strange Situation classifications over time, mentioned above. Secondly, Main and Weston reported barely any concordance between a child's Strange Situation behaviour with their mother and their father, and each relationship made distinct contributions to a child's social competence. This was timely evidence in favour of Ainsworth's claim that attachment behaviour reflected the child's experiences and expectations with a particular caregiver, rather than solely reflecting a child's general temperament.<sup>260</sup> A third observation was that 12 of Strange Situations were not readily classifiable according to the Ainsworth classifications. For another researcher, this might have been taken merely as a limitation of the Ainsworth classifications. But Main had extrapolated these classifications to become the universal forms of human relational life: exceptions were therefore highly salient. Furthermore, the children whose behaviour did not fit the Ainsworth classifications tended to show signs of conflict, confusion, or apprehension on reunion with their caregivers. Main was primed to take note of conflict behaviours as a result of interest in the observations of animal behaviour by the ethologist Robert Hinde. Hinde had noted that when animals experience two conflicting behavioural tendencies, they may show them in alternation, simultaneously, or undirected or misdirected movements.<sup>261</sup> Bowlby dedicated a chapter of his book *Attachment* to underling the tremendous interest of Hinde's observations, which resonated for him with the stress placed in psychoanalytic theory on psychological conflict.<sup>262</sup>

In 1977, Judith Solomon joined Main's lab as a graduate student, following studies in ethology and comparative psychology. As well as coding Main's sample, she began coding Strange Situations for a clinic working with maltreated infants and their parents. In coding these two samples, Solomon observed a variety of conflict behaviours, very similar to the behaviours documented by Hinde, and especially at reunion with the mother. She also observed some signs of confusion or apprehension among the children. The first use of a 'Group D' classification in the Berkeley study occurred in August 1979. The infant's behaviour on reunion displayed a whole variety of conflict behaviours. After attempting at length to work out a best-fit Ainsworth classification, Solomon eventually gave up: 'Well, it is not A and it is not B and it is not C. I'm going to call it D.' Solomon's first use of the 'D' label was in pique. However, from 1979 Main and Solomon began thinking about and discussing a 'D' category for the Strange Situation, which they ultimately labelled 'disorganized'.<sup>263</sup> This category would comprise both Hinde's conflict behaviours, and signs of confusion or apprehension, displayed towards the caregiver in the Strange Situation. To gather more data and to support a claim to wider relevance, Main's laboratory began to collect unclassifiable tapes from other researchers working with high-risk samples such as Mary J. O'Connor, Elizabeth Carlson, Leila Beckwith, and Susan Spieker. Main observed

<sup>259</sup> Main, M., & Weston, D. R. (1981) The quality of the toddler's relationship to mother and to father: Related to conflict behavior and the readiness to establish new relationships. *Child Development*, 52(3), 932–940.

<sup>260</sup> Supporting evidence was published the same year by Karin and Klaus Grossmann, with Main contributing to the coding: Grossmann, K. E., Grossmann, K., Huber, F., & Wartner, U. (1981) German children's behavior towards their mothers at 12 months and their fathers at 18 months in Ainsworth's Strange Situation. *International Journal of Behavioral Development*, 4(2), 157–181. See also Grossmann, K. (1984) *Zweijährige Kinder im Zusammenspiel mit ihren Müttern, Vätern, einer fremden Erwachsenen und in einer Überraschungssituation: Beobachtungen aus bindungs- und kompetenztheoretischer Sicht*. Unpublished doctoral dissertation, Regensburg University.

<sup>261</sup> Hinde, R. (1970) *Animal Behavior*, 2nd ed. New York: McGraw-Hill.

<sup>262</sup> Bowlby, J. (1969, 1982) *Attachment*, Vol. 1. London: Penguin, pp. 97–101: 'Incompatible behavioural systems: results of simultaneous activation.' See also Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, pp. 75–79.

<sup>263</sup> Duschinsky, R. (2015) The emergence of the disorganized/disoriented (D) attachment classification, 1979–1982. *History of Psychology*, 18(1), 32–46.

that signs of confusion or apprehension, in particular, were more common in these tapes from high-risk samples than in the Berkeley sample.<sup>264</sup>

In 1980, Main began a relationship with Erik Hesse. Main and Hesse spent time discussing the meaning of the conflicted, confused, and apprehensive behaviours shown by infants in the Strange Situation. Drawing on Bowlby's reflections on conflict behaviour, Hesse's ingenious proposal was that one cause of such behaviours would be experiences of alarming behaviour by their caregiver, the haven of safety sought by the attachment system. This would not permit the redirection of attention that, for Main, provided the infrastructure for a conditional strategy: 'the infant may at times be experiencing a fear or distress too intense to be deactivated through a shift in attention (the Ainsworth A pattern), yet at least momentarily cannot be ameliorated through approach to the attachment figure (the Ainsworth B and C patterns).'<sup>265</sup> This predicament could be produced if the fear or distress the infant experiences 'stems from the parent as its source', due to the injunction of the attachment system to approach the caregiver when alarmed.<sup>266</sup> Alarming behaviour by an attachment figure would cause an injunction to both approach and take flight, blocking the redirection of attention upon or away from the caregiver that underpins the two forms of infant conditional attachment strategy. Apprehensive behaviour could be directly accounted for in terms of fear-inducing caregiver behaviour; confused behaviour made sense if the infant was experiencing an intense injunction to both approach and take flight; conflict behaviours in the manner described by Hinde could be caused by a distress from conflict that could not be deactivated through a shift in attention or use of the caregiver to reduce the distress.

Main and Hesse published an initial sketch of these ideas in 1990, in a chapter immediately following the coding protocols for the new disorganized classification. The focus of the chapter was the idea that children may experience an imperative to both approach and take flight from their caregiver. From the early 1990s, this became the accepted, mainstream account of the psychological state reflected in disorganized attachment. In fact, this was something of a misunderstanding. Main and Hesse's claim was that a child was predisposed to behave in an apprehensive, confused and/or conflicted way in the Strange Situation if they had *past experience* of alarming behaviour by their attachment figure. It was not a claim that a child, in the Strange Situation itself, was experiencing an injunction to both approach and take flight caused by experiencing the caregiver as frightening or distressing. That is to say, Main and Hesse were making a claim about a *historical aetiology*—their experiences with their caregiver at home over time—rather than the *proximal psychological mechanism* of disorganized attachment.

Main and Hesse by no means intended to rule out that there could be other aetiological factors for apprehension, confusion, or conflict behaviour. In fact, Main had written about one herself in an earlier paper, documenting empirically that when a child's bids for comfort are met by grossly aversive caregiver behaviour, this leads to the conflict behaviours noted by Hinde in the home environment.<sup>267</sup> Main and Hesse were also enthusiastic about the work of Van IJzendoorn and Bakermans-Kranenburg examining temperamental

<sup>264</sup> Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds), London: Routledge.

<sup>265</sup> Main, M. & Hesse, E. (1990) Parents' unresolved traumatic experiences are related to infant disorganized attachment status. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (eds), *Attachment in the Preschool Years* (pp. 161–181), Chicago: University of Chicago Press, p. 163.

<sup>266</sup> *Ibid.*, 182.

<sup>267</sup> Main, M., & Stadtman, J. (1981) Infant response to rejection of physical contact by the mother. *Journal of the American Academy of Child Psychiatry*, 20(2), 292–307.

factors that might interact with caregiving experiences, making disorganized attachment behaviour more likely (Chapter 4).

As such, one consequence of the misunderstanding of Main and Hesse position was that, from the early 1990s onwards, main-stream attachment researchers and other audiences assumed that frightening caregiving behaviours were the sole and equal cause of all disorganized behaviours. Another consequence was that audiences generally did not register what Mary and Erik *actually* considered to be the proximal psychological mechanism of disorganized attachment. Part of the problem was that their most elaborated discussion of the proximal psychological mechanism of disorganized attachment was only published at the time in Italian, in 1992 (ultimately republished in English in 2021 by Forslund and myself).<sup>268</sup> The ideas can be found in their 1990 paper and a later 1995 chapter,<sup>269</sup> but are less accessible and clearly elaborated.

As we saw above, Main's theory of conditional strategies had proposed that the threshold for activation of the attachment system could be raised or lowered by focusing attention either away from or towards the attachment figure and any cues to danger implicit in the situation. To this, Main and Hesse added that where attachment-relevant perceptions and memories are experienced as alarming, attention cannot simply be turned away or turned to them since there is an imperative to do both at the same time. The result, understood as the proximal mechanism of disorganized attachment, is a 'looping' of attention. If sustained or repeated over time, this looping was theorized by Main and Hesse to result in breakdowns of the attachment motivational system itself. This damage might be seen as weakened regulatory capacities, localized holes or blockages in the functioning of the system, or potentially the development of relatively independent 'nets' of dispositional responses organized with respect to one of the competing and incompatible goals.

Main and Hesse observed that some of the behaviours used for coding infant disorganized attachment appear dissociated in their behaviour. One category is 'freezing/stilling'. They suspected that this directly reflects a lapse in processing in the context of looping attention. Another category Main and Hesse identified as phenotypically dissociative was 'direct indices of disorientation'. They regarded this kind of behaviour as caused by 'incompatible perceptions, experiences and impulses in which independent "nets" have developed and momentarily control behaviour'.<sup>270</sup> Some undirected behaviours could also have this basis, for instance when a child approaches the stranger with arms raised directly on reunion with their parent. Where a child displayed outright apprehension towards their caregiver in the Strange Situation, rather than proximity-seeking when distressed, this might suggest segregation of the attachment behavioural response.

Main and Hesse highlighted the diversity of disorganized behaviours, and in particular drew a contrast between outright frightened or confused behaviours, and the kinds of conflict behaviours noted by Hinde. They argued that 'not all disorganised-appearing behaviour listed by Main and Solomon need imply more than momentary experiences of

<sup>268</sup> Main, M. & Hesse, E. ([1992] 2021) Disorganized/disoriented infant behaviour in the Strange Situation, lapses in the monitoring of reasoning and discourse during the parent's Adult Attachment Interview, and dissociative states. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 108–132), New York: Wiley.

<sup>269</sup> Main, M. (1995) Recent studies in attachment: Overview, with selected implications for clinical work. In S. Goldberg, R. Muir, & J. Kerr (eds), *Attachment Theory: Social, Developmental and Clinical Perspectives* (pp. 407–470). Hillsdale, NJ: Analytic Press.

<sup>270</sup> Main, M. & Hesse, E. ([1992] 2021) Disorganized/disoriented infant behaviour in the Strange Situation, lapses in the monitoring of reasoning and discourse during the parent's Adult Attachment Interview, and dissociative states. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 108–132), New York: Wiley, p. 124.

conflict, and expressions of conflict between approach and avoidance behaviour towards the parent need not imply the intrusion of a dissociated secondary plan or system.<sup>271</sup> Yet this distinction was only made in detail in the 1992 chapter, though it is implied in a 1996 paper: ‘a more fine-grained analysis of disorganised behaviour may be advisable because, for example, trace-like states may predict different sequelae than do apprehensive gestures.’<sup>272</sup> Yet Main and Hesse did not develop scales for conflicted, confused or apprehensive infant behaviours. As a consequence, attachment researchers generally assumed that Main and Hesse regarded disorganized attachment behaviours as all of a piece and equivalent in meaning (important exceptions were Jacobvitz and Lyons-Ruth; Chapter 2).<sup>273</sup>

The distinction among forms of disorganized behaviour was reiterated and underlined by Main and Hesse in a 2006 paper,<sup>274</sup> but this went unnoticed. It was then proposed anew by Padron, Carlson, and Sroufe in 2014,<sup>275</sup> apparently as a criticism, without awareness that the distinction had already been put forward by Main and Hesse—in fairness, in Italian—12 years earlier. Recently, the value of the distinction has been indicated by findings that the Group Attachment Based Intervention reduces both insecure attachment and apprehensive or disoriented behaviours, but not Hinde’s conflict behaviours (e.g., misdirected approach).<sup>276</sup>

The perception that the injunction to approach and flee the caregiver was the proximal mechanism of disorganized attachment also had a second consequence: it led to a perception of the behaviours and related psychological processes as rare, because the category is uncommon. In fact, where there is any risk factor facing the families (which applies to the majority of studies funded over recent decades) most infants show at least some readily visible behaviour characterized in the Main and Solomon indices. Indeed, the primary deliberation associated with coding is *not* whether the behaviours are present, but in judging *whether* the extent of disorganization warrants or does not warrant assignment to the overall category. Main was explicit that ‘disorganization operates as a category only in extreme cases, being otherwise ... a dimension.’<sup>277</sup> But this point was neglected, as Main did not empirically test it, and the position did not readily align with her operationalization of disorganization as a category.

As a result, attachment researchers and the audiences for attachment knowledge have widely missed Main’s point, in which approach-avoidance conflict is a *familiar* and *expectable* aspect human experience. From cradle to grave, we both want to be close to loved ones and are concerned about what they can or will offer us. This can cause us

<sup>271</sup> Ibid., 117.

<sup>272</sup> Main, M. (1996) Introduction to the special section on attachment and psychopathology: 2. Overview of the field of attachment. *Journal of Consulting and Clinical Psychology*, 64(2), 237–243, p. 239.

<sup>273</sup> Lyons-Ruth, K., and Jacobvitz, D. (1999) Attachment disorganization: Unresolved loss, relational violence, and lapses in behavioral and attentional strategies. In J. Cassidy & P. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Implications* (pp. 520–554). New York: Guilford. The chapter received extensive feedback from Main.

<sup>274</sup> Hesse, E., & Main, M. (2006) Frightened, threatening, and dissociative parental behavior in low-risk samples: Description, discussion, and interpretations. *Development and Psychopathology*, 18(2), 309–343.

<sup>275</sup> Padrón, E., Carlson, E. A., & Sroufe, L. A. (2014) Frightened versus not frightened disorganized infant attachment: Newborn characteristics and maternal caregiving. *The American Journal of Orthopsychiatry*, 84(2), 201–208.

<sup>276</sup> Lewis, K. S. (2022) The Group Attachment Based Intervention (Gabi©) increases attachment security and reduces attachment disorganization: An exploratory analysis of disorganization at the level of behavior. Unpublished doctoral dissertation, The New School.

<sup>277</sup> Main, M., & Cassidy, J. (1988) Categories of response to reunion with the parent at age 6: Predictable from infant attachment classifications and stable over a 1-month period. *Developmental Psychology*, 24(3), 415–426, pp. 423–424.

feelings of conflict, confusion, or worry or fear. Even in secure relationships, wanting from other people can feel inconvenient and there is a good deal of misattunement, and these secure relationships may face obstacles which hinder our capacity to ask for or provide care, obscure these signals or make it more difficult for us to express them.

From infancy, with more or less success, we develop ways of resolving the challenges of wanting and being concerned by what loved ones can offer us. Day by day, relationship by relationship, we resolve a variety of approach-avoidance conflicts into something by degrees tolerable, and by degrees satisfying. One approach to resolution, made available by our evolutionary history, are the conditional strategies. These neutralize an approach-avoidance conflict into an alternative means of accessing the person we love: either through vigilance about their availability; or through remaining nearby without provoking rebuff through direct approach. Whereas Ainsworth conceptualized 'avoidance' as *avoidance of the caregiver*, Main had a different account: she stated that 'avoidance' is '*avoidance of behavioural disorganisation*' and, to a greater or lesser extent, disorganization will *always* haunt the conditional strategy as it is used to stave off an approach-avoidance conflict.<sup>278</sup>

For Main, disorganization is more than a category that can be assigned to a minority of individuals. It is a psychological process relevant to all of us, to which we seek and perhaps find our different ways of resolving. The point has occasionally been recognized by clinical scholars, especially by Spanish clinician-researchers who have read Main especially closely.<sup>279</sup> Yet with disorganization *limited to the category* for main-stream attachment researchers, only Main's closest collaborators have actually empirically studied the attentional processes which she felt were so important in underpinning disorganization in everyday life in humans. For instance, disorganization in everyday life may be seen in propensities towards absorption, which is a kind of fixed attention not responsive to the immediate environment.<sup>280</sup>

Main was saddened that understandings of disorganization severed the concept from its roots in ethological observations of conflict behaviour. In a 1999 paper, Main surveyed similarities and differences between disorganized attachment and forms of conflict behaviour seen in animals, calling for more research to put forms of conflict, confusion and fear shown by children towards their caregivers in ethological perspective, and further develop the concept of conditional strategies.<sup>281</sup> Unfortunately, she did not publish the 1999 paper. As well as taking disorganized attachment out of dialogue with other disciplines, the sequestration of conflict, confusion, and fear in attachment theory to the disorganized category, and neglect of Main's attentional theory, left valuable research agendas underexplored—such as how children with relatively independent 'nets' of dispositional responses manage concentrating at school or help-seeking in everyday life. Main, Hesse, and Waters conducted a study which found associations between the AAI and college students' capacities to multitask, but this work was again not published.<sup>282</sup>

<sup>278</sup> Main, M. (1981) Avoidance in the service of attachment. In K. Immelman, G. Barlow, L. Petrinoitch, & M. Main (eds), *Behavioral Development* (pp. 651–669), Cambridge: Cambridge University Press, p. 681.

<sup>279</sup> Serván, I. (2023) *Desorganización del apego: Clínica y psicoterapia con adultos*. Bilbao: Desclee de Brouwer; Pitillas, C. (2024) *Caminar sobre las huellas: Vínculos, trauma y desarrollo humano*. Bilbao: Desclee de Brouwer.

<sup>280</sup> Hesse, E., & Van IJzendoorn, M. H. (1999) Propensities towards absorption are related to lapses in the monitoring of reasoning or discourse during the Adult Attachment Interview: A preliminary investigation. *Attachment & Human Development*, 1(1), 67–91; Granqvist, P., Hagekull, B., & Ivarsson, T. (2012) Disorganized attachment promotes mystical experiences via a propensity for alterations in consciousness (absorption). *International Journal for the Psychology of Religion*, 22(3), 180–197.

<sup>281</sup> Main, M. (1999) Disorganized attachment in infancy, childhood, and adulthood: An introduction to the phenomena. Unpublished manuscript, Mary Main & Erik Hesse personal archive.

<sup>282</sup> Mentioned in Main, M. (1991) Metacognitive knowledge, metacognitive monitoring, and singular (coherent) vs. multiple (incoherent) models of attachment: Some findings and some directions for future research. In

Furthermore, problems in the transmission and reception of Main's ideas led to considerable misunderstanding of what was actually operationalized by disorganized attachment. In general, among both academic and non-academic audiences, disorganized attachment is a widely misunderstood concept.<sup>283</sup> Allodoxic characterizations are very much more common than exact ones. Sometimes, as with Mikulincer and Shaver, people assume that the behaviour reflects the familiar connotations of the term 'disorganized', and that the category reflects any random and chaotic behaviour.<sup>284</sup> Sometimes, as with Gaskin, people assume that disorganized behaviour is any infant behaviour discrepant with the Ainsworth categories.<sup>285</sup> Sometimes, as in Parke and Clarke-Stewart's textbook, people assume that disorganized attachment means apprehensive behaviour, following from the misapprehension of Main and Hesse's aetiological account as a model of proximal mechanism.<sup>286</sup> More careful commentators describe disorganization as apprehension, confusion, or conflict behaviour shown by children to their caregivers, listing the markers put forward by Main and Solomon. Yet these are only the external faces of disorganization, and not what the markers were understood by Main to signify.

Disorganized attachment is coded when visible behaviour suggests one of two psychological processes: either behaviour suggestive of fear or dissociation, or behaviour that suggests a child is distressed but unable to direct their attention to the environment or ameliorate their distress through approach to their caregiver. The centrality of orientation and attention to the definition of disorganized attachment is evident already from the early versions of the coding system, where Main remarked that 'the common themes are lack of coherent purpose, lack of a conscious or voluntary quality; lack of normal direction or directedness.'<sup>287</sup> Subsequently, in guidance provided to coders at training institutes, Main stated that the 'Major Considerations' for coding disorganized attachment are:

is the behaviour explicable only if we presume:

- a) The baby is afraid of the parent;
- b) The baby is inhibited from approach without being able to shift attention to the environment?<sup>288</sup>

Disorganized attachment is, in fact, an operationalization of behaviour from which a coder can infer a mechanism occurring at the level of attention disrupting the functioning of the attachment system.<sup>289</sup> Without 'repetition and patterning' suggesting such disruption, coders should not treat apprehensive, confused, or conflicted behaviours as warranting

P. Marris, J. Stevenson-Hinde, & C. Parkes (eds), *Attachment across the Life Cycle* (pp. 127–159). New York: Routledge, p. 155.

<sup>283</sup> Granqvist, P., Sroufe, L. A., Dozier, M., Hesse, E., Steele, M., Van IJzendoorn, M., ... & Duschinsky, R. (2017) Disorganized attachment in infancy: A review of the phenomenon and its implications for clinicians and policy-makers. *Attachment & Human Development*, 19(6), 534–558; Reijman, S., Foster, S., & Duschinsky, R. (2018) The infant disorganised attachment classification: 'Patterning within the disturbance of coherence'. *Social Science & Medicine*, 200, 52–58.

<sup>284</sup> Mikulincer, M. & Shaver, P. (2016) *Attachment in Adulthood*. New York: Guilford.

<sup>285</sup> Gaskins, S. (2013) The puzzle of attachment. In N. Quinn & J. M. Mageo (eds), *Attachment Reconsidered: Cultural Perspectives on a Western Theory* (pp. 33–66). London: Palgrave.

<sup>286</sup> Parke, R. D. & Clarke-Stewart, A. (2011) *Social Development*, New York: Wiley.

<sup>287</sup> Mary, M. (undated) Scoring criteria for disorganised, disoriented and undirected behaviours. Appendix M in Wartner, U. G. (1987) Attachment in infancy and at age six, and children's selfconcept: A follow-up of a German longitudinal study. Unpublished doctoral dissertation, University of Virginia, Charlottesville.

<sup>288</sup> Main, M. (undated; c.1995) Disorganised/disoriented classification scheme: major considerations. Unpublished manuscript. Received from Elizabeth Carlson, and cited with her permission.

<sup>289</sup> Duschinsky, R., & Solomon, J. (2017) Infant disorganized attachment: Clarifying levels of analysis. *Clinical Child Psychology and Psychiatry*, 22(4), 524–538.

a disorganized classification.<sup>290</sup> In short, lack of awareness of Main's attentional model has not only led to misunderstanding of her theoretical position. Except for a handful of researchers with intimate knowledge of Main's work, it has meant that the research community and its audiences have *not been fully aware of what disorganized attachment has in fact been measuring for the past three decades*; or at least what Main *thought* it was measuring.

At a four-day workshop in 1985 at the University of Washington, Ainsworth sat on the floor to be as close as possible to the screen as Mary showed her tapes coded with the new disorganized classification. The idea of modifying Ainsworth's classification system was controversial.<sup>291</sup> Nonetheless, at the end of the event, Ainsworth wrote to Bowlby that she and 'everyone there was most impressed with the need for adding a new "D" or disorganised category to the classification system.'<sup>292</sup> She began coding using the new classification in coding Strange Situations conducted by her graduate students.<sup>293</sup> In print, Ainsworth concluded that 'it may be accepted as a valuable extension of the Strange Situation classificatory system.'<sup>294</sup>

Another landmark in the acceptance of the disorganized classification was a conference in 1996 for European attachment researchers hosted by Van IJzendoorn, Bakermans-Kranenburg, and Schuengel at Leiden. In his introduction to the pack of materials circulated afterwards to attendees at the event, Schuengel acknowledged that making an adjustment to coding the Strange Situation was high stakes, with impacts not only method, but on the priorities and conceptualization within which future attachment research would take place:

Progress in a field of inquiry is highly dependent upon unified measurement methods and agreement about categories. For attachment researchers this has been a fact of life ever since the Ainsworth Strange Situation Procedure and its coding and classification systems have been widely accepted. It is difficult to imagine the field of attachment research without its workers being able to talk about 'insecure-avoidant attachment relationships' or 'secure attachment relationships' and understanding each other. Almost all prominent workers in the field are themselves proficient coders of infant attachment behavior in the context of the Strange Situation. And important additional step is now underway, as the category of Disorganised/disoriented infant attachment behavior receives growing interest, since its discovery by Mary Main and Judith Solomon in the early eighties. Great pains are being taken to investigate the origins of this behaviour, and intriguing findings are emerging on the consequences of early D-attachment for later development. As attachment theory and research are moving into the clinical realm, the D-category is likely to

<sup>290</sup> Reijman, S., Foster, S., & Duschinsky, R. (2018) The infant disorganised attachment classification: 'Patterning within the disturbance of coherence'. *Social Science & Medicine*, 200, 52–58; Carlson, E. (2021) Attachment disturbance: Disorganization and disorder. In E. Waters, B. E. Vaughn, & H. S. Waters (eds), *Measuring Attachment: Developmental Assessment across the Lifespan* (pp. 141–170), New York: Guilford.

<sup>291</sup> See for instance a doctoral study by Taylor, supervised by Belsky, from 1989. Here the disorganised attachment classification is characterized as a contamination of Ainsworth's coding system, undermining the capacity of findings from the Berkeley group to communicate with the wider attachment literature. Taylor, D. G. (1989) Coherence in individual development: early attachment, intervening experience, and attachment, exploration and cognition in 3½-year-olds. Unpublished doctoral thesis, Pennsylvania State University.

<sup>292</sup> Mary Ainsworth (1985) letter to John Bowlby, 14 February 1985, John Bowlby Archive, Wellcome Collections, PP/BOW/B.3/8.

<sup>293</sup> For example, Colin, V. L. (1985) Hierarchies and patterns of infants' attachments to parents and day caregivers: An exploration. Unpublished doctoral dissertation, University of Virginia.

<sup>294</sup> Ainsworth, M. D. S. (1990) Epilogue: Some considerations of attachment theory and assessment relevant to the years beyond infancy. In M. T. Greenberg, D. Cicchetti, & M. Cummings (eds), *Attachment in the Preschool Years: Theory, Research, and Intervention* (pp. 463–488). Chicago: University of Chicago Press, p. 480.



become more important. Some would even argue the viability of this recent move rests for a good deal on Main and Solomon's discovery of the 'D's'.<sup>295</sup>

Sagi-Schwartz has recalled that participants went home impressed by the value of the disorganized classification, and subsequently used it in their studies.<sup>296</sup>

A convergent body of research findings emerged over the 1990s. Further support was provided by a 1999 meta-analysis by Van IJzendoorn, Schuengel, and Bakermans-Kranenburg, full of praise for the new classification. Van IJzendoorn and colleagues documented the classification's short-term stability ( $r = 0.35$ ), lack of association with measures of child temperament, and greater prevalence in samples facing greater adversity.<sup>297</sup> Subsequent meta-analyses by Van IJzendoorn and collaborators documented that the disorganized category is linked to alarming caregiver behaviour and predicts poor social adaptation and externalizing difficulties (Chapter 4).

These meta-analytic reports conveyed a sense of surety in the disorganized classification. Yet the system for coding disorganized attachment is a sketch. It is difficult to use, and—globally—there are few reliable coders. The system as a whole is likely overfitted to its development sample, and many items are extremely rarely seen by coders. No psychometric research has ever been conducted on the disorganized attachment category, in part because main-stream researchers assumed that Main would *already have done* this preliminary work,<sup>298</sup> and in part because the formulation of the coding system—behavioural descriptors sorted into seven categories—makes psychometric tests extremely difficult. No assessment was made, for example, of whether the 1–9 scale used in coding disorganization would be more serviceable than the category. As Van IJzendoorn and Bakermans-Kranenburg have observed, this is especially a shame as use of the 1–9 scale would have probably capture greater variance than the category.<sup>299</sup> Use of the scale would have made structural equation modelling less statistically dicey in work to account for the causes and sequelae of disorganized attachment (Chapter 2).

Main's personal copy of the 1990 chapter contains her notes in the margins for potential improvements. Yet the disarray of the coding system made it personally difficult for Main to pick it up again to make improvements (e.g., through the elaboration of scales).

<sup>295</sup> Schuengel, C. (ed.) (1996) Fragments of disorganised/disoriented infant behaviour—Notebook. 1995 Leiden. The Netherlands Workshop on the Analysis of Disorganised/Disoriented Infant Strange Situation Behaviour. Unpublished conference pack. Leiden University. My thanks to Avi Sagi-Schwartz for access to a copy of this manuscript.

<sup>296</sup> Alkalay, S. & Sagi-Schwartz, A. (2024) The legacy of Mary Main in attachment and developmental research in Israel. *Attachment & Human Development*, early view.

<sup>297</sup> Van IJzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999) Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, 11(2), 225–250.

<sup>298</sup> Elizabeth Parsons reports that 'a solid body of identifying data about the disorganized infants is forthcoming in a report by Main & Solomon (in press), where 200 infants classified as Type D (including 100 from high-risk and maltreatment samples) will be described'. This presumably is based on a verbal account by Main of what would be her 1990 chapter with Solomon, since there is no published or unpublished report by Main characterizing any group of infants with a disorganized classification. Main and Solomon's 1990 chapter introduces a coding scheme which, they state, is based on review of 200 cases, but no identifying data about the cases is offered. It is notable to see, circa 1990, colleagues presuming upon the disorganized classification, and using it as the criterion for development of other measures, on the basis of descriptive validation work that was assumed to have been conducted by Main. In reality, this descriptive work may have conducted informally at best, and was not written up. Parsons, E. (1991) Maternal behavior and disorganized attachment: Relational sequelae of traumatic experience. Unpublished doctoral dissertation, Massachusetts School of Professional Psychology, Dedham, MA, p. 42.

<sup>299</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. (2019) Finding order in disorder? Society for Emotion and Attachment Studies SRCD Pre-conference Symposium on Partners in Attachment Research, Baltimore, 20 March 2019.

Furthermore, implementation of these changes could be deferred since the system was usable, albeit with difficulty and only by a small number of people, and Main was anxious about efforts to complete the coding system in case this led to coding drift from the original approach. There have been calls to refine the classification: for instance Padrón, Carlson and Sroufe proposed distinguishing between conflicted/confused behaviours and apprehension towards the caregiver.<sup>300</sup> There has been some work in this direction in recent years.<sup>301</sup> However, Van IJzendoorn and Bakermans-Kranenburg have characterized such inquiry as squandered effort. Such attempts to refine the disorganized classification, in their view, will yield diminishing returns and risk inter-rater reliability. If the disorganized classification as it is will not do well enough, their preference would be to attempt afresh to specify the underpinning mechanisms, and measure them in another way, more directly (Chapter 4).

### Alarming Caregiver Behaviour

In contrast, a coherent and elaborated system with individual behavioural scales was developed by Main and Hesse for coding alarming caregiving behaviour. This was dubbed the 'FR coding system,' named after two central components: frightening and frightened caregiver behaviours. Examples of frightening behaviour provided by the coding manual were directly threatening or predatory behaviours, such as bared teeth, lunging, or looming at the infant without markers of play or prior warning. Merely angry behaviours by the caregiver, or ordinary forms of 'culturally sanctioned' discipline, were not included. Curiously, and likely as a result of oversight, the scale did explicitly not include angry verbal threats by the caregiver to a child,<sup>302</sup> though this was later added by Jacobvitz to the version of the scale used in her laboratory and may have improved its effectiveness (Chapter 4).

Frightened behaviours shown by the caregiver towards the infant were also identified, such as sudden withdrawal from the baby or a strong startle response in response to the infant's approach. Such displays were anticipated to alarm the infant when they sought the caregiver as a safe haven. A third kind of behaviour identified by the FR system was apparently dissociative behaviours by the caregiver, which were assumed to alarm an infant through the caregiver's inexplicable attentional unavailability. Both the study of the Berkeley sample<sup>303</sup> and Leiden sample<sup>304</sup> revealed that in fact dissociative

<sup>300</sup> Padrón, E., Carlson, E. A., & Sroufe, L. A. (2014) Frightened versus not frightened disorganized infant attachment: Newborn characteristics and maternal caregiving. *American Journal of Orthopsychiatry*, 84(2), 201–208.

<sup>301</sup> Flykt, M., Gastelle, M., Punamäki, R. L., & Kerns, K. A. (2022) Signs of disorganization in middle childhood attachment narratives. *Merrill-Palmer Quarterly*, 68(3), 266–295; Lewis, K. S. (2022) The Group Attachment Based Intervention (Gabi©) increases attachment security and reduces attachment disorganization: An exploratory analysis of disorganization at the level of behavior. Unpublished doctoral dissertation, The New School for Social Research; Reijman, S. (2024) Broadening the horizon: Can machine learning techniques uncover new pathways to infant disorganized attachment? International Attachment Conference, Rouen, 15–17 July 2024.

<sup>302</sup> That this was simply an oversight, rather than a theoretically motivated decision, is suggested by the fact that verbal threats were included by Main in the traumatic abuse scale for the Adult Attachment Interview composed around same time. For discussion of the addition of verbal behaviours, see Jacobvitz, D., Hazan, N., Zackagnino, M., Mesina, S., & Beverung, L. (2011) Frightening maternal behaviour, infant disorganisation, and risks for psychopathology. In D. Cicchetti & G. Roismann (eds), *The Origins and Organization of Adaptation and Maladaptation* (pp. 283–322). New York: Wiley, p. 299.

<sup>303</sup> Abrams, K. Y. (2000) Pathways to disorganization: A study concerning varying types of parental frightened and frightening behaviors as related to infant disorganized attachment. Unpublished doctoral dissertation, University of California at Berkeley.

<sup>304</sup> Out, D., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2009) The role of disconnected and extremely insensitive parenting in the development of disorganized attachment: Validation of a new measure. *Attachment & Human Development*, 11(5), 419–443, p. 422.

caregiver behaviours were the most predictive of disorganized attachment, more so even than directly frightening caregiver behaviours, though the two were intercorrelated.

A meta-analysis by Van IJzendoorn, Schuengel, and Bakermans Kranenburg in 1999 had found that caregiver insensitivity had only a weak relationship with disorganized attachment ( $r = -0.10$ ) (a finding reevaluated by a later meta-analysis, see [Chapter 5](#)).<sup>305</sup> A meta-analysis by Madigan and colleagues in 2006 found that FR was a much more important predictor:  $r = 0.32$  (CI 0.17–0.47).<sup>306</sup> Though, as we shall see in [Chapter 2](#), a misunderstanding by Madigan and colleagues meant that this was an underestimate.

Underpinning its strengths, the FR system is exacting in its precise articulation of theoretical ideas about fear and attention in scales of observable behaviours. Dozier and Bernard have also praised the clinical relevance of the FR system and used it as inspiration for a successful family intervention approach, Attachment and Biobehavioural Catchup.<sup>307</sup> More so than any other of the measures developed by the Berkeley group, for all their diverse strengths, the FR system encapsulates the core of Main and Hesse's conceptual achievements. It was first developed when Main was at the height of her considerable powers. However, by the time the FR system was getting established, mental and physical health problems had obstructed Main's ability to continue further work. The FR coding system remained unpublished. And key questions about the implications of FR remained unexamined, including its psychometric properties. In particular, a ready next step could have been to use already-collected data from the Berkeley study to examine whether disorganized infant attachment still predicted later outcomes after taking account of caregiver FR behaviour. Was it perhaps really FR that was driving prediction of later child outcomes, not disorganization?

The importance of disorganized attachment might be as a correlate of alarming caregiver behaviour, rather than having predictive value in itself. At the same time, the damage to the attachment system caused by repeated experiences of a desire to approach and flee the caregiver might also make an independent contribution to the child's outcomes. Main and Hesse thought both processes might be relevant, and that disorganized attachment may have some specific consequences such as a propensity towards disrupted attention (e.g., dissociation; absorption). However, ultimately they regarded FR as the horse and disorganization as the cart, and they may have bet on FR as overall the more significant for child development. But they were not able to undertake this analysis. It would only be undertaken recently by Jacobvitz and colleagues, who indeed found that infant disorganization did not predict later teacher report of externalizing and internalizing difficulties at age seven, except when caregiver FR was high.<sup>308</sup>

However, Jacobvitz was one of the only researchers ever trained by Main and Hesse on the FR system. Trainings were run for three research groups, those of Jacobvitz/Hazen, Pederson/Moran (including Sheri Madigan; [Chapter 5](#)) and Van IJzendoorn/Bakermans-Kranenburg.<sup>309</sup> Due to mental and physical health difficulties, Main was not able to

<sup>305</sup> Van IJzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999) Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, 11(2), 225–250.

<sup>306</sup> Madigan, S., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Moran, G., Pederson, D. R., & Benoit, D. (2006) Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment & Human Development*, 8(2), 89–111.

<sup>307</sup> Dozier, M. & Bernard, K. (2019) *Coaching Parents of Vulnerable Infants: The Attachment and Biobehavioral Catch-up Approach*, New York: Guilford.

<sup>308</sup> Jacobvitz, D., Aviles, A. I., Reisz, S., & Hazen, N. (2024) Frightening maternal behavior over the first two years of life: Effects on children's behavior problems in middle childhood. *Attachment & Human Development*, early view.

<sup>309</sup> D. Jacobvitz, personal communication, September 9, 23.

provide further trainings in the measure. As such, the FR system has not been disseminated or made available for use by the research community. Instead, a coding system incorporating the FR system, developed by Karlen Lyons-Ruth, became the primary measure used by attachment researchers for coding alarming caregiving behaviour (Chapter 2).

### The Development of New Measures with ‘Guess and Uncover’

When participants in the Berkeley study were 5–6 years old, 45 families were invited back to the laboratory, stratified by infant attachment classification. While fathers and mothers went to be interviewed, the children were asked to do a drawing of their family. In a procedure designed by Main’s graduate student Nancy Kaplan, the children were then asked to consider six pictured parent–child separations and offer their thoughts on what the pictured child might feel and do.<sup>310</sup> They then played in a sandbox for a quarter of an hour, before their parents returned—counterbalanced so that some fathers returned first and some mothers. These reunions were coded by Jude Cassidy, visiting from Virginia.<sup>311</sup>

In the early 1980s the Berkeley group developed coding systems for these observational assessments. Central to this was an innovative, inductive approach to the development of coding systems. ‘Guess and uncover’ is a memory game for children. In the game, each player secretly writes a number pattern that follows a rule (e.g., 3, 6, 10, 15, 21, 28). They then cover all but two numbers from the right-hand side. One player attempts to predict the third number in their friend’s pattern. If they are correct (a ‘hit’), they get to continue to guess the fourth number, and so on. If they do not guess correctly (a ‘miss’), the number is revealed, but their opponent gets to take a turn. The game uses inductive processes in the identification of a pattern, forming the basis for a deductive system that can support further extrapolation.

Main had researchers in her group use a version of this game as a methodology for developing new coding systems. The researcher would view an observational assessment (e.g., reading an interview transcript), and then need to infer the dyad’s classification in the Strange Situation. On learning whether this inference was correct or not, the researcher then confirms or adjusts their deductive system.

‘Guess and uncover’ was applied by Cassidy in analysing the six-year reunion observational data. The central finding from the study of the reunions was that many of the dyads who had been classified as disorganized in infancy showed one of two patterns.<sup>312</sup> In both cases the child’s behaviour towards the caregiver was controlling, though the coding system remained unpublished so their operationalization and meaning was not fully clear to the research community (colleagues and I are editing the manuscript for posthumous

<sup>310</sup> Kaplan, N. R. (1987) Individual differences in six-year-olds’ thoughts about separation: Predicted from attachment to mother at one year. Unpublished doctoral thesis, University of California, Berkeley.

<sup>311</sup> Main, M., & Cassidy, J. (1988) Categories of response to reunion with the parent at age 6: Predictable from infant attachment classifications and stable over a 1-month period. *Developmental Psychology*, 24(3), 415–426.

<sup>312</sup> Though later meta-analytic research would show that a minority of dyads classified as disorganized show these patterns: most continue to show the forms of disorganization from the infant classification. See Deneault, A. A., Bureau, J. F., Duschinsky, R., Fearon, P., & Madigan, S. (2023) A meta-analysis of the distribution of preschool and early childhood attachment as assessed in the strange situation procedure and its modified versions. *Attachment & Human Development*, 25(2), 322–351.

publication).<sup>313</sup> The first to be identified was behaviour that was punitive and directive: one previously disorganized child ordered the mother to ‘Sit down and shut up, and keep your eyes closed! I said, keep them closed!’<sup>314</sup>

In the other category, the control was solicitous and caregiving. In one such dyad, the child asked the parent what she had been doing and how she was feeling, then carefully invited her to play, reassuring her that it would be fun for her. In the case of controlling-punitive behaviour, Main and Cassidy theorized that angry behaviour permitted the child to regulate the relationship, and ensure a conditional kind of proximity, even if it did not afford comfort. In the case of controlling-caregiving behaviour, again this seemed an attempt to regulate the adult, and achieve a conditional kind of availability and responsiveness. Their draft coding manual indicates that Main and Cassidy were thinking about the controlling behaviours in ethological terms, in considering their interpersonal function. They did not speculate about their attentional mechanisms. In Main’s earlier terms, controlling-caregiving and controlling-punitive behaviour were ‘adaptive strategies’ for managing a relationship at risk of dysregulation, with the threat of lack of care. Cassidy therefore went on to refer to them as strategies. Main, however, did not. She was unsure what the attentional underpinnings were for the controlling behaviours, and also whether they were conditioned by social learning or represented a behavioural repertoire made available by human evolution. As a result, she held back from characterizing them as conditional strategies.

In 1986 Main completed a book manuscript with details of ‘guess and uncover’—really ‘informed speculation and uncover’—and each of the Berkeley coding systems, which was due to be published by Cambridge University Press.<sup>315</sup> However, she was ultimately unable to send the book to the publisher (it will now be published posthumously).<sup>316</sup> As a result, ‘guess and uncover’ is only mentioned in a paper with Cassidy from 1988, and even there it appears with sufficient brevity that it was not clear how someone else might use ‘guess and uncover’ in a scientific context.<sup>317</sup>

A first problem with this invisibility of ‘guess and uncover’ was confusion between the ‘context of discovery’ and the ‘context of justification’, that is, between exploratory research and hypothesis-testing research (Chapter 4). In Main’s presentation of results from the assessments with the 5–6 year olds, which were associated with the Strange Situation classifications, she tended to imply that her findings empirically confirmed the stability of the classifications: ‘behavior changes’ but ‘security is stable.’<sup>318</sup> She did not make it clear that the measures were actually developed via associations with the Strange Situation classifications. The Berkeley findings were not an empirical confirmation of an association between the Strange Situation and behaviour at age 5–6, but an inductive identification of a potential

<sup>313</sup> There were very few cases of a resistant response, which meant that Main and Cassidy were unable to elaborate that category well. This obstacle may have compounded Main’s general difficulty finalizing coding systems and papers. Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds), London: Routledge.

<sup>314</sup> Ibid.

<sup>315</sup> Ibid.

<sup>316</sup> Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds), London: Routledge

<sup>317</sup> Main, M. & Cassidy, J. (1988) Categories of response to reunion with the parent at age 6: Predictable from infant attachment classifications and stable over a 1-month period. *Developmental Psychology*, 24(3), 415–426, p. 417.

<sup>318</sup> Cassidy, J. & Main, M. (1984) Quality of attachment from infancy to early childhood: Security is stable but behavior changes. *Infant Behavior and Development*, 7, 66.

relationship. The impression of the Berkeley findings as confirming individual differences in attachment relationships using the infant Strange Situation categories implied stability of the *same* construct over time, and directed attention away from investigation into how individual differences in attachment motivations and behaviour change with development.<sup>319</sup>

The child–mother Strange Situation was generally used as the criterion for the development of the measures, and Main made no attempt to examine the respective associations of child–mother and child–father attachment with her other measures, despite repeated urging from her Berkeley colleagues Phil and Carolyn Cowan.<sup>320</sup> In part this likely reflected Main's theoretical commitments; it may have also reflected limitations to the statistical approaches she was comfortable using. Main's depiction of the Berkeley findings as empirical support for stability of child–mother attachment, rather than an inductive approach to the development of new measures, contributed to the impression of individual differences in 'attachment' as some kind of stable, causal property within children. This was what sociologists term a 'reification'. When a social process has been reified, this inhibits our capacity to *learn about and from it* beyond our preconceptions, or even to *recognize* these preconceptions.<sup>321</sup> In this case, the impression of individual differences in attachment as trait-like drew attention away from the role of the ongoing and wider caregiving context and the concerns raised by Lamb and Thompson.

With the Berkeley research misapprehended as hypothesis-testing, the creative approach used in the exploratory work of Main and colleagues was not passed on to the broader field. Besides Main's former students, 'guess and uncover' was mislaid for attachment research for decades, with the exception of Karlen Lyons-Ruth who encouraged its use by her doctoral students (Chapter 2).<sup>322</sup> As an approach to the development of coding systems it certainly has limitations. As Fury, Carlson, and Sroufe observed, the semi-inductive approach risked a coding system overfitted to the development sample, with elements characteristic only or primarily of that sample.<sup>323</sup> The approach could also be overly scattershot in the identification of specific markers, diverging from or without a good level of ordering by theoretical principles, resulting in a rather baroque coding system. Nonetheless, 'guess and uncover' had strengths for supporting ingenious discovery—and for pushing the envelope of a research paradigm, as the Adult Attachment Interview coding system makes clear.

<sup>319</sup> Allen, J. P. (2021) Beyond stability: Towards understanding the development of attachment beyond childhood. In Thompson, R. A., Simpson, J. A., & Berlin, L. J. (eds), *Attachment: The Fundamental Questions* (pp. 161–168). New York: Guilford Publications.

<sup>320</sup> For example, Cohn, D. A., Cowan, P. A., Cowan, C. P., & Pearson, J. (1992) Mothers' and fathers' working models of childhood attachment relationships, parenting styles, and child behavior. *Development and Psychopathology*, 4(3), 417–431.

<sup>321</sup> Lijster T (2017) 'All reification is a forgetting': Benjamin, Adorno, and the dialectic of reification. In S. Gandedsha & J. K. Hartle (eds), *The Spell of Capital: Reification and Spectacle* (pp. 55–66). Amsterdam: Amsterdam University Press.

<sup>322</sup> Recent work by Alessandro Talia has reengaged the 'guess and uncover' methodology, studying the behaviour of people with unresolved states of mind during psychotherapy and illustrating the potential value of the methodology for a new generation of researchers. Talia, A., Georg, A., Siepe, B., Gullo, S., Miller-Bottomo, M., Volkert, J., ... & Taubner, S. (2022) An exploratory study on how attachment classifications manifest in group psychotherapy. *Research in Psychotherapy: Psychopathology, Process, and Outcome*, 25(3); Talia, A., Taubner, S., Miller-Bottomo, M., Muurholm, S. D., Winther, A., Frandsen, F. W., ... & Duschinsky, R. (2022) The in-session discourse of unresolved/disorganized psychotherapy patients: An exploratory study of an attachment classification. *Frontiers in Psychology*, 13, 985685.

<sup>323</sup> Fury, G. S. (1996) The relation between infant attachment history and representations of relationships in school-aged family drawings, Unpublished doctoral dissertation, University of Minnesota.



### Adult States of Mind Regarding Attachment

When the Berkeley group recalled 45 families from their sample back to the laboratory, they conducted interviews with the mothers and fathers about their experiences of care when growing up. Overall, the goal of the interview was to ask about the speaker's experience in attachment relationships. For this reason, the assessment was termed the Adult Attachment Interview (AAI)—not, in fact, because it measured something called 'attachment' in adulthood. They were first asked to generally describe their relationship with their parents, and then to choose five adjectives to describe each relationship. The speaker was asked to explain what made them choose each adjective with reference to illustrative memories, which helps reveal whether the adjectives used to describe an attachment figure have a good basis in remembered experiences. Speakers were asked what they did when they were upset in childhood, a verbal analogue for the separations and reunions experienced by a child in the Strange Situation procedure. Speakers were also asked whether they could remember being physically held by their parents for comfort as a child.

Another question asked by the interview protocol concerned whether the speaker had any experiences of feeling rejected as a child, and if yes, why they now thought their parents had behaved as they did. Additionally, participants were asked whether they had undergone any major separations from their parents in childhood, building on Bowlby's classic concern with separations. They were asked about occasions when parents might have been threatening to them, following on from Main's interest in the role of threatening behaviour in the aetiology of insecure attachment. Participants were also asked about why their parents behaved as they did, and whether their early experiences of care have had an impact on them as an adult.

A first investigation of the AAI transcripts counted incidents—such as losses—in the lives of participants.<sup>324</sup> Main then asked Ruth Goldwyn, a teenaged research assistant, to apply the 'guess and uncover' approach to the transcripts. The first pattern identified was that some parents described their childhoods in flatly glowing terms. There were no problems; everything was fine. Yet, there was a sharp discrepancy between the descriptions of key attachment relationships and specific supportive memories, since the glowing descriptions of the caregivers could not be backed up by details from memory. These transcripts were labelled 'dismissing'. Intriguingly, rather than belonging to the accounts of parents from securely attached dyads, these accounts of perfect childhoods belonged to the parents from avoidantly attached dyads.

Another pattern identified was characteristically clear and orderly, often with a fresh quality to the speech. These transcripts were labelled 'autonomous', because the defining feature of the transcript was the absence of restrictions in the discussion of experiences. Speakers could talk about both the positive and the negative in their relationships growing up, and in their current experiences. These accounts belong to parents of securely attached dyads.

A third pattern identified by Main and Goldwyn was that several speakers seemed highly concerned with grievances; they remained angry and preoccupied with their past and present relationships with attachment figures to such an extent that they often took long conversational turns and lost track of the question. Again there was a discrepancy between the descriptions of key attachment relationships and specific supportive memories, since the aggrieved description of the caregivers were not well substantiated by details from

<sup>324</sup> George, C. (1984) Individual differences in affective sensitivity: A study of five-year olds and their parents. Unpublished doctoral dissertation, University of California, Berkeley.

memory. The Berkeley sample had few resistant infants, but there seemed a link between resistant attachment and this ‘preoccupied’ speech in the AAI.

A fourth ‘unresolved’ category was identified by Main, Hesse, and Anitra DeMoss. This category was characterized by lapses in monitoring of reasoning about a loss or trauma without recognition by the speaker, leading to interruptions in the plausibility of the speaker’s account; or lapses in the monitoring of discourse about a loss or trauma without recognition by the speaker, for instance apparent invasions of remarks about a death into apparently unrelated discussions. These speakers were often those from dyads classified as disorganized.

In Main’s view, what was operationalized by the AAI was individual differences prompted by the interview’s demand on speakers to pay attention to and communicate regarding attachment-relevant experiences. As described in a 1983 conference paper, ‘we were attempting to trace what could happen to information regarding negative or rejecting attachment experiences, other than their easy and coherent recognition and evaluation.’<sup>325</sup> The coder is asked to consider both the internal consistency of the account, and the extent to which the speaker’s interpretation seemed plausible based on the episodic information provided: ‘in order to determine the overall plausibility of the subject’s remarks—in other words, the likelihood of their correspondence to the state of affairs in the external world—the judge must be able to step outside of the internal boundaries of the interview.’<sup>326</sup> As such, the coder must *consider the world from the speaker’s point of view*, and then take a step back to *evaluate the speaker’s account of the world and appraise potential distortions of information*. The coder could then find out whether or not their appraisal was correct by comparing their categorization to that of the caregiver–child dyad in the Strange Situation, considered by Main to offer an objective touchstone.<sup>327</sup>

In the AAI, the interviewer’s questions place a social injunction on the interviewee to turn inwards to find thoughts and memories, to sift for relevance and integrate the results, and to turn outwards again to report to the interviewer.<sup>328</sup> A degree of anxiety is evoked for the interviewee to the degree their expectations are evoked about what others will judge acceptable, while talking about heavily freighted personal experiences. In the Strange Situation, the threatening separations and opportunities for reunion call on the infant to turn to their expectations about their caregiver, integrate the results, and use this integration to adjust to the opportunities for play and comfort available. Both are a kind of *circuit* between the social and the psychological, an obstacle course of sorts, as well as representing a cumulative challenge over the duration of the measures.

The secure child shows flexibility in the Strange Situation in attention to the environment or their expectations about the caregiver in response to the degree of threat represented by separations and reunions. In analogous fashion, the autonomous speaker in the AAI has the capacity to both turn attention inwards to find attachment-related memories and turn attention outwards to report them. More than just the absence of distortion

<sup>325</sup> Main, M. & Goldwyn, R. (1983) Predicting rejection of an infant from mother’s representation of her own experiences. National Conference on Infant Mental Health, Children’s Institute International, Los Angeles, February 1983, John Bowlby Archive, Wellcome Collections, PP/BOW/J.4/3.

<sup>326</sup> Main, M. (1991) Metacognitive knowledge, metacognitive monitoring, and singular (coherent) vs. multiple (incoherent) models of attachment: Some findings and some directions for future research. In P. Marris, J. Stevenson-Hinde & C. Parkes (eds), *Attachment across the Life Cycle* (pp. 127–159). London: Routledge, p. 144.

<sup>327</sup> Main, M. ([1995] 2025) Attachment and psychoanalysis: Implications for the hermeneutic controversy in psychoanalysis. *Psychoanalytic Inquiry*, forthcoming.

<sup>328</sup> Hesse, E. (1996) Discourse, memory, and the Adult Attachment Interview: A note with emphasis on the emerging cannot classify category. *Infant Mental Health Journal: Official Publication of the World Association for Infant Mental Health*, 17(1), 4–11.



from defences, this capacity to access and draw together internal and external realities contributes to the freshness of autonomous discourse in the AAI, and the quality of the child's play in the Strange Situation, as each has been anchored, enlivened, and enriched by the circuit underpinning it. While certainly different constructs, Main anticipated that perceptions of secure base/safe haven availability would be associated with flexibility in attention to attachment-related information.<sup>329</sup> Indeed, as later researchers have documented, though these do seem quite distinct constructs with different correlates, there is a moderate level of correlation between individuals' perceptions of secure base/safe haven availability and their classification on the Adult Attachment Interview.<sup>330</sup>

Main likewise perceived a parallel between avoidance in the Strange Situation and dismissing speech in the AAI. Just as Main conceptualized the infant showing avoidant behaviour in the Strange Situation as primarily avoiding disorganization, and only secondarily the attachment figure, so the dismissing speaker was conceptualized as primarily avoiding a breakdown in their conditional strategy and its attentional and behavioural architecture. It seemed as if the child had inherited an attentional response that mirrored that of their parent. And like the ambivalent/resistant infant, the preoccupied speaker was conceptualized as keeping attention and behaviour trained on attachment-relevant information, avoiding cues from the environment that might suggest other priorities for attention and behaviour. Again, at an attentional level, the child's strategy in the Strange Situation appeared as if an inheritance of the caregiver's behaviour in response to autobiographical questions.

Whether in childhood or in adulthood, what conditional strategies had in common for Main was that they 'follow upon alterations in the focus of attention.'<sup>331</sup> It is attention that orchestrates what attachment-relevant information and cues are received from the environment or from memory. Unresolved speech is characterized by lapses in reasoning or discourse precisely because these behaviours offer evidence of a disruption at the level of attentional processes. They suggest that attachment-relevant perceptions and memories are experienced as alarming and, as a result, attention cannot simply be turned away or turned to them since the other response intrudes, resulting in disruption of working memory. Loss may prompt loops in attention, such as when the person we most want to comfort us in our grief is precisely the person lost to us forever. In the case of trauma, loops may occur when there have been times that the caregiver's memory was associated with alarming experiences.

Main was fully aware that alterations in the focus of attention might be shaped by circumstances, and might change day-to-day and over time, especially on the basis of interactions with the people we love. She said as much to her students.<sup>332</sup> Her concept of conditional strategies was developed out of a lamination of function and perception,

<sup>329</sup> Main, M. (1995) Recent studies in attachment: Overview, with selected implications for clinical work. In S. Goldberg, R. Muir, & J. Kerr (eds), *Attachment Theory: Social, Developmental and Clinical Perspectives* (pp. 407–470). Hillsdale, NJ: Analytic Press.

<sup>330</sup> For example, Grossmann, K. E., Grossmann, K., Winter, M., & Zimmermann, P. (2002) Attachment relationships and appraisal of partnership: From early experience of sensitive support to later relationship representation. In L. Pulkkinen & A. Caspi (eds), *Paths to successful development*. Cambridge: Cambridge University Press, 73–105; Nivison, M. D., Dagan, O., Booth-LaForce, C., Roisman, G. I., & Waters, T. E. (2023) Caregiving antecedents of secure base script knowledge inferred from the Adult Attachment Interview: A comparative, pre-registered analysis. *Infant and Child Development*, e2410.

<sup>331</sup> Main, M. & Hesse, E. ([1992] 2021) Disorganized/disoriented infant behaviour in the Strange Situation, lapses in the monitoring of reasoning and discourse during the parent's Adult Attachment Interview, and dissociative states. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 108–132). New York: Wiley, p. 108.

<sup>332</sup> Duschinsky, R. (2024) Mary Main: Portrait and tribute. *Attachment & Human Development*, early view: 'Kazuko Behrens, one of the second cohort of graduate students, recalls that part-way through a lab meeting

and she anticipated that if a strategy was reliably unsuccessful in close relationships, this would prompt change. Nonetheless, she generally wrote as if individual differences in the AAI would unquestionably be stable, trait-like, cognitive characteristics. This may reflect three factors:

- In part, it likely reflected the influence of Bowlby's characterization of individual differences in attachment as stable, and his subsequent interpretation of these differences in terms of information-processing.
- It also likely reflected a bias to assume that real phenomena would have independent permanence, an assumption evident in Main's early writings on Plato and the nature of truth, and influenced by discussions with her late husband, who had been her classics professor.<sup>333</sup>
- Furthermore, measurement stability had been invested as a symbol of the staying power of the attachment research paradigm by the debates between Waters and critics of attachment research in the early 1980s.

An inadvertent side-effect of the characterization of the AAI as measuring trait-like characteristics, one that in retrospect Main regretted, was to obstruct research on day-to-day changes in attachment states for several decades—though recently Verhees, Bosmans, Bakermans-Kranenburg, and colleagues have begun to pursue this neglected research agenda.<sup>334</sup>

The AAI coding system was met by great interest by clinicians and researchers. Bowlby was delighted. He described it as 'most exciting, and the biggest contribution to the field since Mary A's great work.'<sup>335</sup> Clinicians and clinical researchers with a psychodynamic orientation were, especially, thrilled by the AAI as a scientific measure concerned with the disruptions in individuals' capacity to speak coherently about their lives. It aligned with Freud's prediction that distorted or disrupted autobiographical speech would be 'a necessary correlate' of difficulties in other aspects of an individual's life.<sup>336</sup> As Slade recalled:

Hearing Mary Main present some of her preliminary findings in 1985 was a pivotal experience for me. As a clinician, I got very excited. It was the first time I'd heard these kinds of phenomena addressed in an empirical fashion. My training in the Adult Attachment Interview has completely changed the way I listen to how people talk. I hear language differently, because the scoring system of the interview is focused on language—on the kinds of words people use and the ways they back up what they say. These subtle things can tell you a great deal about a patient's defences, and the way he constructs his reality.<sup>337</sup>

that was getting too staid, Mary started singing, riffing on the blues: "When I woke up in the morning, I was dismissing; but by the afternoon, I was secure."

<sup>333</sup> Main, M. (1977) Sicherheit und Wissen. In K. E. Grossmann (ed.), *Entwicklung der Lernfähigkeit in der sozialen Umwelt* (pp. 47–95). München: Kindler.

<sup>334</sup> Verhees, M. W., Ceulemans, E., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Bosmans, G. (2020) State attachment variability across distressing situations in middle childhood. *Social Development*, 29(1), 196–216; Verhees, M. W., Ceulemans, E., Finet, C., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Bosmans, G. (2023) Exploring everyday state attachment dynamics in middle childhood. *Development and Psychopathology*, 35(2), 652–661.

<sup>335</sup> Bowlby, J. (1982) Letter to Mary Main, 18 December 1982. Mary Main & Erik Hesse personal archive.

<sup>336</sup> Freud, S. (1905) *Fragment of an Analysis of a Case of Hysteria*. *The Standard Edition of the Complete Psychological Works of Sigmund Freud, Volume VII*, London: Vintage, p. 18. Cf. Steele, H. & Steele, M. (2008) Ten clinical uses of the Adult Attachment Interview. In H. Steele & M. Steele (eds), *Clinical Applications of the Adult Attachment Interview* (pp. 3–30). New York: Guilford Press.

<sup>337</sup> Cited in Karen, R. (2024) *Becoming Attached*, 2nd ed. Oxford: Oxford University Press, p. 276.

Like the Strange Situation, but even more so, from a psychoanalytic perspective the AAI seemed to make defence mechanisms visible and available for research. It appeared to represent an effective transposition into empirical developmental science of forms of interpretation characteristic of psychodynamic psychology.

One metric of the shift represented by Main's work was the expansion in who was interested by attachment research. For example, whereas empirical attachment research had struggled to make headway in Italy on the basis of Ainsworth's contributions, Main's work sparked studies among psychodynamically oriented researchers, especially using the AAI.<sup>338</sup> Main's work likewise began to stimulate attachment research in France.<sup>339</sup>

Van IJzendoorn's passion for attachment research was also galvanized by Main, contributing to the establishment of an important community of researchers in the Netherlands (Chapter 4). A landmark study by Marian Bakermans-Kranenburg, Van IJzendoorn, and colleagues conducted the AAI with 83 mothers. Of these, 17% were identified in the AAI as unresolved for loss. Test–retest reliability was very good, except for subjects for whom the loss was fresh, where there was less stability. Stability for unresolved loss was the same as for the other classifications when mothers with a recent bereavement were excluded, suggesting that this lack of resolution was specific to the mourning period. The AAI classifications were not significantly associated with measures of social desirability or skill at autobiographical memory. Moreover, there was no difference between AAI classifications of whether participants remembered the colour of their first bicycle, despite considerable difference in whether participants could recall and report the characteristics of their mother.<sup>340</sup> These findings were replicated by Sagi-Schwartz, Van IJzendoorn, and colleagues in an Israeli sample.<sup>341</sup>

The discriminant validity of the AAI was further supported by the Stony Brook Relationship Study, led by Crowell and Waters. In a sample of engaged women, the Stony Brook team found that the AAI was not significantly associated with discourse style on the topic of education and jobs, suggesting that the patterns of speech characteristic coded by the Main, Goldwyn, and Hesse system were not general traits, but specific to attachment-related content.<sup>342</sup> In line with this conclusion, a doctoral study by Elliot, supervised by Crowell and Waters, found that participants' classification on the AAI was strongly associated with mothers' secure base provision with their child when aged 36–48 months

<sup>338</sup> For example, Ammaniti, M. (1991) Maternal representations during pregnancy and early infant–mother interactions. *Infant Mental Health Journal*, 12(3), 246–255; Muscetta, S., Dazzi, N., Decoro, A., Ortu, F., & Speranza, A. M. (1999) 'States of mind with respect to attachment' and change in a psychotherapeutic relationship: A study of the coherence of transcript in a short-term psychotherapy with an adolescent. *Psychoanalytic Inquiry*, 19(5), 885–921. See also Farina, B., Onofri, A., Monticelli, F., Cotugno, A., Talia, A., & Liotti, M. (2020) Giovanni Liotti (1945–2018): The Pied Noir of research in attachment and psychotherapy. *Attachment & Human Development*, 22(5), 582–591.

<sup>339</sup> Miljkovitch, R. (2001) *L'attachement au cours de la vie. Modèles internes opérants et narratifs*. Paris: Presses Universitaires de France; Pierrehumbert, B. (2003) Attachement et psychopathologie. *Enfance*, 55(1), 74–80. Prior to this, there had been limited interest in attachment research, again following Bowlby's work on maternal deprivation rather than Ainsworth's, as in Italy, for example David, M. & Appell G. (1966) La relation mère/enfant. Étude de cinq patterns d'interaction entre mère et enfant à l'âge de 1 an. *La Psychiatrie de l'enfant*, 9(2), 445–531. For a brief history of attachment research in France, see Dugravier, R. (2024) La théorie de l'attachement. Origines et perspectives. *Enfances & Psy*, 1, 107–119.

<sup>340</sup> Bakermans-Kranenburg, M. J. (1993) Het gehechtheidsbiografisch interview: betrouwbaarheid en discriminante validiteit, Unpublished doctoral dissertation, Leiden University; Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (1993) A psychometric study of the Adult Attachment Interview: Reliability and discriminant validity. *Developmental Psychology*, 29(5), 870–879.

<sup>341</sup> Sagi, A., Van IJzendoorn, M. H., Scharf, M., Koren-Karie, N., Joels, T., & Mayseless, O. (1994) Stability and discriminant validity of the Adult Attachment Interview: A psychometric study in young Israeli adults. *Developmental Psychology*, 30, 988–1000.

<sup>342</sup> Crowell, J. A., Waters, E., Treboux, D., O'Connor, E., Colon-Downs, C., Feider, O., ... & Posada, G. (1996) Discriminant validity of the adult attachment interview. *Child Development*, 67(5), 2584–2599.

( $r = 0.54$ ), though not with fathers.<sup>343</sup> Though there was an interesting interaction: when the AAI scoring system was adapted to code an interview about the marriage relationship, mothers who were coded as having a secure state of mind in this assessment had scores as high for secure base provision to their child, even if they were coded as having an insecure state of mind on the AAI. Mothers classified as having insecure states of mind on both measures showed the least secure base provision to their child.<sup>344</sup>

Fathers' secure base provision was primarily associated with their report of parenting stress ( $r = -0.38$ ). However, when structural equation modelling was used to predict fathers' secure base provision, and mothers' and fathers' report of stress included in the model, only mothers' reported stress significantly predicted fathers' secure base provision for their child. Elliott and colleagues reflected that 'in organising secure base support for their preschool-aged child, a father may be drawing cues from the child's mother rather than his own attachment experiences.'<sup>345</sup> Though an alternative explanation is that, in this small sample, the research was underpowered to successfully identify a smaller effect of fathers' attachment experiences on their parenting behaviour.

In a follow-up after 21 months, Crowell and colleagues found that 83% of participants retained a secure or insecure AAI classification when the measure was repeated, suggesting considerable stability.<sup>346</sup> Though the paper is explicit that the same coders were used at both time points. As in Waters' earlier work on the stability of the Strange Situation in the late 1970s, again the coders for first and second applications of the AAI were the same, which may have unintentionally elevated the stability of the classifications. Nonetheless, at the time, the findings were taken as decisive evidence of profound stability of the measure. This stability was characterized by Crowell and colleagues as evidence of validity, further reinforcing the impression given by Main that individual differences in attachment in adulthood are trait-like.

Crowell and colleagues additionally showed that women's AAI scores were significantly associated with provision of a secure base to their husbands during a discussion of a frequent topic of disagreement ( $r = 0.41$ ) and their use of their husbands as a secure base ( $r = 0.43$ ). Likewise, they found equivalent associations for the husbands in provision and use of their partner as a secure base.<sup>347</sup> Crowell and colleagues interpreted their findings as suggesting that individuals with coherent and elaborated expectations about secure base and safe haven availability could both provide and accept support to and from their spouse, and provide support and help to their child. Crowell and colleagues interpreted the AAI as an indirect measure of these expectations about secure base and safe haven availability. Though their paper implicitly raised the possibility that these expectations might be measured more directly and effectively than with the AAI, which in fact focused on assessing distortions in processing attachment-relevant information. Yet this criticism was not

<sup>343</sup> Elliott, M. E. (2002) Mothers, fathers, and marriage: Sources of secure base support in the preschool years. Unpublished doctoral thesis, State University of New York at Stony Brook.

<sup>344</sup> Ibid. These findings held even controlling for covariates including mothers' and fathers' ratings of marital satisfaction and conflict and mothers' report of parenting support from her spouse.

<sup>345</sup> Ibid., 25.

<sup>346</sup> Crowell, J. A., Treboux, D., & Waters, E. (2002) Stability of attachment representations: The transition to marriage. *Developmental psychology*, 38(4), 467–479. See also Crowell, J. A., & Hauser, S. T. (2008) AAIs in a high-risk sample: Stability and relation to functioning from adolescence to 39 years. In H. Steele & M. Steele (eds), *Clinical Applications of the Adult Attachment Interview* (pp. 341–370). New York: Guilford Press.

<sup>347</sup> Crowell, J. A., Treboux, D., Gao, Y., Fyffe, C., Pan, H., & Waters, E. (2002) Assessing secure base behavior in adulthood: Development of a measure, links to adult attachment representations and relations to couples' communication and reports of relationships. *Developmental Psychology*, 38(5), 679–693. See also Simpson, J., Rholes, W. S., Orina, M. M., & Grich, J. (2002) Working models of attachment, support giving, and support seeking in a stressful situation. *Personality and Social Psychology Bulletin*, 28, 598–608.

explicit. Their work was generally framed, and widely interpreted, as further validation of the AAI.

Another important early study was conducted by Ainsworth and Eichberg. This would be Ainsworth's final direct involvement in empirical research. The AAI and the Strange Situation were conducted with a sample of 45 Charlottesville mother–infant dyads. Ainsworth and Eichberg found that 30 of the sample had experienced loss of an attachment figure, but 20 displayed few or no markers of unresolved/disorganized/disoriented state of mind regarding attachment. A qualitative review of these transcripts revealed that these speakers had experienced various forms of social connectedness following the bereavement, whether in terms of the availability of comfort from others or in terms of their own responsibility for other family members. Only two of the mothers classified as resolved for their loss were part of dyads classified as disorganized in the Strange Situation, showing clearly that loss in itself was not a powerful predictor of infant disorganized attachment.

In the final count, 10 bereaved mothers received an unresolved classification, and of these all were members of dyads classified by blind coders as disorganized/disoriented in the Strange Situation. The other five dyads who received a disorganized classification had experienced frightening occurrences, such as a near-death experience or a partner's severe drug dependency.<sup>348</sup> Ainsworth and Eichberg also found a 90% match between the other classifications: secure-autonomous state of mind in the AAI was highly associated with infant secure attachment, and dismissing state of mind highly associated with avoidant attachment. There was no association between preoccupied state of mind and ambivalent/resistant attachment.

The strong association between the Strange Situation and the AAI, evidenced in a study coded by no less than Ainsworth herself, provided a powerful consecration of the AAI. Outside of the group of Ainsworth's students, the Ainsworth and Eichberg paper quickly came to be widely interpreted as confirmation of Main's extension of the Ainsworth categories across the lifespan.<sup>349</sup> Bowlby and Ainsworth personally hosted the first trainings in the AAI.<sup>350</sup> This may have further contributed to this impression of dynastic sponsorship. With the Ainsworth and Eichberg paper, it appeared that Main had been passed the baton of Ainsworth's role as the field's method-giver, offering a distinct 'common soil' upon which the attachment research community could labour and access the truth.<sup>351</sup>

<sup>348</sup> Ainsworth, M. D. S. & Eichberg, C. G. (1991) Effects on infant–mother attachment of mother's experience related to loss of an attachment figure. In C. M. Parkes, J. Stevenson-Hinde, & P. Marris (eds), *Attachment across the Life Cycle* (pp. 160–183). London: Routledge, p. 164.

<sup>349</sup> See the discussions of Ainsworth and Main for instance in Fonagy, P., Steele, H., & Steele, M. (1991) Maternal representations of attachment during pregnancy predict the organization of infant–mother attachment at one year of age. *Child Development*, 62(5), 891–905; Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (1993) A psychometric study of the Adult Attachment Interview: reliability and discriminant validity. *Developmental Psychology*, 29(5), 870–879; Bacciagaluppi, M. (1994) The relevance of attachment research to psychoanalysis and analytic social psychology. *Journal of the American Academy of Psychoanalysis*, 22(3), 465–479.

<sup>350</sup> Main, M. (2021) Revisiting the founder of attachment theory: Memories and informal reflections. *Attachment & Human Development*, 23(4), 468–480. For an anecdote about Bowlby defending Main's categories from critics, see Steele, H. & Steele, M. (2021) Categorical assessments of attachment: On the ontological relevance of group membership. In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 63–69). New York: Guilford.

<sup>351</sup> The analogy here is with the role of the law-giver in Rousseau in founding/refounding a community that identifies itself as such: Rousseau, J.-J. ([1762] 2008) *The Social Contract*, trans. C. Betts, Oxford: Oxford University Press, Book II, chapter 6. See also Rousseau, J.-J. ([1782] 1953) Considerations on the Government of Poland. In F. Watkins (ed.), *Jean-Jacques Rousseau: Political Writings*. New York: Thomas Yelsen, [chapter 2](#), where the idea of the law-giver as providing common soil is developed.

In fact, despite its critical symbolic importance in shaping attitudes in the field towards Main's work, the results from the Ainsworth and Eichberg study have not held up well. Though generally treated by main-stream attachment researchers as a replication, the study should frankly be recognized as another work in the context of discovery.<sup>352</sup> In fact, the authors acknowledged this. Ainsworth clearly stated in the paper that, after coding the sample a first time, she repeated her coding on the basis of changes made by Main to the coding manual, which lead to the perfect correlation between unresolved loss and infant disorganized attachment.<sup>353</sup> In correspondence with Bowlby she explained that the coding was repeated at Main's insistence.<sup>354</sup>

The study has been such an outlier in terms of the strength of the association between the AAI and the Strange Situation Procedure that Van IJzendoorn made the decision—politically risky in the context of 1990s attachment research—to exclude the finding from his meta-analysis.<sup>355</sup> This was tantamount to characterizing the work of Ainsworth as not science. Van IJzendoorn's meta-analysis nonetheless confirmed an impressive association between the AAI and Strange Situation (Chapter 4). He was effusive in his praise for the AAI as an ingenious and credible measure. While the 1995 meta-analysis reported considerably lower associations than Ainsworth and Eichberg, Van IJzendoorn emphasized that they were nonetheless substantial effect sizes for the social sciences. This is all the more salient when we keep in mind that the AAI and Strange Situation are tremendously different kinds of assessment, applied to two different persons, and can be conducted many years apart, including before the child is even born.<sup>356</sup> The 1995 report would later be updated by Marije Verhage and colleagues in 2016, again confirming a definite, if more modest, association (Chapter 4). Part, though not all, of this link can be accounted for in terms of the capacity of the AAI to predict observable caregiver behaviour, including insensitivity and alarming caregiving behaviours.<sup>357</sup>

Research with the AAI has flourished. Bakermans-Kranenburg, Dagan, Cárcamo, and Van IJzendoorn have recently reported from a meta-analysis of 26,443 AAIs, representing at least 170 years of cumulative interviewing, transcription, and coding time.<sup>358</sup>

<sup>352</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2021) Replication crisis lost in translation? On translational caution and premature applications of attachment theory. *Attachment & Human Development*, 23(4), 422–437.

<sup>353</sup> Ainsworth, M. D. S. & Eichberg, C. G. (1991) Effects on infant-mother attachment of mother's experience related to loss of an attachment figure. In C. M. Parkes, J. Stevenson-Hinde, & P. Marris (eds), *Attachment across the Life Cycle*. New York: Routledge, p. 164.

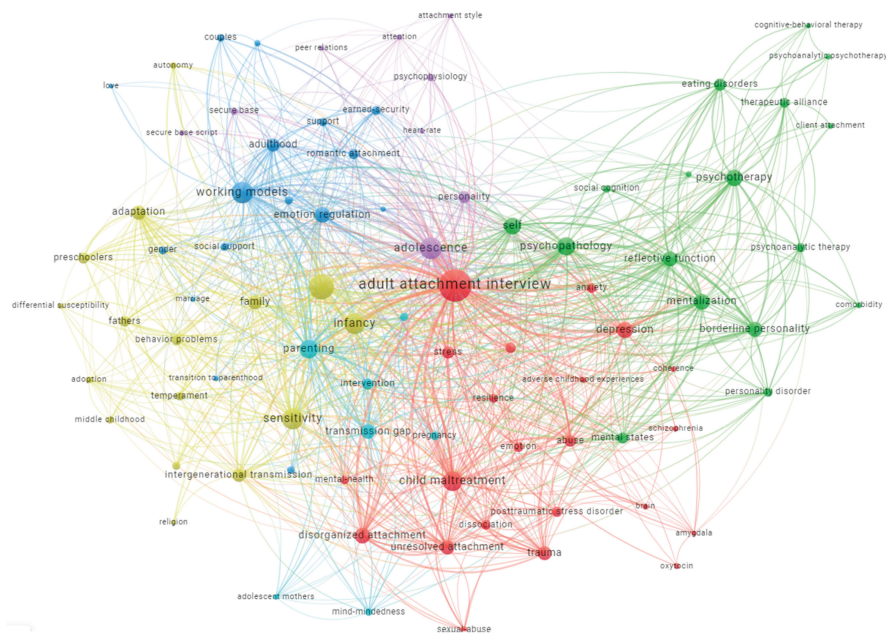
<sup>354</sup> Ainsworth, M. (1990) Letter to John Bowlby, 17 January 1990, John Bowlby Archive, Wellcome Collections, PP/BOW/B.3/8: 'My concern about Mary has been growing gradually for the past five years. She has been very creative and has won quite a following. She certainly is eager to have her contributions known and respected, and hence she wants to speak at meetings, and publish her findings. But on the other hand she does not want to lose control over the way her contributions are used. She does not seem to realise that once she has delivered a paper or published it, she has given others the right to interpret or use her communications as they see fit. So she tries to control the work of her students and ex-students, and the students of her ex-students, my students and ex-students, and me.'

<sup>355</sup> Van IJzendoorn, M. H. (1995) Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin*, 117(3), 387–403.

<sup>356</sup> For example, Fonagy, P., Steele, H., & Steele, M. (1991) Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development*, 62(5), 891–905.

<sup>357</sup> Madigan, S., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Moran, G., Pederson, D. R., & Benoit, D. (2006) Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment & Human Development*, 8(2), 89–111.

<sup>358</sup> Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A. & Van IJzendoorn, M. H. (2024) Celebrating more than 25,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status. *Attachment & Human Development*, forthcoming.



Among these major lines of research with the measure, researchers have repeatedly found links between the AAI and mental health difficulties.<sup>359,360</sup> A meta-analysis by Valois-Demers in 2021, drawing data from 37 independent samples (N = 2307), found an association between insecure states of mind and anxiety symptoms ( $d = 0.27$ , CI 0.08–0.47).<sup>361</sup> The effect sizes of studies using a measure of anxiety by diagnosis ( $d = 0.79$ ) were larger than those of studies using a measure of self-reported anxiety ( $d = 0.16$ ). When anxiety was self-reported, there was no association with dismissing states of mind, in line with the expectation that this state of mind would be associated with minimization of awareness of, and reporting on, distress.<sup>362</sup> Other moderators examined were not found to be significant, including the country where the data were collected, the publication status, and the level of adversity faced by the sample.

More recently, the meta-analysis by Bakermans-Kranenburg and collaborators of 26,000 AAIs found that a combination of high scores on the unresolved and insecure-preoccupied dimensions was shared by borderline personality disorder, autism spectrum disorders, and gender dysphoria. High scores on the unresolved and insecure-dismissing dimensions characterized anxiety problems, obsessive-compulsive, and thought disorders (see [Figure 1.1](#)).

As well as studies in mental health research, the Main, Goldwyn, and Hesse system for coding the AAI has also been used for innovative studies to understand altered psychological states. For instance, work by one of Main's proteges, Pehr Granqvist, found that New Age spiritual beliefs are associated with unresolved and preoccupied AAI categories.<sup>363</sup>

359 Ibid.

<sup>360</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2009) The first 10,000 Adult Attachment Interviews: Distributions of adult attachment representations in clinical and non-clinical groups. *Attachment & Human Development*, 11(3), 223–263.

<sup>361</sup> Valois-Demers, M. (2021) Attachement et adaptation psychologique: Étude empirique et méta-analyse. Unpublished doctoral dissertation, Université Laval.

<sup>362</sup> Dozier, M., Lomax, L., Tyrrell, C. L., & Lee, S. W. (2001) The challenge of treatment for clients with dismissing states of mind. *Attachment & Human Development*, 3(1), 62-76.

<sup>363</sup> Granqvist, P., Ivarsson, T., Broberg, A. G., & Hagekull, B. (2007). Examining relations among attachment, religiosity, and new age spirituality using the Adult Attachment Interview. *Developmental Psychology*, 43(3), 590.



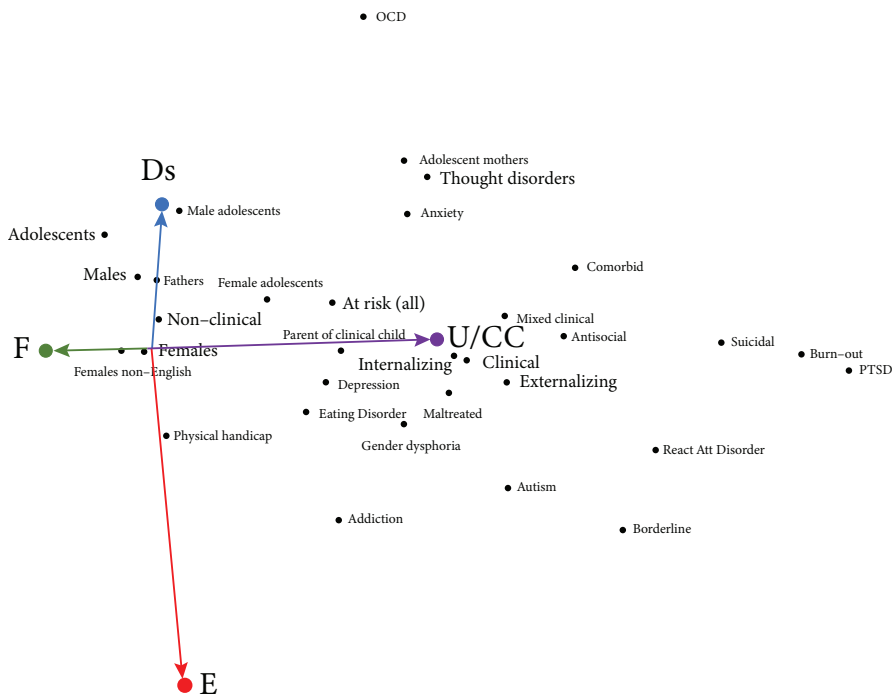


**Figure 1.1** Four-way Adult Attachment Interview classifications, overall

*Note:* The centre of the plot, at the intersection of the Ds, F, E, and U/CC vectors, represents the norm distribution of typical North American mothers. Distributions closer to the centre are more similar to the norm. Perpendicular lines from a specific group on to the Ds, F, E, and U/CC vectors indicate the overrepresentation (or underrepresentation) of those classifications in that specific group.

Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A., & Van IJzendoorn, M. H. (2024) Celebrating more than 25,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status. *Attachment & Human Development*, forthcoming.

Research by Schimmenti and colleagues found that addiction to role playing computer games is associated with unresolved status on the AAI.<sup>364</sup> Van Hoof and colleagues have reported that unresolved status is associated with neurological differences (smaller left hippocampal volume) in adolescents, a finding that remained even after controlling for participants' mental health, puberty status, age, gender, and IQ (Chapter 4).

There have been numerous adaptations and elaborations of the AAI, including by Lyons-Ruth (Chapter 2), Shmueli-Goetz and colleagues,<sup>365</sup> Crittenden,<sup>366</sup> and Howard and Miriam Steele.<sup>367</sup> One especially influential adaptation of the AAI was the development of

<sup>364</sup> Schimmenti, A., Guglielmucci, F., Barbasio, C. P., & Granieri, A. (2012) Attachment disorganization and dissociation in virtual worlds: A study on problematic Internet use among players of online role playing games. *Clinical Neuropsychiatry*, 9(5), 195–202.

<sup>365</sup> Target, M., Fonagy, P., & Shmueli-Goetz, Y. (2003) Attachment representations in school-age children: The development of the Child Attachment Interview (CAI). *Journal of Child Psychotherapy*, 29(2), 171–186.

<sup>366</sup> Crittenden, P. M. & Landini, A. (2011) *Assessing Adult Attachment: A Dynamic-Maturational Method of Discourse Analysis*. New York: Norton.

<sup>367</sup> Kriss, A., Steele, H., & Steele, M. (2012) Measuring attachment and reflective functioning in early adolescence: An introduction to the Friends and Family Interview. *Research in Psychotherapy: Psychopathology, Process and Outcome*, 15(2), 87–95.



an assessment of reflective functioning by Fonagy, Steele, and Steele.<sup>368</sup> This contributed to the model of mentalizing that Sarah Foster and I have explored in depth in *Mentalizing and Epistemic Trust*.<sup>369</sup> In its more overtly psychodynamic conceptual formulation, and use of a scale rather than categories, the reflective functioning approach to the AAI has had greater appeal to clinicians than the coding system developed by Main and colleagues.

Main's mental and physical health difficulties in the 1990s meant that she and Hesse needed to make hard choices about where to allocate their attention and time. Ultimately, they judged that the AAI represented the most important and sophisticated aspect of their work. They prioritized delivery of trainings, reliability assessment, and other work to establish and protect the measure. The manuscript of the coding system contains many important theoretical and methodological reflections essential for understanding the measure. It is one of Main's most extraordinary scholarly achievements. Hesse developed a revised edition in 2002–2003 (version 7.2). But the manuscript is haphazard still despite these edits. Though it will be published posthumously, Main was not able to prepare the manual for publication during her lifetime.

As with disorganized attachment, a consequence has been that, except for trained coders, the research community and its audiences have not been fully aware of what the AAI has in fact been measuring for the past three decades. Among other ramifications, this has contributed to in-group/out-group dynamics. It has obstructed efforts to appraise and evaluate the AAI coding system, its constructs and concepts. In particular, it hindered efforts to elaborate or explicitly test Main's attentional model. Instead, metaphors offered by Main in particular texts have been reified by researchers and other audiences: the AAI is perceived to measure 'internal working models,' 'states of mind,' 'attachment representations'—all ultimately potentially misleading.

Main characterized the object of the interview as the adult's 'state of mind' with respect to attachment. Yet what is in question is not what psychological research generally means by a 'state': a transitory experience responding to an external prompt without the expectation of stability over time. Unfortunately, the pivotal article in which Main set out and described the concept of 'state of mind' was accepted by the journal *Developmental Psychology*, but then withdrawn. And the coding manual remained unpublished. As such, the meaning of the term has often been foggy to her readers, contributing to misunderstanding of what the AAI actually measures. Karen asked Lyons-Ruth what attachment researchers thought the AAI measures: 'she opened her eyes wide and silently mouthed the words, "no one knows!"'<sup>370</sup> Strauss and colleagues have described this as the 'elephant in the room' within attachment research.<sup>371</sup>

Perhaps the most widespread and misleading of metaphors for what the AAI measures, and the most frequently used by researchers who regard their work as following Main, has been 'representations'. In ordinary language, the term usually connotes an image of something. On the basis of this connotation, Main's reference to 'attachment

<sup>368</sup> Fonagy, P., Target, M., Steele, H., & Steele, M. (1998) Reflective-functioning manual version 5 for application to adult attachment interviews. <https://discovery.ucl.ac.uk/id/eprint/1461016/1/Reflective%20Functioning%20Manual%20v5%201998.pdf>.

<sup>369</sup> Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford University Press.

<sup>370</sup> Karen, R. (2024) *Becoming Attached*, 2nd ed. Oxford: Oxford University Press.

<sup>371</sup> Strauss, B., Altmann, U., Schönherr, D., Schurig, S., Singh, S., & Petrowski, K. (2022) Is there an elephant in the room? A study of convergences and divergences of adult attachment measures commonly used in clinical studies. *Psychotherapy Research*, 32(6), 695–709.

representations' has generally been taken to imply a speaker's image of their early attachment relationships. Based on such connotations, researchers have been surprised that, in general, an individual's infant attachment classification only minimally predicts their AAI classification.<sup>372</sup>

Main and Hesse held that secure child-caregiver attachment will generally predispose later flexibility and less distortion in processing attachment-relevant information, implying that the Strange Situation could be expected to be associated with the child's later AAI.<sup>373</sup> And researchers can certainly draw an image of the speaker's early childhood experiences from the AAI transcript using other approaches, for instance by coding participant reference to Adverse Childhood Experiences.<sup>374</sup> But this is distinct from what the AAI coding system developed by Main, Goldwyn, and Hesse seeks to capture, which is distortion in the processing of attachment-relevant information as revealed through distortions in discourse and reasoning.

To take another example: both attachment researchers and their critics have often wondered why adults are assigned a single classification, rather than a classification for each attachment relationship, as could be anticipated if the AAI were measuring representations of relationships.<sup>375</sup> Miljkovitch and colleagues, for example, assumed that this was Main's intention, one that she failed to achieve, and so they developed a 'refined' Attachment Multiple Model Interview guided by the idea of attachment representations.<sup>376</sup> The use of a single classification for the AAI makes sense, however, if Main's focus on attentional and communicative processes in the years of its development is recognized: she conceptualized the AAI as an assessment of individual differences prompted by the interview's demand on speakers to attend to and communicate regarding attachment-relevant experiences.

Among the few researchers to have consistently emphasized the importance of Main's attentional model of states of mind regarding attachment, and designed studies explicitly on this basis, has been Deborah Jacobvitz. She has also written helpful expository works seeking to clarify Main's position for others.<sup>377</sup> Another researcher interested in Main's attentional model has been Van IJzendoorn (Chapter 4). He met Main at the second AAI

<sup>372</sup> Becker-Stoll, F. (1997) Interaktionsverhalten zwischen Jugendlichen und Müttern im Kontext langsschnittlicher Bindungsentwicklung. Unpublished doctoral dissertation, University of Regensburg; Weinfeld, N. S., Sroufe, L. A., & Egeland, B. (2000) Attachment from infancy to early adulthood in a high-risk sample: Continuity, discontinuity, and their correlates. *Child Development*, 71(3), 695–702. See also Groh, A. M., Roisman, G. I., Booth-LaForce, C., Fraley, R. C., Owen, M. T., Cox, M. J., & Burchinal, M. R. (2014) Stability of attachment security from infancy to late adolescence. *Monographs of the Society for Research in Child Development*, 79(3), 51–66.

<sup>373</sup> Main, M. (2001, April) Attachment to mother and father in infancy, as related to the Adult Attachment Interview and a self-visualizing task at age 19. Poster presented at the biennial meeting of the Society for Research in Child Development, Minneapolis, MN. The association reported in this paper was  $r = 0.50$ .

<sup>374</sup> Murphy, A., Steele, M., Dube, S. R., Bate, J., Bonuck, K., Meissner, P., ... & Steele, H. (2014) Adverse childhood experiences (ACEs) questionnaire and adult attachment interview (AAI): Implications for parent child relationships. *Child Abuse & Neglect*, 38(2), 224–233.

<sup>375</sup> For example, Morelli, G. A. & P. Henry (2013) Afterwards: Cross-cultural challenges to attachment theory. In N. Quinn & J. M. Mageo (eds), *Attachment Reconsidered: Cultural Perspectives on a Western Theory* (pp. 241–150). New York: Palgrave-Macmillan.

<sup>376</sup> Miljkovitch, R., Moss, E., Bernier, A., Pascuzzo, K., & Sander, E. (2015) Refining the assessment of internal working models: The Attachment Multiple Model Interview. *Attachment & Human Development*, 17(5), 492–521.

<sup>377</sup> For example, Lyons-Ruth, K., & Jacobvitz, D. (1999). Attachment disorganization: Unresolved loss, relational violence, and lapses in behavioral and attentional strategies. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (pp. 520–554). New York: Guilford Press; Jacobvitz, D., Hazan, N., Zackagnino, M., Mesina, S., & Beverung, L. (2011) Frightening maternal behavior, infant disorganization, and risks for psychopathology. In D. Cicchetti & G. Roisman (eds), *The Origins and Organization of Adaptation and Maladaptation* (pp. 283–322). New York: Wiley.

training institute, in 1986 in Charlottesville, and they became close friends. While Van IJzendoorn had developed some relationships with the US attachment community prior to this, such as with Michael Lamb, his Dutch background and academic position had positioned him outside the core group of Ainsworth's circle. His work prior to 1986 has the tone of an outsider to the attachment community,<sup>378</sup> and Greenberg's review of his 1987 book was favourable, but emphasized his status as outside the US mainstream.<sup>379</sup> It was primarily through Main that Van IJzendoorn gained full access to the US attachment community, and it was her image of attachment theory, more than that of Ainsworth or Bowlby, that inspired his work. In turn, his orientation as a researcher combined with personal access to Main meant that his understanding of her ideas has been unusually sharp.

Citing his personal copy of the unpublished *Developmental Psychology* manuscript on the concept of 'states of mind', Van IJzendoorn observed that generally in Main's writings 'the concepts of "internal representation", "state of mind", and "internal working model" of attachment are used interchangeably'. Nonetheless, he argued, the 'concept of "state of mind"' is in fact less about representational content and more about 'the direction and organization of attention and memory', which underpin related affective and behavioural aspects.<sup>380</sup> Recognition of the importance assigned by Main to attention has gone on to inspire Van IJzendoorn's research using the Strange Situation and AAI, for instance his concern with genetic polymorphisms that influence the dopamine system, given the role of this system in attention and reward processing.<sup>381</sup>

Reflecting on the state of attachment research in the 1980s, Van IJzendoorn regarded Main's work as tremendously bold, and as opening up a new dimension of the world for attachment research. As we saw above, Van IJzendoorn had described Ainsworth's Strange Situation as initiating attachment as a cumulative empirical research programme, able to generate a stable body of knowledge with implications for policy and practice. Nonetheless, he was concerned that 'some symptoms of the saturation stage are notable'.<sup>382</sup> He felt that attachment research was reaching a potential impasse, with critics such as Lamb identifying legitimate problems for attachment research. Many researchers, especially in research conducted with families under strain, were finding anomalous cases that were difficult to code using the Ainsworth protocols for the Strange Situation. It was also not clear for the field how to progress beyond the study of infancy in the conceptualization and measurement of attachment-related processes. Writing in 1987, Van IJzendoorn felt that Main's work had the potential to rejuvenate attachment research and address features of this impasse. By 1997 he and Bakermans-Kranenburg felt this potential had been realized,

<sup>378</sup> For example, Van IJzendoorn, M. H., Goossens, F. A., Kroonenberg, P. M., & Tavecchio, L. W. C. (1985) Premature attachment: B-4 children in the strange situation. *Psychological Reports*, 57(2), 439–451.

<sup>379</sup> Greenberg, M. T. (1989) Attachment in social networks: Contributions to the Bowlby-Ainsworth Attachment Theory edited by Louis W. C. Tavecchio and Marinus H. van IJzendoorn (book review), *Contemporary Psychology*, 34(3), 260.

<sup>380</sup> Van IJzendoorn, M. H. (1992) Intergenerational transmission of parenting: A review of studies in nonclinical populations. *Developmental Review*, 12(1), 76–99, p. 80.

<sup>381</sup> For example, Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2006) DRD4 7-repeat polymorphism moderates the association between maternal unresolved loss or trauma and infant disorganization. *Attachment & Human Development*, 8(4), 291–307.

<sup>382</sup> Van IJzendoorn, M. H. & Tavecchio, L. W. C. (1987) The development of attachment theory as a Lakatosian research program. In L. W. C. Tavecchio & Van IJzendoorn, M. H. (eds), *Attachment in Social Networks. Contributions to the Bowlby-Ainsworth Attachment Theory* (pp. 3–31). New York: Elsevier Science Publishers, p. 13.

writing that Main's contributions had helped initiate a 'revolutionary shift' in attachment research,<sup>383</sup> a claim echoed by other attachment researchers.<sup>384</sup>

### Main's Legacy

Cowan and colleagues have described Main as a 'towering and path-breaking figure'.<sup>385</sup> For Slade, 'she simply changed the course of both academic and clinical psychology'.<sup>386</sup> The image of human emotional life as strung out along axes of minimizing and maximizing, or disrupted by disorganization, has been the beating heart of attachment research within developmental psychology for decades. This has included a central role in hypothesis generation and the interpretation of empirical findings regarding individual differences in attachment.

Beyond the dominant role of the Strange Situation as an empirical tool, as a result of Main's work, the categories for classifying the Strange Situation became the 'grid of specification' according to which individual differences in attachment research have been divided, contrasted, related, grouped, classified, and derived in relation to one another.<sup>387</sup> In other words, the different responses of infants on reunion in the Strange Situation were experienced by researchers as 'good to think with', since the kinds of division suggested by these responses seemed able to extend to other phenomena.<sup>388</sup> When researchers have desired to gain knowledge about attachment or caregiving, following Main the dominant and taken-for-granted approach has been to envision and pursue access to the truth in terms of these categories.<sup>389</sup> Illustrative of its hegemony, the same approach has been adopted even

<sup>383</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (1997) Intergenerational transmission of attachment. A move to the contextual level. In L. Atkinson & K. J. Zucker (eds), *Attachment and Psychopathology* (pp. 135–170). New York: Guilford, p. 138; Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A., & Van IJzendoorn, M. H. (2024) Celebrating more than 25,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status. *Attachment & Human Development*, forthcoming.

<sup>384</sup> Holmes, J. (2009) *Exploring in Security: Towards an Attachment-Informed Psychoanalytic Psychotherapy*. London: Routledge, p. 4; Durham-Fowler, J. (2013) An interview with Arietta Slade. *DIVISION/Review*, 7, 39–40; Fonagy, P. (2023) Mary Main. *Attachment*, 17(1), 1–5.

<sup>385</sup> Cowan, P., Cowan, C. P., & Weinstein, R. (2022) Remembering Mary Main, <https://psychology.berkeley.edu/news/remembering-mary-main>.

<sup>386</sup> Cited in Karen, R. (2024) *Becoming Attached*, 2nd ed. Oxford: Oxford University Press, p. 672.

<sup>387</sup> Foucault, M. ([1969] 1972) *The Archaeology of Knowledge*, trans. A. M. Sheridan Smith, London: Routledge, chapter 3; Deleuze, G. ([1986] 1988) *Foucault*, trans. S. Hand. Minneapolis: University of Minnesota Press.

<sup>388</sup> Cf. Lévi-Strauss, C. ([1962] 1963) *Totemism*, trans. R. Needham, Boston: Beacon: 'The animals in totemism cease to be solely or principally creatures which are feared, admired, or envied; their perceptible reality permits the embodiment of ideas and relations conceived by speculative thought on the basis of empirical observations. We can understand, too, that natural species are chosen not because they are "good to eat" but because they are "good to think." (89).

<sup>389</sup> For example, Pianta, R. C., Marvin, R. S., Britner, P. A., & Borowitz, K. C. (1996) Mothers' resolution of their children's diagnosis: Organized patterns of caregiving representations. *Infant Mental Health Journal*, 17(3), 239–256; Benoit, D., Zeanah, C. H., Parker, K. C., Nicholson, E., & Coolbear, J. (1997) Working model of the child interview: Infant clinical status related to maternal perceptions. *Infant Mental Health Journal*, 18(1), 107–121; Goldwyn, R., Stanley, C., Smith, V., & Green, J. (2000) The Manchester Child Attachment Story Task: Relationship with parental AAI, SAT and child behaviour. *Attachment & Human Development*, 2(1), 71–84; Solomon, J. & George, C. (2011) Disorganization of maternal caregiving across two generations. In J. Solomon & C. George (eds), *Disorganized Attachment and Caregiving* (pp. 25–51). New York: Guilford Press; Bifulco, A. (2014) The Attachment Style Interview. In S. Farnfield & P. Holmes (eds), *The Routledge Handbook of Attachment: Assessment* (pp. 178–191). London: Routledge. In the social psychological tradition, taking some inspiration from Main, the Strange Situation categories also formed the grid of specification, though formulated as two dimensions (anxiety and avoidance) rather than four categories. Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 5.

by researchers who have framed their work as contesting aspects of Main's methods.<sup>390</sup> The ascension of the Strange Situation to become the grid of specification for attachment research rerouted the field just as much as the development of the Strange Situation as an empirical measure. It also contributed to the insularity of attachment research, by separating forms of desire for knowledge organized by the Strange Situation categories from other forms of desire to know about child development. This would ultimately contribute to disaffection with attachment research among some scholars (e.g., Belsky, Meins; [Chapters 3 and 4](#)), and reduced the interest of other developmental psychologists in engaging with its theory and methods.<sup>391</sup>

One source of support and stability for Main's four-category model of individual differences in attachment may have been the flexible opportunities it offered to developmental scientists with varying interests. Indeed, the four category model could scaffold empirical study addressing four of the great preoccupations of developmentalists: salutogenesis and resilience (security), vulnerability to dysregulation (resistance), defence and coping (avoidance), and pathology (disorganization).<sup>392</sup>

The four-category system as a model of individual differences is versatile and mobile. Just as an infant may seek their primary caregiver for their diverse needs, even if these could in principle be met elsewhere, the four-category has been sought for its different functions by researchers. The model can also turn a face towards researchers with distinct interests. It could therefore sustain a coalition of scholars concerned with at least one of these themes, despite the fact that almost no one was concerned with all four. In this regard, the hegemonic status of the four-category model may be regarded as overdetermined, as a compromise and articulation between potentially diverging concerns, allowing them each the perception of a common interest in the approach.<sup>393</sup>

That said, like a personal relationship asked to bear the demand to satisfy all our needs, there has been strain in investment in the four-category model. The primary challenges have come from those on the clinical wing of developmental psychology, who have tended to want more granularity in conceptualizing and measuring pathology in attachment and caregiving ([Chapter 3](#)).<sup>394</sup> There have also been challenges from researchers influenced

<sup>390</sup> For example, George, C. & West, M. L. (2012) *The adult attachment projective picture system: Attachment theory and assessment in adults*. New York: Guilford Press; Groh, A. M. & Haydon, K. C. (2024) *The Attachment Script Assessment: Introduction of a coding system to evaluate deactivation, hyperactivation, and anomalous content*. *Attachment & Human Development*, 26(3), 203–211. See also Laclau, E. & Mouffe, C. ([1985] 2001) *Hegemony and Socialist Strategy: Towards a Radical Democratic Politics*. New York: Verso Books: 'A hegemonic formation also embraces what opposes it, insofar as the opposing force accepts the system of basic articulations of that formation as something it negates, but the place of the negation is defined by the internal parameters of the formation itself' (139).

<sup>391</sup> Mann, A., Thompson, M., Foster, S., Beckwith, H., Madigan, S., Fearon, R. P., ... & Duschinsky, R. (2023) *The Perspectives of Senior Researchers in Applied Disciplines on the Current State of Developmental Attachment Research: An Interview Study*. *Sage Open*, 13(2), 21582440231179204.

<sup>392</sup> Madigan, S., Fearon, R. M., Van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J., ... & Verhage, M. L. (2023) *The first 20,000 strange situation procedures: A meta-analytic review*. *Psychological Bulletin*, 149(1–2), 99–132; Deneault, A. A., Bureau, J. F., Duschinsky, R., Fearon, P., & Madigan, S. (2023) *A meta-analysis of the distribution of preschool and early childhood attachment as assessed in the strange situation procedure and its modified versions*. *Attachment & Human Development*, 25(2), 322–351; Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A. & Van IJzendoorn, M. H. (2024) *Celebrating more than 25,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status*. *Attachment & Human Development*, forthcoming.

<sup>393</sup> Cf. Laclau, E. (2014) *The Rhetorical Foundations of Society*. New York: Verso Books.

<sup>394</sup> For example, Hodges, J., Steele, M., Hillman, S., Henderson, K., & Kaniuk, J. (2003) *Changes in attachment representations over the first year of adoptive placement: Narratives of maltreated children*. *Clinical Child Psychology and Psychiatry*, 8(3), 351–367; Crittenden, P. M. (2001) *Organisation, alternative organisations and disorganisation: Competing perspectives on endangered children*. *Contemporary Psychology*, 46, 593–596; Slade, A. (2004) *The move from categories to process: Attachment phenomena and clinical evaluation*. *Infant Mental*

by social psychology, where disorganization and resistance have both been considered as kinds of dysregulation.<sup>395</sup> No taxometric test has ever supported the four-category model, resulting in concerns from psychometrically oriented researchers.<sup>396</sup>

Against these challenges, another source of support and stability for recognition of the value of Main's work within attachment research has been its defence by friends and allies in key roles in the production of credible knowledge and its accumulation, able to shape the story the attachment research community tells itself and others.<sup>397</sup> This has included:

- Howard Steele as, inter alia, editor of *Attachment & Human Development*, co-editor of the *Handbook of Attachment-Based Interventions*, and founding Chair of the Society of Emotion and Attachment Studies;<sup>398</sup>
- Jude Cassidy as co-editor of the three editions of the *Handbook of Attachment*, the central reference work characterizing the current state of knowledge of attachment across developmental, social, and clinical psychology;<sup>399</sup>
- Marinus van IJzendoorn and Marian Bakermans-Kranenburg as leaders in meta-analytic research, testing the validity of methods and summing up research to date (Chapter 4).

Other allies have offered public defence when Main's categories or theory have been criticized, including major figures in developmental science such as Sroufe.<sup>400</sup> Less visible, but of no less importance, has been the role of Sroufe and Carlson, Solomon, and Van

*Health Journal*, 25(4), 269–283; Fonagy, P. & Campbell, C. (2015) Bad blood revisited: Attachment and psychoanalysis, 2015. *British Journal of Psychotherapy*, 31(2), 229–250; Grey, B. & Farnfield, S. (2017) The Meaning of the Child Interview: A new procedure for assessing and understanding parent–child relationships of 'at-risk' families. *Clinical Child Psychology and Psychiatry*, 22(2), 204–218; Serván, I. (2023) *Desorganización del apego: Clínica y psicoterapia con adultos*. Bilbao: Desclee de Brouwer.

<sup>395</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 5.

<sup>396</sup> Fraley, R. C. & Spieker, S. J. (2003) Are infant attachment patterns continuously or categorically distributed? A taxometric analysis of strange situation behavior. *Developmental Psychology*, 39(3), 387–404; Raby, K. L., Fraley, R. C., & Roisman, G. I. (2021) Categorical or dimensional measures of attachment? In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 70–77). New York: Guilford Press; Raby, K. L., Verhage, M. L., Fearon, R. P., Fraley, R. C., Roisman, G. I., Van IJzendoorn, M. H., ... & Wong, M. S. (2022) The latent structure of the adult attachment interview: Large sample evidence from the collaboration on attachment transmission synthesis. *Development and Psychopathology*, 34(1), 307–319; Pollard, C., Bucci, S., & Berry, K. (2023) A systematic review of measures of adult disorganized attachment. *British Journal of Clinical Psychology*, 62(2), 329–355. Exactly parallel questions have been raised by taxometric analysis of measures based on the Strange Situation and AAI, for instance the Working Model of the Child: Sandnes, K., Lydersen, S., Berg Kärstad, S., & Berg-Nielsen, T. S. (2021) Measuring mothers' representations of their infants: Psychometric properties of the clinical scales of the working model of the child interview in a low-to moderate-risk sample. *Infant Mental Health Journal*, 42(5), 690–704. For rejoinder, see Van IJzendoorn, M. H. & Makino, N. (2023) In defense of unresolved attachment: Re-modelling intergenerational transmission of attachment. *Attachment & Human Development*, 25(2), 311–321. However even Van IJzendoorn and Makino did not find support for a four category model.

<sup>397</sup> Knoche, M. (2007) Medienkonzentration. In B. Thomass (ed.), *Mediensysteme im internationalen Vergleich* (pp. 122–144). Konstanz: UVK.

<sup>398</sup> Steele, H. & Steele, M. (eds) (2008) *Clinical applications of the adult attachment interview*. New York: Guilford Press; Steele, H. & Steele, M. (2021) Categorical assessments of attachment: On the ontological relevance of group membership. In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 63–69). New York: Guilford.

<sup>399</sup> On the prominence of Main's work within the *Handbook of Attachment*, see Kroonenberg, P. M. & Stoltenborgh, M. (2023) Handbooks as a means of mapping a discipline: An exploration of the world of attachment. In A. Okada, K. Shigemasa, R. Yoshino, & S. Yokoyama (eds), *Facets of Behaviormetrics: The 50th Anniversary of the Behaviormetric Society* (pp. 123–143). New York: Springer.

<sup>400</sup> Sroufe, L. A. (2003) Attachment categories as reflections of multiple dimensions: Comment on Fraley and Spieker (2003). *Developmental Psychology*, 39(3), 413–416.



IJzendoorn in offering accredited training in coding the Strange Situation, all oriented by Main's thinking and methods.<sup>401</sup>

That said, Van IJzendoorn has not held back from documenting the extensive publication bias that has stemmed from the hegemony of Main's proposals, and which provides one index of their power over developmental psychologists (Chapters 4 and 5).<sup>402</sup> It may also be noted that Main's advocates within developmental science only partly align in their images of her contribution. One may compare, for instance, Howard and Miriam Steele's delight in the psychological insights and rigour of Main's work as psychoanalysis-become-science,<sup>403</sup> with Van IJzendoorn's loyalty to Main's bold hypotheses available for empirical testing (Chapter 4). Certainly there is overlap, for example in their enthusiasm for the AAI, their impression of the elegance and utility of Main's account of attachment strategies, and their use of the Strange Situation categories as the grid of specification for empirical research. Nonetheless, the basic ontology is noticeably different when examined closely. So, despite the anchor provided by the Strange Situation classification coding system, even fundamental terms such as 'insecurity' or 'disorganization' can ring with a different valence.

As a point assumed by attachment researchers for decades now, Main's basic concept of individual differences in attachment as organized by minimizing and maximizing strategies has had more sway for later attachment theory than even Bowlby's theory of attachment as a motivational system that it ostensibly modified. Since the 1980s, the idea of attachment as a 'motivational system', grounded in human evolutionary history, has rather the status of a memento that the developmental tradition of attachment research is pleased to have, and without which they might feel bereft, but which never gets actually brought out for further examination, except perhaps when teaching. Critics of attachment theory and research still write papers criticizing Bowlby's account of attachment as a motivational system.<sup>404</sup> But in truth, it has been the ghost of honour at the party since the 1990s in developmental science.

In preparation for a conference with leading developmental, social, and clinical attachment researchers, Waters prepared a list of 72 questions that he felt were especially urgent for attachment research. Many of these addressed Bowlby's idea of attachment as a motivational system engendered by human evolutionary history. For example:

What are the key motivational constructs and mechanisms in Bowlby's infant attachment theory? What kinds of interactions are there with other motivational systems? Can we discuss motivation with enough specificity to formulate testable hypotheses?

<sup>401</sup> Reijman, S., Foster, S., & Duschinsky, R. (2018) The infant disorganised attachment classification: 'Patterning within the disturbance of coherence'. *Social Science & Medicine*, 200, 52–58.

<sup>402</sup> For example, Verhage, M. L., Schuengel, C., Madigan, S., Fearon, R. M., Oosterman, M., Cassibba, R., ... & Van IJzendoorn, M. H. (2016) Narrowing the transmission gap: A synthesis of three decades of research on intergenerational transmission of attachment. *Psychological Bulletin*, 142(4), 337–366.

<sup>403</sup> For example, Steele, H. (2003) Unrelenting catastrophic trauma within the family: When every secure base is abusive. *Attachment and Human Development*, 5, 353–366; Steele, M., Hodges, J., Kaniuk, J., & Steele, H. (2009) Mental representation and change: Developing attachment relationships in an adoption context. *Psychoanalytic Inquiry*, 30, 25–40; Steele, H. & Steele, M. (2017) On conflict in attachment theory and research. In C. Christian, M. N. Eagle, & D. L. Wolitsky (eds), *Psychoanalytic Perspectives on Conflict* (pp. 210–222). New York: Routledge.

<sup>404</sup> For example, Sosteric, M. & Ratkovic, G. (2022) It takes a village: Advancing attachment theory and recovering the roots of human health with the circle of seven essential needs. *Aotearoa New Zealand Social Work*, 34(1), 113–127.

What does it mean to say that an attachment system is turned on/turned off or activated/inactivated in emergency vs non-emergency situations? What are the key observations to be accounted for and are there other types of explanations for them? Is the control systems concept primarily a metaphor or a source of testable hypotheses?

Is the behavioural control system model Bowlby used in his work on infancy central to adult attachment theory? If so, what kind of testable hypotheses can be derived from this motivation model?<sup>405</sup>

Attendees at the conference were uninterested in such questions. Furthermore, Waters' questions about Bowlby's theory of attachment as a motivational system engendered by human evolution have, with a few exceptions,<sup>406</sup> barely been seriously examined subsequently, let alone answered. What attention has been given by attachment researchers to evolutionary science has generally dispensed with the idea of attachment as a motivational system (Chapter 3).

If Ainsworth's concept of insensitivity represented a caregiver's inability to '[i] perceive and to [ii] interpret accurately the signals and communications implicit in her infant's behavior, and [iii] given this understanding, to [iv] respond to them appropriately and promptly',<sup>407</sup> we may correspondingly distinguish four analogous ways that questions facing research can remain unaddressed. It may be that researchers:

- i. did not perceive the problem;
- ii. interpreted the problem as not requiring a response from them;
- iii. knew a response to the problem was needed but did not have a response available or could not imagine developing one;
- iv. selected a response to the problem but failed to effectively implement it.

In the case of Waters' questions about Bowlby's theory of attachment, it may be suspected that developmental scientists interpreted the problem as not requiring a response from them. This is because, in practice, the theory of attachment as a motivational system was quietly mothballed from the 1980s, with the exception of outliers such as the Grossmans and Marvin.<sup>408</sup> Even Bowlby himself largely dropped these ideas from his writings of the 1980s, seeming to sense that it had little intuitive appeal to clinicians and posed challenges for operationalization and further investigation for researchers.

<sup>405</sup> Waters, E. (2002) Agenda questions for adult attachment: Theory to research. [http://www.psychology.sunysb.edu/attachment/danfords2002/documents/agenda\\_questions.pdf](http://www.psychology.sunysb.edu/attachment/danfords2002/documents/agenda_questions.pdf).

<sup>406</sup> For example, Panksepp, J. (2013) How primary-process emotional systems guide child development. In D. Narvaez, J. Panksepp, A. N. Schore, & T. R. Gleason (eds), *Evolution, Early Experience and Human Development* (pp. 75–94). New York: Oxford University Press; Liotti, G. (2016) Infant attachment and the origins of dissociative processes: An approach based on the evolutionary theory of multiple motivational systems. *Attachment*, 10(1), 20–36.

<sup>407</sup> Ainsworth, M. (1969) Sensitivity vs. insensitivity to the Baby's Signals Scale, [http://www.psychology.sunysb.edu/attachment/measures/content/ainsworth\\_scales.html](http://www.psychology.sunysb.edu/attachment/measures/content/ainsworth_scales.html). Crittenden conceptualized each of the four components of the sensitivity construct as representing a potential 'gate' through which information needs to pass for a caregiver to recognise potential difficulties facing a child. Crittenden, P. M. (1993) An information-processing perspective on the behavior of neglectful parents. *Criminal Justice and Behavior*, 20(1), 27–48.

<sup>408</sup> Exceptions have subsequently marked themselves as battling the current. See, for example, Marvin, R. S. & Britner, P. A. (1999) Normative development: The ontogeny of attachment. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (pp. 44–67). New York: The Guilford Press; Grossmann, K. & Grossmann, K. (2012) *Bindungen—das Gefüge psychischer Sicherheit*, Stuttgart: Klett-Cotta; Solomon, J. (2021) Shame as a behavioral system: Its links to attachment, defense, and dysregulation. In O. B. Epstein (ed.), *Shame Matters: Attachment and Relational Perspectives for Psychotherapists* (pp. 6–20). London: Routledge.



Partly out of respect for Bowlby's memory, and partly due to the impatient empiricism of academic developmental science and its journals, the research community has generally not been forthright about this seismic theoretical shift. A few attachment researchers with interest in theory, such as Cassidy and Lyons-Ruth (Chapter 2), have explicitly argued for the retirement or supersession of Bowlby's control systems theory.<sup>409</sup> However, such arguments have not led to any sustained public discussion. The exception has been Shaver and Mikulincer: in applying attachment theory to adult relationships the question of the nature of attachment at this later developmental stage became of critical concern to the social psychological tradition of attachment.<sup>410</sup>

The basic conceptual and methodological environment within which developmental attachment research has been structured since the late 1990s, has been largely shaped by Mary Main.<sup>411</sup> But not exclusively. If this chapter has been a coming-of-age story, this is a ultimately genre about growing maturity and capacities, discovery and adventure, but also roads not taken, about how adult stability is purchased, and at what price.<sup>412</sup>

## Secure Base/Safe Haven Expectations

### Security Theory

Though generally regarded as having passed the baton to Main, Ainsworth encouraged her different graduate students. Bretherton, Waters, Crittenden, and Marvin were all making both methodological and theoretical innovations at the turn of the 1990s that built on Ainsworth's work.<sup>413</sup> Ainsworth felt that there was enough complexity in reality for researchers to make varied contributions: 'Things are always more interesting the way they really are than the way your theory hopes they are.'<sup>414</sup> She felt keenly that attachment research should be capable of both finding inspiration and support in its tradition, and of venturing out to explore, develop, and change that tradition in various ways.<sup>415</sup>

<sup>409</sup> Cassidy, J., Ehrlich, K. B., & Sherman, L. J. (2013) Child-parent attachment and response to threat: A move from the level of representation. In M. Mikulincer & P. R. Shaver (eds), *Nature and Development of Social Connections: From Brain to Group* (pp. 125–144). Washington: American Psychological Association.

<sup>410</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 5.

<sup>411</sup> Some lingering sense of still needing to prove and justify the Berkeley theory and measures can be seen in the editors' introduction to Solomon, J. E. & George, C. E. (eds) (1999) *Attachment Disorganization*. New York: Guilford Press. However the taken-for-granted quality of the theory and measures can be seen by the early 2000s. For instance ideas regarding disorganization were used without definition or defence in Fonagy, P., Gergely, G., & Jurist, E. L. (2002) *Affect Regulation, Mentalization and the Development of the Self*. London Routledge.

<sup>412</sup> Jeffers, T. (2005) *Apprenticeships: The Bildungsroman from Goethe to Santayana*. New York: Springer; Graham, S. (ed.) (2019) *A History of the Bildungsroman*. Cambridge: Cambridge University Press.

<sup>413</sup> For example, Bretherton, I., Prentiss, C., & Ridgeway, D. (1990). Family relationships as represented in a story-completion task at thirty-seven and fifty-four months of age. *New Directions for Child and Adolescent Development*, 48, 85–105; Vaughn, B. E. & Waters, E. (1990) Attachment behavior at home and in the laboratory: Q-sort observations and strange situation classifications of one-year-olds. *Child Development*, 61(6), 1965–1973; Crittenden, P. M. (1992). Quality of attachment in the preschool years. *Development & Psychopathology*, 4(2), 209–241; Cassidy, J., Marvin, R. with the Attachment Working Group of the John D. and Catherine T. MacArthur Network on the Transition from Infancy to Early Childhood (1992) Attachment organisation in preschool children: Procedures and coding manual, unpublished manual

<sup>414</sup> M. Ainsworth, personal communication, cited in Waters, E. (2017) The secure base script in attachment theory and research. Presentation to the Rapaport-Klein Study Group, [https://www.psychomedia.it/rapaport-klein/Waters-2017\\_Talk+Slides\\_1-Intro.mp4](https://www.psychomedia.it/rapaport-klein/Waters-2017_Talk+Slides_1-Intro.mp4). See also Landa, S. & Duschinsky, R. (2013) Letters from Ainsworth: Contesting the 'organization' of attachment. *Journal of the Canadian Academy of Child and Adolescent Psychiatry*, 22(2), 172–177.

<sup>415</sup> Comments made at the first Adult Attachment Interview training in Charlottesville, 1985. Reported by Grossmann, K. & Grossmann, K. (2012) *Bindungen—das Gefüge psychischer Sicherheit*. Stuttgart: Klett-Cotta, p. 147.

In conversations with colleagues in the period Ainsworth characterized the Berkeley AAI as a highly creative contribution, but somewhat away from what she regarded as the core issues of attachment theory and research: secure base and safe haven interactions within attachment relationships.<sup>416</sup> Though in general Main wanted to characterize the AAI classifications as equivalent to Ainsworth's Strange Situation classifications, she was forced to accept that Ainsworth was right on this point: 'coherent, collaborative (secure) discourse has no direct resemblance to the corresponding (secure) infant Strange Situation response involving exhibition of distress on maternal leavetaking, and the return to exploration on reunion.'<sup>417</sup> In Main's account, autonomous/secure discourse on the AAI is characterized by the absence of distortions in the processing of attachment-relevant information, and this is the basis for similarity to security in the Strange Situation: the caregiver's absence is a cause of distress to the child, and the caregiver's presence resolves the problem, without distortion of distress or resolution.<sup>418</sup> Nonetheless, secure base and safe haven interactions were not Main's focus. In the Main and Cassidy six-year system, security is coded more on the basis of absence of distortion in child-caregiver communication, and less on use of the caregiver as a secure base or safe haven.<sup>419</sup>

Ainsworth also spoke to her students, including Main, about another worry. Ainsworth was concerned that the use of equivalent categories in the Strange Situation and AAI suggested that individual differences would always have the same form, implying that there is no need to consider further the 'criteria for differentiating among patterns of attachment at different points in the life cycle.'<sup>420</sup> In 1990, she described this in print as an 'obvious limitation' in Main's work.<sup>421</sup> In principle such a limitation could be addressed. However, Ainsworth felt that use of equivalent categories in the Strange Situation and AAI risked directing attachment research away from a developmental perspective, since it implied that individual differences were always of the same nature and kind.<sup>422</sup> Marvin's impression was that Ainsworth wanted to be encouraging to Main, but that she held—like him—that 'the history of biology demonstrates that despite some analogical similarities

<sup>416</sup> Klaus and Karin Grossmann, personal communication, November 17, 2023.

<sup>417</sup> Main, M. (1996) Introduction to the special section on attachment and psychopathology: 2. Overview of the field of attachment. *Journal of Consulting and Clinical Psychology*, 64(2), 237–243, p. 241.

<sup>418</sup> Main, M. (1995) Recent studies in attachment: Overview, with selected implications for clinical work. In S. Goldberg, R. Muir, & J. Kerr (eds), *Attachment Theory: Social, Developmental and Clinical Perspectives* (pp. 407–470). Hillsdale, NJ: Analytic Press, pp. 451–452.

<sup>419</sup> Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds), London: Routledge. Forthcoming.

<sup>420</sup> Ainsworth, M. D. S. (1988) Security. Unpublished discussion paper prepared for the Foundations of Attachment Theory Workshop. Convened for the New York Attachment Consortium by G. Cox-Steiner & E. Waters, Port Jefferson, NY, [http://www.psychology.sunysb.edu/attachment/online/mda\\_security.pdf](http://www.psychology.sunysb.edu/attachment/online/mda_security.pdf): 'To be sure, Main and Cassidy, in the process of back-and-forthing between patterns of reunion behavior in the sixth year and strange-situation classification at age one, did formulate a new classification system for assessing quality of attachment in six-year-olds. But this tells us little about either the developmental changes or changes in life circumstances that require us to find new criteria for differentiating among patterns of attachment at different points in the life cycle.'

<sup>421</sup> Ainsworth, M. D. S. (1990) Epilogue: Some considerations of attachment theory and assessment relevant to the years beyond infancy. In M. T. Greenberg, D. Cicchetti, & M. Cummings (eds), *Attachment in the Preschool Years: Theory, Research, and Intervention* (pp. 463–488). Chicago: University of Chicago Press, p. 466.

<sup>422</sup> An example of this kind of appearance can be seen in a 2024 meta-analysis of the correlates of the Strange Situation by Madigan, Fearon, and colleagues. Having discussed the lack of evidence for sex or age as a moderator of distributions in the Strange Situation or AAI, the authors conclude: 'We believe the present study provides the most definitive conclusion to date that early security of infant–parent attachment does not develop in sex- or age specific ways, at least as captured by the distribution of the four major attachment classifications.' Madigan, S., Fearon, R. M., Van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J., ... & Verhage, M. L. (2023) The first 20,000 strange situation procedures: A meta-analytic review. *Psychological Bulletin*, 149(1–2), 99–132, p. 118.

between immature and mature forms of an organism, any attempt to understand adaptive or maladaptive versions of the mature form without constant reference to structural transformations throughout ontogeny is doomed to failure.<sup>423</sup>

Indeed, none of Ainsworth's immediate students wholeheartedly adopted Main's innovations, besides Cassidy in the years immediately after studying with Main. This may have been partly a matter of academic differentiation and positioning.<sup>424</sup> More importantly, it reflected a substantive commitment among many of Ainsworth's students, especially those from the 1970s, to the ideas of secure base and safe haven, which many felt were lost in Main's focus on conditional strategies and disorganization. Like Ainsworth, several of her students were concerned by Main's use of infant categories as the frame of reference for conceptualizing individual differences in secure base and safe haven use across the life course, without scrutiny of changing developmental capacities. Main and Cassidy's work on the controlling-caregiving and controlling-punitive patterns was a partial exception, but these categories were never fully conceptually established and the coding system remained unfinished and was not disseminated.

Main's work represented a branching of the developmental pathway of attachment research. An alternative developmental pathway would certainly have been available, and in fact was perhaps a more obvious progression of work to date by Ainsworth and her students, focused on the dimension of individuals' trust in the willingness and availability of attachment figures to provide support and help. Ideas of secure base and safe haven provision were central to Ainsworth's own thinking, and the model assumed by many of her direct students from Johns Hopkins in the 1970s. Unpublished papers by Ainsworth from the mid-1970s, about the importance of expectations about relationships as a source of security, circulated among the former Johns Hopkins students, as a resource for this thinking.<sup>425</sup>

By contrast, the students supervised by Ainsworth at Virginia in the 1980s (e.g., Crittenden, Kobak, Cohn, Wartner; Colin was here an exception) were oriented more by Bowlby's information-processing model from his book *Loss*, and interested by what Main's work showed was possible with such a perspective.<sup>426</sup> Other relevant changes were also occurring in the broader context of developmental science, such as the penetration of family systems theory, again stressing the importance of distortions of communication. In sum,

<sup>423</sup> Marvin, R. S. (1997) Ethological and general systems perspectives on child–parent attachment during the toddler and preschool years. In N. Segal, G. Weisfeld, & C. Weisfeld (eds), *Uniting Psychology and Biology: Integrative Perspectives on Human Development* (pp. 189–216). Washington, DC: American Psychological Association, p. 191.

<sup>424</sup> Baert, P. (2012) Positioning theory and intellectual interventions. *Journal for the Theory of Social Behaviour*, 42(3), 304–324.

<sup>425</sup> Ainsworth, M. D. S. (1974) The Secure Base Phenomenon. Unpublished manuscript, Everett Waters personal archive.

<sup>426</sup> For example, Kobak, R. R. (1985) The transition to college: Attitudes toward attachment and social competence. Unpublished doctoral dissertation, University of Virginia; Wartner, U. G. (1987) Attachment in infancy and at age six, and children's self-concept: A followup of a German longitudinal study. University of Virginia; Cohn, D. A. (1988) Security of attachment at 6 years of age and peer social competence in first grade. Unpublished doctoral dissertation, University of Virginia; Kobak, R. R., Cole, H. E., Ferenz-Gillies, R., Fleming, W. S., & Gamble, W. (1993) Attachment and emotion regulation during mother–teen problem solving: A control theory analysis. *Child Development*, 64, 231–245. Crittenden's earliest work on the CARE-Index, which began in the 1970s, still reflected a central concern with secure base/safe haven dynamics; this was superseded in her subsequent theory and measures by an information-processing model. Crittenden has recalled Ainsworth returning from a trip to England with some of the early chapters from Bowlby's forthcoming book *Loss*, published in 1980. She announced to her students, 'Here is chapter 4 of the Bible.' Crittenden, P. M. (2012, September) Discus-sant's remarks. Paper presented at the Attachment, Assessment & Treatment Conference, Frankfurt, Germany. See also Crittenden, P. M. (1988) Distorted patterns of relationship in maltreating families: The role of internal representation models. *Journal of Reproductive and Infant Psychology*, 6(3), 183–199.

the perspective of Ainsworth's Virginia students was very different to the former Johns Hopkins students. The central focus of the latter was not on *distortions of information* but on *individuals' cognitive expectations about the availability of their familiar caregivers* (or potential sources of support in adulthood), anticipated to contribute to feelings of security.

This set of ideas was sometimes privately referred to as the 'security theory' by the former Johns Hopkins students.<sup>427</sup> This referred back to the origin of concern with security in the work of Ainsworth's teacher William Blatz. For her part, Ainsworth acknowledged to her former students that 'it is clear that Blatz's security theory is really quite different from Bowlby's attachment theory, even though I found some useful overlap.'<sup>428</sup>

There were some differences among the former Johns Hopkins students in their interpretations of Blatz and Ainsworth. Cummings assumed that it was feelings of security that would be of primary causal relevance for socioemotional development.<sup>429</sup> By contrast, Waters held that it was the cognitive expectations about others' availability ('security'), *not the associated feelings about it per se* ('felt security'), that would shape later development. For Waters, the relevance of the extent of felt security was its role in activating or terminating the attachment motivational system, not as the determinant of child outcomes.<sup>430</sup> While they might often co-occur, especially after infancy there are varied factors that influence a person's sense of felt security besides expectations about the availability of attachment figures. The issue of the role of cognitive expectations vs feelings of security remained unclear, and the distinction was sometimes outright elided.<sup>431</sup> Regardless, their emphasis was not on distortions of information but on perceptions of secure base and safe haven availability, however this was conceived.

Several of Ainsworth's former Johns Hopkins students from the 1970s, among them Bretherton, Waters, Cummings, and Marvin, and allies including Vaughn, Oppenheimer, Teti, and Veríssimo, felt that Ainsworth had made important advances beyond Bowlby in her thinking about secure base and safe haven dynamics, which were not reflected in her Strange Situation classifications. Goldberg and Toronto colleagues independently came to the same conclusions.<sup>432</sup> They recognized, for example, that Main and Cassidy's six-year system was much more concerned with the absence of distortion in the child-caregiver relationship, than the presence of secure base and safe haven availability.<sup>433</sup>

<sup>427</sup> Waters, E. (1987) Outline for Winter Attachment Project: Compiled from written briefs (12/87). Unpublished manuscript. Everett Waters personal archive.

<sup>428</sup> Ainsworth, M. D. S. (1988) Security. Unpublished discussion paper prepared for the Foundations of Attachment Theory Workshop. Convened for the New York Attachment Consortium by G. Cox-Steiner & E. Waters, Port Jefferson, NY, [http://www.psychology.sunysb.edu/attachment/online/mda\\_security.pdf](http://www.psychology.sunysb.edu/attachment/online/mda_security.pdf).

<sup>429</sup> Cummings, E. M. & El-Sheikh, M. (1986) An organizational scheme for the classification of attachments on a continuum of felt-security. International Conference on Infant Studies, Los Angeles, CA, April 1986, <https://files.eric.ed.gov/fulltext/ED288653.pdf>; Cummings, E. M. & Davies, P. (1996) Emotional security as a regulatory process in normal development and the development of psychopathology. *Development and Psychopathology*, 8, 123–139. See also Davies, P. & Martin, M. (2014) Children's coping and adjustment in high-conflict homes: The reformulation of emotional security theory. *Child Development Perspectives*, 8(4), 242–249.

<sup>430</sup> Sroufe, L. A. & Waters, E. (1977) Attachment as an organizational construct. *Child Development*, 48, 1184–1199.

<sup>431</sup> For example, Waters, E. & Cummings, E. M. (2000) A secure base from which to explore close relationships. *Child Development*, 71(1), 164–172. See also Davies, P. T. & Martin, M. J. (2013) The reformulation of emotional security theory: The role of children's social defense in developmental psychopathology. *Development and Psychopathology*, 25(4.2), 1435–1454: 'Theory has lagged substantially behind empirical work in accounting for how and why emotional security is distinct from attachment security' (1437).

<sup>432</sup> Goldberg, S., Grusec, J. E., & Jenkins, J. M. (1999) Confidence in protection: Arguments for a narrow definition of attachment. *Journal of Family Psychology*, 13(4), 475–483.

<sup>433</sup> See the appendices to Goldberg, S. (1995) Introduction. In S. Goldberg, R. Muir, & J. Kerry (eds), *Attachment Theory: Social, Developmental and Clinical Perspectives* (pp. 1–18). Hillsdale, NJ: The Analytic Press.

This set of Ainsworth's students, and separately the Toronto group, felt that the Strange Situation and AAI, for all that they had classifications named 'secure' and 'insecure', had subordinated and drawn attachment research away from concern with expectations of secure base and safe haven availability. They believed that, in both the Strange Situation and AAI, too little attention was given to the ordinary, incremental moments that form the basis for trust or distrust in the availability and responsiveness of attachment figures.

In the AAI, security is coded on the basis of the absence of distortions in autobiographical memory, not on the basis of expectations that attachment figures will offer support or help when needed. These might well be empirically related, but by no means could they be assumed to be the same thing, or have the same correlates.<sup>434</sup> These students of Ainsworth were also dismayed that the 'secure' Strange Situation classification had come to be treated as if it were security *itself* rather than, as Ainsworth intended, a window into the child's experiences of care by an attachment figure and therefore a proxy for naturalistic observation of secure base and safe haven use.<sup>435</sup>

These are critical distinctions. At stake were nothing less than questions about the nature of attachment, how individual differences should be conceptualized and measured, and the priorities for future study of attachment and caregiving within developmental science. It was also a question of leadership, with the death of Bowlby in 1990 and Ainsworth aging and experiencing cognitive decline.

In the same period the social psychological tradition of attachment research was becoming established, following encouragement from Bowlby.<sup>436</sup> Crittenden was also developing an alternative conceptual system and set of measures, with support from Ainsworth.<sup>437</sup> Such departures were public, and came to the attention of the attachment research community in developmental science. By contrast, the proposals of the security theorists and their criticisms of Main's position went unnoticed even among fellow developmental scientists, let alone the many audiences of attachment research. A large part of the reason is that the disagreement was almost never discussed in public. This was a polite, and generally private, front in a contest for the future of the paradigm.

Whereas until the 1980s Main had collaborated in various ways with Waters, they drifted apart. Main generally ceased referencing new work by Bretherton, Waters, Cummings, and other advocates of security theory. Waters and colleagues still looked to support Main, publishing an important study to evidence the discriminant validity of the AAI in 1996,<sup>438</sup> and documenting associations between the Strange Situation in infancy and AAI classifications later in life in a 2000 paper.<sup>439</sup> More generally, advocates of security theory sought to draw

<sup>434</sup> Bretherton, I. (1990) Open communication and internal working models: Their role in the development of attachment relationships. In R. A. Thompson (ed.), *Socio-emotional Development, Nebraska Symposium on Motivation, 1988* (pp. 57–113). Lincoln, NE: University of Nebraska Press.

<sup>435</sup> Waters, E., Kondo-Ikemura, K., Posada, G., and Richters, J. E. (1991) Learning to love. In R. Megan, L. A. Sroufe (eds), *Self Processes and Development* (pp. 217–255). New York: Psychology Press, pp. 241–242; Marvin, R. S. (1997) Ethological and general systems perspectives on child–parent attachment during the toddler and preschool years. In N. Segal, G. Weisfeld, & C. Weisfeld (eds), *Uniting Psychology and Biology: Integrative Perspectives on Human Development* (pp. 189–216). Washington, DC: American Psychological Association.

<sup>436</sup> For example, Hazan, C. & Shaver, P. R. (1994) Attachment as an organizational framework for research on close relationships, *Psychological Inquiry*, 5(1), 1–22.

<sup>437</sup> Crittenden, P. M. & Ainsworth, M. (1989) Child maltreatment and attachment theory. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment* pp. 432–463. Cambridge: Cambridge University Press; Crittenden, P. M. (1995) Attachment and psychopathology. In S. Goldberg, R. Muir, & J. Kerr (eds), *John Bowlby's Attachment Theory: Historical, Clinical and Social Significance*. New York: Analytical Press, pp. 367–406.

<sup>438</sup> Crowell, J. A., Waters, E., Treboux, D., O'Connor, E., Colon-Downs, C., Feider, O., ... & Posada, G. (1996) Discriminant validity of the adult attachment interview. *Child Development*, 67(5), 2584–2599.

<sup>439</sup> Waters, E., Weinfield, N. S., & Hamilton, C. E. (2000) The stability of attachment security from infancy to adolescence and early adulthood: General discussion. *Child Development*, 71(3), 703–706.

methodological and conceptual distinctions, and increase recognition of the importance of expectations about secure base and safe haven availability, but without public criticism of Main.<sup>440</sup> They invited Main to contribute to special issues and edited books.

In fact, one of these collections represented a total exception to the characteristically cordial response of the security theorists to Main's work. The 1990 edited volume *Attachment in the Preschool Years*, edited by Greenberg, Cicchetti, and Cummings, had two important contributions from Main. It included both Main and Solomon's chapter with the coding system for disorganized attachment, and Main and Hesse's chapter proposing that an important cause of disorganized attachment is caregiver alarming behaviour.

Greenberg and Cummings were both direct students of Ainsworth, and advocates for the centrality of expectations of secure base and safe haven availability to attachment theory. It is contrary to form for editors of a book to criticize a contributor within the book itself. Nonetheless, Cummings especially expressed disapproval of the chapters by Main and colleagues, which he characterized as a departure from the security theory associated with Ainsworth.

Cummings argued that 'deviations from expected sequences do not constitute a sufficient criterion for classification.'<sup>441</sup> A better criterion for disorganization, Cummings argued, would be behaviors that suggest an extreme lack of security. Attachment should be classified on a continuum of security, not assessed with categories of insecurity. The tone of Cummings' criticisms reflect genuine surprise that Main, a former student of Ainsworth's, would propose a different model of individual differences in attachment and how to measure them to the one generally held by Ainsworth's circle. Yet from the vantage of the present, it is Cummings' position that is surprising after decades in which Main's proposals have been largely hegemonic, and security theory has generally kept quiet about Main's work.

Waters's perception of the situation was offered in a graduate seminar, 'Modern Attachment Theory: Traditions and Transitions' at Stony Brook.<sup>442</sup> In this seminar, he reported to students the state of debates and discussions happening among Ainsworth's students and at Minnesota, but only in private conversations rather than in print. Waters acknowledged that the attachment research community might seem unified: while on the surface there appears to be a consensus, in fact 'things are somewhat in flux right now'. He reflected that researchers entering the study of attachment without personal links to Ainsworth or her students, relying on the published record, would likely be led to overestimate the importance of the Strange Situation classifications, and underestimate the importance of secure base and safe haven provision and how this shapes expectations and child development within attachment relationships.

Waters was anxious that important aspects of Ainsworth's position, and especially the centrality of secure base and safe haven provision, had no definitive published statement. As a result, it was generally assumed that, especially given the *Patterns of Attachment* book,

<sup>440</sup> For example, Oppenheim, D. & Waters, H. S. (1995) Narrative processes and attachment representations: Issues of development and assessment. *Monographs of the Society for Research in Child Development*, 60(2/3), 197–215: 'Are narrative assessments of attachment security based on what children say or on how they communicate?' (204). A key later statement of security theory discretely avoids mentioning Main or the AAI by name when observing that 'measuring secure-base use and support in adults would ... provide a criterion against which to validate measures of adult attachment'. Waters, E. & Cummings, E. M. (2000) A secure base from which to explore close relationships. *Child Development*, 71(1), 164–172, p. 168.

<sup>441</sup> Cummings, E. M. (1990) Classification of attachment on a continuum of felt-security. In M. T. Greenberg, D. Cicchetti, & E. M. Cummings (eds), *Attachment in the Preschool Years* (pp. 311–338). Chicago, IL: University of Chicago Press, p. 319.

<sup>442</sup> Waters, E. (1995) Modern Attachment Theory: Traditions and Transitions. Graduate seminar delivered 9 May 1995. Everett Waters personal archive.

Ainsworth's legacy lay in the Strange Situation and its categories, further emphasized by the work of Main and colleagues at Berkeley. The use of the Strange Situation categories in the AAI, and the association between the two measures, had made it seem like these categories were critical to attachment theory. For Waters, they were not only incidental, but in fact potentially misleading in directing theory and research away from expectations about secure base and safe haven availability, and how these expectations shape development. Waters suspected that attachment research had gained enemies and lost allies among researchers and practitioners who assumed that the paradigm hung its flag on distinctions between categories of babies and categories of people.

Waters characterized Main's emphasis on attentional mechanisms and distortions of information in the Strange Situation and AAI as interesting but, given the current state of evidence, 'speculative'.<sup>443</sup> He worried that the way her claims were made, and her loose use of concepts, made her proposals alluring, evasive, and difficult to challenge or test. As we saw above, Main gave a central place in her theory to the idea of attention, which is a powerful, organizing idea in principle. But the concept always skirts landfall: Main gave no definition of attention, and used the term with different meanings in different places, for instance sometimes including perception and memory, and sometimes distinct from perception and memory.

Almost all of Main's concepts shuttle between different meanings, without this movement being marked or explained. Not only does this risk confusing her reader, but it risks taking the ideas and methods out of potential dialogue with other disciplines. Closed in on themselves, they become starved of oxygen. Of particular concern for Waters, learning with and from cognitive science would surely be hindered for attachment research if it was not certain what Main meant by 'state of mind with respect to attachment' (besides the circular meaning of a term that can be used to refer to classifications of the AAI). Likewise hypothesis-driven research would be stymied in scoping the concept's limits and possibilities, or ever refine it. The same would be true for other innovations such as the conditional strategies and disorganized attachment classification. Working with assumed meanings obstructed from dialogue or development, Waters predicted that attachment research was ultimately painting itself into a corner.<sup>444</sup>

Waters was also concerned that Main's account risked a model of attachment focused on intra-psychic differences, treated like individual personality traits. Her early, ethological interest in function and adaption seemed to have been mislaid. For Waters, Main's work failed to address the way that intra-psychic differences are profoundly responsive to the context of interactions with attachment figures and other features of life that might contribute to expectations about caregiver availability, and ensuing feelings of security or insecurity. The appeal of the AAI in psychoanalytic circles reflected its strengths in attention to intra-psychic processes, but corresponding weaknesses in addressing the social context of such processes, which psychoanalytic theory and practice likewise tended to neglect.

In the seminar, Waters drew out that Main's approach had materially different implications for interventions to the security theory. Main's position would imply that, aligned with a psychoanalytic approach, practitioners should focus on reducing distortions of

<sup>443</sup> Ibid.

<sup>444</sup> It is striking how close Waters' predictions are to the descriptions offered, 25 years later, by Dagan, O. & Bernard, K. (2021) It takes a village: A call for engaging attachment with adjunct disciplines to clarify 'in-house' clinical conundrums. *Attachment & Human Development*, 23(4), 455–467; Haltigan, J. D., Del Giudice, M., & Khorsand, S. (2021) Growing points in attachment disorganization: Looking back to advance forward. *Attachment & Human Development*, 23(4), 438–454.

attachment-relevant information, and that patients with unresolved states of mind may have the most to gain from therapy.<sup>445</sup> Following Main's ideas, a parenting intervention should help caregivers resolve unresolved states of mind, in turn to reduce alarming behaviour, or dismissing responses to difficult memories, in turn to increase sensitivity. Waters argued that such an approach underestimates the importance of supporting interactions in which individuals experience that they can receive help or support when needed. Facilitating secure base and safe haven provision was not merely the opposite of reducing impediments to it. Waters gave the example of a marriage: the absence of distortions of understanding and communication in a relationship is *by no means* the same as the presence of unconditionality, reciprocal trust and confidence, and mutual support and encouragement.

Waters acknowledged that correspondence between the AAI and the Strange Situation was an eye-catching finding given the extensive differences between adult autobiographical discourse and infant behaviour. Even so, he felt that it risked spurring research driven by what the instruments could do, rather than by an understanding of what the AAI is actually measuring, and a specific theory of how and why this correspondence might occur: 'The "Adult Attachment" work by Mary Main is popular, but it's not very well defined yet, as far as how working models should be conceptualized and the measurements are still sort of a mystery.'<sup>446</sup> Indeed, 'methods like the AAI or the Strange Situation yield limited insights into the cognitive processes underlying attachment.'<sup>447</sup>

Waters worried that researchers might then heap findings demonstrating negative associations of insecurity and unresolved states of mind on the AAI. However, research would be hindered by an unsteady theoretical basis for where to look for such associations, for interpreting their meaning, for making improvements to the AAI, for adapting the measure for other contexts or developmental stages, or for sustaining dialogue with the rest of developmental psychology and cognate disciplines. It risked trapping the attachment research community in a conversation that even its members did not understand well, and to which others could not readily gain access or contribute.<sup>448</sup>

## The Attachment Q-Sort

A counterpart to Waters' private concerns about the direction of attachment research were public efforts in methodological innovation. To help refocus attachment research on use of attachment figures as a secure base and safe haven, Waters and colleagues developed a new measure, the Attachment Q-Sort (AQS). They were encouraged by Ainsworth, who felt that the Strange Situation had come to overshadow the naturalistic observations of secure base and safe haven behaviour that were at the core of her work. She publicly stated her approval of both the work of Main and Waters:

<sup>445</sup> For example, Kuipers, G. S., Bekker, M. H., & Riem, M. M. (2021) Pretreatment unresolved-disorganized attachment status in eating disorder patients associated with stronger reduction of comorbid symptoms after psychotherapy. *Eating Disorders*, 29(6), 661–676.

<sup>446</sup> Waters, E. (1995) Modern Attachment Theory: Traditions and Transitions. Graduate seminar delivered 9 May 1995. Everett Waters personal archive.

<sup>447</sup> Ibid.

<sup>448</sup> See also Waters, E. & Waters, T. E. A. (2024) Developmental change, bricolage, and how a lot of things develop: Mechanisms and changes in attachment across the lifespan. *Development & Psychopathology*, forthcoming.



I am delighted with the extent to which this [Strange Situation] procedure has proved useful in research, but have repeatedly stated that its success should stimulate rather than discourage the development of other procedures.... It is paradoxical that the search for new procedures comes not from the critics of strange-situation research but from among those who have been most intimately involved in it. I mention here particularly Mary Main and Everett Waters.<sup>449</sup>

In a 1988 symposium, Ainsworth admitted that 'I myself am unenthusiastic about future efforts to fine-tune a security-insecurity scale. I believe that such efforts could better be directed toward fine-tuning pattern discrimination, for pattern discrimination was the break-through in attachment assessment.'<sup>450</sup> She felt that discrimination between forms of insecurity was essential. But she entirely approved of Waters and colleagues' focus on naturalistic observations. Waters recalled Ainsworth telling him:

If the baby shows confidence in the mother's availability in naturalistic observation, but doesn't do it in the Strange Situation, he's secure. I don't care what he does in the Strange Situation.<sup>451</sup>

In the AQS, observers are asked to sort a set of behavioural descriptors of a child observed for a few hours in a naturalistic setting like the home. These descriptors, printed on pieces of card, are sifted into piles ranging from 'most descriptive of this child' to 'least descriptive of this child'. The set of descriptors covers a broad range of secure base/safe haven and exploratory behaviour, affective response, social referencing, and other aspects of social cognition. Observers can then be kept unaware of the constructs that will be scored from the data they provide, while attachment phenomena can be picked out and distinguished from other aspects of behaviour.

Items highly related to secure base/safe haven dynamics include: 'Child keeps track of mother's location when he plays around the house' (Item #21), and 'If held in mother's arms, child stops crying after being frightened or upset' (Item #71).<sup>452</sup> Many such descriptors of secure base and safe haven behaviour were drawn from or inspired by an unpublished 1970 scale developed by Ainsworth for coding secure base/safe haven behaviour in her Baltimore sample.<sup>453</sup> Ainsworth used the scale to first validate her Strange Situation classifications, though did not develop or use it further.<sup>454</sup>

Like the Strange Situation, the measure is grounded in concretely observed behaviour. However, compared to the Strange Situation, the AQS can be used to assess ordinary interaction between a child and caregiver in naturalistic settings; it therefore may well have

<sup>449</sup> Ainsworth, M. (1984) Attachment, adaptation and continuity. Paper presented at the International Conference on Infant Studies, April 1984, John Bowlby Archive, Wellcome Collections, PP/Bow/J.1/57.

<sup>450</sup> Ainsworth, M. D. S. (1988) Security. Unpublished discussion paper prepared for the Foundations of Attachment Theory Workshop. Convened for the New York Attachment Consortium by G. Cox-Steiner & E. Waters, Port Jefferson, NY, [http://www.psychology.sunysb.edu/attachment/online/mda\\_security.pdf](http://www.psychology.sunysb.edu/attachment/online/mda_security.pdf).

<sup>451</sup> M. Ainsworth, personal communication, cited in Waters, E. & Rothbaum, F. (2002) Attachment theory—is it relevant universally? Symposium held at the International Society of Infant Studies, Toronto, Canada, Everett Waters personal archive.

<sup>452</sup> Waters, E., Vaughn, B., Posada, G., & Kondo-Ikemura, K. (eds) (1995) Caregiving, cultural, and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory and research. With Commentary by C. M. Heinicke and I. Bretherton. *Monographs of the Society for Research in Child Development*, 60(2–3, Serial No. 244), Appendix.

<sup>453</sup> Waters, E. (2002) Note on secure base behavior at home and the Strange Situation. Unpublished manuscript. [https://www.psychology.sunysb.edu/attachment/measures/content/home\\_secure\\_base\\_patterns.pdf](https://www.psychology.sunysb.edu/attachment/measures/content/home_secure_base_patterns.pdf).

<sup>454</sup> Ainsworth, M. D. S., Bell, S. M., & Stayton, D. J. (1971) Individual differences in the strange situation behavior of one-year-olds. In H. R. Schaffer (ed.), *The Origins of Human Social Relations* (pp. 17–58). San Diego, CA: Academic Press.

greater ecological validity than the dramatized prompts and interactions of the Strange Situation.<sup>455</sup> The way that the AQS was constructed quietly, but insistently, downplayed the importance of the avoidant and resistant classifications. The measure focused instead on how close or distant a case was from the paradigm of an infant using the caregiver as a secure base and safe haven.

Ainsworth emphasized that the developmental changes from infancy to toddlerhood entail nothing less than a ‘recasting of attachment relationship, so that they now include perspective taking, include communication, negotiation and mutual plans.’ Any adequate measure of attachment after infancy, she felt, needs above all to consider the way that ‘seeing things from the partner’s point of view’ gets integrated with secure base/safe haven dynamics.<sup>456</sup>

While applications of the Strange Situation with toddlers and preschoolers have been developed, such extensions have been troubled by the dual pull to both respond to such maturational differences and, simultaneously, to retain the semblance of Ainsworth’s infant system.<sup>457</sup> An advantage of the AQS is that, with minor adaptations, it can be used with children of different ages. The AQS could readily incorporate expected changes in the way that children:

- use their caregiver as a secure base and safe haven in the context of more sophisticated capacities for communication, negotiation, mutual planning and perspective taking
- modulate the threshold for activation of the attachment behavioural system
- integrate cognition, affect and behaviour as part of the system
- show attachment behaviour in interplay with other behavioural systems.

Meta-analytic evidence from 245 studies and 32,426 child–caregiver dyads suggests substantial convergence between the Strange Situation and AQS.<sup>458</sup> When children are assessed with the Ainsworth Strange Situation, and when the Q-Sort is used for at least 180 minutes, agreement is substantial ( $r = 0.39$ ), as are associations with measures of caregiver sensitivity ( $r = 0.44$ ). Agreement is reduced when coding a shorter period of observation ( $r = 0.25$  with the Strange Situation; and  $0.28$  with caregiver sensitivity); and later work has shown less agreement for fathers.<sup>459</sup>

These findings affirm that the AQS is measuring a facet of child experience related to the Strange Situation. However there is material non-overlap. One possible cause is that

<sup>455</sup> Teti, D. & Kim, B.-R. (2014) Infants and preschool children: Observational assessments of attachment, a review and discussion of clinical applications. In S. Farnfield & P. Holmes (eds), *The Routledge Handbook of Attachment: Assessment* (pp. 53–80). London: Routledge.

<sup>456</sup> Ainsworth, M. (1991) Past and future trends in attachment research. International Society for the Study of Behavioral Development. Minneapolis, MN, July 1991. <https://www.youtube.com/watch?v=TWS1XBA7vmk>.

<sup>457</sup> For discussions of, and different approaches to, this problem see Cassidy, J., Marvin, R. with the Attachment Working Group of the John D. and Catherine T. MacArthur Network on the Transition from Infancy to Early Childhood (1992) Attachment organisation in preschool children: Procedures and coding manual, unpublished manual; Crittenden, P. M. (2017) Gifts from Mary Ainsworth and John Bowlby. *Clinical Child Psychology and Psychiatry*, 22(3), 436–442; Waters, E., Vaughn, B., & Waters, H. S. (eds) (2021) *Measuring Attachment*. New York: Guilford.

<sup>458</sup> Cadman, T., Diamond, P. R., & Fearon, P. (2018) Reassessing the validity of the attachment Q-sort: An updated meta-analysis. *Infant and Child Development*, 27(1), e2034. See also Van Ijzendoorn, M. H., Vereijken, C. M., Bakermans-Kranenburg, M. J., & Marianne Riksen-Walraven, J. (2004) Assessing attachment security with the attachment Q sort: Meta-analytic evidence for the validity of the observer AQS. *Child Development*, 75(4), 1188–1213.

<sup>459</sup> Bendel-Stenzel, L. (2024) Measure for measure: Multi-method approaches to exploring father–child relationship. Paper given at the International Attachment Conference, Rouen, France, July 2024.

Q-methodology has several psychometric advantages over Ainsworth's categories.<sup>460</sup> The primary output of the measure is the assessment of attachment security in terms of a continuous variable, based on the extent to which the child can use their caregiver as a secure base and safe haven as needed within their everyday context. Furthermore, the Q-methodology enforces data that is normally distributed, even at the individual level, which puts variance more readily at the disposal of statistical tests. As we shall see in [Chapter 4](#), the AQS has repeatedly outperformed the Strange Situation in predicting later child outcomes, though there are ongoing debates as to why this might be.

Contrary to Waters' intentions when developing the measure,<sup>461</sup> some researchers have asked parents themselves to complete the AQS, rather than have it completed by research observers.<sup>462</sup> However, there are good reasons to suspect that this approach is invalid, since—as Waters predicted—associations with the Strange Situation and sensitivity are much lower, and associations with caregiver report on the child temperament are substantial ( $r = 0.33$ ).<sup>463</sup> It would seem that a child's own caregivers are less effective than unfamiliar observers at distinguishing a child's attachment behaviours from a global impression of their child's temperament.<sup>464</sup> Van IJzendoorn, Bakermans-Kranenburg, and colleagues have praised the AQS when used by research observers, claiming that the availability of a second well-validated measure of child attachment alongside the Strange Situation helps 'separate the concept of attachment in young children from the way it is measured', a major contribution to the field.<sup>465</sup> Not least, for Van IJzendoorn and Bakermans-Kranenburg, systematic replication of research findings must include varying the instruments used to assess the same construct.

As will be seen in subsequent chapters, the AQS has also been used in creative ways. For instance, a latent class analysis of the AQS by the Western Ontario group provided important evidence for the relevance of behaviour by children showing preference for the researcher over their caregiver, documenting associations with unresolved states of mind on the mother's AAI ( $r = 0.41$ ) and with disorganization in the Strange Situation ( $r = 0.37$ ). This research helped prompt Lyons-Ruth's research into infant friendliness to the stranger in the Strange Situation ([Chapter 2](#)).

Inspired by the AQS, in the late 1980s Pederson, Moran, and Bento from the Western Ontario group developed a Q-sort measure of caregiver sensitivity, the Maternal Behaviour Q-Sort (MBQS).<sup>466</sup> A first report by Pederson and colleagues, based on observations of

<sup>460</sup> Seifer, R. & Schiller, M. (1995) The role of parenting sensitivity, infant temperament, and dyadic interaction in attachment theory and assessment. *Monographs of the Society for Research in Child Development*, 60(2–3), 146–174.

<sup>461</sup> Waters, E. (1998) Note: Mothers as attachment Q-set observers. Unpublished manuscript, [https://psychology.psy.sunysb.edu/attachment/measures/content/mom\\_qsorts.html](https://psychology.psy.sunysb.edu/attachment/measures/content/mom_qsorts.html): 'I strongly prefer to make the observations myself. This is what I had in mind in developing the Q-set and I am embarrassed to say I was surprised when most of the people who contacted me wanted to have mothers do the sorting. My impression is that most mothers don't monitor the secure base phenomenon in detail.'

<sup>462</sup> For example, Teti, D. M. & McGourty, S. (1996) Using mothers versus trained observers in assessing children's secure base behavior: Theoretical and methodological considerations. *Child Development*, 67(2), 597–605.

<sup>463</sup> Cadman, T., Diamond, P. R., & Fearon, P. (2018) Reassessing the validity of the attachment Q-sort: An updated meta-analysis. *Infant and Child Development*, 27(1).

<sup>464</sup> Tarabulsky, G. M., Provost, M. A., Larose, S., Moss, E., Lemelin, J. P., Moran, G., et al. (2008) Similarities and differences in mothers' and observers' ratings of infant security on the Attachment Q-Sort. *Infant Behavior & Development*, 31(1), 10–22.

<sup>465</sup> Van IJzendoorn, M. H., Vereijken, C. M., Bakermans-Kranenburg, M. J., & Marianne Riksen-Walraven, J. (2004) Assessing attachment security with the Attachment Q-Sort: Meta-analytic evidence for the validity of the observer AQS. *Child Development*, 75(4), 1188–1213, p. 1207.

<sup>466</sup> Pederson, D. R., Moran, G., & Bento, S. (2015) The Maternal Behaviour Q-Sort (MBQS): Assessing maternal sensitivity and the quality of mother–infant interaction. Unpublished manual. University of Western Ontario.

40 mother–infant dyads, found that the MBQS had a wild degree of agreement with the Ainsworth sensitivity scale ( $r = 0.90$ ) and with the AQS ( $r = 0.43$ ), independently coded.<sup>467</sup> In fact, equally strong convergence has been replicated in the one other study to report on this association.<sup>468</sup> Admittedly, this may reflect the Proteus phenomenon discussed earlier and, if so, a more modest convergence will be found in subsequent studies.

Like the AQS, the MBQS has been used in creative ways. For instance, the MBQS items have been used in cross-cultural research on mothers' values (Chapter 4). Chapter 5 will also discuss meta-analytic findings by Madigan and colleagues that document that the MBQS has had a stronger association with the Strange Situation than other measures of caregiver sensitivity, including the NICHD scale (Chapter 3) and even Ainsworth's sensitivity scale. Though, to the surprise of many, associations between the MBQS and child mental health have not been significant, in contrast with other measures of sensitivity.<sup>469</sup>

In the 1990s, Waters and Gao developed an alternative to the MBQS, the Parental Secure Base Q-set. This was focused not on sensitivity generally but *specifically* on a caregiver's provision of a secure base and safe haven for their child.<sup>470</sup> Items include 'under-estimates child's competence. Provides unnecessary help' (reversed); 'over-estimates child's competence. Does not provide necessary help' (reversed); 'follows or moves to a better location to supervise as child moves from place to place'; 'parent readily stops conversation, reading, etc. to supervise or respond to child'; 'if child is upset, parent comes close, offers contact, comfort, and helps transition back to play'. The Parental Secure Base Q-set was used in Elliott's doctoral study mentioned earlier, and performed well in terms of associations with expectable correlates such as maternal behaviour and AAI. Ultimately, Waters and colleagues did not publish the Parental Secure Base Q-set, perhaps to avoid unnecessary competition with the MBQS.<sup>471</sup>

### Cassidy's Evolving Stance

Jude Cassidy was Ainsworth's final doctoral student. One of Cassidy's distinctive characteristics was a seriousness about theory. Whereas many attachment researchers remained largely within a particular theoretical position, Cassidy's position was always developing, deepening, with reflection on attachment theory as a key impetus.

Another distinctive characteristic of Cassidy's work was her pluralism. While Waters and Bretherton were the most direct proponents for security theory in the 1980s and early

On the origins of the measure, see Moran, G. & Pederson, D. (2000) Des représentations maternelles jusqu'à la première relation par l'entremise de la sensibilité maternelle: une révision du modèle développemental. In Tarabulsky, G., Larose, S., Pederson, D. and Moran, G. (eds), *Attachement et développement: le rôle des premières relations dans le développement humain* (pp. 235–267). Presses de l'Université du Québec, Sainte-Foy, Quebec.

<sup>467</sup> Pederson, D. R., Moran, G., Sitko, C., Campbell, K., Ghesquire, K., & Acton, H. (1990) Maternal sensitivity and the security of infant–mother attachment: A Q-sort study. *Child Development*, 61(6), 1974–1983.

<sup>468</sup> Bohr, Y., Putnick, D. L., Lee, Y., & Bornstein, M. H. (2018) Evaluating caregiver sensitivity to infants: Measures matter. *Infancy*, 23(5), 730–747. Here an association between the MBQS and Ainsworth's scale was also  $r = 0.91$ .

<sup>469</sup> Cooke, J. E., Deneault, A. A., Devereux, C., Eirich, R., Fearon, R. P., & Madigan, S. (2022) Parental sensitivity and child behavioral problems: A meta-analytic review. *Child Development*, 93(5), 1231–1248, Table 1.

<sup>470</sup> Waters, E., Gao, Y., & Elliott, M. (1997) The Parental Secure Base Q-set. Unpublished manuscript, State University of New York at Stony Brook, [https://www.psychology.sunysb.edu/attachment/measures/content/parent\\_support\\_qset.html](https://www.psychology.sunysb.edu/attachment/measures/content/parent_support_qset.html).

<sup>471</sup> The measure has been used very occasionally by subsequent researchers, e.g. Kennedy, M. (2012) Examining the importance of the family on pre-school attachment and children's social development. Unpublished doctoral thesis, Nottingham Trent University. A curious finding from this study was no significant association for mothers or fathers between Parental Secure Base Support Q-Set scores and security measured by the AQS. Though the small sample should be noted ( $N = 29$ ).

1990s, with considerable differences compared to Main's theory and research agenda, Cassidy held something of a middle position. Although formally Ainsworth's final student, Cassidy's doctoral research was actually conducted with Mary Main: in the 1980s and early 1990s she tended to advocate for Main's theory and methods, within which ideas of secure base and safe haven availability were not absent but not central. Nonetheless, she valued the work of Waters and Bretherton: she collaborated with Bretherton on one of the first studies to use the AQS.<sup>472</sup> In her role as co-editor of the 1999 *Handbook of Attachment* she gave prominent place to Main's work, but also invited chapters from Thompson and the Grossmanns which emphasized childrens' experiences of secure base and safe haven availability. A bibliometric study by Kroonenberg and Stoltenborgh showed that Cassidy's work—quite distinctively—engaged with, and was engaged by, attachment researchers across developmental, social, and clinical psychology.<sup>473</sup>

Building from Main's account of the interpersonal function of attachment strategies underpinned by differences in internal and external perception, across her work in the 1980s and early 1990s Cassidy was interested in attachment strategies as different solutions to negative affect (fear, loneliness, anxiety). In her reflections, Cassidy tended to align security theory and Main's work as pointing to much the same thing. Unlike Waters and Bretherton, she saw no contrast between a focus on secure base/safe haven availability and a focus on distortions in processing of attachment-relevant information. Her opening chapter to the 1999 *Handbook* mentioned Bretherton's work briefly and the idea that 'repeated attachment-related experiences become organized as scripts, which in turn become the building blocks of broader representations.'<sup>474</sup> She then characterized Main's work as offering distinctions among kinds of such representation.<sup>475</sup> As we saw above, the term 'representation' used by Main was potentially misleading: the AAI coding system was not examining how caregivers perceived their attachment relationships, but distortions in information-processing and reporting when discussing these relationships. Yet Cassidy perceived these as essentially compatible and convergent, as did many others at the period.<sup>476</sup>

In the 1990s Cassidy's pluralism extended to being one of the first developmental scientists, alongside her Penn State colleague Belsky, to celebrate the social psychological tradition of attachment research as compatible and convergent with the developmental tradition (Chapter 3). A position aligned with Cassidy's on this issue has subsequently been adopted by most third-generation attachment researchers (Chapter 5)—with the main exceptions being the students and collaborators of Van IJzendoorn and Bakermans-Kranenburg in the Netherlands, and Waters in the United States, given their antipathy to self-report measures.

In 1996, Cassidy took up a position at the University of Maryland. This brought her back into contact with another student of Ainsworth's, Bob Marvin. Through Marvin, she met

<sup>472</sup> Bretherton, I., Ridgeway, D., & Cassidy, J. (1990) Assessing internal working models of the attachment relationship. In J. Cassidy & P. R. Shaver (eds), *Attachment in the Preschool Years: Theory, Research, and Intervention* (pp. 273–308). New York: Guilford Press.

<sup>473</sup> Kroonenberg, P. M. & Stoltenborgh, M. (2023) Handbooks as a means of mapping a discipline: An exploration of the world of attachment. In A. Okada, K. Shigemasu, R. Yoshino, & S. Yokoyama (eds), *Facets of Behaviormetrics: The 50th Anniversary of the Behaviormetric Society* (pp. 123–143). New York: Springer.

<sup>474</sup> Cassidy, J. (1999) The nature of the child's ties. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (pp. 3–20). New York: Guilford Press, p. 8.

<sup>475</sup> Cassidy, J. (2001) Truth, lies, and intimacy: An attachment perspective, *Attachment & Human Development*, 3(2), 121–155.

<sup>476</sup> For example, Steele, M. (2005) Attachment, actual experience and mental representation. In V. Green (ed.), *Emotional Development in Psychoanalysis, Attachment Theory and Neuroscience* (pp. 83–102). New York: Brunner Routledge.

his clinical collaborators Cooper, Hoffman, and Powell. For his part, Marvin's own theoretical position was much the same as the Grossmanns: sensitivity was conceptualized as a matter of the caregiver recognizing and accurately interpreting their child's needs, as would stem from the operation of various systems.<sup>477</sup> The focus on needs rather than signals reflected Marvin's ongoing commitment—much like the Grossmanns—to Bowlby's ethological idea of motivational systems and interest in attachment relationships after infancy: older children's may, all the more than infants, show signals that do not reflect their needs. Marvin preferred the term 'needs' to the term 'motivations' used by the Grossmanns, not least as children may learn to suppress their motivations but still have needs.

Among children's needs, depending on the situation, were a need for support with exploration (secure base) and for help and comfort (safe haven). In his clinical work, to help caregivers recognize these two needs, Marvin developed a heuristic diagram of the child's journey out from the caregiver in exploration, and returning to the caregiver for help and comfort. The diagram was captioned: 'Whenever possible: follow my child's need.'<sup>478</sup> Secure base and safe haven provision were conceptualized by Marvin as kinds of need, among others, to which a sensitive caregiver should attend in a developmentally appropriate way. He viewed the central clinical task as supporting caregivers to avoid being derailed by their own defences, or obstacles in the functioning of the family system, that would prevent them from interpretive inference-making about possible needs when faced with their child's signal.<sup>479</sup>

Marvin's heuristic diagram became the basis for a collaboration with Cooper, Hoffman, and Powell, clinicians and clinical educators based in Spokane in the development of the Circle of Security parenting intervention. Whereas for Marvin secure base and safe haven provision were especially important *illustrations* of the more general value of sensitivity to children's needs for their development, Cooper, Hoffman, and Powell regarded secure base and safe haven provision as primary.<sup>480</sup> Ultimately, this ended up as a minor ambiguity within the Circle of Security literature, though in general emphasis was given to secure base and safe haven provision.<sup>481</sup>

In collaboration with Cooper, Hoffman, and Powell, in 2005 Cassidy reported from a qualitative study examining cases where caregiver sensitivity did not predict infant attachment security. This qualitative study suggested that infant attachment security was more related to caregiver secure base and safe haven availability than caregiver's sensitivity. A caregiver could be quite insensitive in other ways, but provide a secure base and safe haven for their child, and be classified as secure.<sup>482</sup>

<sup>477</sup> See the discussion of 'miscuing' in Marvin, R., Cooper, G., Hoffman, K., & Powell, B. (2002) The Circle of Security project: Attachment-based intervention with caregiver-pre-school child dyads. *Attachment & Human Development*, 4(1), 107–124.

<sup>478</sup> *Ibid.*

<sup>479</sup> Marvin, R. & Stewart, R. (1990) A family systems framework for the study of attachment. In M. Greenberg, D. Cicchetti, & M. Cummings (eds), *Attachment in the Preschool Years: Theory, Research, and Intervention* (pp. 51–86). Chicago: University of Chicago Press.

<sup>480</sup> This difference in emphasis can be seen in writings without Marvin, for example Cooper, G., Hoffman, K., & Powell, B. (2009) Circle of Security parenting: A relationship based parenting program. Facilitator DVD Manual 5.0. Spokane, WA: Circle of Security International; Zanetti, C. A., Powell, B., Cooper, G., & Hoffman, K. (2011) The Circle of Security intervention: Using the therapeutic relationship to ameliorate attachment security in disorganized dyads. In J. Solomon & C. George (eds), *Disorganization of Attachment and Caregiving: Research and Clinical Advances* (pp. 318–342). New York: Guilford Press.

<sup>481</sup> For example, Powell, B., Cooper, G., Hoffman, K., & Marvin, B. (2014) *The Circle of Security Intervention: Enhancing Attachment in Early Parent–Child Relationships*. New York: Guilford Press.

<sup>482</sup> Cassidy, J., Woodhouse, S. S., Cooper, G., Hoffman, K., Powell, B., & Rodenberg, M. (2005) Examination of the precursors of infant attachment security: Implications for early intervention and intervention research. In L. J. Berlin, Y. Ziv, L. Amaya-Jackson, & M. T. Greenberg (eds), *Enhancing Early Attachments: Theory, Research, Intervention, and Policy* (pp. 34–60). New York: Guilford.

This finding was affirmed in a later study by Woodhouse, Scott, Hepworth, and Cassidy, with 174 mothers randomized to receive the Circle of Security or a control intervention. A new observational measure of secure base/safe haven provision was significantly associated with infant security in the Strange Situation ( $r = 0.41$ ), in contrast to sensitivity, which was in the expected direction but not statistically significant ( $r = 0.14$ ). Secure base/safe haven provision was a materially different construct, with barely any convergence with caregiver sensitivity ( $r = 0.11$ ).<sup>483</sup>

Cassidy and colleagues praised Waters and the Western Ontario group for recognizing the centrality of secure base and safe haven provision to attachment theory and research. However, they imply that these researchers did not go far enough. Many items in the AQS and MBQS are still oriented by Ainsworth's concept of sensitivity, which is about perception and responsiveness to all and any infant signals, or address other aspects of dyadic interaction such as exploratory behaviour, affective response, or social referencing. In contrast to the AQS and MBQS, the new observational measure of secure base/safe haven provision was intended, like the Parental Secure Base Q-set, to be more focused on the aspect of caregiver behaviour anticipated to be critical to attachment security.

In the introduction to a recent French translation of their classic book on attachment theory, Prior and Glaser have characterized Woodhouse's study as a watershed for attachment research, in that it isolates the aspect of caregiving that contributes to child security, a major advance over Ainsworth's sensitivity scale or the MBQS.<sup>484</sup> Unfortunately, Woodhouse and colleagues leave their measure to the imagination, since the instrument is neither appended to their paper nor available on request from the authors. Nonetheless, their paper surely provides very encouraging initial evidence for the approach.

### Secure Base Scripts

Compared to the AQS and MBQS, later work on secure base scripts likewise had a more specific, sharper focus on secure base/safe haven dynamics. The origins of the approach go back to the 1990s. In papers from the early 1990s, Everett Waters and colleagues reflected that attentive responsiveness to infant signals in general conveys a sense of availability, but the signals of particular importance are those relating to *secure base* and *safe haven* availability. Not captured by Ainsworth's sensitivity scale are the ways that caregivers teach expectations about secure base and safe haven availability. This includes 'secure base/safe haven games' such as peek-a-boo, which dramatize the script of separation followed by reunion, obstruction resolved into relational closeness and accessibility.<sup>485</sup>

<sup>483</sup> Woodhouse, S. S., Scott, J. R., Hepworth, A. D., & Cassidy, J. (2020) Secure base provision: A new approach to examining links between maternal caregiving and infant attachment. *Child Development*, 91(1), 249–265.

<sup>484</sup> Prior, V. & Glaser, D. (2022) *Comprendre l'attachement et ses troubles: Théorie et pratique*. 2nd ed. Paris: De Boeck supérieur. See also Slade, A., with Sadler, L. S., Eaves, T., & Webb, D. L. (2023) *Enhancing Attachment and Reflective Parenting in Clinical Practice: A Minding the Baby Approach*. New York: Guilford Press, p. 61.

<sup>485</sup> Waters, E., Kondo-Ikemura, K., Posada, G. and Richters, J. E. (1991) Learning to love. In M. R. Gunnar & L. A. Sroufe (eds), *Self Processes and Development* (pp. 217–255), New York: Psychology Press, p. 236; Waters, E., Posada, G., Crowell, J. A., & Lay, K. L. (1994) The development of attachment: From control system to working models. *Psychiatry*, 57(1), 32–42, p. 35. For an elaborated discussion, see Waters, E. & Waters, T. E. A. (2024) Developmental change, bricolage, and how a lot of things develop: Mechanisms and changes in attachment across the lifespan. *Development & Psychopathology*, forthcoming.



Also not captured by Ainsworth's sensitivity scale are the ways in which caregivers intuit and respond to children's need for a secure base or safe haven *before* a signal is offered or when the child displays confused signals about what they need.<sup>486</sup> The concept of sensitivity places the caregiver always in the mode of responding, with the infant making the first move with their signal. In his papers of the early 1990s, Waters offered implicit criticism of this characterization, and emphasized that infants' signals to their caregiver are entrained by interactions over time. Even monitoring caregivers' whereabouts, which Bowlby treated as a natural impulse of the infant, Waters characterized as a predisposition entrained within the dance of child-caregiver interaction. Ainsworth's last publication, a 1992 book chapter on infant social referencing, similarly pointed in this direction and away from the scene of responsiveness characterized by her sensitivity construct.<sup>487</sup> If the baby is playing out of range and a mother or father sees her about to touch something, the adult might ask 'what are you doing?' If the infant pauses, listens, and orients to the adult, the adult may leave her alone and allow play to continue. If the infant shows no sign of orienting to the question, the adult may then come to scoop her up, signalling to the infant the need to monitor for caregiver availability.

This teaching and learning of secure base and safe haven availability is evident also in adolescent and adult relationships, when romantic relationships are invested with attachment components. In 'Bowlby's theory grown up', published in 1994, Crowell and Waters argued that 'commitment in secure-base terms is unlikely to be "hearts and flowers" responsiveness or "I want to marry you"; rather, we suggest it may be more like "I'm here, I will be here, I'm interested in what you do and what you think and feel, I will actively support your independent actions, I trust you and you can trust me to be here if you need me, et cetera"'.<sup>488</sup> All the small ways that adolescent or adult dyads repeatedly, across situations, affirm their availability to one another form the intricate little bones within the structure of the relationship and relationship-related expectations, giving strength and stability to its capacity to serve as a secure base and safe haven. *This* is security; not expressive gestures or intense feelings necessarily, though they may follow on at times.<sup>489</sup>

<sup>486</sup> See also Waters' collaborator Kondo-Ikemura on this point: Kondo-Ikemura, K. (2001) Insufficient evidence. *American Psychologist*, 56(10), 825. For valuable later discussions, see Shai, D. & Belsky, J. (2017) Parental embodied mentalizing: How the nonverbal dance between parents and infants predicts children's socio-emotional functioning. *Attachment & Human Development*, 19(2), 191–219; Van Tuyl van Serooskerken, J. M., Willemen, A. M., De La Croix, A., Embregts, P. J., & Schuengel, C. (2022) Satisfying basic psychological needs among people with complex support needs: A self-determination theory-guided analysis of primary relatives' perspectives. *Disabilities*, 2(2), 330–47.

<sup>487</sup> Ainsworth, M. (1992) A consideration of social referencing in the context of attachment theory and research. In S. Feinman (ed.), *Social Referencing and the Construction of Reality in Infancy* (pp. 349–367). New York: Plenum Press.

<sup>488</sup> Crowell, J. A. & Waters, E. (1994) Bowlby's theory grown up: The role of attachment in adult love relationships. *Psychological Inquiry*, 5(1), 31–34, p. 32.

<sup>489</sup> Waters, E. & Waters, T. E. A. (2024) Developmental change, bricolage, and how a lot of things develop: Mechanisms and changes in attachment across the lifespan. *Development & Psychopathology*, forthcoming: 'We have referred to security, emotion, and trust somewhat less often than cognition. This is not to underplay the role of emotion in attachment. It is simply that many—some would say most—emotional experiences are influenced by cognitive appraisal processes and the confirmation or disconfirmation of expectations and self-theory postulates (Epstein (1973, 2014; the contributors to Scherer et al. (2001)). Furthermore, cognitive strategies play a leading role in emotion regulation (Gross, 2001; Gross & Thompson, 2007). As well, much of our emotional experience is precipitated by cognitions about emotion. Thus, it is simply uninformed to suggest that emphasizing cognitive processes minimizes the place of emotion.'



Out of fidelity, in the early 1990s Waters refrained from phrasing these arguments as criticism of Ainsworth, implying that his points were merely extrapolations.<sup>490</sup> The novelty remained enveloped in its seed pod. No one even noticed it. In fact, the implications were far-reaching. Waters' point was that children's expectations about secure base and safe haven availability—the heart of Ainsworth's theory, for Waters—are *only indirectly addressed by Ainsworth's own measures*. This contrast would be drawn out more explicitly, and influentially, later in the 1990s by Thompson and by Goldberg and colleagues,<sup>491</sup> and ultimately, decades later, lead to innovation in the coding of sensitivity.<sup>492</sup>

In the early 1990s, Bretherton was examining parallel limitations in Bowlby's theory. She reflected that Bowlby's internal working model concept encompasses (i) how accessible or inaccessible attachment figures tend to be under ordinary situations, (ii) whether attachment behaviours are regarded as acceptable or unacceptable, and (iii) a forecast about how available and responsive these figures when difficulties are faced.<sup>493</sup> Though hesitant to publicly criticize Bowlby, she implied that the idea of the internal working model is too general a concept for developing specific testable hypotheses. She was supported by Hinde, who fully agreed, and argued that the concept of 'internal working model' represented perhaps the weakest element of attachment theory.<sup>494</sup> Drawing on developments in cognitive science, Bretherton advocated instead the idea of 'scripts', sedimented by repetition and experience, which respond to particular cues with involuntary expectations about what tends to happen next and predispositions to behave in certain ways.

A similar point had been proposed to Bowlby in the 1980s by John Byng-Hall. Bowlby was highly sympathetic, describing the specification of internal working models using the metaphor of a 'script' as 'a most valuable step'.<sup>495</sup> However, he did not offer this reflection publicly. Byng-Hall's proposals were therefore picked up only primarily by family and systems therapists interested in attachment.<sup>496</sup> Bretherton's proposals likewise remained understated, and gained little traction. One obstacle was that, in 1985, Main and colleagues had initially framed the AAI as measuring individual differences in 'internal working models'—or, interchangeably, as 'attachment representations'—reaffirming the conceptual centrality of internal working models just as the AAI had affirmed the methodological centrality of the Strange Situation classifications.

<sup>490</sup> A more explicit statement would later be made in Waters, E., Petters D. & Facompre, C. (2013) Epilogue: Reflections on a Special Issue of Attachment & Human Development in Mary Ainsworth's 100th year. *Attachment & Human Development*, 15(5–6), 673–681: 'Although sensitivity to infant signals and cooperation with ongoing behavior may predict maternal engagement in such games, it is the secure base game, not sensitivity per se, that knits such attachment behavior patterns together ... attachment theory implicitly suggests that maternal sensitivity causes attachment or attachment security. That is simply painting with too broad a brush' (679–680).

<sup>491</sup> Thompson, R. A. (1997) Sensitivity and security: New questions to ponder. *Child Development*, 68, 595–597; Goldberg, S., Grusec, J. E., & Jenkins, J. M. (1999) Confidence in protection: Arguments for a narrow definition of attachment. *Journal of Family Psychology*, 13, 475–483.

<sup>492</sup> Leerkes, E. M. (2011). Maternal sensitivity during distressing tasks: A unique predictor of attachment security. *Infant Behavior and Development*, 34(3), 443–446; Woodhouse, S. S., Scott, J. R., Hepworth, A. D., & Cassidy, J. (2020) Secure base provision: A new approach to examining links between maternal caregiving and infant attachment. *Child Development*, 91(1), 249–265.

<sup>493</sup> Bretherton, I. (1987) New perspectives on attachment relations: Security, communication, and working models. In J. Osofsky (ed.), *Handbook of Infant Development* (2nd ed., pp. 1061–1100). New York: Wiley.

<sup>494</sup> Hinde, R. A. (1988) Continuities and discontinuities. In M. Rutter (ed.), *Studies of Psychosocial Risk: The Power of Longitudinal Data* (pp. 367–384). Cambridge: Cambridge University Press; Hinde, R. A. (1991) Relationships, attachment, and culture: A tribute to John Bowlby. *Infant Mental Health Journal*, 12(3), 154–163.

<sup>495</sup> Bowlby, J. (1985) Letter to John Byng-Hall, 12 April 1985, John Bowlby Archive, Wellcome Collections, PP/Bow/J,9/45, discussing Byng-Hall, J. (1985). The family script: A useful bridge between theory and practice. *Journal of Family Therapy*, 7(3), 301–305.

<sup>496</sup> Byng-Hall, J. (1998) *Rewriting Family Scripts: Improvisation and Systems Change*. New York: Guilford Press; Dallos, R. (2019) *Don't Blame the Parents: Corrective Scripts and the Development of Problems in Families*. New York: McGraw-Hill.

In the first edition of the AAI coding manual, the Berkeley group stated that the AAI was created ‘to assess the security of the adult’s overall working model of attachment, that is, the security of the self in relation to attachment in its generality rather than in relation to any particular present or past relationship’.<sup>497</sup> What made such statements confusing and misleading is that Main and colleagues used the term ‘internal working models’ to mean *differences in attentional strategy*, adopting the term primarily for legitimacy to link their ideas back to Bowlby, not because this was Bowlby’s intended meaning. Unfortunately, the shift in sense given to the ‘internal working models’ construct was by no means clear, and not generally noticed by readers. On advice from Hinde, from 1987 onwards, Main ceased equating states of mind regarding attachment and internal working models.<sup>498</sup> And in 1999, Main acknowledged that the characterization of the AAI as an assessment of internal working models had been ‘misleading and unwarranted’.<sup>499</sup> With the exception of Main’s immediate collaborators (i.e., those able to speak to her directly),<sup>500</sup> most developmental scientists working on attachment tended to continue to use the concept of internal working models, on the precedent of Bowlby and Main.

In the early 2000s, Fonagy and Target observed that Main’s description of the AAI as assessing internal working models prompted much ‘futile’ research through the 1990s, and generally ‘distracted attachment researchers’.<sup>501</sup> Kobak and Esposito likewise described how Main’s appeal to internal working models inadvertently oriented researchers’ towards personality trait-style qualities of individuals and their ‘models’ of others, rather than on attentional or communicative processes.<sup>502</sup> Everett Waters joked that it would have been better termed ‘internal working muddles’. He felt that the community of attachment researchers had mistaken Bowlby’s placeholder concept for a substantive theoretical proposal.<sup>503</sup>

Everett Waters talked these issues through with his wife, Harriet Waters, an experimental and cognitive psychologist:

Finding the AAI transcripts themselves and the AAI scoring manual overwhelmingly complex, I asked Harriet to look at some AAIs and tell me how a cognitive psychologist would view such complex material. She reviewed the material and said a cognitive psychologist would have a hard time with such complexity without a sense of what was being sought. So, what did attachment theorists think was going on here? I said an attachment theorist would be looking for a person’s understanding of the support to be found in attachment relationships. She said, too vague. What exactly do you think is going on? Exasperated, I said, ‘It is like Clark Kent/Superman and news reporters Lois and Jimmy Olson. Every show starts with Lois and Jimmy going out to report some story. They get themselves in trouble. Clark/Superman (using his super powers) can see or hear of the trouble and recognizes that they need help. He changes into Superman, flies to the rescue, tells them to

<sup>497</sup> Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds), London: Routledge. Forthcoming.

<sup>498</sup> Main, M. (1987) Letter to John Bowlby, 3 June 1987, John Bowlby Archive, Wellcome Collections, PP/Bow/B.3/36/1.

<sup>499</sup> Main, M. (1999) Epilogue. Attachment theory: Eighteen points with suggestions for future studies. In J. Cassidy & P. Shaver, *Handbook of Attachment* (pp. 845–887). New York: Guilford, p. 877.

<sup>500</sup> For example, Kirsh, S. & Cassidy, J. (1997) Preschoolers’ attention to and memory for attachment relevant information. *Child Development*, 68, 1143–1153.

<sup>501</sup> Fonagy, P. & Target, M. (2002) Early intervention and the development of self-regulation, *Psychoanalytic Inquiry*, 22(3), 307–335, p. 328.

<sup>502</sup> Kobak, R. & Esposito, A. (2004) Levels of processing in parent–child relationships: Implications for clinical assessment and treatment. In L. Atkinson & S. Goldberg (eds), *Attachment Issues in Psychopathology and Interventions* (pp. 139–166). Mahwah, NJ: Lawrence Erlbaum, p. 143.

<sup>503</sup> Waters, E. (2017) The secure base script in attachment theory and research. Presentation to the Rapaport–Klein Study Group, [https://www.psychomedia.it/rapaport-klein/Waters-2017\\_Talk+Slides\\_1-Intro.mp4](https://www.psychomedia.it/rapaport-klein/Waters-2017_Talk+Slides_1-Intro.mp4).

relax, addresses the problem by defeating the trouble makers or neutralizing the menacing situation (e.g., bomb is about to go off). Then Superman returns to Jimmy and Lois to say everything is back in order. Then he flies off. When Lois and Jimmy return to the newspaper office, the find Clark (clueless as always), explain the problem and the rescue and everyone is glad that the City has Superman.' Harriet promptly said, 'Well, that is what cognitive psychologists call a "script" and I developed a prompt-word based story production method you could use my dissertation. You can adapt that to assess whether individuals know the secure base script you are interested in.'<sup>504</sup>

Harriet and Everett Waters suspected that the coding system for the AAI was functioning, in practice, as an indirect assessment of speakers' expectations about secure base and safe haven availability. Such a script might include some source of distress for one member of a dyad which prompts a signal for help. This signal is then detected, help is offered, this help is accepted and proves effective. As a whole, the interaction proves comforting and matters are sufficiently resolved that other activities can be recommenced. Whereas experimental and cognitive psychologists had generally studied the effects of scriptedness per se (i.e., comparing memory for scripted vs less scripted stimuli), Harriet Waters' innovation was to consider the script knowledge itself.

Harriet Waters re-analysed data from an earlier story-stem study by Bretherton, Ridgeway, and Cassidy with 37-month-olds, investigating the extent to which participants seemed to have access to this 'script' about the availability of caregivers as a secure base and safe haven. The pilot was successful, in that access to the script was associated with security in the original story-stem classifications by Bretherton and colleagues, but had better discriminant validity in terms of children's general developmental level.<sup>505</sup>

In the 2001 biennial meeting of the Society for Research in Child Development in Minneapolis, Minnesota, Harriet and Everett Waters convened a symposium of speakers proposing that consideration of attachment-related scripts offers a way of better specifying the ideas previously, and imprecisely, signalled by the terms 'internal working models' or 'attachment representations'.<sup>506</sup> Waters and Waters conceptualized security as a single dimension, running counter to the central position of categories of attachment in the research imagination of Main and other attachment researchers. For Waters and Waters, the capacity to make effective use of others as a secure base and safe haven is much like a skill, and the effectiveness of skills is generally measured on continua.<sup>507</sup>

Harriet Waters led the development of methods for assessing the secure base/safe haven scripts, both using word-prompt narrative methodologies appropriate for children and in coding the first six questions of the Berkeley AAI.<sup>508</sup> Seemingly as a polemical move to signal the basis of their ideas in Ainsworth's security theory, rather than Bowlby, they referred to 'secure base' scripts, even though these scripts addressed secure base and safe haven expectations, and perhaps even safe haven expectations especially.

<sup>504</sup> E. Waters, personal communication, September 20, 24.

<sup>505</sup> Waters, H. S., Rodrigues, L. M., & Ridgeway, D. (1998) Cognitive underpinnings of narrative attachment assessment. *Journal of Experimental Child Psychology*, 71(3), 211–234.

<sup>506</sup> Waters, H. S., & Rodrigues, L. M. (2001) Are attachment scripts the building blocks of attachment representations? Narrative assessment of representations and the AAI. Poster presented at a Poster Symposium 'What does the Adult Attachment Interview measure and when does it matter? Longitudinal studies of attachment representations' at the biennial meeting of the Society for Research in Child Development. Minneapolis, Minnesota. <http://www.psychology.sunysb.edu/attachment/srcd2001/HSWScripts/index.htm>.

<sup>507</sup> Waters, H. S. & Waters, E. (2006) The attachment working models concept: Among other things, we build script-like representations of secure base experiences, *Attachment & Human Development*, 8(3), 185–197.

<sup>508</sup> Waters, T. E. A. & Facompré, C. R. (2021) Measuring secure base script knowledge in the adult attachment interview. In Waters E., Vaughn B. E., & Waters H. S. (eds), *Measuring Attachment: Developmental Assessment across the Lifespan*. New York: Guilford Press.

Transcripts can be coded for what the researchers term ‘secure base scenes’, which are descriptions of specific events that instantiate an elaborated and complete secure base script. There may be ‘scene fragments’, with some elements of the script. Transcripts may display ‘secure base misses’, when memories of sources of distress are not accompanied by any account of comfort. ‘Secure base fails’ may also be coded where speakers relay memories of caregivers making their distress worse. Essentially this inquiry asks, where a secure base script is absent, what is present? Theodore Waters and Christopher Facompré have observed narratives in which, rather than giving confidence in their availability as a secure base or safe haven, the caregiver is harsh and threatening, unresponsive, or enmeshed.<sup>509</sup> This inquiry resembles the work of Lyons-Ruth and her colleagues that led to the identification of the Hostile/Helpless subtypes (Chapter 2), and may in a way be regarded as a replication, though now guided by the secure base script as reference point. Though there has been this growing interest in insecurity,<sup>510</sup> to date the focus has been on the secure base script.

Bibliometric studies have suggested declining reference to work by Bowlby and Main over time.<sup>511</sup> This is part of the context in which research with the secure base script measures has gathered considerable momentum. Studies have demonstrated that secure base scripts in middle childhood, adolescence, and adulthood are predicted by early experiences of sensitive care and early attachment patterns, are generally stable over time, and in turn predict adult caregiving behaviour to children and other aspects of functioning, including even adult physical health.<sup>512</sup>

Much of this research has been led by Theodore Waters. This has often been in collaboration with Glenn Roisman at Minnesota.<sup>513</sup> In a 2017 paper using data from the Minnesota longitudinal study, Waters, Ruiz and Roisman reported that secure base script scores on the AAI at 19 and 26 years were more strongly associated with observations of maternal sensitivity from infancy to age 13 ( $r = 0.33$ ,  $r = 0.37$ ) than were the Main, Goldwyn and Hesse coding system for the AAI ( $r = 0.15$ ).<sup>514</sup> Agreement between the secure base script and Main and colleagues coding for the AAI was  $r = 0.15$  at age 19 and 0.33

<sup>509</sup> Waters, T. E. A. & Facompré, C. R. (2021) Measuring secure base script knowledge in the adult attachment interview. In Waters E., Vaughn B. E., & Waters H. S. (eds), *Measuring Attachment: Developmental Assessment across the Lifespan*. New York: Guilford Press; Groh, A. M. & Haydon, K. C. (2024) The Attachment Script Assessment: Introduction of a coding system to evaluate deactivation, hyperactivation, and anomalous content. *Attachment & Human Development*, 26(3), 203–211.

<sup>510</sup> Groh and Haydon have recently developed a supplement to the secure base script approach, investigating markers of deactivation, hyperactivation, or anomalous content. This rearticulates the study of secure base scripts with Main’s categories, re-engaging her concern with distortions of information-processing. Groh, A. M. & Haydon, K. C. (2024) The Attachment Script Assessment: Introduction of a coding system to evaluate deactivation, hyperactivation, and anomalous content. *Attachment & Human Development*, 26(3), 203–211.

<sup>511</sup> Schuengel, C., Verhage, M. L., & Duschinsky, R. (2021) Prospecting the attachment research field: A move to the level of engagement. *Attachment & Human Development*, 23(4), 375–395; Kroonenberg, P. M. & Stoltenborgh, M. (2023) Handbooks as a means of mapping a discipline: An exploration of the world of attachment. In A. Okada, K. Shigemasa, R. Yoshino, & S. Yokoyama (eds), *Facets of Behaviormetrics: The 50th Anniversary of the Behaviormetric Society* (pp. 123–143). New York: Springer.

<sup>512</sup> Waters, T. E., Brockmeyer, S. L., & Crowell, J. A. (2013) AAI coherence predicts caregiving and care seeking behavior: Secure base script knowledge helps explain why. *Attachment & Human Development*, 15(3), 316–331; Farrell, A. K., Waters, T. E. A., Young, E. S., Englund, M. M., Carlson, E., Roisman, G. I., & Simpson, J. A. (2019) Early maternal sensitivity, attachment security in young adulthood, and cardiometabolic risk at midlife. *Attachment & Human Development*, 21(1), 70–86; Finet, C., Waters, T. E., Vermeer, H. J., Juffer, F., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Bosmans, G. (2021) Attachment development in children adopted from China: The role of pre-adoption care and sensitive adoptive parenting. *Attachment & Human Development*, 23(5), 587–607.

<sup>513</sup> Waters, T. E. A. & Roisman, G. I. (2019) The secure base script concept: An overview. *Current Opinion in Psychology*, 25, 162–166.

<sup>514</sup> Waters, T. E. A., Ruiz, S. K., & Roisman, G. I. (2017) Origins of secure base script knowledge and the developmental construction of attachment representations. *Child Development*, 88, 198–209.

at age 26. This reflects some convergence between the measures, but with clear indication of nonoverlap.<sup>515</sup> Secure base script knowledge at age 19 was found to mediate 40% of the effect of maternal sensitivity on AAI coherence at 26 years. There was considerable stability in secure base script knowledge between age 19 and 26 ( $r = 0.55$ ), whereas stability of the Main, Goldwyn and Hesse coding across the seven years was distinctly lower ( $r = 0.22$ ).<sup>516</sup>

For Waters and colleagues, these results had important implications.<sup>517</sup> They support an account that starts from the premise that children's representations of events develop over a very long period of time. Ultimately, children are able, to varying degrees, to link interconnected episodes together to form more comprehensive representations. Waters and colleagues suggested that having a cognitive script helps facilitate the construction of a internally consistent, detailed, orderly account in the AAI. This is why secure base scripts mediate associations between childhood experiences of sensitive care and less distortion and incoherence identified in the AAI. It represents a developmental progression and indication of mechanism. In turn, the account was felt by Waters to bring more coherence to attachment theory as a lifespan model of socioemotional development.

With Roisman's support as a leader of the second generation Minnesota group, the secure base script approach has had influential backing, a prolific source of successful NIH grants, and access to data from the Minnesota and NICHD longitudinal studies. Roisman and Groh first used the secure base script approach soon after it was introduced in Groh's first year project.<sup>518</sup> This was largely a practical matter: they did not have resources to code the AAI using the Main and colleagues approach.<sup>519</sup> The measure worked well enough in this study that when Roisman and collaborators were applying for an NIH R01 grant to collect AAIs on the NICHD study at age 18, he also included the secure base script approach and self-report assessments of attachment among the measures. The AAI data was coded with the Main and colleagues approach first, as this remained his primary interest at the time.<sup>520</sup> When the secure base script data was coded, Roisman was surprised at how well it performed in the NICHD sample, with good associations with metrics of early experiences of care.<sup>521</sup>

<sup>515</sup> See also Dykas, M. J., Woodhouse, S. S., Cassidy, J., & Waters, H. S. (2006) Narrative assessment of attachment representations: Links between secure base scripts and adolescent attachment. *Attachment & Human Development*, 8(3), 221–240; Nivison, M. D., Dagan, O., Booth-LaForce, C., Roisman, G. I., & Waters, T. E. (2024) Caregiving antecedents of secure base script knowledge inferred from the Adult Attachment Interview: A comparative, pre-registered analysis. *Infant and Child Development*, 33(2), e2410.

<sup>516</sup> See also Waters, T. E., Facompré, C. R., Van de Walle, M., Dujardin, A., De Winter, S., Heylen, J., ... & Bosmans, G. (2019) Stability and change in secure base script knowledge during middle childhood and early adolescence: A 3-year longitudinal study. *Developmental Psychology*, 55(11), 2379.

<sup>517</sup> Waters, H. S., Waters, T. E. A., & Waters, E. (2021) From internal working models to script-like attachment representations. In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 111–119). New York: Guilford Press; Houbrechts, M., Waters, T. E., Facompré, C. R., Bijttebier, P., Goossens, L., Van Leeuwen, K., ... & Bosmans, G. (2024) Evidence of a developmental shift in the nature attachment representations: A longitudinal taxometric investigation of secure base script knowledge from middle childhood into adolescence. *Attachment & Human Development*, early view; Waters, E., & Waters, T. E. A. (2024) Developmental change, bricolage, and how a lot of things develop: Mechanisms and changes in attachment across the lifespan. *Development & Psychopathology*, forthcoming.

<sup>518</sup> Groh, A. M. & Roisman, G. I. (2009) Adults' autonomic and subjective emotional responses to infant vocalizations: The role of secure base script knowledge. *Developmental Psychology*, 45(3), 889–893.

<sup>519</sup> G. Roisman, personal communication, July 28, 2024.

<sup>520</sup> Booth-LaForce, C. & Roisman, G. I. (2014) Introduction. *Monographs of the Society for Research in Child Development*, 79(3), 1–14.

<sup>521</sup> Steele, R. D., Waters, T. E., Bost, K. K., Vaughn, B. E., Truitt, W., Waters, H. S., ... & Roisman, G. I. (2014) Caregiving antecedents of secure base script knowledge: A comparative analysis of young adult attachment representations. *Developmental Psychology*, 50(11), 2526.

Roisman has subsequently been able to use grant income to attract some of the most able of the younger generation of attachment researchers to use secure base script methodology, such as Or Dagan and Marissa Nivison. For instance, Dagan, Nivison, and colleagues recently examined antecedents of depressive symptoms and relationship difficulties in the NICHD sample at age 30.<sup>522</sup> The AAI was conducted at age 18 and coded with the Main, Goldwyn, and Hesse coding system and the secure base script approach. The researchers found that the secure base script method was a better predictor of later depressive symptoms and relationship difficulties than the Main, Goldwyn, and Hesse method, and continued to predict well when controlling for the other approach as well as other potential covariates such as age, ethnicity, socioeconomic status, and cognitive functioning.

There has also been great enthusiasm for the secure base script approach from the Leuven and VU Amsterdam groups, major contemporary leaders, and innovators in the developmental attachment research community.<sup>523</sup> With links to both groups, Van IJzendoorn and Bakermans-Kranenburg, generally ahead of the curve for broader shifts in consensus within attachment research, have become interested in the secure base script approach.<sup>524</sup> They have been increasingly embedding secure base script measures in their studies, including sometimes at the expense of the Main and colleagues approach to the AAI.<sup>525</sup> In a recent study of 461 families with 922 same-sex twin children they found that parents with more secure base script knowledge interacted with their twin children in a more sensitive manner ( $r = 0.11$ ) and showed more sensitive discipline ( $r = 0.12$ ), 'providing support for the use of the secure base script procedure as a complement or alternative to the AAI'.<sup>526</sup> Again, grants held by Bakermans-Kranenburg have brought young researchers to engage with the secure base script measures. Van IJzendoorn and Bakermans-Kranenburg's interest has, in turn, contributed to support for the approach

<sup>522</sup> Dagan, O., Nivison, M. D., Bleil, M. E., Booth-LaForce, C., Waters, T. E., & Roisman, G. I. (2023) Longitudinal associations between attachment representations coded in the adult attachment interview in late adolescence and perceptions of romantic relationship adjustment in adulthood. *Infant and Child Development*, e2512; Dagan, O., Nivison, M. D., Bleil, M. E., Waters, T. E. A., & Roisman, G. I. (2024) AAIs as predictor for depression and romantic relationship quality in the NICHD SECCYD study. Paper presented at the International Attachment Conference, Rouen, France, July 2024.

<sup>523</sup> For example, Houbrechts, M., Bijttebier, P., Calders, F., Goossens, L., Van Leeuwen, K., Van Den Noortgate, W., & Bosmans, G. (2023) Cumulative family stress and externalizing problems: Secure base script knowledge as a protective factor. *Child Development*, 94(4), 941–955; <https://osf.io/n53aj>; Maingot, S., Verhage, M., Schuengel, C., Duschinsky, R., Meijer, E., Meeuwen, E. C., ... & Wong, M. (2024) Organizing adult attachment in alternative ways: A qualitative assessment of schemas antithetical to the secure base script. <https://osf.io/765jy>.

<sup>524</sup> An initial response by Bakermans-Kranenburg emphasized continuity between the secure base script approach and the work of Main and colleagues, downplaying the novelty. Bakermans-Kranenburg, M. J. (2006) Script-like attachment representations: Steps towards a secure base for further research. *Attachment & Human Development*, 8(3), 275–281. However, more recently, Bakermans-Kranenburg has situated the relative value and relevance of secure base script measures as an important current research agenda. See Witte, A., Runze, J., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. (2023) A randomized controlled trial of the effectiveness of the VIPP-SD: Parental secure base script knowledge as an outcome and moderator, OSF, <https://osf.io/ujbyq/>; Witte, A. M., Runze, J., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2024) Secure base script knowledge and video-feedback intervention to promote positive parenting-sensitive discipline. *Journal of Applied Developmental Psychology*, 92, 101,651.

<sup>525</sup> For example, Schoenmaker, C., Juffer, F., Van IJzendoorn, M. H., Linting, M., van der Voort, A., & Bakermans-Kranenburg, M. J. (2015). From maternal sensitivity in infancy to adult attachment representations: A longitudinal adoption study with secure base scripts. *Attachment & Human Development*, 17(3), 241–256; Witte, A. M., Runze, J., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2023) Parents' secure base script knowledge predicts observed sensitive caregiving and discipline toward twin children. *Journal of Family Psychology*, 37(7), 966–976.

<sup>526</sup> Witte, A. M., Runze, J., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2023) Parents' secure base script knowledge predicts observed sensitive caregiving and discipline toward twin children. *Journal of Family Psychology*, 37(7), 966–976, p. 973.



from those who advocate their perspective on future directions for attachment research, such as Tereno.<sup>527</sup>

Beyond the availability of employment for research using the measures, the secure base script has also been attractive to these younger researchers, who have found it more theoretically coherent and well-elaborated than Main's claims about attentional processes. Theodore Waters has generally characterized the secure base script approach as complementary to the AAI, each offering their insights.<sup>528</sup> A more combative tone can be seen from younger researchers associated with Roisman, such as Nivison and Dagan. They have argued that 'conceptually, the AAI secure base script coding system directly assesses the content of the underlying attachment representation (i.e., access to and knowledge of cognitive script outlining prior secure base interactions), in contrast to the traditional coding system, which indirectly assesses the underlying representations with reference to how an individual discusses their childhood experiences'.<sup>529</sup> Similar points have likewise been made by Groh and Haydon.<sup>530</sup> They have also been offered by Mucha in the best recent popular science book on attachment research, suggesting the potential value and coherence of the idea of the secure base script in dissemination to the general public.<sup>531</sup>

Nivison and Dagan suggest that part of the appeal of the secure base script system has been that the relationship between theory and method is vivid and bright. It offers the prospect of clearer hypothesis-building and testing. For instance, the secure base script approach was an important foundation for work by the Leuven group on how social learning might be involved in individual differences in attachment (Chapter 4). By comparison to the secure base script approach, Nivison and Dagan feel that there are elements of Main's work where little light reaches. In the absence of clear guiding theory, research with the Main, Goldwyn, and Hesse coding system have—with exceptions especially among researchers close to Main—started to veer towards merely exploring associations between insecurity and undesirable outcomes.

In sociological terms, Nivison and Dagan seem concerned by hindrances to scientific productivity stemming from the AAI as a tool for the means of production. They stress that the secure base script coding system is much simpler. It can be coded on the AAI in an hour. This is in contrast to the Main, Goldwyn, and Hesse coding system, which, in their estimate, tends to take around 4–8 hours per transcript, reducing its attraction to researchers without a central interest in attachment.<sup>532</sup> The methodology has therefore appealed as less resource intensive and more scalable. These qualities make the measure more available for travel beyond the community of dedicated attachment researchers.

<sup>527</sup> Tereno, S. (2024) Attachment theory and research: Some ideas to face challenges in the new century. Keynote address to the International Attachment Conference, Rouen, France, July 2024.

<sup>528</sup> For example, Houbrechts, M., Waters, T. E., Facompré, C. R., Bijttebier, P., Goossens, L., Van Leeuwen, K., ... & Bosmans, G. (2024) Evidence of a developmental shift in the nature attachment representations: A longitudinal taxometric investigation of secure base script knowledge from middle childhood into adolescence. *Attachment & Human Development*, 1–18.

<sup>529</sup> Nivison, M. D., Dagan, O., Booth-LaForce, C., Roisman, G. I., & Waters, T. E. (2024) Caregiving antecedents of secure base script knowledge inferred from the Adult Attachment Interview: A comparative, pre-registered analysis. *Infant and Child Development*, 33(2), e2410.

<sup>530</sup> Groh, A. M. & Haydon, K. C. (2024) The Attachment Script Assessment: Introduction of a coding system to evaluate deactivation, hyperactivation, and anomalous content. *Attachment & Human Development*, 26(3), 203–211.

<sup>531</sup> Mucha, L. (2024) *Please Find Attached*. London: Bloomsbury.

<sup>532</sup> Ravitz, P., Maunder, R., Hunter, J., Shankiya, B., & Lancee, W. (2010) Adult attachment measures: A 25-year review. *Journal of Psychosomatic Research*, 69(4), 419–432; Venta, A., McLaren, V., Sharp, C., Abate, A., Allman, M., Cervantes, B., ... & Wall, K. (2024) Does coding internal working models of attachment have to be so hard? *Child Psychiatry & Human Development*, 55(1), 227–235.

As Groh and Haydon observe, ‘individuals who become reliable coders and use the AAI in their research programs are typically well-funded researchers who are already committed attachment theorists. Relative to the AAI, the attachment script assessment is more time- and resource-effective. As such, the attachment script assessment offers additional appeal as it has the potential to increase the accessibility of attachment methods and encourage greater use of attachment measures beyond labs already engaged in attachment research.’<sup>533</sup> Dagan, Nivison, and colleagues also regard secure base scripts as a more direct intervention target than the somewhat mysterious construct of states of mind regarding attachment.<sup>534</sup> They anticipate that the unencumbered clarity of the secure base script approach will help attachment theory and research enter into a more effective, two-way dialogue with clinical research and practice.<sup>535</sup>

### Growing Points

A building can appear unchanging to those uninvolved in its upkeep. But any building must be sustained and evolve through varying degrees of ongoing repair, maintenance, and alterations. This has been documented by research in geography. Strebel has described our physical structures as ‘living buildings’ to draw attention to the architectural drama of their continuation through time. This continuation will depend on a variety of physical and social factors, including the durability of their materials, how much stretch they can accept before breaking, and whether sufficient consensus can be found that the materials are worth preserving, replacing, or improving.<sup>536</sup>

Edensor has beautifully characterized the way that the stone of St Ann’s Church in Manchester has been sustained and developed, responding to changing ecological, political, and cultural circumstances, while appearing to be constitutive of the church building as a simple and unified entity.<sup>537</sup> The contemporary building of St Ann’s reflects a collective effort of creativity and love, of elaboration, and problem-solving. It incorporates transformations both big and small, which vary in the degree to which they are visible from the outside—in this regard, much like attachment research.

Proponents and critics of attachment research often offer stories that implicitly or explicitly emphasize continuity over time in ideas and methodology. Certainly there are some unusual continuities, including continued research with the Strange Situation even after 50 years (Chapter 5). Yet the qualities of a particular instrument may shape, but do not determine, how it is used or with what implications. A great deal depends on what that instrument can be asked to do, and within what context.<sup>538</sup> This comes into focus when we give attention to the work of attachment researchers, and lines of diversity within the

<sup>533</sup> Groh, A. M. & Haydon, K. C. (2024) The Attachment Script Assessment: Introduction of a coding system to evaluate deactivation, hyperactivation, and anomalous content. *Attachment & Human Development*, 26(3), 203–211, p. 205.

<sup>534</sup> See, for example, Van Vlierberghe, L., Diamond, G., & Bosmans, G. (2023) Middle childhood attachment-based family therapy: Theory and model description. *Family Process*, 62(3), 1040–1054.

<sup>535</sup> Dagan, O., Nivison, M. D., Bleil, M. E., Waters, T. E. A., & Roisman, G. I. (2024) AAIsbs as predictor for depression and romantic relationship quality in the NICHD SECCYD study. Paper presented at the International Attachment Conference, Rouen, France, July 2024.

<sup>536</sup> Strebel, I. (2011) The living building: Towards a geography of maintenance work. *Social & Cultural Geography*, 12(03), 243–262.

<sup>537</sup> Edensor, T. (2011) Entangled agencies, material networks and repair in a building assemblage: The mutable stone of St Ann’s Church, Manchester 1. *Transactions of the Institute of British Geographers*, 36(2), 238–252.

<sup>538</sup> Cf. Loesser, A. (1990) *Men, Women, and Pianos: A Social History*. New York: Courier Corporation.



research community, rather than assuming we know what attachment research is doing, or what the paradigm is intending.<sup>539</sup>

Attachment research within developmental psychology is not a single, stable whole. For all that there are centre/periphery dynamics, the developmental tradition is still a variable, uneven repertoire of concepts and methods. Its liveliness and generativity comes in part from the other genres and forms of knowledge with which it can engage and learn. For example, in this chapter we have seen how Main was able to make theoretical advances by bringing together ideas from Bowlby and Ainsworth with ideas from ethology, cognitive science, and psychoanalysis. That said, these elements themselves did not always sit together comfortably, with the ethological elements getting sidelined or, sometimes, squashed. As Brecht observed in one of his dialogues, understanding a system of thought has analogies to understanding the dynamics of a family.<sup>540</sup> Much like any family, concepts in such a system can sometimes be seen supporting one another, sometimes changing and improving themselves to offer better support in the future; sometimes they can be seen squabbling or undermining one another. It is not hard for concepts to sit down for dinner, or pose for a family photo, as if nothing had happened. That's the all-too-familiar history of attachment research as continuity from Bowlby to the present. But this is far from the whole story.

If this dynamism and tension occurs even within the work of particular scholars, it also certainly occurs between researchers. Attachment research is more like a political bloc, or a coalition, of partially articulated approaches. At most, there are some relatively stable elements across research groups and over time, which are likely to trigger in trained individuals roughly similar forms of illumination, expectation, and inference.<sup>541</sup> The Strange Situation as a method has served as a decisive anchor and stabilization point for attachment research as an empirical and theoretical paradigm.<sup>542</sup> Yet as we have seen so far, and will see further in the subsequent chapters, even the Strange Situation categories have been interpreted with tremendous diversity across research groups and over time. Furthermore, a growing number of attachment researchers have been primarily oriented by the concepts of secure base and safe haven and the importance of studying them through naturalistic observation, rather than focusing on the Strange Situation and its categories.

A narrative of continuity in attachment theory and research over the decades masks critical changes. Sometimes such narratives are offered, seemingly rhetorically, by proponents and critics whose discussions in other contexts suggest that in fact they know better.<sup>543</sup> In a debate about the value of attachment research at the Leipzig Research Center for Early Child Development in November 2018, Thompson argued that anthropologists have not recognized how the field has evolved since Bowlby and Ainsworth, leading to misdirected and out-of-date criticism. Heidi Keller replied that this is essentially irrelevant, since the version of attachment theory in wider circulation is that of Bowlby and Ainsworth, and

<sup>539</sup> Denis, J. & Pontille, D. (2023) Cultivating attention to fragility: The sensible encounters of maintenance. In J. Denis & D. Pontille (eds), *Ecological Reparation* (pp. 344–361). Bristol: Bristol University Press.

<sup>540</sup> Brecht, B. ([1961] 2019) *Refugee Dialogues*, trans. T. Kuhn, London: Bloomsbury, p. 63. See also Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press, p. 6.

<sup>541</sup> Schönplflug, U. (ed.) (2008) *Cultural Transmission: Psychological, Developmental, Social, and Methodological Aspects*. Cambridge: Cambridge University Press.

<sup>542</sup> Ziv, Y. & Hotam, Y. (2015) Theory and measure in the psychological field: The case of attachment theory and the strange situation procedure. *Theory & Psychology*, 25(3), 274–291.

<sup>543</sup> For example, Garrett, P. M. (2023) Bowlby, attachment and the potency of a 'received idea'. *The British Journal of Social Work*, 53(1), 100–117.

subsequent researchers have not raised their voices to correct this account: ‘The real problem I have is that attachment theory in the applied field is really causing, to put it mildly, a lot of distress because children are evaluated according to attachment theory.’<sup>544</sup>

Keller acknowledges that the image of attachment theory and research that she subjects to critique is out of date. However, it is the image in circulation, which she perceives as legitimated by the activity of contemporary researchers, and who she therefore seeks to caricature and discredit. While empirical evidence on uses of attachment theory and research in practice remain limited, there is certainly some evidence in support of Keller’s claim that such legitimation is taking place.<sup>545</sup> There also seems to have been some impact from the consensus statement on disorganized attachment.<sup>546</sup> Keller’s strategy appears, in part, an attempt to provoke researchers to disown the use of attachment theory in applied practice. Her criticisms of ‘attachment research’, then, resound with a partially dislocated intensity.

A contributory to the popularity of misleading images of attachment theory and research may be the success of Bowlby’s early marketing of a light, commodified version of his ideas to public and practitioner audiences—followed by a cliff-edge of public engagement, with Ainsworth and other developmental psychologists focused on engaging with academic audiences. Simplified accounts may also reflect that attachment theory and research combined (i) apparently intuitive and accessible elements, integrated with (ii) subtle, technical distinctions in the use of concepts and theory (e.g., between attachment behaviour and the attachment behavioural system), and (iii) complex observational measures. Even when readers had access to the relevant academic texts, aspects of the relevant subtexts for making full meaning of them were inaccessible. So readers, understandably, rely on the connotations of terms from ordinary language.

All three challenges to public and practitioner understanding of attachment research were at least redoubled in the work of Mary Main, leading to serious obstacles to accessing her theory and methods even for other researchers, and all the more for those interested in attachment outside of academia. This has hindered the accuracy and specificity of criticism received by attachment research, an obstacle to further progress and development. It has additionally hindered dialogue with cognate disciplines and public intelligibility. For instance, research on unresolved states of mind has not been fed by dialogue with developments in the study of trauma, and vice versa, though clearly the phenomena are related.<sup>547</sup> In part, this is because the theory of unresolved states is underdeveloped, and conceptually and methodologically difficult to pin down.<sup>548</sup> There is huge missed potential in the

<sup>544</sup> Keller, H. & Thompson, R. (2018) Attachment theory: Past, present & future, recorded at the 2nd ‘Wilhelm Wundt Dialogue’, 28 November 2018 at Leipzig University, hosted by the Leipzig Research Center for Early Child Development (LFE), [https://www.youtube.com/watch?v=\\_nG5SeEj28](https://www.youtube.com/watch?v=_nG5SeEj28).

<sup>545</sup> For example, Masciantonio, S. C. (2015) Mothering and mental illness: An ethnography of attachment in an institutional context. Unpublished doctoral dissertation, University of Adelaide.

<sup>546</sup> Granqvist, P., Sroufe, L. A., Dozier, M., Hesse, E., Steele, M., Van IJzendoorn, M., ... & Duschinsky, R. (2017) Disorganized attachment in infancy: A review of the phenomenon and its implications for clinicians and policy-makers. *Attachment & Human Development*, 19(6), 534–558; Wilkins, D. (2021) Disorganised attachment does not indicate child maltreatment. *Journal of Social Work Practice*, 35(2), 219–220.

<sup>547</sup> Zagaria, A., Baggio, T., Rodella, L., & Leto, K. (2024) Toward a definition of Attachment Trauma: Integrating attachment and trauma studies. *European Journal of Trauma & Dissociation*, early view. Though see van Hoof, M. J., Riem, M., Garrett, A., Pannekoek, N., van der Wee, N., Van IJzendoorn, M., & Vermeiren, R. (2019) Unresolved–disorganized attachment is associated with smaller hippocampus and increased functional connectivity beyond psychopathology. *Journal of Traumatic Stress*, 32(5), 742–752; Pitillas, C. (2021) *El Daño que se Hereda: Comprender y abordar la transmisión intergeneracional del trauma*. Bilbao: Desclee De Brouwer.

<sup>548</sup> Bakum, L., Schuengel, C., Foster, S. L., Fearon, R. P., & Duschinsky, R. (2023) Trauma and loss in the Adult Attachment Interview: Situating the unresolved state of mind classification in disciplinary and social context. *History of the Human Sciences*, 36(3–4), 133–157.

relevance of Main's work for many cognate areas of research and practice, as she herself noted.<sup>549</sup> However, the way Main's ideas and methods were formulated mean that they do not travel at all well, and, when they do, there is often damage or distortion in transit.

In a way, attachment research in developmental psychology has become what Bowlby called a 'segregated system': information can travel in and out, but with considerable challenges and risk of distortion.<sup>550</sup> There are many major discoveries by attachment researchers since the 1980s that are relevant to applied practice and policy for children and families—discussed in subsequent chapters—but which are barely known.<sup>551</sup> Only a modest portion of empirical work on attachment after the 1980s has entered into the popular understanding of attachment, with exceptions such as the work of Fonagy and colleagues on mentalizing,<sup>552</sup> the Circle of Security,<sup>553</sup> the Dynamic-Maturational Model,<sup>554</sup> and a distorted image of disorganized attachment.<sup>555</sup> Indeed, the widespread circulation of discourses emphasizing the importance of attachment, and the relative inaccessibility of the tools to access detailed knowledge of the model, has contributed to an industry of commercial trainings on attachment. As we shall see in [Chapter 5](#), this predicament has been important for Sheri Madigan, who observed that: 'The public are looking for information, and will get misinformation unless we extend research findings to the public.'<sup>556</sup>

In *Cornerstones* I proposed that circulation of allodoxia about attachment in clinical and child welfare practice has contributed to the circulation of simplified stories of continuity from Bowlby and Ainsworth to the present. Proponents use these stories to legitimize their image of how attachment ideas are relevant to caregiving and professional practice by claiming continuity with attachment ancestors. Critics use stories of continuity to caricature and prosecute attachment research today through critique of Bowlby, and sometimes Ainsworth.

Attachment researchers themselves have also tended to emphasize continuity. To take one example, Mary Main not infrequently attributed ideas she had developed from out

<sup>549</sup> Main, M. ([1986] 2025) *Behaviour and the development of representational models of attachment: Five methods of assessment*. In R. Duschinsky, E. Hesse, K. White, & P. Granqvist (eds). London: Routledge: 'In my view, however, the audience for which these methods will be useful is much wider. Consideration of the ways in which dyads and individuals seek actively to preserve their mental or dyadic attachment organization suggests at once a multitude of new experiments involving discourse, pragmatics, perception and memory.' Forthcoming.

<sup>550</sup> Bowlby distinguished four levels of segregation. At Level 2 segregation is 'Moderate. Some degree of concentration but still possible to attend to other input.' At Level 3 segregation is 'Considerable. Strong concentration & resulting exclusion of all other input.' There is likely variability between research groups and topics within attachment research as to which characterization is the better fit. Bowlby, J. ([1962] 2020) *Defences that follow loss: Causation and function*. In R. Duschinsky & K. White (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 17–65). London: Routledge, p. 64.

<sup>551</sup> Foster, S., Schofield, G. L., Geoghegan, L., Hood, R., Sagi-Schwartz, A., Bakkum, L., ... & Duschinsky, R. (2025) Attachment theory and research: What should be on the core curriculum for children and families social workers? Under review.

<sup>552</sup> Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press.

<sup>553</sup> Marvin, R., Cooper, G., Hoffman, K., & Powell, B. (2002). The Circle of Security project: Attachment-based intervention with caregiver–pre-school child dyads. *Attachment & Human Development*, 4(1), 107–124. For a valuable ethnographic study of how Circle of Security ideas influence practice in a mother–baby unit, see Masciantonio, S. C. (2015) *Mothering and mental illness: An ethnography of attachment in an institutional context*. Unpublished doctoral dissertation, University of Adelaide.

<sup>554</sup> Farnfield, F. & Holmes, P. (eds) (2014) *The Routledge Handbook of Attachment: Assessment*. London: Routledge; Baim, C. M. (2020) Applying the dynamic–maturational model of attachment and adaptation in criminal justice interventions. *Probation Journal*, 67(1), 26–46.

<sup>555</sup> Granqvist, P., Sroufe, L. A., Dozier, M., Hesse, E., Steele, M., Van IJzendoorn, M., ... & Duschinsky, R. (2017) Disorganized attachment in infancy: A review of the phenomenon and its implications for clinicians and policy-makers. *Attachment & Human Development*, 19(6), 534–558.

<sup>556</sup> Madigan, S. (2019) Beyond the academic silo: Collaboration and community partnerships in attachment research. Paper presented on 20 July 2019, International Attachment Conference, Vancouver, Canada.

of the legacy of Bowlby and Ainsworth to her teachers, partly out of due respect for their inspiration, partly out of personal love for them, and partly as a way of claiming mandate from the tradition for her innovations. In turn, subsequent researchers have very often cited Main in the same breath as citations of Bowlby and Ainsworth, as if they were a set.<sup>557</sup> Researchers have failed to make clear, if indeed many understood, that continuities in the use of terminology and measures masked major ruptures in the meaning assigned to them. It is as if it were generally assumed that Plato and Freud represent the same theory since both state that dreams fulfil desires.<sup>558</sup>

In fact, already by the start of the 1990s, on close inspection attachment research was barely recognizable as the same paradigm as the late 1970s. It was profoundly transformed in terms of personnel, theory, and approaches to research. The Steeles have underscored 'the difference the 1980s made,' describing the change as essentially 'seismic'.<sup>559</sup>

As such, descriptions and criticisms of attachment research that have assumed continuity across this period have often had poor aim, and tended to miss the mark.<sup>560</sup> Reflecting this transition, and marking it symbolically, was a landmark double special issue of the *Monographs of the Society for Research in Child Development* in 1985, edited by Inge Bretherton and Everett Waters. The special issue was entitled 'Growing Points of Attachment Theory and Research.' It began with a major historical and programmatic paper by Bretherton.<sup>561</sup> Bretherton's paper traced the origins of attachment theory in the work of Bowlby, the empirical and theoretical transformations entailed by Ainsworth's contributions, and identified current questions faced by attachment research, especially in the face of the possibilities and limitations of Bowlby's concept of 'internal working models'.

Bretherton's paper was followed by the Waters and Deane article introducing the attachment Q-sort as an alternative to the Strange Situation, and then Main's first paper introducing the Adult Attachment Interview and her six-year measures. A section on maladaptation included a high-profile prospective report from Vaughn, Deane, and Waters, using data from the Minnesota longitudinal study, documenting associations between day-care use and insecure attachment (Chapter 3).<sup>562</sup> The Minnesota group also published a paper documenting prospective associations between insecurity in the Strange Situation and children's behaviour problems.<sup>563</sup>

<sup>557</sup> Schuengel, C., Bakkm, L., Madigan, S., & Fearon, P. (2024) Mary Main's written legacy: A bibliometric analysis, *Attachment & Human Development*, early view.

<sup>558</sup> Foucault, M. ([1969] 1972) *The Archeology of Knowledge and the Order of Discourse*, trans. A. M. Sheridan Smith. London: Tavistock Press: 'The sentence "dreams fulfil desires" may have been repeated throughout the centuries; it is not the same statement in Plato and in Freud. The schemata of use, the rules of application, the constellations in which they can play a part, their strategic potentialities constitute for statements a field of stabilization that makes it possible, despite all the differences of enunciation, to repeat them in their identity; but this same field may also, beneath the most manifest semantic, grammatical, or formal identities, define a threshold beyond which there can be no further equivalence, and the appearance of a new statement must be recognized' (103).

<sup>559</sup> Steele, H. & Steele, M. (2017) On conflict in attachment theory and research. In C. Christian, M. N. Eagle, & D. L. Wolitsky (eds), *Psychoanalytic Perspectives on Conflict* (pp. 210–222). London: Routledge, p. 212.

<sup>560</sup> Duschinsky, R., Van IJzendoorn, M., Foster, S., Reijman, S., & Lionetti, F. (2020) Attachment histories and futures: Reply to Vicedo's 'Putting attachment in its place'. *European Journal of Developmental Psychology*, 17(1), 138–146.

<sup>561</sup> Bretherton, I. (1985) Attachment theory: Retrospect and prospect. *Monographs of the Society for Research in Child Development*, 50(1/2), 3–35.

<sup>562</sup> Vaughn, B. E., Deane, K., & Waters, E. (1985) The impact of out-of-home care on child–mother attachment quality: Another look at some enduring questions. *Monographs of the Society for Research in Child Development*, 50(1/2), 110–135.

<sup>563</sup> Erickson, M. F., Sroufe, L. A., & Egeland, B. (1985) The relationship between quality of attachment and behavior problems in preschool in a high-risk sample. *Monographs of the Society for Research in Child Development*, 50(1/2), 147–166.

A section of papers on cross-national research included several important studies. Among these was a first report from the Grossmann's group, corroborating Ainsworth's findings linking caregiver sensitivity to Strange Situation classifications. Sagi-Schwartz and colleagues also reported on the correspondence of Strange Situation classifications of Israeli children to their mother, father, and daycarer. 'Growing Points of Attachment Theory and Research' embodied the confidence of attachment research within developmental psychology to make advances beyond the limitations of Bowlby's work, to develop new measures beyond those provided by Ainsworth, to assess attachment-related processes later in development, to contribute to key questions in developmental psychology such as the origin of conduct problems, and to pursue cross-national research.

As Bretherton noted, in the 1970s the researchers conducting attachment research were generally Ainsworth's direct students, or else close colleagues such as Klaus and Karin Grossmann and Alan Sroufe. Though a number of research groups in the United States remained the centre of gravity of attachment research, by the end of the 1980s a diversification of attachment researchers beyond Ainsworth's circle had taken place. Symbolically tracing this transition, while the first few papers in 'Growing Points of Attachment Theory and Research' were by Ainsworth's direct students, the subsequent papers were frequently by researchers with little or no link to Ainsworth.

Informal channels of communication remained in the 1980s and would be fundamental to the development of security theory after Ainsworth, ultimately culminating in the secure base script approaches. However, in this period, much more of the activity of the study of attachment research was taking place in formal contexts such as discussions at academic conferences and publication in academic journals such as *Monographs of the Society for Research in Child Development* and *Child Development*. In the mid-1980s, Ainsworth described attachment research as having 'grown out of infancy',<sup>564</sup> able to now speak as part of the scientific community. Published research findings had accumulated to such an extent that meta-analytic synthesis of quantitative researchers on predictors of the Strange Situation classifications was called for by Van IJzendoorn in 1983,<sup>565</sup> and introduced to attachment research by Goldsmith and Alansky in 1987.<sup>566</sup>

Whereas in the late 1970s caregiver sensitivity was the central concern in research on caregiving among Ainsworth and her collaborators, by the second half of the 1980s developmental psychologists had come to acknowledge other factors. This recognition was fully solidified by De Wolff and Van IJzendoorn's 1997 meta-analysis on sensitivity and child attachment. Yet already by the mid-1980s, Lamb had raised the question of whether it was caregiver sensitivity, rather than children's expectations about care as measured in the Strange Situation, that was the more relevant predictor of later development. Main and Hesse proposed alarming behaviour as another critical aspect of caregiving with implications for attachment relationships and for later development.

Researchers also drew on Main's work to reconceptualize Ainsworth's concept of caregiver sensitivity as, in fact, an index or effect of the caregiver's capacity to give attention to the child and their needs. In a strong version of the claim for the secondary status of sensitivity, Fonagy, Steele, and Steele drew on Main's work to argue that it was the caregiver's

<sup>564</sup> M. Ainsworth, personal communication to Wartner, May 1, 1984, cited in Wartner, U. G. (1987) Attachment in infancy and at age six, and children's selfconcept: A follow-up of a German longitudinal study. Unpublished doctoral dissertation, University of Virginia, Charlottesville, p. 3.

<sup>565</sup> Van IJzendoorn, M. H. (1983) *Van wijsgerige naar theoretische pedagogiek. Over de taken van de theoretische pedagogiek bij onderzoek naar vroegkinderlijke opvoeding (oratie)*. Deventer: Van Loghum Slaterus.

<sup>566</sup> Goldsmith, H. H. & Alansky, J. A. (1987) Maternal and infant temperamental predictors of attachment: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 55(6), 805–816.

capacity to attend to and conceptualize the mind of their child that was shaping both sensitive care and the child's expectations about the caregiver.<sup>567</sup> Into the 1990s, Slade drew on similar ideas in the construction of the Parent Development Interview.<sup>568</sup>

Additional changes to attachment research were underway, transforming the shape of the paradigm. One was the growth of research on attachment-based interventions. From 1980, small studies had begun to scientifically test the effectiveness of parenting interventions developed on the basis of attachment research, and evaluated in terms of impact on caregiving measured using attachment instruments.<sup>569</sup> By the late 1980s, there were a good number of well-designed such studies, with somewhat larger samples.<sup>570</sup> Many of these interventions aimed to improve caregiver sensitivity, including those of Spieker and colleagues,<sup>571</sup> Bustan and Sagi,<sup>572</sup> and Van IJzendoorn, Juffer, and Bakermans-Kranenburg (Chapter 4). Others sought to improve caregivers' processing of attachment-relevant information, or generally provide support for the functioning of the caregiving system.<sup>573</sup> This early work would provide essential platform for later attachment-based interventions targeting alarming caregiver behaviour, such as Attachment and Biobehavioral Catchup.<sup>574</sup>

Within this changing context, a number of remarkable developmental psychologists from outside of Ainsworth's circle began to undertake research on attachment. The work of these scholars was often in a profound dialogue with Bowlby, Ainsworth, and Main. Part of the strength of the empirical work of these researchers stemmed from the depth of

<sup>567</sup> Fonagy, P., Steele, H., & Steele, M. (1991) Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development*, 62(5), 891–905. It might be thought that the role of caregiver reflective functioning would readily have been identified regardless of the work of Main and colleagues, since it drew from prominent ideas already in circulation in psychoanalytic theory and developmental psychology, as well as threads in Ainsworth's work. For instance, an earlier study supervised by the Grossmanns had explored associations between Strange Situation classifications and mothers' thinking about their child's perspective, behaviour and role in the family, and whether they can acknowledge the good and difficult aspects of being a parent. Dorsch, K. (1985) Analyse von Interviews mit Müttern über die Beziehung zu ihren zweijährigen Kindern. Unpublished doctoral thesis, Regensburg University. Yet the Dorsch study found no relationship between mothers' reflective function and the Strange Situation. It may well be that aspects of the Main and colleagues' work contributed to the success of the work of Fonagy, Steele, and Steele, such as the meta-cognitive monitoring scale and the AAI questions requesting descriptions and examples of caregivers, as a more demanding and incisive obstacle course for assessing reflective functioning.

<sup>568</sup> Slade, A., Belsky, J., Aber, J. L., & Phelps, J. L. (1999) Mothers' representations of their relationships with their toddlers: Links to adult attachment and observed mothering. *Developmental Psychology*, 35(3), 611–619. See also Meins, E., Fernyhough, C., Fradley, E., & Tuckey, M. (2001) Rethinking maternal sensitivity: Mothers' comments on infants' mental processes predict security of attachment at 12 months. *The Journal of Child Psychology and Psychiatry and Allied Disciplines*, 42(5), 637–648.

<sup>569</sup> For example, Larson, C. P. (1980) Efficacy of prenatal and postpartum home visits in child health and development. *Pediatrics*, 66, 191–197; Field, T. M., Widmayer, M., Stringer, S., & Ignatoff, E. (1980) Teenage, lower-class, Black mothers and their preterm infants: An intervention and developmental follow-up. *Child Development*, 51, 426–436; Metzl, M. N. (1980) Teaching parents a strategy for enhancing infant development. *Child Development*, 51, 583–586.

<sup>570</sup> For example, Olds, D. L., Henderson, C. R., Chamberlin, R., & Tatelbaum, R. (1986) Preventing child abuse and neglect: A randomized trial of nurse home visitation. *Pediatrics*, 78, 65–77; Barnett, B., Blignault, L., Holmes, S., Payne, A., & Parker, G. (1987) Quality of attachment in a sample of 1-year-old Australian children. *Journal of the American Academy of Child & Adolescent Psychiatry*, 26(3), 303–307; Beckwith, L. (1988) Intervention with disadvantaged parents of sick preterm infants. *Psychiatry*, 51, 242–247.

<sup>571</sup> Barnard, K. E., Magyary, D., Sumner, G., Booth, C. L., Mitchell, S. K., & Spieker, S. (1988) Prevention of parenting alterations for women with low social support. *Psychiatry*, 51(3), 248–253.

<sup>572</sup> Bustan, D., & Sagi, A. (1984) Effects of early hospital-based intervention on mothers and their preterm infants. *Journal of Applied Developmental Psychology*, 5(4), 305–317.

<sup>573</sup> For reviews, see Egeland, B., & Erickson, M. F. (1993) Attachment theory and findings: Implications for prevention and intervention. In S. Kramer & H. Parens (eds), *Prevention in Mental Health: Now, Tomorrow, Ever?* (pp. 21–50). Northvale, NJ: Aronson; Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2003) Less is more: Meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin*, 129(2), 195.

<sup>574</sup> Dozier, M. & Bernard, K. (2019) *Coaching Parents of Vulnerable Infants: The Attachment and Biobehavioral Catch-up Approach*. New York: Guilford.

their understanding and engagement with the rich proposals and loose ends of Bowlby, Ainsworth, and Main, and lack of complacency about attachment theory and concepts, which in turn is why their work is interesting to revisit today. Though making contributions across a number of domains within developmental psychology, several of these scholars came to self-describe—especially in the 1990s and early 2000s, but some still into the present—as ‘attachment researchers’, which appeared to become part of their identity.

Entry into attachment research shaped, and in some ways, constrained their thinking and research. Theories and the social infrastructures that sustain them together prefigure the characters who might use the theory.<sup>575</sup> Yet the developmental scientists who embarked on careers of attachment research in the 1980s also deflected aspects of this prefiguring process, making room for creativity, renewal and enlargement of what being an attachment researcher might entail. They did this in different ways, giving their work distinctive strengths and primary concerns. This is part of the tension, and part of the adventure, that I hope to convey over the subsequent chapters.

<sup>575</sup> Callon, M. (2007) What does it mean to say that economics is performative? In D. MacKenzie, F. Muniesa, & Siu, L. (eds), *Do Economists Make Markets? On the Performativity of Economics* (pp. 311–357). Princeton, NJ: Princeton University Press.



# Karlen Lyons-Ruth, the Harvard Family Pathways Study, and the Mother–Infant Neurobiological Development (MIND) Study

## Biographical Sketch

Karlen Lyons-Ruth began to teach attachment theory and Ainsworth's research to undergraduates during graduate school in developmental psychology in the early 1970s. She found that Ainsworth's work opened up many questions about psychopathology as well as about normal development, so during her graduate studies she also trained as a clinical psychologist. In 1975 Lyons-Ruth visited Ainsworth, who offered encouragement, especially regarding Lyons-Ruth's plans to examine attachment relationships in a sample facing considerable adversity and clinical need.<sup>1</sup> After graduation, Lyons-Ruth practiced at the Cambridge Hospital associated with Harvard Medical School. She became an important figure among clinicians engaged in updating psychoanalytic theory and technique, including as one of the founding members of the Boston Change Process Study Group. Lyons-Ruth continued to pursue empirical developmental research, gaining federal funding for the Family Support Project, a study evaluating the effects of a parenting intervention for families in Boston facing multiple adversities. Based in a clinical setting, Lyons-Ruth's graduate students were either psychology interns or graduate students in local PhD programmes who sought out her lab and were interested in doing their dissertations with her. Lyons-Ruth was both captivated and haunted by the observations and transcripts from her study of high-risk families, and passionate about understanding them. Relying on federal funding to conduct research, Lyons-Ruth led the longitudinal follow-up of this sample, which became the Harvard Family Pathways Study. The study would be described by Target as offering 'intriguing developmental psychopathology data that challenge our current understandings and provide important clues for appropriate clinical interventions'.<sup>2</sup> Target praised the 'care, creativity, and combination of research and clinical sophistication' that has characterized Lyons-Ruth's work. After the Minnesota Longitudinal Study of Risk and Adaptation, the Harvard study has functioned as the second multi-decade study of attachment and risk, providing both important corroborations and extensions. Lyons-Ruth and colleagues adapted or drew from measures developed by Mary Main in research with their risk sample, including development of a new Hostile/Helpless classification for the Adult Attachment Interview, and the AMBIANCE assessment of disrupted caregiver behaviours. Research from the Harvard Family Pathways Study has also generated important findings

<sup>1</sup> Lyons-Ruth, K., Bureau, J. F., Easterbrooks, M. A., Obsuth, I., Hennighausen, K., & Vulliez-Coady, L. (2013) Parsing the construct of maternal insensitivity: Distinct longitudinal pathways associated with early maternal withdrawal. *Attachment & Human Development*, 15(5–6), 562–582, p. 579.

<sup>2</sup> Target, M. (2007) The interface between attachment and intersubjectivity: Another contribution from Karlen Lyons-Ruth. *Psychoanalytic Inquiry*, 26(4), 617–621, pp. 617, 621.



regarding relationships between parenting, attachment, and mental health, including personality disorder and dissociative symptoms. Recent work by Lyons-Ruth and colleagues has examined links between attachment relationships and children's neurology and neuroendocrinology. As well as contributing to attachment research, Lyons-Ruth has served as mentor for important younger attachment researchers, including Sheri Madigan and Jean-François Bureau. She won the Lifetime Achievement Award from the Society for Emotion and Attachment Studies in 2024.

## Introduction

This chapter begins by situating Lyons-Ruth's clinical approach to attachment research, based on reflections on the respective strengths and limitations of psychoanalytic and attachment theory. This includes her perspective on human psychological development, trauma, and how change happens within psychotherapy. I then go on to introduce her Harvard Family Pathways Study, a groundbreaking decades-long longitudinal study of caregivers at risk for inadequate care of their infants. I will discuss the early research of Lyons-Ruth and colleagues on aspects of insensitivity and insecurity in the dyads, and her influential findings regarding prediction from disorganized attachment to later externalizing problems. The chapter will then discuss and evaluate ways that Lyons-Ruth's team innovated on existing measures of attachment and caregiving in seeking to make them more suited to families facing multiple adversities. When the children in the sample were young adults, Lyons-Ruth and colleagues conducted follow-up assessments, with striking findings regarding links between early care and later mental health difficulties. This has prompted Lyons-Ruth's current focus on neuroscientific research, including in a new larger sample.

Lyons-Ruth's entry into research occurred in the context of the emergence of developmental psychopathology as a movement or meta-paradigm within developmental science, led especially by Dante Cicchetti.<sup>3</sup> The movement provided a source of inspiration for longitudinal research with at-risk populations.<sup>4</sup> It also offered a body of empirical findings demonstrating the importance of experiences of compounding adversity for the development of mental health difficulties. Early research in developmental psychopathology highlighted the role of poverty, contextual risks, and conflictual family relationships in the prediction of a variety of mental health outcomes for individuals and across generations.<sup>5</sup> The compounding of adversities seemed to be much more predictive than any 'main effect' from single causes.

<sup>3</sup> Cicchetti, D. (1990) A historical perspective on the discipline of developmental psychopathology. In J. Rolf, A. Masten, D. Cicchetti, K. Nuechterlein, & S. Weintraub (eds), *Risk and Protective Factors in the Development of Psychopathology* (pp. 2–28). New York: Cambridge University Press.

<sup>4</sup> Lyons-Ruth, K. (2003) Dissociation and the Parent–Infant Dialogue: A longitudinal perspective from attachment research. *Journal of the American Psychoanalytic Association*, 51, 883–911: 'In 1989, the launching of the journal *Development and Psychopathology* marked the birth of a new discipline. At that point, video-based observational methodologies for studying patterns of infant attachment behaviors, face-to-face interaction, parent-child interaction, and peer relations had been honed in normative, nonclinical studies and were beginning to be applied to the study of infants at risk for psychopathology. The then new application of longitudinal and developmental methodologies to the study of psychopathology carried with it the promise that the multiple causal contributors to child and adult psychopathology could eventually be identified and tracked from conception onward' (883–884).

<sup>5</sup> Garnezy, N. (1974) Children at risk: The search for the antecedents of schizophrenia. Part I. Conceptual models and research methods. *Schizophrenia Bulletin*, 1(8), 14–90; Rutter, M. & Quinton, D. (1984) Parental psychiatric disorder: Effects on children. *Psychological Medicine*, 14(4), 853–880.

As described in *Cornerstones*, the field of developmental psychopathology was influenced by the theoretical positions of Alan Sroufe and Byron Egeland and findings from their Minnesota Longitudinal Study of Risk and Adaptation. Belsky has speculated that there might well not have been a developmental psychopathology movement without the model of the Minnesota group and their work on attachment.<sup>6</sup> Sroufe and Rutter's 1984 article, 'The domain of developmental psychopathology', was a turning-point for developmental psychopathology, as a number of related trends within developmental science resolved into an explicit and self-identified alternative movement for the study of mental health.

Whereas the dominant medical model started from adult diagnostic categories and explored precursors, developmental psychopathology was defined by a concern to study 'the origins and time course of a given disorder, its varying manifestation with development, its precursors and sequelae, and its relation to nondisordered patterns of behaviour. Thus, developmental psychopathologists may be just as interested in a group of children showing precursors of a disordered behavior pattern, but not developing the disorder proper, as the group that in time manifested the complete pathology.'<sup>7</sup>

Attachment was a central concern for developmental psychopathology in its first decades. It provided both theory and empirical results supporting the role of transdiagnostic, developmental processes for mental health.<sup>8</sup> The Minnesota Longitudinal Study of Risk and Adaptation provided ample evidence of the continuing importance of early experiences across different areas of life. This included enduring associations between early experiences of abuse and later relationships with peers and romantic partners, as well as mental health symptoms such as externalizing behaviours and dissociation. On a personal level, Sroufe had supervised Cicchetti's doctoral studies, and was a tremendous influence. Having grown up in an impoverished and dangerous environment, Cicchetti found in Sroufe a secure base for his personal and professional development.<sup>9</sup> In turn, developmental psychopathology as a movement used attachment research as a secure base.<sup>10</sup>

Part of the capacity of the Minnesota group to serve this role stemmed from their use of multiple forms of measurement for their key variables, offering a degree of dependability. The Minnesota group were trying to feel their way, hoping to distil the general trends in their data to establish the theory and methods offered by Ainsworth and Main as an empirical science: 'this structure must be secured through observation.'<sup>11</sup> Their approach to statistical analysis focused on identifying broad-band relationships, making extensive use

<sup>6</sup> Belsky, J. & Nezworski, T. (1988) Clinical implications of attachment: An introduction. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 3–17). Hillsdale, NJ: Lawrence Erlbaum Associates, p. 7.

<sup>7</sup> Sroufe, L. A. & Rutter, M. (1984) The domain of developmental psychopathology. *Child Development*, 55(1), 17–29, p. 18.

<sup>8</sup> Rutter, M. (1983) Stress, coping and development: Some issues and some questions. In N. Garmezy & M. Rutter (eds), *Stress, Coping, and Development in Children* (pp. 1–42). Baltimore: Johns Hopkins University Press, p. 23.

<sup>9</sup> Cicchetti has recalled that, at the start of his graduate studies, he had terrible nightmares, inflected by unbearable feelings from his childhood. These dreams changed with time, to repeated narratives of Sroufe saving him from threats. Towards the end of his graduate studies, Cicchetti increasingly had dreams of being hardy and able to cope himself, having internalized Sroufe's support. Discussant remarks by Dante Cicchetti at the MindinMind Legacy Interview with Alan Sroufe, 28/3/2024, [www.mindinmind.org.uk](http://www.mindinmind.org.uk). See also Cicchetti, D. (2004) Biography. *American Psychologist*, 59(8), 728–731.

<sup>10</sup> Indeed, at times the story of the possibilities and development of security, including in the face of adversity, functioned as a symbol, expression and promise for developmental psychopathology itself. Cf. Moretti, F. ([1983] 2005) *Signs Taken for Wonders: On the Sociology of Literary Forms*. New York: Verso.

<sup>11</sup> Carlson, E. A., Sroufe, L. A., & Egeland, B. (2004) The construction of experience: A longitudinal study of representation and behavior. *Child Development*, 75(1), 66–83, p. 77.

of basket variables by compositing together different measures. For instance, attachment classifications from the Strange Situation at 12 and 18 months, and observations of maternal sensitivity and intrusiveness, were often all heaped into an 'early caregiving composite'. Occasionally more specific tests were conducted when warranted by theoretical propositions, such as examining the role of maternal sensitivity and intrusiveness as predictors of attachment security. However, use of composites was the norm.

Lyons-Ruth's statistical approach reflects her different mission. Like the Minnesota group, she wanted to examine attachment relationships in an at-risk sample. However, rather than examining whether Ainsworth and Main's theories and methods would have relevance, Lyons-Ruth sought to examine whether attachment relationships were shaped by similar or different processes between community and at-risk contexts: 'rather than attempting to fit attachment patterns seen in high-risk or clinical samples into descriptors developed for normative populations, what is needed is further description of the specific attachment behaviors and internal models characteristic of the clinical groups themselves; these patterns are likely to be more complex and contradictory than those prevalent in nonclinical samples'.<sup>12</sup>

Furthermore, Lyons-Ruth was interested from a clinical perspective as to whether more specific, localized aspects of atypical caregiving might have decisive importance. She held that 'small-scale, carefully done exploratory studies play an important role in emerging areas of science', examining 'possible influences and assessment paradigms to identify those that warrant more expensive and long-range studies. Committing to large-scale studies too soon in the development of a field runs the risk of foreclosing this exploratory phase and weakening rather than strengthening future work'.<sup>13</sup> The proposals about causal relationships offered by Lyons-Ruth and collaborators are intended without arrogance: they are novel avenues for exploration, not certainties.

As we saw in [Chapter 1](#), most researchers in the developmental tradition regarded the major questions of theory and methodology in the study of attachment to be adequately addressed by the late 1990s. The Minnesota group, for instance, set out to replicate the findings of Ainsworth and Main, and assess the correlates of the instruments they and their groups had introduced. For her part, Lyons-Ruth carefully engaged with the perspectives of Ainsworth and Main, partially took them on, but also pursued further innovation and exploration in the context of discovery. It was characteristic of Lyons-Ruth and her students and mentees to highlight a contingency and historicity in the methods adopted by attachment research following Ainsworth and Main, which other researchers tended to forget or dismiss.<sup>14</sup> Running counter to simplified accounts circulating widely ([Chapter 1](#)), Lyons-Ruth also had an unusually strong understanding of Main's work, its details, strengths, and its points of tension or difficulty.<sup>15</sup> From her earliest research to the present, this has been a major asset to her scientific research, especially when placed into conversation with her clinical perspective.

<sup>12</sup> Agrawal, H. R., Gunderson, J., Holmes, B. M., & Lyons-Ruth, K. (2004) Attachment studies with borderline patients: A review. *Harvard Review of Psychiatry*, 12(2), 94–104, p. 103.

<sup>13</sup> Lyons-Ruth, K., Pechtel, P., Yoon, S. A., Anderson, C. M., & Teicher, M. H. (2016) Disorganized attachment in infancy predicts greater amygdala volume in adulthood. *Behavioural Brain Research*, 308, 83–93, p. 91.

<sup>14</sup> For example, Bureau, J.-F., Deneault, A.-A., Yurkowski, K., & Lyons-Ruth, K. (2018) Traumas multiples et attachement: L'importance du retrait maternel dans les premières années de vie. In N. Godbout, D. Collin-Vezina, & T. Milot (eds), *Le trauma complexe: comprendre, évaluer et intervenir* (pp. 116–136). Québec: Presses de l'Université du Québec.

<sup>15</sup> See, for example, Lyons-Ruth, K. & Jacobvitz, D. (1999) Attachment disorganization: Unresolved loss, relational violence, and lapses in behavioral and attentional strategies. In J. Cassidy & P. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Implications* (pp. 520–554). New York: Guilford.

## Between Developmental Science and Psychoanalysis

### Appraising Psychoanalytic Theory

Few readers of Lyons-Ruth's work in developmental science have examined her papers on psychoanalytic theory in any detail, and vice versa. However, it is important to recognize that Lyons-Ruth has been a practising psychodynamic clinician throughout her career. She trained in the inpatient service at Mclean Hospital as an intern, learning to provide psychodynamic psychotherapy, the dominant form of therapy at McLean at the time. She then set up a private practice and also joined the clinical outpatient service at Cambridge Hospital, first providing direct services and then as a supervisor to psychology and psychiatry interns and residents:

Because Cambridge Hospital serves a largely low-income, uninsured population, our patient group has always had a high rate of childhood trauma and more severe psychiatric diagnoses, including borderline personality disorder, dissociative disorder, and various forms of psychosis. So, in my clinical work, I observed first-hand the importance of early attachment relationships and maltreatment in shaping subsequent psychiatric disorders, which very much influenced my interest in demonstrating that the clinical phenomena that I was observing could be scientifically described and investigated in a rigorous and reliable way.<sup>16</sup>

Lyons-Ruth's early interests as a researcher may be situated in the context of movements towards rapprochement between developmental science and psychoanalytic theory in the early 1990s.<sup>17</sup> Indeed, some of her research would be partially funded by the Fund for Psychoanalytic Research from the American Psychoanalytic Association. Lyons-Ruth found these two domains of scholarship mutually illuminative, and attention to both is needed to understand her perspective on attachment and research priorities. She was mindful of the institutionalized hierarchies between clinical and academic knowledge; for her part, Lyons-Ruth had respect for both forms of knowledge. Her direction of inquiry followed very much in the footsteps of Bowlby, who observed repeatedly across his career:

There has been a deplorable tendency for the experimentalist to despise the clinician's lack of precision and the clinician to reciprocate with contempt for the experimentalist's lack of insight into human nature. Each has stoutly maintained that his own method was the one true way to knowledge. These claims are absurd: each method is indispensable. It is the clinician who usually has the earliest insights, defines the problem, and formulates the first hypotheses. By the detailed minute study of the feelings and motivations of his patients, and the complicated intellectual and emotional repercussions to which they give rise, the clinical worker provides information regarding the relations of psychic and environmental forces which can be obtained in no other way.<sup>18</sup>

Like Bowlby, Lyons-Ruth was fascinated by the clinical literature, which 'contains detailed portraits of the recurrent meanings that accrue in family relationships, the intricate defensive maneuvers available to distort those meanings, and the repetition of those

<sup>16</sup> K. Lyons-Ruth, personal communication, September 23, 2024.

<sup>17</sup> Emde, R. N. & Fonagy, P. (1997) An emerging culture for psychoanalytic research? *The International Journal of Psycho-Analysis*, 78(4), 643–651.

<sup>18</sup> Bowlby, J. (1951) *Maternal Care and Mental Health*. Geneva: WHO Report, p. 61. See also Bowlby, J. ([1978] 1988) Psychoanalysis as art and science. In J. Bowlby, *A Secure Base* (pp. 43–64). London: Routledge,

meaning-based control systems in new relationships.<sup>19</sup> Jean-François Bureau recalls from collaborative work that the first versions of Lyons-Ruth's papers have often been twice or three times the permissible length, bursting with details from her clinical observations or the clinical literature, which form the fundamental basis for her thinking.<sup>20</sup> Her published papers, radically cut back on these details, are only what is visible of the plant above the soil.

Lyons-Ruth emphasized the inspiration Ainsworth had taken from psychoanalytic theory in the identification of the avoidant attachment classification, which in turn had seemed to offer demonstrable, replicable evidence for defensive processes in infancy. She also highlighted the ideas Main had drawn from psychoanalytic theory in considering links between patterns of infant behaviour to adult autobiographical discourse.

Lyons-Ruth was also impressed by the insights Bowlby had taken from psychoanalysis in understanding disturbances in individual's knowledge of themselves. In this regard, she was enthusiastic about the Adult Attachment Interview (AAI) as a 'scientifically tractable index of psychodynamic organization,'<sup>21</sup> since its focus is not on what events happened to the speaker, but on disturbances and defences that obscure their self-understanding. Lyons-Ruth was rather ambivalent about research on attachment in the social psychological tradition, suspecting that it measures something of note, but keen where possible to depend upon observational and physiological measures in understanding child development and child-caregiver relationships.

In her own research Lyons-Ruth did use self-report measures, and even has one paper—albeit something of an outlier—proposing a self-report assessment of attachment.<sup>22</sup> She was, in the absence of other data, heavily reliant on parental self-report of experiences of childhood abuse and neglect, including in validating the new Hostile/Helpless categories for the AAI. But she was mindful that retrospective reports of abuse and neglect may have limitations and differ from the findings of prospective research. In general, she tended to look for convergent evidence, especially from observational data or specific examples provided by respondents, before drawing conclusions from self-report measures. And at times she took inspiration from psychoanalytic approaches in interpreting their results.

For instance, some of the mothers in her longitudinal study, faced with extremely challenging personal circumstances, nonetheless reported a score of zero on standardized measures of depression.<sup>23</sup> In general, studies in the period had begun to find that mothers depressive symptoms were positively correlated with the accuracy of their reports about their children and parenting.<sup>24</sup> Yet Lyons-Ruth suspected that a score of zero represented denial, rather than a genuinely good situation. In fact, they had a distinct profile of parenting behaviours, one which would not have been identified without the psychoanalytic inspiration to doubt their report.

Specifically, a score of zero was associated with few angry behaviours towards the infant by the caregiver, but high scores on covert hostility and interfering manipulation. Just as

<sup>19</sup> Lyons-Ruth, K. (1998) Commentary on Steele and Steele: Lexicons, eyes, and videotape. *Social Development*, 7(1), 127–131, p. 127.

<sup>20</sup> J. F. Bureau, personal communication, March 22, 2024.

<sup>21</sup> Hobson, R. P., Patrick, M., Kapur, R., & Lyons-Ruth, K. (2018) Research reflections. In *Consultations in Psychoanalytic Psychotherapy* (pp. 183–203). London: Routledge, p. 200.

<sup>22</sup> Holmes, B. M., & Lyons-Ruth, K. (2006) The relationship questionnaire-clinical version (RQ-CV): Introducing a profoundly-distrustful attachment style. *Infant Mental Health Journal*, 27(3), 310–325.

<sup>23</sup> Lyons-Ruth, K., Zöll, D., Connell, D., & Grunebaum, H. U. (1986) The depressed mother and her one-year-old infant: Environment, interaction, attachment, and infant development. *New Directions for Child and Adolescent Development*, 1986(34), 61–82.

<sup>24</sup> Conrad, M. & Hammen, C. (1989) Role of maternal depression in perceptions of child maladjustment. *Journal of Consulting and Clinical Psychology*, 57(5), 663–667.

negative feelings were denied in the self-report measure, so the mothers with a score of zero appeared to be keeping angry emotions in check in interactions with their infants. The infant-caregiver relationships were nonetheless found to be avoidantly attached in the Strange Situation. Such findings suggest the defensive exclusion of negative emotion these caregivers were using to protect themselves and their child was nonetheless linked to their child's expectation that the caregiver would not respond to their bids for comfort when distressed.<sup>25</sup>

Though impressed by the inspiration that could be taken from psychoanalytic theory and clinical reports, Lyons-Ruth was nonetheless also dismayed by 'the weaknesses of psychoanalytic metatheory'.<sup>26</sup> In the 1960s, Bowlby felt that the particular weaknesses of psychoanalytic theory were the confusion between genuine insights into child development with speculative ideas about drives and extrapolations from the narratives of unwell adults. Decades later, Lyons-Ruth nonetheless observed much the same situation. She felt that the weaknesses in psychoanalytic theory were 'nowhere more evident than in its developmental aspects, where solid developmental insights mingle with lingering traces of drive theory and with concepts extrapolated to infants and toddlers from work with disturbed adults'.<sup>27</sup> Clinical work was regarded by Lyons-Ruth as providing a tremendous source of insight into potential causal processes relevant to mental health, but as possessing few tools for sifting these models and semi-theories, beyond what was felt to resonate for individual clinicians. Observations from the clinic and the clinical literature needed to be poured, gurgling and hiccupping, into the more stable containers of the research process.

An example was Margaret Mahler's characterization of frustration and conflict between child and caregiver centred around the child's need for comfort as normative to a particular developmental stage. Lyons-Ruth regarded this theory as a generalization of clinical work with distressed children, rather than a good characterization of normative development. She argued that frustration and conflict between child and caregiver centred around the child's need for comfort might occur in any relationship, but where such difficulties were sustained or frequently repeated, this likely reflected an insecure attachment relationship: 'Toddlers with secure attachment histories may not experience the challenge of integrating intensely positive and intensely negative images of the caregiver to any emotionally significant degree, whereas this struggle may dominate the affective experience of other toddlers'.<sup>28</sup>

Lyons-Ruth was also concerned that psychoanalytic theory had a tendency to veer towards an account of mental life focused on the one-person level, with defences viewed as intra-psychoic structures. In her teaching to clinicians and her research publications, she emphasized that developmental science was well positioned to contribute to refinements in psychoanalytic theory, not only by seeking to specify and test specific causal hypotheses, but also by refocusing attention to the relational context of development, within which human mental life emerges and occurs.<sup>29</sup> A central strength of attachment theory and research for Lyons-Ruth is that, 'in contrast to an intrapsychic theory of defense', it is a

<sup>25</sup> Spieker and Booth likewise found that mothers of avoidant infants reported the lowest mean depression scores. See Spieker, S. & Booth, C. (1988) Maternal antecedents of attachment quality. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 95–135). Hillsdale, NJ: Erlbaum.

<sup>26</sup> Lyons-Ruth, K. (1998) Commentary on Steele and Steele: Lexicons, eyes, and videotape. *Social Development*, 7(1), 127–131, p. 127.

<sup>27</sup> Ibid. 127.

<sup>28</sup> Lyons-Ruth, K. (1991) Rapprochement or approachment: Mahler's theory reconsidered from the vantage point of recent research on early attachment relationships. *Psychoanalytic Psychology*, 8(1), 1–23, p. 16.

<sup>29</sup> Lyons-Ruth, K. (2017) Revisiting the idealizing transferences: 'Needful Things' and the Faustian bargain. *Psychoanalysis, Self and Context*, 12(3), 197–210, p. 215.

‘two-person theory of conflict and defense. It emphasizes the coping defensive processes required to deal with fearful arousal within a particular set of attachment relationships.’<sup>30</sup>

Lyons-Ruth was especially impressed by Main’s lamination of function (‘adaptive strategies’) and perception (‘attentional strategies’) in the concept of conditional strategies (Chapter 1). She was persuaded by the idea that avoidance serves as an adaptation and response to the child’s caregiving environment, maintaining a degree of closeness with a caregiver who may rebuff direct displays of proximity-seeking.<sup>31</sup> The idea that adaptive strategies are also attentional strategies impressed Lyons-Ruth in helping to understand distortions in communication, and how these distortions may represent a response to repeated developmental experiences within attachment relationships.

### Implicit Relational Knowing

From 1995, Lyons-Ruth was one of the inaugural members of The Boston Change Process Study Group. Other members of this collective of eminent analytic clinicians and clinical researchers included Daniel Stern, Nadia Bruschweiler-Stern, Louis Sander, and Edward Tronick. The group set out to explore how developmental research on infancy could help inform thinking about change processes in the context of psychotherapy,<sup>32</sup> and their reflections have been highly lauded, including by international attachment researchers.<sup>33</sup>

Since the early days of psychoanalysis, there had been dissatisfaction with the ‘classical technique’ of psychoanalytic treatment, where interpretations of patient remarks are offered by the clinician as their primary means of helping the patient. Several early psychoanalysts argued that patients first needed to receive support in establishing relationships within which the silences and the interpretations could be meaningful and useful.<sup>34</sup> For example, Anna Freud found that patients were most likely to improve when she offered undivided attention, helped the patient recognize and verbalize feelings and develop an account of themselves and their needs, and clarify the reality of situations and of cause and effect.<sup>35</sup> Supportive interaction with the analyst seemed itself to offer benefit through changing patients’ assumptions about themselves and social relationships. However, Anna Freud was ambivalent about making changes to her father’s clinical technique, and did not develop a theory of how or why something more than interpretation was needed to bring about change in psychoanalytic treatment. This left analysts in a difficult position, as there was no model to make sense of the limitations of a clinical technique focused on interpretation or to support progress in the refinement of clinical practice.

In an unpublished paper circulated in the 1980s only to fellow analysts, Bowlby admitted that one of his goals in the development of attachment theory was to respond to this

<sup>30</sup> Lyons-Ruth, K. & Spielman, E. (2004) Disorganized infant attachment strategies and helpless-fearful profiles of parenting: Integrating attachment research with clinical intervention. *Infant Mental Health Journal*, 25(4), 318–335, p. 320.

<sup>31</sup> Lyons-Ruth, K. (1991) Rapprochement or approchement: Mahler’s theory reconsidered from the vantage point of recent research on early attachment relationships. *Psychoanalytic psychology*, 8(1), 1–23.

<sup>32</sup> Bruschweiler-Stern, N., Lyons-Ruth, K., Morgan, A. C., Nahum, J. P., Sander, L. W., Stern, D. N. S., Harrison, A. M., Tronick, E. Z. (Collaborators), & The Boston Change Process Study Group (2010) *Change in Psychotherapy: A Unifying Paradigm*. New York: Norton & Co.

<sup>33</sup> For example, Dugravier, R. (2024) La théorie de l’attachement. Origines et perspectives. *Enfances & Psy*, (1), 107–119.

<sup>34</sup> For example, Fenichel, O. (1941) *Problems of Psychoanalytic Technique*. Trans. D. Brunswick. Albany, NY: Psychoanalytic Quarterly, Inc.

<sup>35</sup> Freud, A. ([1956] 1969) The assessment of borderline cases. In *The Writings of Anna Freud, Volume 5* (pp. 301–314). New York: International Universities Press. See also Edgumbe, R. (1995) The history of Anna Freud’s thinking on developmental disturbances. *Bulletin of the Anna Freud Centre*, 18(1), 21–34.

difficulty, which he felt keenly in his work with patients.<sup>36</sup> He did not regard himself as someone with strong clinical intuition, and wanted to have some framework to help him support patients beyond offering speculative interpretations, which he felt could not only be ineffective but potentially harmful.<sup>37</sup> From available unpublished and published case material, his clinical technique appears to have remained focused on explicit communication and using questions to help the patient sort through their feelings about the past and present, rather than on supportive interactions to change patients' assumptions.<sup>38</sup> Though more of a balance can be seen than in classical psychoanalytic technique.

The Boston Change Process Study Group sought to address this question about the 'something more' than interpretation needed to help patients change and grow in therapy, responding to rising attention to the topic.<sup>39</sup> Lyons-Ruth largely wrote one of the first papers published by the group, published in 1998. She and colleagues proposed that 'interactional processes from birth onward give rise to a form of procedural knowledge regarding how to do things with intimate others, knowledge we call implicit relational knowing'.<sup>40</sup> This was a version of Bowlby's concept of internal working models (Chapter 1), emphasizing the importance of tacit expectations and approaches to relationships, which operate below the level of conscious awareness, but which have not been specifically blocked from awareness by defences. With work, implicit relational knowing can be transported into words, but it is not its native soil.

A disadvantage of Bowlby's concept of internal working model was that in principle it could refer to any cognitive content relevant to attachment relationships (e.g., explicit semantic knowledge, or implicit procedural knowledge). Bowlby himself, and several subsequent attachment researchers, had called for a respecification of the concept to focus on procedural knowledge and feelings about relationships.<sup>41</sup> The idea of implicit relational knowing was intended as a way of focusing attention on this particular role of procedural knowledge and feelings, which was so important for the attachment strategies identified by Ainsworth and colleagues in empirical attachment research with pre-verbal infants.

Another limitation of Bowlby's concept of internal working model was that, indebted to the cognitive science of the 1950s, it tended towards thinking about one person—the holder of the model—and the influences on this person of their experiences of care. In general, at this point Bowlby's account of internal working models tended to come to a close, giving the impression that such models would tend to be highly stable over time and applied indiscriminately across diverse relationships.

<sup>36</sup> Bowlby, J. ([1985] 2019) The role of the psychotherapist's personal resources in the treatment situation. In R. Duschinsky & K. White (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 212–221). London: Routledge.

<sup>37</sup> In 'Constructions in Analysis', Freud wrote that 'no damage is done if, for once in a way, we make a mistake and offer the patient a wrong construction as the probably historical truth'. Bowlby, in his marginalia, described Freud's stance as 'complacent'. Annotations, dated 1964, on p. 261 of Volume 23 of the Standard Edition of the *Complete Psychological Works of Sigmund Freud*; copy held in the library of Human Development Scotland.

<sup>38</sup> For example, three unpublished, undated case histories in 'Maternal Behaviour: Humans', John Bowlby Archive, Wellcome Collections, PP/Bow/H.136.

<sup>39</sup> For example, Mitchell, S. A. (1988) *Relational Concepts in Psychoanalysis: An Integration*. Cambridge, MA: Harvard University Press.

<sup>40</sup> Lyons-Ruth, K., Bruschweiler-Stern, N., Harrison, A. M., Morgan, A. C., Nahum, J. P., Sander, L., ... & Tronick, E. Z. (1998) Implicit relational knowing: Its role in development and psychoanalytic treatment. *Infant Mental Health Journal*, 19(3), 282–289, p. 282.

<sup>41</sup> Bowlby, J. ([c.1978–1979] 2019) The place of defensive exclusion in depressive disorders. In Duschinsky, R. & White, K. (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 97–103). London: Routledge; Crittenden, P. M. (1990) Internal representational models of attachment relationships. *Infant Mental Health Journal*, 11(3), 259–277; Bretherton, I. (1991) Pouring new wine into old bottles: The social self as internal working model. In M. R. Gunnar and L. A. Sroufe (eds), *Self-Processes and Development: The Minnesota Symposia on Child Development*, Vol. 23 (pp. 1–41). Hillsdale, NJ: Erlbaum Associates.



In part, this was Bowlby's clinical experience of patients' expectations about relationships, which he experienced as relatively intractable to change.<sup>42</sup> Bowlby was certainly aware that these expectations could change, and he emphasized the role of the therapist as a secure base for the patient in exploring alternative accounts of their past and present, adjusting their expectations about relationships: 'I see psychoanalytic therapy as an attempt to help a patient explore his own motives, his own model of the world and himself in it, and also to reconsider the validity of that model. Often I believe it is more valuable to raise questions for a patient than to attempt to inform him by means of interpretations.'<sup>43</sup> However Bowlby did not develop any elaborated account of what happens when the expectations of the patient interact with the expectations of the therapist, or how these interactions affect the therapeutic process. In fact, he felt that he did not understand these processes well.<sup>44</sup>

In an early unpublished manuscript from the 1930s, Bowlby developed ideas about implicit contracts that could organize relationships, based on the intersection of individuals' expectations of one another. Such implicit contracts could, for example, stabilize feelings like guilt, giving them an implicit and enduring role in shaping the tone of relationships, without the conscious awareness of the individuals involved but equally without assuming that the feelings were subject to repression.<sup>45</sup> But these early ideas were not incorporated into his later attachment theory, though they can be seen poking out around the edges in his 1979 paper on 'knowing what you are not supposed to know'.<sup>46</sup>

Unaware of Bowlby's early paper, but pursuing very similar questions, Lyons-Ruth and colleagues proposed that the patient and therapist each possess an implicit, workable sense of the other person's characteristic ways of being with others, and associated feelings and intentions, which shapes their reciprocal interaction. In Bowlby's terms, a kind of implicit contract, or fit, emerges regarding what patient and therapist might expect from one another, which then provides underpinning and implicit structure to their interactions and the affective cues they give one another. Lyons-Ruth and colleagues argued that many of the concerns of psychodynamic practice—including conflict, defence, and fantasy—operate primarily at the level of implicit social interactions, rather than either reflecting entirely conscious/narrative or unconscious processes within an individual.

The Boston Change Process Study Group proposed that change is facilitated in psychotherapy by incremental, small-scale interactions that contribute to the patient's experience of being invested in the therapeutic relationship, with a sense that the therapist is on their side, and that the relationship is reliable.<sup>47</sup> This may be regarded as akin to Bowlby's position that change is facilitated by the availability of the caregiver as a secure base from which the patient can explore their past and present. Bowlby also observed that 'lack of open communication between attachment partners may be associated with

<sup>42</sup> Bowlby, J. (1988) *A Secure Base*, London: Routledge.

<sup>43</sup> Bowlby, J. (1971) Letter to Graham Davies, 15 April 1971. PP/Bow/H.5.

<sup>44</sup> Bowlby, J. ([1985] 2019) The role of the psychotherapist's personal resources in the treatment situation. In Duschinsky, R. & White, K. (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 212–221). London: Routledge.

<sup>45</sup> Bowlby, J. ([c.1937–1939] 2019) Guilt and family contracts. In Duschinsky, R. & White, K. (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 141–165). London: Routledge.

<sup>46</sup> Bowlby, J. ([1979] 1988) On knowing what you are not supposed to know and feeling what you are not supposed to feel. In J. Bowlby, *A Secure Base*. London: Routledge, pp. 111–133.

<sup>47</sup> Boston Change Process Study Group (2018) Engagement and the emergence of a charged other. *Contemporary Psychoanalysis*, 54(3), 540–559.

restricted flow of information about attachment issues not only between partners, but within each partner's representational system.<sup>48</sup> Nonetheless, the Boston Change Process Study Group emphasized moment-to-moment interaction and attunement, in contrast to Bowlby's rather cognitive account.

In place of Bowlby's image of an individual reevaluating past and present on the basis of support from their therapist, the Boston Change Process Study Group characterized the relational context as the means through which change occurs. They proposed that 'the emergent directions of the individual are continually selected, reassembled, recontextualized, and redirected by the relational context. Functionally speaking, then, the relational unit is the crucible in which 'individual' intentions are forged.'<sup>49</sup> The directions taken by an individual emerge ultimately from their relationships, including their disarray or the pressures placed upon them.

Within and beyond the clinic, Lyons-Ruth argued, for humans 'meaning, including symbolic meaning, emerges from the to and fro of affective engagement with another, of following into the perspective of another and partially taking on that perspective.'<sup>50</sup> The meanings we have available to us to use in understanding ourselves and the world come from relationships, and negotiation with what we understand from the perspectives of others. Every one of our gestures or words is inflected by our history of past communicational exchanges, the people we had these exchanges with, our understanding of their intentions, and the spaces they opened or closed for who we might become.<sup>51</sup>

This account of meaning has considerable implications for thinking about attachment. Bowlby's primary image of the attachment behavioural system was of the infant moving away from the caregiver in exploration, monitoring the availability of the caregiver, and returning when reassurance or comfort is needed. Lyons-Ruth's account of how human meaning works led to a different perspective, developing Ainsworth's account of secure base provision and responsiveness to infant cues into an overarching focus on everyday intersubjective communication:

I would argue that current attachment research needs to be expanded in three critical directions:

first, from an emphasis on mechanisms of physical proximity and protection to an emphasis on mechanisms of intersubjective exchange;

<sup>48</sup> J. Bowlby, personal communication, June 1987, cited in Bretherton, I. (1990) Open communication and internal working models: Their role in the development of attachment relationships. In R. A. Thompson (ed.), *Socio-emotional Development, Nebraska Symposium on Motivation*, 1988 (pp. 57–113). Lincoln, NE: University of Nebraska Press.

<sup>49</sup> Boston Change Process Study Group (2005) The 'something more' than interpretation revisited: Sloppiness and co-creativity in the psychoanalytic encounter. *Journal of the American Psychoanalytic Association*, 53(3), 693–729, p. 715; see also Boston Change Process Study Group (2018) Engagement and the emergence of a charged other. *Contemporary Psychoanalysis*, 54(3), 540–559.

<sup>50</sup> Lyons-Ruth, K. (2006) Play, precariousness, and the negotiation of shared meaning: A developmental research perspective on child psychotherapy. *Journal of Infant, Child, and Adolescent Psychotherapy*, 5(2), 142–159, p. 153.

<sup>51</sup> Boston Change Process Study Group. (2005) Response to commentaries. *Journal of the American Psychoanalytic Association*, 53(3), 761–769: 'We are also in agreement regarding the positions of Quine and Bakhtin that beneath the generalized meanings of words lies a history of "past communicational exchanges [that] cling to our words"' (762).

second, from an emphasis on processes of comfort and soothing to an equal emphasis on processes involved in maintaining the baby's positive engagement with others;  
and, finally, from an emphasis on separation and loss events to an equal emphasis on the more continuous relational processes that regulate both positive engagement and the baby's fearful responses to challenging events.<sup>52</sup>

Whether or not a child achieved proximity with the caregiver when alarmed might be of less critical developmental importance than the broader experience of intersubjective communication emerging from the to and fro of affective engagement of the child and caregiver. For Lyons-Ruth, expectations about safe haven availability are *entailed* by intersubjective communication, much as gravitation is entailed by mass.

The theory of human meaning developed by Lyons-Ruth in conjunction with the Boston Change Process Study Group was also aligned with her personal conduct as a researcher. A notable characteristic of Lyons-Ruth has been her engagement with the perspectives of others, seeking influence and inspiration, able to partially take on a perspective, but also pursue exploration. Consideration of her perspective on human meaning also helps clarify Lyons-Ruth's absolute dismay at the obstacles to communication in the field of attachment research, with attachment terminology used in various and confusing ways, in-group/out-group dynamics, and misleading and simplified images of attachment theory abounding in practice contexts. Ainsworth, Sroufe, Waters, and colleagues were aware of these issues, but regarded them at the time as incidental and resolvable challenges rather than serious threats to the paradigm.<sup>53</sup> For Lyons-Ruth, such obstacles were essential threats to the generation, integrity, and stability of knowledge about caregiving and attachment, and the capacity of this knowledge to be selected, reassembled, recontextualized, and redirected to and fro in dialogue between research groups, and between research and practice settings. This is a perspective that she would nurture in her students and mentees, including Madigan (Chapter 5).

As one illustration of this interest in dialogue to clarify meaning, Lyons-Ruth and the Boston Change Process Study Group considered similarities and differences between their perspective and that of Peter Fonagy and colleagues. For Fonagy and colleagues, mental health difficulties often stem from patients' difficulties considering the past and present mental states of themselves and others. These difficulties in turn often stem from developmental experiences in which the mental states of oneself or others were experienced as overwhelming. Fonagy and colleagues hold that change in psychotherapy occurs when work in the clinic helps a patient develop skills in being able to consider mental states, including when feeling worried or threatened.<sup>54</sup>

For her part, Lyons-Ruth and colleagues argued that the critical developmental experiences are specifically those in attachment relationships where a child undergoes situations that leave them feeling alone and overwhelmed. For instance, a parent may step away from the infant's approach for comfort. Such implicit forms of interaction hinder the child's emergent capacities for emotion regulation and can predispose developmental pathways towards mental ill health. What are critical are routine interactions that contribute to and

<sup>52</sup> Lyons-Ruth, K. (2007) The interface between attachment and intersubjectivity: Perspective from the longitudinal study of disorganized attachment. *Psychoanalytic Inquiry*, 26(4), 595–616, p. 601.

<sup>53</sup> Waters, E. (1987) Outline for Winter Attachment Project: Compiled from written briefs (12/87). Unpublished manuscript.

<sup>54</sup> Bateman, A. & Fonagy, P. (2004) *Psychotherapy for Borderline Personality Disorder: Mentalization-Based Treatment*. Oxford: Oxford University Press.

stabilize an individual's forms of implicit relational knowing, not necessarily their capacity for considering the past and present mental states of themselves and others.

In turn, this has implications for clinical practice. Whereas mentalization-based approaches treat mentalizing as a capacity of the individual and as the problem to be addressed, Lyons-Ruth and colleagues placed greater emphasis on the patient's past and present social context and the quality of support that shapes the intersubjective field of their daily lives. Implicit relational knowing, stress reactivity, and the quality of relationships are regarded as three parts of a developmental whole. They also place greater emphasis on the importance of bit-by-bit change in implicit relational knowing through the implicit and affective communication of patient and therapist, whereas mentalization-based approaches have a tendency to conflate implicit relational knowing with *non-mentalizing*.<sup>55</sup> Fonagy and colleagues have subsequently sought to adjust their model and clinical practice to be more in line with the position of Lyons-Ruth.<sup>56</sup>

## Trauma

As we saw in [Chapter 1](#), Lyons-Ruth had regretted that Bowlby had left out of his work ideas from ethology about how the moment-to-moment, day-to-day interaction of offspring with their caregiver contributes to physiological regulation or dysregulation. In her view, 'physiological and psychological responses to threatening events in early childhood can be understood fully only in reference to the quality of psychobiological regulation available within primary attachment relationships.'<sup>57</sup> In an unpublished manuscript from the late 1960s, 'Anxiety, stress and homeostasis', this was exactly the direction Bowlby was himself thinking.<sup>58</sup> However Bowlby was not able to elaborate and integrate these ideas. His published account of how psychobiological regulation relates to attachment remained underdeveloped.

Lyons-Ruth's emphasis on the psychobiological not only took Lyons-Ruth beyond Bowlby, but also her colleagues in the Boston Change Process Study Group, for whom the implicit was predominantly conceptualized still in terms of affective cues, rather than implicating biological processes. Lyons-Ruth argued that sensitive caregiving does not only contribute to conscious expectations about the caregiver's availability, or implicit expectations about interaction. It also contributes to neuroendocrinological processes related to stress regulation. This included neuroendocrine pathways that organize transitions back from states of arousal to homeostatic recovery following environmental challenge.

In contrast to sensitive care, caregiving that leaves a child to manage stress themselves when faced with difficulties, or that is itself a source of alarm, may hinder the development of effective neuroendocrine recovery pathways. Lyons-Ruth pointed to supporting empirical evidence, such as findings from a study by Scheeringa and Zeanah that found that

<sup>55</sup> For other aligned reflections on the unsettled position of implicit processes within mentalizing theory, see also Davidsen, A. S., & Fosgerau, C. F. (2015) Grasping the process of implicit mentalization. *Theory & Psychology*, 25(4), 434–454; Køster, A. (2017) Mentalization, embodiment, and narrative: Critical comments on the social ontology of mentalization theory. *Theory & Psychology*, 27(4), 458–476.

<sup>56</sup> Luyten, P., Campbell, C., & Fonagy, P. (2020) Borderline personality disorder, complex trauma, and problems with self and identity: A social-communicative approach. *Journal of personality*, 88(1), 88–105.

<sup>57</sup> Schuder, M. & Lyons-Ruth, K. (2004) 'Hidden trauma' in infancy: Attachment, fearful arousal, and early dysfunction of the stress response system. In Osofsky, J. (ed.), *Young Children and Trauma* (pp. 69–104). New York: Guilford Press, p. 69.

<sup>58</sup> Bowlby, J. ([1969] 2021) Anxiety, stress and homeostasis. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 34–45). New York: Wiley.

the single best predictor of severity of posttraumatic symptomatology in young children was whether or not their caregivers had also been threatened by the events. This situation may reduce the caregiver's availability to support the child and also prompt alarming behaviours at times by the traumatized caregiver.<sup>59</sup>

Furthermore, Lyons-Ruth argued that discussions of trauma had been magnetized by the image of a child faced by an acute threat or mental assault, and so generally missed a whole hidden category of trauma experienced by children. Trauma from external threats is, she argued, especially relevant for older, verbal children, which is part of the reason for its prominence. Another category of threat are chronic and serious experiences of lack of regulation and support from a caregiver, where there may be no acute event, but rather a chronic situation in which a child experiences fear.

Such lack of regulation and support does not only lower the threshold for future trauma, by hindering psychobiological recovery pathways. Especially for younger children, Lyons-Ruth proposed that routine experience of caregiver emotional neglect can be an outright frightening and traumatic experience:

Arguably, the most primary and potent threat in infancy is not attack by predator, but neglect/abandonment by the caregiver. Neglect/abandonment, in turn, exposes the infant to a variety of threats to survival, including starvation and freezing, as well as exposure to predation and failure to develop.<sup>60</sup>

However even for older, verbal children who experience acute threat or mental assault, there can be a hidden dimension: where the threat comes from an attachment figure, as in the case of physical or sexual abuse, the harm 'involves two distinct processes that are confounded: a) occurrence of a physically threatening event and b) failure in the ongoing protective function of attachment figures', which therefore contains a component of emotional neglect in leaving the child alone with their fear.<sup>61</sup>

In such arguments, Lyons-Ruth was reengaging Bowlby's classic claims about the potential harm to child development from major caregiver absence, loss, or emotional neglect. These predicaments had in common that the child would be left without a way to achieve comfort and psychosocial regulation, with the attachment motivational system chronically unmet. Bowlby wrote that 'Freud defines trauma as a situation in which "the ego comes into contact with excessive libidinal demand"; for me it is a situation in which there is high motivation persisting over a period of time, a concept not very different.'<sup>62</sup> Many of Bowlby's colleagues, including Ainsworth, criticized Bowlby's formulation because it failed to distinguish what kinds of separations or forms of caregiver unavailability would be associated with negative outcomes.<sup>63</sup> This contributed to the impression that attachment theory would regard daycare as harmful in the same manner as emotional abuse (Chapter 3). Bowlby's basic claim that major caregiver absence, loss or emotional neglect increase

<sup>59</sup> Scheeringa, M. S. & Zeanah, C. H. (1995) Symptom expression and trauma variables in children under 48 months of age. *Infant Mental Health Journal*, 16(4), 259–270.

<sup>60</sup> Lyons-Ruth, K. (2024) Is neglect the first form of threat? Paper presented at the International Attachment Conference, Rouen, July 2024

<sup>61</sup> Lyons-Ruth, K., Yellin, C., Melnick, S., & Atwood, G. (2005) Expanding the concept of unresolved mental states: Hostile/helpless states of mind on the Adult Attachment Interview are associated with disrupted mother–infant communication and infant disorganization. *Development and Psychopathology*, 17(1), 1–23, p. 4.

<sup>62</sup> Bowlby, J. ([1962] 2019) Defences that follow loss: Causation and function. In Duschinsky, R. & White, K. (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 17–65). London: Routledge.

<sup>63</sup> Ainsworth, M. (1962) The effects of maternal deprivation: A review of findings and controversy in the context of research strategy. In *Deprivation of Maternal Care: A Reassessment of its Effects* (pp. 87–195). Geneva: WHO, p. 99.

the likelihood of negative child outcomes, and may be regarded as a kind of trauma, has nonetheless stood the test of time, albeit as a considerable generalization.

Lyons-Ruth felt that, with a few exceptions, attachment researchers had abandoned Bowlby's insight into the importance of deprivation and failed to follow up and elaborate on these ideas.<sup>64</sup> Refining published Bowlby's position, and aligned with his unpublished notes,<sup>65</sup> Lyons-Ruth argued that harm may be expected where a child experiences chronic and serious lack of regulation and support from a caregiver, especially young children, and that such experiences could be anticipated to be traumatic. Some of the child's symptoms may fit diagnostic criteria for PTSD. However, Lyons-Ruth agreed with Bowlby that major caregiver absence and emotional neglect would have consequences for psychological and social development that would extend beyond formal diagnostic criteria.

## The Harvard Family Pathways Study

### The Sample and Interventions

In 1980, Lyons-Ruth was awarded funding from NIMH for a study of interventions with the children of mothers with mental illness in the Boston area. Ten mothers living in poverty were identified as having difficulty caring for their infants due to psychological difficulties. They received the short-term support provided by local services, but no additional longer intervention. Another 34 mothers living in poverty were identified on the basis of clinical referral for psychological difficulties and/or history of social services involvement. These participants were randomly assigned to one of two intervention services. In one of the interventions, local mothers were employed to visit the families as once-a-week home visitors. In the other intervention, psychologists with psychoanalytic training offered once-a-week home visiting plus weekly group meetings in a neighbourhood location.<sup>66</sup> The interventions generally had considerable engagement from families: there was a 91% retention rate in the programme after the third home visit.

Both interventions had four goals:

1. 'Building an accepting and trustworthy relationship with the parent;
2. Increasing the family's competence in accessing community resources to meet basic needs;
3. Modeling and reinforcing more interactive, positive, and developmentally appropriate exchanges between mother and infant; and
4. Decreasing social isolation from other mothers.'<sup>67</sup>

In each case, 'the home visitor served both as an ombudsperson for the parent and as a model for a reliable and responsive attachment partner in relation both to the parent and to

<sup>64</sup> Lyons-Ruth, K., Chasson, M., Khoury, J., & Ahtam, B. (2024) Reconsidering the nature of threat in infancy: Integrating animal and human studies on neurobiological effects of infant stress. *Neuroscience & Biobehavioral Reviews*, 163 (2024) 105746.

<sup>65</sup> Reisz, S., Duschinsky, R., & Siegel, D. J. (2018) Disorganized attachment and defense: Exploring John Bowlby's unpublished reflections. *Attachment & Human Development*, 20(2), 107–134.

<sup>66</sup> Lyons-Ruth, K., Botein, S., & Grunebaum, H. U. (1984) Reaching the hard-to-reach: Serving isolated and depressed mothers with infants in the community. *New Directions for Mental Health Services*, 1984(24), 95–122.

<sup>67</sup> Lyons-Ruth, K., & Melnick, S. (2004) Dose-response effect of mother-infant clinical home visiting on aggressive behavior problems in kindergarten. *Journal of the American Academy of Child & Adolescent Psychiatry*, 43(6), 699–707, p. 706.

the infant ... this relationship was viewed as the most powerful vehicle for directly providing new models of relatedness that could be transferred to the parent–infant relationship’ (see Table 2.1).<sup>68</sup>

The families were identified by services as at risk on multiple dimensions, and were representative of those Lyons-Ruth was seeing in her clinical work in the period at Cambridge hospital. In 39% of the families one or both parents were black or hispanic; 47% of mothers reported sexual or physical abuse in their own childhoods that met social service guidelines for maltreatment and only 9% of mothers reported benign childhood experiences;<sup>69</sup> 74% of mothers reported clinical levels of depressive symptoms, and 31% had experienced psychiatric hospitalization; 80% of the families were supported by Aid to Families with Dependent Children, and 45% of mothers had never graduated from high school. Only 15% of the women were currently living with men who were neither violent nor substance abusing.

In a third of families, social services had documented infant neglect. No cases in the sample were known to social services for physical or sexual abuse, likely because infants had already been removed where this had been present.<sup>70</sup> When the infants in the study were young adults, 55% reported that they had experienced abuse in childhood.<sup>71</sup> Of these, 29% of the sample reported physical or sexual abuse.<sup>72</sup> A third reported domestic violence between their parents.<sup>73</sup>

The cohort was very similar in profile to the Minnesota Longitudinal Study of Risk and Adaptation, recruited a decade earlier, and Lyons-Ruth was influenced in her study design by the Minnesota group, whose findings were just being published. The participants identified by services as at risk were compared by Lyons-Ruth with 37 families recruited on the basis of match demographic characteristics, but without an assessment of clinical need.

At 12 months, Lyons-Ruth and colleagues reported that longer duration of home visiting was associated with greater involvement of the mother with her infant, with increases in service time from three to 12 months accounting for 24% of variance, though the choice of statistical procedure likely risked an overestimation of effects.<sup>74</sup> There were no other significant effects of treatment on maternal behaviour ratings, though this may have been due to the small sample. There was a decrease in social isolation for mothers who were depressed at the start of the intervention.

<sup>68</sup> Ibid.

<sup>69</sup> Lyons-Ruth, K., & Block, D. (1996) The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal*, 17(3), 257–275.

<sup>70</sup> This was in contrast to Cicchetti and colleagues’ Harvard Child Maltreatment Project, where the sample was recruited through child protective services rather than community organizations, and the spread of forms of abuse was wider, though neglect still predominated. Cicchetti, D., Carlson, V., Braunwald, K. G., & Aber, J. L. (1987) The sequelae of child maltreatment. In R. Gelles & J. Lancaster (eds), *Child Abuse and Neglect: Biosocial Dimensions*. New York: Aldine De Gruyter.

<sup>71</sup> Shi, Z., Bureau, J. F., Easterbrooks, M. A., Zhao, X., & Lyons-Ruth, K. (2012) Childhood maltreatment and prospectively observed quality of early care as predictors of antisocial personality disorder features. *Infant Mental Health Journal*, 33(1), 55–69, Table 1.

<sup>72</sup> Dutra, L., Bureau, J. F., Holmes, B., Lyubchik, A., & Lyons-Ruth, K. (2009) Quality of early care and childhood trauma: A prospective study of developmental pathways to dissociation. *The Journal of Nervous and Mental Disease*, 197(6), 383–390, pp. 385–386.

<sup>73</sup> DiPalma, L. M. (2004) Shades of wisdom: Portraits of attachment in families at risk. Unpublished doctoral thesis, Harvard University, p. 36.

<sup>74</sup> Lyons-Ruth, K., Connell, D. B., Grunebaum, H. U., & Botein, S. (1990) Infants at social risk: Maternal depression and family support services as mediators of infant development and security of attachment. *Child Development*, 61(1), 85–98. Associations between duration of home visiting and involvement of the mother with her infant are reported controlling for maternal depression, infant maltreatment, and maternal psychiatric hospitalization. Lyons-Ruth and colleagues justify this on the basis that these three factors predict maternal behaviour. However, this is an odd decision, not least as the resulting construct—maternal behaviour unrelated to maternal mental health or child maltreatment—does not seem to make much theoretical or clinical sense.

**Table 2.1** Clinical intervention research design-Family Support Project

|                                 | Group                                              | N  | Intake                      | Assessment Schedule |                                                                                               |                                                                                                           |
|---------------------------------|----------------------------------------------------|----|-----------------------------|---------------------|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|
|                                 |                                                    |    |                             | Age six months      | Age 12 months                                                                                 | Age 18 months                                                                                             |
| High-risk infants 0–8 months    | Paraprofessional home-visit service                | 18 | Maternal interview measures | Home videotape      | Ainsworth Strange situation<br>Home videotape<br>Bayley scales                                | Ainsworth Strange situation<br>Home videotape<br>Bayley scales Maternal island and depression measures    |
|                                 | Professional home and center-based service         | 17 | Maternal interview measures | Home videotape      | Ainsworth Strange situation<br>Home videotape<br>Bayley scales                                | Ainsworth Strange situation<br>Home videotape<br>Bayley scales<br>Maternal island and depression measures |
| High-risk toddlers 15–18 months | Short-term services after developmental assessment | 10 |                             |                     |                                                                                               | Ainsworth Strange situation<br>Home videotape<br>Bayley scales<br>Maternal interview measures             |
| Comparison group                | Matched community group                            | 37 |                             |                     | Ainsworth Strange situation<br>Home videotape<br>Bayley scales<br>Maternal interview measures | Ainsworth Strange situation<br>Home videotape<br>Bayley scales<br>Maternal island and depression measures |



A follow-up was conducted when the children were aged five, with a measure of child cognitive development, and reports on the child's behaviour solicited from the mother and the child's primary school teacher. The families identified as of concern to services were found to have more difficulties than the matched controls at age five across all these measures, suggesting that services had generally been correct in identifying families whose caregiving placed the child at risk of less positive development. Nonetheless, it was found that teachers' report of hostile child behaviour decreased in a dose-response relation to the duration of the early home-visiting services, and that this accounted for 15% of the variance in child hostile behaviour. Parents' report of child social competence and positive play with peers was likewise related in a linear way to how long services were provided.<sup>75</sup>

A further follow-up was conducted when the children were aged seven, in collaboration with Ann Easterbrooks, a developmental psychologist at Tufts University. It was found that children who had a shorter duration of services during infancy tended to have escalating behaviour problems over time at school. These findings were interpreted by Lyons-Ruth as indicating that difficulties in the child-caregiver relationship and/or in child socioemotional development established during infancy may 'impact the child in new ways at each developmental level', leading to escalating problems over time.<sup>76</sup> In part, she suspected that this may reflect the hindered development of foundational skills in affect regulation or the expressive use of language; and in part the development of emotional and behavioural responses that could prove counterproductive in the school setting.

### Insensitivity

First findings from the attachment and caregiving variables examined by the study were reported in the mid-to-late 1980s. Lyons-Ruth's team found that the mothers identified by services as at risk were much more likely to report adverse childhood experiences, and their children had delayed mental and motor development compared to the matched community control. Using video-recordings of child-caregiver interaction at home, they coded maternal behaviour on 13 dimensions: sensitivity; warmth; verbal communication; quantity of relational touching; quality of relational touching; quantity of caretaking; disengagement; anger; time out of room; covert hostility; interfering manipulation; quantity of caretaking; and flatness of affect, which was characterized by lack of variability in affect and a "burnt out" and depressed demeanor.<sup>77</sup>

The researchers found that the mothers of infants who displayed avoidant behaviour on reunion were rated at home as more covertly hostile; they were no less involved with their child compared to secure dyads, though they tended to spend more time out of the room.<sup>78</sup> There were few resistant dyads, but resistance in the Strange Situation was associated with

<sup>75</sup> Lyons-Ruth, K. & Melnick, S. (2004) Dose-response effect of mother-infant clinical home visiting on aggressive behavior problems in kindergarten. *Journal of the American Academy of Child & Adolescent Psychiatry*, 43(6), 699-707.

<sup>76</sup> Lyons-Ruth, K. & Easterbrooks, M. A. (2006) Assessing mediated models of family change in response to infant home visiting: A two-phase longitudinal analysis. *Infant Mental Health Journal*, 27(1), 55-69, p. 66.

<sup>77</sup> Lyons-Ruth, K., Connell, D. B., & Zoll, D. (1989) Patterns of maternal behavior among infants at risk for abuse: Relations with infant attachment behavior and infant development at 12 months of age. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 464-493). New York: Cambridge University Press, p. 488.

<sup>78</sup> Lyons-Ruth, K., Connell, D. B., Zoll, D., & Stahl, J. (1987) Infants at social risk: Relations among infant maltreatment, maternal behavior, and infant attachment behavior. *Developmental Psychology*, 23(2), 223-232.

mothers' flatness of affect and disengagement with their child. They interpreted these findings as congruent with the idea that resistance is associated with less engaged caregiving behaviour (Chapter 1).

The Minnesota study found associations between measures of sensitivity and security in the Strange Situation. Though these associations were weak. In the Harvard study there was no association between caregiver sensitivity and security in the Strange Situation or maltreatment status. This was not surprising: there was little variance. Almost all the mothers in the sample—whether clinical or community, maltreating or non-maltreating—had low scores for sensitivity. Lyons-Ruth and colleagues also failed to replicate Main's reports, from her own study and Ainsworth's data, of an association between a tender quality to maternal touch and security of attachment.<sup>79</sup> Again, this may have been due to low frequency of such behaviours in the sample.

Lyons-Ruth and her team acknowledged that research in community samples such as Belsky's (Chapter 3) supported the capacity of the Ainsworth sensitivity scale to identify sensitive care. However, she and collaborators felt that the scale was not well suited for identifying insensitive care,<sup>80</sup> and highlighted studies with higher-risk samples where the scale had not been able to distinguish the most insecure-seeming dyads.<sup>81</sup> This concern would later be supported by research with the NICHD sample (Chapter 3) documenting a quite modest negative association between parental harshness and indices of sensitivity ( $r = -0.14$  to  $r = -0.27$ ), suggesting that insensitive care may not be at all well captured solely by documenting the extent of supportive parental behaviours.<sup>82</sup>

Ainsworth had developed scales for interfering, ignoring, and rejecting caregiving, which distinguished the different forms of insecurity in her sample.<sup>83</sup> Lyons-Ruth had received a copy of these scales from Ainsworth during their meeting in 1975. But Ainsworth had not published them. Neither had they been validated by much use by other research groups: researchers had regarded them as redundant given their intercorrelation with sensitivity in Ainsworth's data.<sup>84</sup> Use of the scales by the Grossmanns in their Bielefeld sample also found high levels of intercorrelation, such that they only undertook statistical analysis

<sup>79</sup> Main, M. & Stadtman, J. (1981) Infant response to rejection of physical contact by the mother. *Journal of the American Academy of Child Psychiatry*, 20(2), 292–307.

<sup>80</sup> Lyons-Ruth's doctoral student Griffin offered three criticisms of Ainsworth and colleagues in this regard: 'First, in their qualitative rating scales, mothers could achieve a low score for highly divergent types of non-optimal behaviors, that arguably likely lead to very different child outcomes.'

'A second way in which the Ainsworth group's measure likely obscured differences between mothers of Avoidant (A) and Resistant (C) infants is in failing to look for behaviors specifically hypothesized to relate to resistant infant behavior.' Only in 'informal, post hoc descriptions' do they note 'distinctions between the behavior of the mothers of C infants and other mothers.'

'A third way the Ainsworth group may have obscured differences between A and C was by doing t-tests designed to test the Secure (B) vs. Insecure (not-B) comparison only. Whereas qualitative descriptions point to differences between these groups, it is impossible to assess the significance of differences in the mean scores for A and C group mothers, given the way Ainsworth et al. report their statistical analyses.'

Griffin, M. E. (1997) Understanding mothers' contribution to disorganized attachment: A behavioral analysis of mother–child interaction in a naturalistic setting. Unpublished doctoral dissertation, Northwestern University, pp. 10–12.

<sup>81</sup> For example, Spieker, S. J., & Booth, C. L. (1988) Maternal antecedents of attachment quality. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 95–135). Hillsdale, NJ: Erlbaum.

<sup>82</sup> Bradley, R. H. & Corwyn, R. F. (2007) Externalizing problems in fifth grade: Relations with productive activity, maternal sensitivity, and harsh parenting from infancy through middle childhood. *Developmental Psychology*, 43(6), 1390–1401, Table 1.

<sup>83</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press, Table 27.

<sup>84</sup> In an attempt to test this assumption, Forrer and colleagues later reported that measuring interfering behaviour added no gain to predictive power compared to measuring sensitivity alone. Forrer, M. L., de Moor, M. H., Schuengel, C., & Oosterman, M. (2024) Early parenting precursors of child developmental outcomes: What counts beyond parental sensitivity? *Parenting*, 24(2/3), 67–77.

of the correlates of the sensitivity scale. The descriptions in the other scales have tremendous ethnographic acuity and are at times quite beautiful. However, the ignoring and rejecting scales, especially, are also less well articulated with specific, discrete behavioural criteria than the sensitivity scale, and so are more difficult to use.<sup>85</sup>

Inspired by Ainsworth's scales, Lyons-Ruth nonetheless felt that the attachment research community had ultimately not developed adequate tools for examining insensitive caregiving, such as may be common in samples facing multiple adversities:

The majority of the work to date has focused on the development of methodologies for describing the construct of sensitive, responsive mothering (Bakeman and Brown, 1977; Belsky, Taylor, and Rovine, 1984; Kaye and Fogel, 1980; Tronick, Als, and Brazelton, 1980). However, the emphasis on assessment of the components of sensitivity has not been matched by an equally careful description of the behaviors characterizing insensitive patterns of mothering. The implicit assumption underlying most previous work has been that maternal insensitivity is adequately defined simply as the absence or opposite of maternal sensitivity. Thus, maternal sensitivity and insensitivity are regarded as quantitatively related along a single theoretical dimension. Support for this conceptualization comes not only from our natural language system regarding the usage of terms like sensitivity but also from factor-analytic studies of mother-infant interaction. These studies have shown that a strong first factor, accounting for 50 percent of the variance or more, reliably emerges and is defined by behaviors such as verbal interaction, maternal responsiveness, maternal positive affect and maternal stimulation (Belsky, Rovine, and Taylor, 1984; Clarke-Stewart, 1973).... However, clinical observation indicates that all 'sensitive' mothers and all 'insensitive' mothers are not alike, and the implicit adoption of linear constructs and reliance on linear statistics may have obscured the identification of qualitatively distinct patterns of interaction that are not linearly related.<sup>86</sup>

The assessment of the components of sensitivity performed by Belsky and colleagues reported a four-factor model.<sup>87</sup> Alongside the first factor suggesting sensitivity and involvement, they also identified a separate factor for caregiver non-responsiveness. A third factor was caregiver soothing of infant crying, which appeared statistically distinct from sensitivity; this distinction would later be supported by Van IJzendoorn and Hubbard (Chapter 4). Finally, a fourth factor was basic physical care of the child.

In a masters thesis supervised by Ainsworth, Crittenden observed caregiving behaviour in 38 families known to social services and 40 matched control families.<sup>88</sup> Inductive analysis of this data led to the identification of three patterns of caregiving.

<sup>85</sup> A small number of groups used the interference scale, especially Minnesota, though without systematic attempts to establish it psychometrically. See, for example, Jacobvitz, D., & Sroufe, L. A. (1987) The early caregiver-child relationship and attention-deficit disorder with hyperactivity in kindergarten: A prospective study. *Child Development*, 58(6), 1496-1504. Biringen's Emotional Availability Scales also distinguished sensitivity, hostility, and intrusiveness. Biringen, Z., Robinson, J. L., & Emde, R. N. (2000) The emotional availability scales. *Attachment & Human Development*, 2(2), 256-270.

<sup>86</sup> Lyons-Ruth, K., Connell, D. B., & Zoll, D. (1989) Patterns of maternal behavior among infants at risk for abuse: Relations with infant attachment behavior and infant development at 12 months of age. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 464-493). New York: Cambridge University Press, p. 464.

<sup>87</sup> Belsky, J., Rovine, M., & Taylor, D. G. (1984) The Pennsylvania Infant and Family Development Project, III: The origins of individual differences in infant-mother attachment: Maternal and infant contributions. *Child Development*, 55(3), 718-728.

<sup>88</sup> Crittenden, P. M. (1981) Abusing, neglecting, problematic, and adequate dyads: Differentiating by patterns of interaction. *Merrill-Palmer Quarterly of Behavior and Development*, 27(3), 201-218.

1. A first factor was sensitivity, which was associated with cooperative infant behaviour and positive displays of affect.
2. A second factor was termed by Crittenden 'abusive' and comprised various markers for interaction set by the caregiver's agenda rather than the child's, alongside hostile behaviours such as 'jabbing, poking, or pinching' the child.<sup>89</sup> The idea of interference with the child's activities aligned with Ainsworth's earlier interference scale, but the addition of hostile caregiving behaviour was new. Hostile-interfering caregiving was found to be associated with observations of infant fussing, deliberate face aversion, uncooperativeness, and frustration.
3. A third factor was termed 'neglect' and comprised markers of lack of emotional expression and non-responsiveness to the child. The idea of non-responsiveness to an infant's cues aligned with Ainsworth's earlier scale for ignoring caregiver behaviour, but the addition of lack of emotional expression was new. Markers of lack of emotional expression and non-responsiveness were associated with reduced infant activity, and the infants seemed depressed. Crittenden would later develop this early work into the CARE-Index assessment.

In a later report, Crittenden shared findings from a larger sample of 73 families known to social services, 22 families receiving help from voluntary child welfare services, and 29 matched controls identified as providing at least adequate care to their child by a home visitor.<sup>90</sup> Dyads were filmed during free play with toys and in the Strange Situation. Mothers participated in a story-stem measure asking them to complete narratives about the availability of others in times of need. They were also asked about their perceptions of welfare professionals.

As anticipated, mothers from the comparison sample were the most sensitive to infant signals, whereas mothers identified by social services as abusive were the most controlling and hostile, and mothers identified by social services as neglecting their infants were the most likely to be unresponsive during play. Mothers identified by social services as both abusing and neglecting their infants were found to be both controlling-hostile and unresponsive. A discriminant function analysis of the variables predicting social services classifications identified two axes of child-caregiver interaction: a dimension of cooperation vs controlling and hostile behaviour by the caregiver towards their child's play; and a dimension of involvement with the child vs withdrawal and unresponsiveness.

Across the different measures in the study, Crittenden reported common themes in how the mothers in the different groups tended to conceive of relationships: with their child, with professionals, and with friends and loved ones. She reported that 'abusing mothers appear to conceptualize social relations in terms of power struggles over scarce emotional and material resources. These women identify their social roles as master or victim and see social behaviour as dominant or submissive ... their emphasis on power use increases the probability that they will be involved in violent episodes'. By contrast, the neglecting mothers' narratives were full of helplessness and despair. They 'appear to conceive of relationships as empty. The key to their representational models is their belief that everyone is helpless; some people have more, some less, but no one has control.'<sup>91</sup> Both sets of dyads received insecure attachment classifications in the Strange Situation.

<sup>89</sup> Ibid., 214.

<sup>90</sup> Crittenden, P. M. (1988) Dyadic and family patterns of functioning in maltreating families. In Browne, K., Davies, C., and Stratton, P. (eds), *Early Prediction and Prevention of Child Abuse* (pp. 161–189). New York: Wiley.

<sup>91</sup> Crittenden, P. M. (1988) Distorted patterns of relationship in maltreating families: The role of internal representation models. *Journal of Reproductive and Infant Psychology*, 6(3), 183–199, p. 195.

Crittenden hypothesized that the mothers' expectations about relationships would be passed down to the children, as the mothers' behaviour shaped their child's expectations in turn. For example, 'neglected children's experiences of unresponsive adults are likely to lead to pervasive passivity, a sense of helplessness, and a generalized lack of motivation.'<sup>92</sup>

Orientated by the work of Belsky and Crittenden, and interested to further articulate the construct of insensitivity, Lyons-Ruth and colleagues undertook a principal components analysis of the 13 variables that had been used in assessing maternal behaviour at home.<sup>93</sup>

1. As with Belsky's analysis, a strong first factor accounting for around half of variance was comprised of indicators of verbal interaction, maternal responsiveness, maternal positive affect, and maternal stimulation.
2. A second factor (14% of variance), termed 'hostile intrusiveness', was characterized by high positive loadings on covert hostility and interfering manipulation. This aligned with Crittenden's 'abusive' classification and axis for controlling-interfering caregiver behaviour.
3. A third factor (10% of variance), as in Belsky's work, was basic physical care of the child, which also seemed distinct from socioemotional interaction also in the Harvard high-risk sample.
4. Finally, a fourth factor was flatness of affect (9% of variance). Lyons-Ruth suggested that this aligned with the lack of emotional expression identified by Crittenden as characteristic of neglecting mothers and related to Crittenden's axis of uninvolved caregiver behaviour.

In Lyons-Ruth and colleagues' analysis of data from the Harvard Family Pathways Study, the main factor indicating maternal sensitivity and involvement predicted children's cognitive development (Chapter 5). However, this factor did not discriminate maltreating mothers from the rest of the sample: 'The primary reason appears to be that some variables loading positively on this dimension, such as sensitivity, warmth, and verbal communication, are affected by both rate and appropriateness of interaction. Because the hostile-intrusive mothers were quite actively interacting with their infants, they tended to receive high scores on verbal communication and middle-range scores on other variables.'<sup>94</sup>

By contrast, the hostile-intrusive factor—comprised of covert hostility and interfering manipulation—did discriminate maltreating mothers from the rest of the sample. It was associated with state services concerns about maternal psychosocial problems. It was also associated with avoidance in the Strange Situation, and more strongly than covert hostility alone. This was curious given that interfering manipulation alone was not associated with avoidance. Lyons-Ruth and colleagues judged that it was in fact the overlap between hostile and interfering caregiver behaviour at home that had a particularly strong relation to infant behaviour in the Strange Situation.

<sup>92</sup> Ibid., 197.

<sup>93</sup> Lyons-Ruth, K., Connell, D. B., & Zoll, D. (1989) Patterns of maternal behavior among infants at risk for abuse: Relations with infant attachment behavior and infant development at 12 months of age. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 464–493). New York: Cambridge University Press.

<sup>94</sup> Ibid., 474.

## Insecurity

Lyons-Ruth concluded that further methodological innovations were needed to adequately measure insensitive caregiving. Findings from the Harvard Family Pathways Study also raised questions about the capacity of the Strange Situation to adequately measure insecurity in the child–caregiver relationship. After all, the Strange Situation identified no relevant differences between the clinical and community samples. While the Minnesota study did find a significant difference between the Strange Situation classifications of maltreated and non-maltreated infants, their report too identified anomalies: 12 of the 31 abused infants were classified as securely attached using Ainsworth's coding protocols.<sup>95</sup>

Similar findings were being reported elsewhere. The Harvard Child Maltreatment Project was initiated in 1979 by Cicchetti and Aber, with a small subsample seen in the Strange Situation: 22 dyads known to child protection services, and 21 dyads from a matched comparison group. Again, a third of the sample were classified as securely attached.<sup>96</sup> These were perplexing findings, which together with the results from the Harvard Family Pathways Study, potentially cast doubt on the capacity of the Strange Situation to assess children's expectations of their caregivers' availability in high-risk samples.

Lyons-Ruth's own view was that the limitation was not with the Strange Situation, but with Ainsworth's system for coding security and insecurity. Lyons-Ruth noticed that a fifth of her sample had high scores for avoidance on the first reunion, but not on the second. Under Ainsworth's protocols she had to classify these as secure, in the B2 subtype. A re-analysis of data from Ainsworth's 104 infants and 54 infants in Connell's dissertation study found that this pattern was barely present in the low-risk samples. However, this behaviour had been seen when Ainsworth started to repeat the Strange Situation with her sample two weeks later: the infants subjected to the repeated procedure were so stressed by all the separations, that those with an avoidant pattern broke down and approached their caregiver, while displaying tension behaviours.<sup>97</sup>

In the Harvard Family Pathways Study too, Lyons-Ruth presumed that this collapse of avoidant behaviour reflected overwhelming distress. In this case, the strain on these dyads from the adversity in their lives meant that many infants struggled to maintain avoidance as the stress of the Strange Situation increased with the second separation and reunion. This fit with Mary Main's conceptualization of avoidance as a secondary, conditional strategy, interposed over the child's desire to use the caregiver as a safe haven. Discussion of these cases with Main suggested that they might be classifiable as disorganized: the Harvard Family Pathways Study would provide a good number of the cases from high-risk samples that Main and Solomon ultimately used in developing their 1990 disorganized attachment classification coding scheme.

A further unusual aspect of Lyons-Ruth's sample was that 43% of dyads were classified as B3, the most prototypically secure subgroup, and these dyads had some distinctive features including less parenting hostility than the other secure dyads.<sup>98</sup> Of the dyads reported in Ainsworth's *Patterns of Attachment* 42% were classified B3. Subsequently, however, the

<sup>95</sup> Egeland, B. & Sroufe, L. A. (1981) Attachment and early maltreatment. *Child Development*, 44–52.

<sup>96</sup> Schneider-Rosen, K., Braunwald, K. G., Carlson, V., & Cicchetti, D. (1985) Current perspectives in attachment theory: Illustration from the study of maltreated infants. In *Monographs of the Society for Research in Child Development*, 50(1–2), 194–210.

<sup>97</sup> Granqvist, P., Hesse, E., Fransson, M., Main, M., Hagekull, B., & Bohlin, G. (2016) Prior participation in the strange situation and overstress jointly facilitate disorganized behaviours: Implications for theory, research and practice. *Attachment & Human Development*, 18(3), 235–249.

<sup>98</sup> Lyons-Ruth, K., Connell, D. B., Zoll, D., & Stahl, J. (1987) Infants at social risk: Relations among infant maltreatment, maternal behavior, and infant attachment behavior. *Developmental Psychology*, 23(2), 223–232.

proportion in middle-class samples has generally been 8–18%.<sup>99</sup> The high proportion in Lyons-Ruth's high-risk sample is all the more surprising.

A possible explanation could rest on similarities in sampling strategy between Lyons-Ruth and Ainsworth. The Baltimore sample was generally reported in print by Ainsworth as a randomly selected community sample, albeit all middle-class. In fact in a late interview she acknowledged that 'the pediatricians who recruited potential participants for us tended to select women who interested them—"this one is a charmer, that one puzzles me, I wonder how motherhood will work out for this one"—and that this led to our getting a particularly diverse group.'<sup>100</sup> This approach to recruitment may have somewhat increased potential lines of difference between participants, making contrasts sharper. It could be that the unusually high proportion of B3s in Lyons-Ruth's sample may likewise have stemmed from some referral of 'interesting cases' by professionals, contributing to a bifurcation between unusually secure and unusually insecure infants in the sample. If so, something to consider when interpreting Lyons-Ruth's papers is that this would have had the inadvertent effect of inflating effect sizes when reporting with an *r* statistic, as the standard deviation would have been increased compared to a more representative sample—whereas a regression slope (unstandardized beta) would give the same result in the two cases.

### Infant Disorganized Attachment

A new disorganized attachment classification was introduced by Main and Solomon in 1986, with coding protocols published in 1990 (Chapter 1). A first study coded using the classification was Cicchetti and Aber's Harvard Child Maltreatment Project sample, with a report published in 1989. Eighty-two per cent of the infant–caregiver dyads known to child protection services were classified as showing disorganized attachment, and 14% classified as secure; in the comparison group 19% were classified as disorganized, and 52% classified as secure.<sup>101</sup> These findings would later be touted by social workers, such as David Shemmings, arguing that disorganized attachment indicates child maltreatment.<sup>102</sup> In fact, it should be noted that though one of the two Strange Situation coders of the Harvard Child Maltreatment Project sample was unaware of maltreatment status, the other had detailed further knowledge of the families, which may have sharpened the contrast, though the findings could have also been an effect of chance in a small sample. In any case, the sharpness of the contrast would prove out of keeping with subsequent meta-analytic evidence, where

<sup>99</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press, p. 230. See, for example, 12% B3 reported in Van IJzendoorn, M. H., Goossens, F. A., Tavecchio, L. W. C., Vergeer, M. M., & Hubbard, F. O. A. (1983) Attachment to soft objects: Its relationship with attachment to the mother and with thumbsucking. *Child Psychiatry & Human Development*, 14(2), 97–105; 17.5% B3s reported in Umemura, T. & Jacobvitz, D. B. (2014) Nonmaternal care hours and temperament predict infants' proximity-seeking behavior and attachment subgroups. *Infant Behavior and Development*, 37(3), 352–365.

<sup>100</sup> Ainsworth, M. (1995) On the shaping of attachment theory and research: An interview with Mary D. S. Ainsworth. *Monographs of the Society for Research in Child Development*, 60(2–3), 2–21, pp. 11–12.

<sup>101</sup> Carlson, V., Cicchetti, D., Barnett, D., & Braunwald, K. (1989) Finding order in disorganization: Lessons from research on maltreated infants' attachments to their caregivers. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 494–528). Cambridge: Cambridge University Press, p. 507.

<sup>102</sup> Shemmings, D. & Shemmings, Y. (2011) Understanding disorganized attachment: Theory and practice for working with children and adults. Jessica Kingsley Publishers; Wilkins, D. (2012) Disorganised attachment indicates child maltreatment: How is this link useful for child protection social workers? *Journal of Social Work Practice*, 26(1), 15–30.

around half of children with experiences of maltreatment are classified as disorganized (CI 47.6 to 71.3%) (Chapter 5).

Strange Situations from the Harvard Child Maltreatment Project were re-coded for disorganization by Mary Main and by Betty Repacholi from Lyons-Ruth's group.<sup>103</sup> At 18 months, the sample comprised 22 secure dyads, 13 avoidant dyads, and 30 dyads classified as disorganized. There were only four resistant infants in the sample, all of whom were also classified as disorganized.<sup>104</sup>

The findings from the Harvard Child Maltreatment Project were eye-catching. So were reports in the early 1990s from Lyons-Ruth and colleagues from the Harvard Family Pathways Study. Together they played a major role in the acceptance of the new disorganized attachment classification. In particular, Lyons-Ruth's Harvard Family Pathways Study was critical for the perception that disorganized attachment signified developmental risk for the child. The most widely cited finding was that 71% of five-year-olds identified by their teachers as showing behavioural difficulties were part of a dyad that had received a disorganized attachment classification in infancy. The two reports of this finding are Lyons-Ruth's most cited papers.<sup>105</sup> This association between disorganized attachment and negative developmental outcomes was regarded as essential validation of the construct within a developmental science community fanatical about prospective prediction.<sup>106</sup> This was despite Main's own prediction that disorganized attachment, alone, would at best weakly predict negative mental health outcomes: 'early disorganized status [will] not yield the outcome specified unless combined with other conditions, for example, genetically biased vulnerabilities or other life events.'<sup>107</sup>

It is true that the 71% figure is headlined in the abstract to the 1993 paper by Lyons-Ruth and colleagues. Yet the 1993 paper itself, and the 1996 paper, were intent on telling a more complex story. Lyons-Ruth and colleagues highlighted that disorganized infant attachment was not the only important factor. In particular, maternal hostile behaviours towards the infant also contributed additively to child behavioural difficulties. Furthermore, Lyons-Ruth and colleagues emphasized that a minority of every attachment classification went on to show behavioural problems. Even among the disorganized category, less than half of the infants from disorganized dyads went on to show behavioural problems. Table 2 in Lyons-Ruth's 1993 paper suggests  $r = 0.34$ , which is in line with later meta-analytic findings of

<sup>103</sup> Lyons-Ruth, K. (2024) Continuing the legacy of Mary Main: Insights from other species on attachment and the development of stress-sensitive brain regions in human infancy. *Attachment & Human Development*, early view.

<sup>104</sup> Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999) Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, 64(3), 67–96.

<sup>105</sup> Lyons-Ruth, K., Alpern, L., & Repacholi, B. (1993) Disorganized infant attachment classification and maternal psychosocial problems as predictors of hostile-aggressive behavior in the preschool classroom. *Child Development*, 64(2), 572–585; Lyons-Ruth, K. (1996) Attachment relationships among children with aggressive behavior problems: The role of disorganized early attachment patterns. *Journal of Consulting and Clinical Psychology*, 64(1), 64–73.

<sup>106</sup> See, for example, Cicchetti, D., Toth, S. L., & Lynch, M. (1995) Bowlby's dream comes full circle: The application of attachment theory to risk and psychopathology. In *Advances in Clinical Child Psychology* (pp. 1–75). Boston, MA: Springer US; Radke-Yarrow, M., McCann, K., DeMulder, E., Belmont, B., Martinez, P., & Richardson, D. T. (1995) Attachment in the context of high-risk conditions. *Development and Psychopathology*, 7(2), 247–265; Fonagy, P., Gergely, G., Jurist, E. L., & Target, M. (2002) *Affect Regulation, Mentalization, and the Development of the Self*. London: Karnac.

<sup>107</sup> Main, M. (1995) Recent studies in attachment: Overview, with selected implications for clinical work. In S. Goldberg, R. Muir, & J. Kerr (eds), *Attachment Theory: Social, Developmental and Clinical Perspectives* (pp. 407–470). Hillsdale, NJ: Analytic Press, p. 458.



associations between disorganized attachment and observer-reported behavioural problems ( $r = 0.29$ ).<sup>108</sup> The association between disorganized attachment and behavioural problems at age five is important, but Lyons-Ruth and colleagues sought to highlight that this finding should not be exaggerated or taken out of context.

In line with this, at the follow-up at age seven, disorganization was again associated with teacher reports of conduct problems ( $r = 0.31$ ), though maternal self-report of depression had a stronger relationship with child conduct problems at age seven ( $r = 0.43$ ). Together these two factors accounted for 26% of variance.<sup>109</sup> There was no association between maternal self-report of depression and disorganized attachment.<sup>110</sup> These seemed to reflect two different aspects of a child's experience of care, both relevant to the child's development. Indeed, maternal self-report of depression and disorganized attachment in infancy both were found to also make independent contributions to children's self-report of depressive symptoms at age eight. Bureau, Easterbrooks, and Lyons-Ruth speculated that 'it is possible that each explains different dimensions or facets of depressive symptoms in childhood. For example, the sadness and resignation aspect of depression might be explained by exposure to maternal depressive mood, whereas the lack of emotion regulation and deficient problem-solving skills may be more strongly associated with disorganization of attachment.'<sup>111</sup>

Observations of maternal hostile intrusiveness at home in infancy and observations of maternal sensitivity during play at the laboratory at age seven were also found to contribute to child self-report depressive symptoms at age eight. This was in contrast to behavioural problems, which were not significantly associated with maternal hostile intrusiveness in infancy, though the test was underpowered.<sup>112</sup> There was no report of whether observations of maternal sensitivity at age seven contributed to child behavioural problems, presumably as the sensitivity data was not analysed by the time of the publication on behavioural problems.<sup>113</sup>

Besides antecedents of child externalizing and internalizing difficulties, there were also other relevant findings from the Harvard Family Pathways Study. Lyons-Ruth and colleagues also found that at 18 months, 60% of infant-caregiver dyads from the 10 high-risk families who received only treatment-as-usual were classified as disorganized, compared to 28–29% for both the intervention sample and the matched controls. Of families known to social services for maltreatment, 55% of infant-mother dyads were

<sup>108</sup> Fearon, R. P., Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010) The significance of insecure attachment and disorganization in the development of children's externalizing behavior: A meta-analytic study. *Child Development*, 81(2), 435–456.

<sup>109</sup> Lyons-Ruth, K., Easterbrooks, M. A., & Cibelli, C. D. (1997) Infant attachment strategies, infant mental lag, and maternal depressive symptoms: Predictors of internalizing and externalizing problems at age 7. *Developmental Psychology*, 33(4), 681–692, Table 1.

<sup>110</sup> Bureau, J. F., Easterbrooks, M. A., & Lyons-Ruth, K. (2009) Maternal depressive symptoms in infancy: Unique contribution to children's depressive symptoms in childhood and adolescence? *Development and Psychopathology*, 21(2), 519–537.

<sup>111</sup> *Ibid.*, 533.

<sup>112</sup> Lyons-Ruth, K., Easterbrooks, M., & Cibelli, C. D. (1997) Infant attachment strategies, infant mental lag, and maternal depressive symptoms: Predictors of internalizing and externalizing problems at age 7. *Developmental Psychology*, 33(4), 681–692: 'Associations between the four home scores (involvement, hostile-intrusiveness, infant distress, and infant anger/resistance) and all maternal and teacher scores ranged from  $\pm 0.02$  to  $\pm 0.27$ , all ns' (687).

<sup>113</sup> The first report from the observations of caregiver sensitivity at age seven was Easterbrooks, A. M., Biesecker, G., & Lyons-Ruth, K. (2000) Infancy predictors of emotional availability in middle childhood: The roles of attachment security and maternal depressive symptomatology. *Attachment & Human Development*, 2(2), 170–187.

classified as disorganized.<sup>114</sup> As described above, the duration of services had been found to predict changes in caregiving behaviour and child developmental outcomes. In the case of attachment classifications, there was a trend to reduced insecurity with longer duration of services.

Especially for the 18-month Strange Situation data, there were associations between the mother's experiences growing up and the dyad's attachment classification. The most notable was that 54% of mothers who had experienced out-of-home care in their childhoods were in dyads classified as disorganized by 18 months—an equivalent rate of disorganized attachment to documented maltreatment of the child by social services.

Even so, the intervention did not measurably change maternal behaviour. Lyons-Ruth and colleagues concluded from this that the measures of maternal behaviour, while workable for community samples, were not fully adequate for identifying the important aspects of maternal behaviour at 18 months among families experiencing more acute difficulties. This finding would prove an important spur for her work to develop a more adequate measure (ultimately resulting in the AMBIANCE system discussed later).

Nonetheless, there were some indicative associations between measures of maternal behaviour and disorganized attachment. Disorganized attachment was very infrequent among dyads where mothers' caregiving had been observed to be both involved and non-hostile. In fact, in these dyads, the distribution of Strange Situation classifications was similar to that of families not facing adversity in other samples, with most classified as secure. In contrast, where mothers' caregiving was either uninvolved or showed hostile-intrusive behaviour, rates of disorganized attachment were higher at 18 months. Lyons-Ruth was intrigued by the finding that uninvolved caregiving behaviour, but not hostile-intrusive behaviour, was associated with disorganized attachment in the Strange Situation at 12 months. She would later theorize that infants under 12 months are more vulnerable to uninvolved caregiving than hostile behaviour, which becomes more salient by 18 months.<sup>115</sup>

Nonetheless, Lyons-Ruth and colleagues were keen to avoid reifying disorganized attachment as if it had a clear meaning, represented a property of the child, and would necessarily predict later pathology. As we saw in [Chapter 1](#), Lamb, Thompson, and colleagues had raised questions about whether associations between children's experiences of care and their later outcomes would be mediated by the Strange Situation as a measure of children's expectations about their caregivers. Where there is stability of children's Strange Situation classification, this may reflect stability of the caregiving situation of the child. And where the Strange Situation classifications are associated with later outcomes, this may be because the Strange Situation serves as an indirect measure of the child's experiences of care rather than individual differences in attachment as a property of the child.

Lyons-Ruth was sympathetic to this argument when it was made about the Ainsworth classifications. She also applied the same logic to the disorganized attachment classification. Disorganized attachment certainly had an association with poorer psychosocial outcomes in the Harvard Family Pathways Study, and in other samples.<sup>116</sup> However Lyons-Ruth and colleagues urged care to avoid overemphasis on the causal role of disorganized

<sup>114</sup> Lyons-Ruth, K., Connell, D. B., Grunebaum, H. U., & Botein, S. (1990) Infants at social risk: Maternal depression and family support services as mediators of infant development and security of attachment. *Child Development*, 61(1), 85–98.

<sup>115</sup> Lyons-Ruth, K., Chasson, M., Khoury, J., & Ahtam, B. (2024) Reconsidering the nature of threat in infancy: Integrating animal and human studies on neurobiological effects of infant stress. *Neuroscience & Biobehavioral Reviews*, 163 (2024) 105746.

<sup>116</sup> For example, O'Connor, E., Bureau, J. F., McCartney, K., & Lyons-Ruth, K. (2011) Risks and outcomes associated with disorganized/controlling patterns of attachment at age three years in the national institute of child

attachment. Bureau, Martin, and Lyons-Ruth observed that the consensus view, following Main, has been that 'the effect of poor-quality early care on long-term outcomes would be mediated by attachment disorganization. However, research to date has not supported this theory. The literature shows instead that infant disorganization and quality of early care each contribute independently to long-term psychological adaptation, and that quality of early care has a more powerful influence overall on negative outcomes than infant attachment disorganization.'<sup>117</sup>

Lyons-Ruth was also concerned about measurement invariance across samples in the assessment of disorganized attachment. According to the Main and Solomon protocols, disorganization is coded alongside a 'best-fit' or 'forced' Ainsworth classification, following Main's assumption that disorganization represents an interruption or disturbance in the child's strategy for achieving direct or conditional proximity with their caregiver. Lyons-Ruth and colleagues noticed that 'disorganized infant behavior in low-risk, middle-socioeconomic status (SES) samples has been predominantly of the forced-secure subtype, with particularly low rates of forced-avoidant behavior. In contrast, disorganized infant behaviors in samples with serious social risk characteristics have been predominantly of the forced-insecure and, particularly, forced-avoidant type.'<sup>118</sup>

The terminology implied by the use of 'forced' classification was rather peculiar, since forced-secure disorganization seemed a contradiction in terms and was not helpfully descriptive. Ainsworth had assumed that direct proximity-seeking in the Situation would mean security in the attachment relationship, and so used the label 'secure' to refer to children who showed this behaviour—a decision Bowlby regarded as unwise. He thought the language of 'security' and 'insecurity' was 'shot through with value judgements & hidden predictions.'<sup>119</sup> Lyons-Ruth felt that for children showing conflict, confusion, or apprehension towards their caregiver as they approached for comfort, Ainsworth's assumption might well not hold.

In the Harvard Family Pathways Study, there were few resistant dyads. Lyons-Ruth therefore distinguished a disorganized–avoidant profile from a disorganized–approach profile (those with a secondary secure classification). In the former, the infant showed conflict, confusion, or apprehension towards the caregiver, and avoided proximity with them. In the latter profile, the infant would achieve proximity with their caregiver in the Strange Situation, while also showing signs of conflict, confusion, or apprehension.

In the Harvard Family Pathways Study, there was 75% stability at 18 months for dyads classified as disorganized–avoidant at 12 months, whereas there were no dyads that remained classified as disorganized–approach at both ages. A six-point scale of degree of concern by state services was associated only with disorganized–avoidant infant behaviour, and not with other forms of insecurity or with disorganized–approach behaviour.<sup>120</sup>

health & human development study of early child care and youth development. *Infant Mental Health Journal*, 32(4), 450–472.

<sup>117</sup> Bureau, J.-F., Martin, J., & Lyons-Ruth, K. (2010) Attachment dysregulation as hidden trauma in infancy: Early stress, maternal buffering and psychiatric morbidity in young adulthood. In R. A. Lanius, E. Vermetten, & C. Pain (eds), *The Impact of Early Life Trauma on Health and Disease: The Hidden Epidemic* (pp. 48–56). Cambridge: Cambridge University Press, p. 51.

<sup>118</sup> Lyons-Ruth, K., Repacholi, B., McLeod, S., & Silva, E. (1991) Disorganized attachment behavior in infancy: Short-term stability, maternal and infant correlates, and risk-related subtypes. *Development and Psychopathology*, 3(4), 377–396, p. 379.

<sup>119</sup> Bowlby, J. (1967) Letter to Mary Ainsworth, 19th April, Mary Ainsworth papers, box M3168, folder 2.

<sup>120</sup> Suggestive for how Lyons-Ruth was thinking about the basis of disorganized–approach in the 1990s is a remark reported in Atwood, G. C. (1995) Adult attachment disorganization: A new classification and scoring scheme for the Adult Attachment Interview. Unpublished doctoral thesis, Graduate School of Education of Harvard University: 'Secure infants, who are by definition open to the experience of their own attachment-related

Examining the caregiving correlates of disorganized–avoidant and disorganized–approach behaviour, Lyons-Ruth and colleagues noticed relevant differences. Uninvolved caregiver behaviour was distinctively associated with disorganized–approach behaviour in the Strange Situation, whereas hostile–intrusive caregiver behaviour was distinctively associated with disorganized–avoidance. A further curious difference in the Harvard Family Pathways Study was that the intervention, despite making no measurable impact on maternal behaviour, resulted in an *increased* proportion of infants who displayed disorganized–approach behaviour, and a *decreased* proportion of infants displaying disorganized–avoidance behaviour.

Given different prevalence between low-risk and high-risk samples, evidence of differences in stability over time, degree of concern by state services, different caregiving experiences, and different responses to intervention, Lyons-Ruth and colleagues therefore raised the question of ‘whether they should be grouped together as variants of a single category or whether they represent distinct subgroups reflecting different processes.’<sup>121</sup>

This question was met with a somewhat muted response from the community of attachment researchers, even those with clinical or high-risk samples with considerable numbers of dyads with a disorganized classification. Many researchers found the disorganized attachment classification attractive and were not inclined to question it (Chapter 1). An individual participant data meta-analysis by Dagan and colleagues of associations between mother–infant and father–infant attachment and later internalizing and externalizing problems with 1,097 children highlighted the great potential value of examining different forms of disorganized attachment, but felt they did not have an adequate sample size.<sup>122</sup>

One of the few investigations to examine the subtypes of disorganized attachment highlighted by Lyons-Ruth was a study using the large NICHD dataset (Chapter 3) by Mills-Koonce and colleagues examined maternal depressive symptoms as a predictor of parenting. They found that dyads classified as disorganized with underlying patterns of avoidant or resistant behaviour showed declining sensitivity between six and 36 months. This was especially the case for dyads where the mother was experiencing symptoms of depression. However, the sensitivity of caregivers of children classified as disorganized–approach tended to increase over time. Mills-Koonce and colleagues argued that the strength of associations between insensitivity and disorganization in meta-analytic research may have been weakened by ‘collapsing these two groups into a single, overall “disorganized” category.’<sup>123</sup>

Using the large Generation R sample (Chapter 4). Luijk, Tharner, and colleagues found that two psychobiological measures of stress-regulation (daily cortisol curve and respiratory sinus arrhythmia) were atypical for infants with a disorganized attachment

distress, may actually be easier to disorganize than organized, insecure infants who already have defensive strategies in place against attachment-related distress. Thus, when the otherwise adequate mother of a secure infant behaves transiently in a disorganized fashion, the infant may be more responsive to her behavior and likely to reflect it in his or her own disorganization (Lyons-Ruth, personal communication) (136).

<sup>121</sup> Lyons-Ruth, K., Repacholi, B., McLeod, S., & Silva, E. (1991) Disorganized attachment behavior in infancy: Short-term stability, maternal and infant correlates, and risk-related subtypes. *Development and Psychopathology*, 3(4), 377–396, p. 380.

<sup>122</sup> Dagan, O., Schuengel, C., Verhage, M. L., van IJzendoorn, M. H., Sagi-Schwartz, A., Madigan, S., ... & Collaboration on Attachment to Multiple Parents and Outcomes Synthesis (2021) Configurations of mother–child and father–child attachment as predictors of internalizing and externalizing behavioral problems: An individual participant data (IPD) meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 67–94.

<sup>123</sup> Mills-Koonce, W. R., Gariepy, J. L., Sutton, K., & Cox, M. J. (2008) Changes in maternal sensitivity across the first three years: Are mothers from different attachment dyads differentially influenced by depressive symptomatology? *Attachment & Human Development*, 10(3), 299–317, p. 312.

classification, but that this effect was weaker for disorganized–approach dyads.<sup>124</sup> Hughes and colleagues examined mothers and infants next-born after stillbirth and matched controls in the Strange Situation. They found that lack of resolution on the AAI about the stillbirth was associated with disorganized approach by the next-born infants towards their mother on reunion.<sup>125</sup>

A few other studies, generally led by researchers outside the United States, have conducted post hoc analyses after finding that an outcome of interest was associated with both disorganization and insecurity. For example, Pauli-Pott and colleagues studied antecedents of child behavioural problems at 30 months.<sup>126</sup> After finding that both disorganization and insecurity in the Strange Situation was associated with behavioural problems, they examined subtypes of disorganization. In their sample all children with a disorganized and secondary insecure classification showed behavioural problems, whereas none of the children from the disorganized–approach dyads were identified as showing behavioural difficulties.

In other studies the distinction has again been used in posthoc analyses, but in this case when the main hypotheses have not turned out as expected. Frosch and colleagues were surprised when there were no significant differences associated with disorganized attachment in observations of toddler–parent interaction when reading a story book. A post hoc analysis was therefore conducted comparing the subtypes of disorganization and found that mothers in disorganized–approach dyads exhibited greater warmth and supportiveness.<sup>127</sup> In general, findings have been very well aligned with the proposals of Lyons-Ruth and colleagues. Still, caution is needed. It is unknown how many researchers conducted tests of the subtypes of disorganization, and then did not report them due to null findings. For instance, in a doctoral study by Wang, she examined interactions between insecurity and disorganization in predicting child externalizing symptoms and found no effect.<sup>128</sup> In the published version of the doctoral study, this test was not mentioned.<sup>129</sup> It should also be noted that no research laboratory has reported inter-rater reliability for the subtypes.

Over the past 10 years, Lyons-Ruth has scaled back advocacy for the two subtypes of disorganized attachment. On the one hand, she has adopted the view that it may be better to track a child's experiences of care more directly, with naturalistic observational measures of

<sup>124</sup> Luijk, P. C. M., Saridjan, N., Tharner, A., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Jaddoe, V. W., ... & Tiemeier, H. (2010) Attachment, depression and cortisol: Deviant patterns in insecure-resistant and disorganized infants. *Developmental Psychobiology*, 52, 441–452; Tharner, A., Dierckx, B., Luijk, M. P., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., van Ginkel, J. R., ... & Tiemeier, H. (2013) Attachment disorganization moderates the effect of maternal postnatal depressive symptoms on infant autonomic functioning. *Psychophysiology*, 50(2), 195–203.

<sup>125</sup> Hughes, P., Turton, P., Hopper, E., McGauley, G. A., & Fonagy, P. (2001) Disorganised attachment behaviour among infants born subsequent to stillbirth. *Journal of Child Psychology and Psychiatry*, 42(6), 791–801.

<sup>126</sup> Pauli-Pott, U., Haverkock, A., Pott, W., & Beckmann, D. (2007) Negative emotionality, attachment quality, and behavior problems in early childhood. *Infant Mental Health Journal*, 28(1), 39–53.

<sup>127</sup> Frosch, C. A., Cox, M. J., & Goldman, B. D. (2001) Infant–parent attachment and parental and child behavior during parent–toddler storybook interaction. *Merrill-Palmer Quarterly* (1982–), 445–474. To give another example, a doctoral thesis by Hinshaw-Fuselier using data from the Jacobvitz/Hazen lab reported that caregivers in disorganized–approach dyads reported more disruptive life events and relationship events. This analysis was undertaken after it was initially found that level of infant disorganization was not, as expected, related to maternal depressed mood, disruptive life events, or the interaction between them. Hinshaw-Fuselier, S. S. (2004) Pathways to disorganized attachment in infancy: Are maternal depressed mood and disruptive life events meaningful contributors? Unpublished doctoral thesis, University of Texas at Austin.

<sup>128</sup> Wang, F. (2011) Levels of attachment disorganization: Its precursors and pathways toward maladaptation. Unpublished doctoral dissertation, University of North Carolina at Chapel Hill.

<sup>129</sup> Wang, F., Willoughby, M., Mills-Koonce, R., & Cox, M. J. (2016) Infant attachment disorganization and moderation pathways to level and change in externalizing behavior during preschool ages. *Attachment & Human Development*, 18(6), 534–553.

child–caregiver interaction, rather than assessing children’s expectations about their caregiver in the Strange Situation. As such, it may be better to attempt to measure the caregiving behaviour associated with disorganized–approach, rather than disorganized–approach behaviour itself.

On the other hand, Lyons-Ruth now regards that a focus on the two subtypes takes too much for granted about disorganization, when in fact we still know too little about conflicted, confused, and apprehensive behaviour in the Strange Situation and their clinical meaning. As a group, these behaviours predict conduct problems in middle childhood—though as we shall see shortly, not as well as observation of caregiving. Disorganization was not predictive of dissociation in early adulthood,<sup>130</sup> but D-approach at 18 months predicted suicidal thoughts and self-harm.<sup>131</sup> There was a slight correlation between disorganized attachment in infancy and young people’s later self-report on child maltreatment, though observed hostile behaviours by caregivers in the home were by far the better concurrent predictor.<sup>132</sup>

Lyons-Ruth and colleagues have contested the widespread assumption—actually a misreading of Main’s work as we saw in [Chapter 1](#)—that the behaviours picked out by Main and Solomon are all caused by some underlying process of ‘disorganization.’ In line with contemporary approaches to mental health symptomatology, she has expressed interest in considering these behaviours and associated psychological processes more like a system than the expression of a single process, with particular forms of disruption potentially reinforcing or perpetuating one another.<sup>133</sup> There may be certain aspects of disorganization that are more important and contribute to cascades of other behaviours. For instance, feelings of fear towards a caregiver may contribute to conflict about approaching them; but conflict about approaching a caregiver may have various causes and is not itself necessarily a cause of fear except insofar as the conflict blocks access to the caregiver in ways that are in turn alarming.

These arguments have quite radical implications for future research. Lyons-Ruth, Zeanah, Benoit, Madigan, and Mills-Koonce—a group predominantly of senior clinically trained attachment researchers—have argued that:

Given the array of odd or contradictory behaviors contributing to the disorganized category, further work is needed to identify distinct subgroups that might share a particular etiology and/or a subsequent developmental pathway. It is not yet clear whether the forced or secondary classifications now assigned are the most empirically useful subgroupings.... The diversity of behavioral presentations also raises the possibility that a number of subgroups may exist within the overall category, with different implications for current disorder or later prognosis. However, the established reliability and concurrent validity of

<sup>130</sup> Dutra, L., Bureau, J. F., Holmes, B., Lyubchik, A., & Lyons-Ruth, K. (2009) Quality of early care and childhood trauma: A prospective study of developmental pathways to dissociation. *The Journal of Nervous and Mental Disease*, 197(6), 383–390.

<sup>131</sup> Lyons-Ruth, K., Bureau, J.-F., Holmes, B., Easterbrooks, A., & Brooks, N. H. (2013) Borderline symptoms and suicidality/self-injury in late adolescence: Prospectively observed relationship correlates in infancy and childhood. *Psychiatry Research*, 206(2), 273–281, p. 279.

<sup>132</sup> Khoury, J. E., Rajamani, M., Bureau, J. F., Easterbrooks, M. A., & Lyons-Ruth, K. (2020) Aspects of parent–child interaction from infancy to late adolescence are associated with severity of childhood maltreatment through age 18. *International Journal of Environmental Research and Public Health*, 17(11), 3749, Table 2.

<sup>133</sup> See, for example, Brumariu, L. E., Kerns, K. A., Giuseppone, K. R., & Lyons-Ruth, K. (2021) Disorganized/controlling attachments, emotion regulation, and emotion communication in later middle childhood. *Journal of Applied Developmental Psychology*, 76, 101324: ‘Longitudinal studies in larger and more diverse samples are needed to better understand how disorganized and controlling attachment behaviors and emotion regulation and communication aspects may reinforce and perpetuate one another over time, in risk and non-risk environments.’

these infant behaviors mandate continued research to distill the most powerfully predictive and clinically usable indicators of disorganized attachment status and integrate them into current diagnostic thinking.<sup>134</sup>

Lyons-Ruth and Jacobvitz repeated this claim in their high-profile chapter on attachment disorganization in the 3rd edition of the *Handbook of Attachment*, arguing that the encompassing disorganised attachment category requires revalidation in terms of which elements are actually associated with developmental risk for children. Lyons-Ruth and Jacobvitz argued that the disorganised category is currently too absorptive and weakly defined to serve as an effective bridge between research and practice.

Main herself had acknowledged that 'our predictive power has been reduced by a failure to record the specific kind of disorganized or disoriented behavior that had been exhibited. In fact, freezing and trancelike states might predict one unfavorable outcome, repeated slow strikes to the parent's face might predict a different outcome.'<sup>135</sup> Lyons-Ruth and Jacobvitz agreed that it was necessary to further 'tune' the category to maximize prediction. Specifically, they urged the need to 'validate a clinically useful set of evidence-based indicators of Disorganized/Disordered attachment in infancy' and 'include only the forms to be considered disordered.'<sup>136</sup> In a context where concerns have been raised about the effectiveness and clarity of dialogue between attachment research and clinical practice, with attachment concepts leading a shadowy life as quasi-diagnostic classifications without a settled place in mainstream clinical practice, Lyons-Ruth and Jacobvitz proposed that disorganized attachment should be revalidated as a clinical diagnostic category.

## The Hostile/Helpless Classification

### The Disturbed Caregiving System

As we saw above, in a masters study supervised by Ainsworth, Crittenden inductively developed a behavioural checklist to identify maternal behaviour that distinguished among abusing, neglecting, and adequate caregivers of infants. The behaviours associated with the 'abusive' profile were of two quite different sorts. On the one hand, Crittenden included hostile behaviours such as jabbing or pinching the child. On the other hand, Crittenden also associated markers for interaction set by the caregiver's agenda at the expense of the child's with the 'abusive' profile. The behaviours associated with the 'neglecting' profile were again of two general sorts: either lack of emotional expression and non-responsiveness to the child. Both the 'abusive' and 'neglectful' profiles were associated with less contingent responsiveness to the infant, less affectionate behaviour, and less adaptation to the goals of the infant. Bowlby had also written about maternal depression, distinguishing frustrated and hopeless forms. These ideas influenced Lyons-Ruth's thinking about how

<sup>134</sup> Lyons-Ruth, K., Zeanah, C. H., Benoit, D., Madigan, S., & Mills-Koonce, W. R. (2014) Disorder and risk for disorder during infancy and toddlerhood. In E. J. Mash & R. A. Barkley (eds), *Child Psychopathology* (3rd ed., pp. 673–736). New York: Guilford Press, pp. 709, 712.

<sup>135</sup> Main, M. (1995) Recent studies in attachment: Overview, with selected implications for clinical work. In S. Goldberg, R. Muir, & J. Kerr (eds), *Attachment Theory: Social, Developmental and Clinical Perspectives* (pp. 407–470). Hillsdale, NJ: Analytic Press, p. 458.

<sup>136</sup> Lyons-Ruth, K. & Jacobvitz, D. (2016) Attachment disorganization from infancy to adulthood: Neurobiological correlates, parenting contexts, and pathways to disorder. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (Vol. 3, pp. 667–695). New York: Guilford, p. 687.

experiences of chronic, untamed distress and fear in high-risk environments may shape the development of individuals and the ways they would go on to parent.

In March 1993, Judith Solomon convened a symposium at the Society for Research in Child Development biennial meeting in New Orleans, focused on elaborating Bowlby's concept of the caregiving motivational system. The New Orleans meeting was an important moment for the attachment community. Ainsworth and Eichberg's 1991 chapter had recently been published in Parkes, Stevenson-Hinde, and Marris's important volume on *Attachment Across the Life Cycle*.<sup>137</sup> Here Ainsworth and Eichberg reported associations between a parent's Adult Attachment Interview and the dyad's Strange Situation procedure classification, aligned with Main and colleagues' original work. Such findings trained attention for researchers on the relationship between attachment-related affects, behaviours, and cognitions, following Main's call for a 'move to the level of representation.' They also trained attention on the mechanisms of continuity and discontinuity between adult states of mind about attachment and the infant-caregiver attachment classification.<sup>138</sup> Furthermore, in 1993, news of Ainsworth's cognitive decline and symptoms of Alzheimer's disease was becoming known, raising practical and symbolic questions about the future directions of the field, which were being worked out at the conference. In asking about the caregiving motivational system, Solomon and colleagues were implicitly asking about the resources available within attachment theory for thinking and researching beyond Ainsworth's account of sensitivity.

The presentation by Solomon and Carol George would become their important 1996 paper, leading to a special issue of the *Infant Mental Health Journal* addressing caregiving in attachment theory and research.<sup>139</sup> Solomon and George argued that the mature balance of the caregiving system with other behavioural systems is critical for the provision of 'good enough' care to a child. They contrasted their account to the image put forward by Bowlby, especially in his early writing, of the caregiving system as the perfect match for the needs of the attachment system and hence the child. In particular, Solomon and George made a strong case that economic and social supports are important for the effective elaboration and functioning of the caregiving system.

Solomon and George were interested in the specific psychology of caregivers, a topic that had been both highlighted, and somewhat elided, by Main's extrapolation of the Strange Situation categories of infant behaviour into the Adult Attachment Interview. The assumption that the AAI was a measure of 'attachment'—rather than, in fact, an interview about attachment experiences—had contributed to the impression that a caregiver's behaviour towards their child was determined by their 'attachment.'

A parent's experiences growing up may well dispose them to certain assumptions and vulnerabilities when faced with the challenges of looking after a child. This may include difficulty noticing and responding to their infant's cries due to having learnt to turn attention away from potentially distressing events or communication by others. However, Solomon and George emphasized that such influence of a parents' attachment experience for their

<sup>137</sup> Ainsworth, M. D. S. & Eichberg, C. G. (1991) Effects on infant-mother attachment of mother's experience related to loss of an attachment figure. In C. M. Parkes, J. Stevenson-Hinde, & P. Marris (eds), *Attachment across the Life Cycle* (pp. 160–183). New York: Routledge.

<sup>138</sup> Slade, A. & Cohn, L. (March, 1993) The process of parenting and the remembrance of things past. In J. Solomon (Chair), *Defining the Caregiving System. Symposium Conducted at the Biennial Meeting of the Society for Research in Child Development, New Orleans*. A later version was published as Slade, A. & Cohen, L. J. (1996) The process of parenting and the remembrance of things past. *Infant Mental Health Journal*, 17(3), 217–238.

<sup>139</sup> George, C. & Solomon, J. (March 1993) Toward a theory of caregiving. Paper presented at the biennial meetings of the Society for Research in Child Development, New Orleans; Solomon, J., & George, C. (1996) Defining the caregiving system: Toward a theory of caregiving. *Infant Mental Health Journal*, 17, 183–197.



caregiving should not lead to neglect of the distinction between attachment and caregiving: in fact, they argued that it would only be through clarity *about* this distinction that the implications of early experience for an adult's parenting experience and behaviour could be understood.<sup>140</sup>

In the 1987 Society for Research in Child Development biennial meeting in Baltimore, Solomon and George had reported initial results from interviews with 32 mothers. They found that the 12 mothers of children classified as disorganized were especially likely to depict themselves as helpless and out of control, lacking effective strategies to handle the child or the role of caregiver.<sup>141</sup> In 1991, in a symposium chaired by Lyons-Ruth, Solomon and George had reported findings on the working models of these children.<sup>142</sup> Now, in the 1993 symposium, Solomon and George elaborated this concern with helplessness, proposing that dysregulation of the caregiving system obstructs the parent from integrating and regulating information stemming from their child's signals, resulting in a state of distress and felt helplessness.

At this symposium, Lyons-Ruth and Deborah Block presented a paper on 'The disturbed caregiving system.'<sup>143</sup> This included new findings from the Harvard Family Pathways Study, exploring associations between parents' self-report of adverse experiences in their childhood and observations of their caregiving behaviours. One finding was that there was considerable resilience in the sample. Even for mothers who had endured a high level of trauma, there were many secure dyads (42%).

Another important finding was that maternal reported history of physical abuse in her childhood was associated with zero or very low scores for self-reported trauma symptoms. It was also associated with hostile-intrusive caregiving behaviour and disorganized infant attachment in the Strange Situation, especially disorganized avoidance.

Yet maternal reported history of sexual abuse in her childhood was associated with considerable scores for self-reported trauma symptoms. It was also associated with time not in the room with the infant, disengagement when with the infant, and flatness of affect. No report was made on associations with Strange Situation classifications.

These findings resonated with other research on trauma in the period. An influential 1989 study by Herman, Perry, and Van der Kolk had found that borderline patients with considerable histories of abuse did not report current symptoms of trauma.<sup>144</sup> Herman proposed that the memories of abuse had become 'integrated into the total personality',<sup>145</sup> by being 'transformed over time and relived in a variety of disguised forms,

<sup>140</sup> See also Bretherton, I., Biringen, Z., Ridgeway, D., Maslin, C., & Sherman, M. (1989) Attachment: The parental perspective. *Infant Mental Health Journal*, 10(3), 203–221. Madigan and colleagues would later find that associations between the AAI and Strange Situation are fully mediated by the caregiver's thoughts and feelings about their child: Madigan, S., Hawkins, E., Plamondon, A., Moran, G., & Benoit, D. (2015) Maternal representations and infant attachment: An examination of the prototype hypothesis. *Infant Mental Health Journal*, 36(5), 459–468.

<sup>141</sup> Solomon, J., George, C., & Ivins, B. (1987, April) Mother-child interaction in the home and security of attachment at age six. Paper presented at the biennial meeting of the Society for Research in Child Development, Baltimore, MD.

<sup>142</sup> Solomon, J. & George, C. (April, 1991) Working models of attachment of children classified as controlling at age six: Disorganization at the level of representation. In K. Lyons-Ruth (Chair), *Symposium Conducted at the Biennial Meetings of the Society for Research in Child Development, Seattle*.

<sup>143</sup> Later published as Lyons-Ruth, K., & Block, D. (1996) The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal*, 17(3), 257–275.

<sup>144</sup> Herman, J. L., Perry, J. C., & Van der Kolk, B. A. (1989) Childhood trauma in borderline personality disorder. *The American Journal of Psychiatry*, 146(4), 490–495.

<sup>145</sup> Herman, J. L. (1992) *Trauma and Recovery*. New York: Basic Books, p. 494.

e.g. as somatic sensations, affect states, visual images, behavioral, reenactments, or even dissociated personality fragments.<sup>146</sup>

Lyons-Ruth and Block interpreted the hostile–intrusive caregiving and withdrawn caregiving behaviours as reflecting defences used by the mothers in the sample to avoid re-experiencing their own vulnerability and distress. For hostile–intrusive caregiving, this could be seen to reflect denial of distress (e.g., denying trauma-related symptoms), denying feelings of community or dependence on others (e.g., denying values beyond individual autonomy and strength), and identification with a tyrannical parent (e.g., taking a hostile posture towards the infant). For withdrawn caregiving, this could be seen as a defensive exclusion of the caregiving motivational system in order to avoid being flooded by feelings of vulnerability and distress associated with child–caregiver relationships, and perhaps also to protect their child from this distress. Identification with the aggressor may be more difficult for women sexually abused by men compared to women who experienced physical abuse.

This was an explosive proposal in the context of attachment research circa 1993. Main and Hesse had influentially argued in their 1990 chapter that disorganized attachment was caused by alarming caregiving behaviour (Chapter 1). While abusive caregiving would be one kind of alarming behaviour, Main and Hesse placed greater emphasis on frightened or frightening caregiver behaviours, which even if transient, would lead children to associate their caregiver with alarm, and experience conflict about approaching them. The unresolved classification in the Adult Attachment Interview, picking up even a few moments of disturbance in language or reasoning about attachment relationships, was associated with these moments of frightened or frightening caregiver behaviours. The reason for this was anticipated to be that both reflected memories of frightening and/or overwhelming experiences that may momentarily be controlling or altering discourse or behaviour.

Main and Hesse were at the New Orleans conference, presenting this position, though they were not in the audience for the symposium.<sup>147</sup> Lyons-Ruth and Block were advocating for quite a different alternative or additional mechanism, making a fundamental allegation: an inadequacy in Main's modes of imagining what it is like to live as an overwhelmed parent. Main's model had no place for a parent holding at bay ugly feelings with strategies like numbing or distortion, perhaps trying to protect our child from ourselves at our worst.

Lyons-Ruth and Block proposed that the same defences adults may use to hold back fear and distress, may also, incrementally and day-by-day, contribute to distortions in interaction and communication with their child. In turn these distortions may lead a child to experience conflict, confusion, or apprehension in the relationship: 'these maternal adaptations to fear become fear-provoking for the infant because the infant's felt security, or experience of the protective function of the attachment relationship, is directly tied to the communicative adequacy of the relationship ... we would expand Main and Hesse's concept of frightening behavior to include not only directly threatening behavior but also behavior that fails to maintain a minimally responsive stance toward the specific content of the infant's affective communications.'<sup>148</sup>

While not explicit in the published paper, in her 1993 symposium paper Lyons-Ruth made a further contrast between her position and that of Main: 'While the frightened or

<sup>146</sup> Ibid., 83–84.

<sup>147</sup> E. Hesse, personal communication, November 7, 2023.

<sup>148</sup> Lyons-Ruth, K. & Block, D. (1996) The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal*, 17(3), 257–275, p. 273.

frightening behaviors which Main sees as central may still play a role in disorganizing the infant, these behaviors take their place in a larger context of maternal errors in affective responsiveness in Lyons-Ruth's population, which may reflect enduring characterological adaptations rather than any transient affect state.<sup>149</sup>

The idea of characterological adaptations might require a little explanation as it has been partially absorbed into concern with personality disorder and has fallen out of favour now. The term stems from psychoanalytic theory, and the idea that pervasive aspects of a person's sense of self and behaviour could reflect a defence against overwhelming experiences or fantasies, and that these would be stabilized through a continued mental relationship with representations of early caregivers. More than 'ego' as an imputed intrapsychic agency, 'characterological adaptations' refer to characteristics that cross-cut experience and behaviour and that function to block painful affects: 'it falls just a bit short of a complete metapsychological profile.'<sup>150</sup>

By the early 1990s, characterological adaptations were anticipated by psychoanalytic scholars to be deployed more often, pervasively, and rigidly, the more a person had undergone unrelenting painful circumstances or events.<sup>151</sup> The proposal was, in essence, that in the face of intolerable suffering in the course of development, humans can adapt to become people who do not experience these feelings, though this adaptation may come at a psychological and social price for us. Psychoanalytic reflections also highlighted that characterological adaptations would be important considerations since their pervasiveness in individuals' behaviour meant that they would appear in the consulting room, including in clinical interviews and discussions with patients.

Lyons-Ruth anticipated that for individuals who had experienced considerable adversity and trauma, the Main and colleagues system for coding the AAI would not be fully suitable. Problems in the processing of chronic trauma did not represent localized vulnerabilities for, in Main's terms, 'otherwise well-functioning' adults.<sup>152</sup> They represented an endemic situation within which a life needed to be built, to the extent possible, while holding at bay intolerable feelings.<sup>153</sup> Specifically, in their 1996 published paper Lyons-Ruth and Block argued that 'characterologically ingrained adaptations to fear' would have fundamental importance in the AAI transcripts of individuals with a history of chronic trauma, where repeated overwhelming experiences had become *expectable* for individuals,

<sup>149</sup> Lyons-Ruth, K. & Block, D. (March, 1993) The disturbed caregiving system: Conceptualizing the impact of childhood trauma on maternal caregiving behavior during infancy. In J. Solomon (Chair), *Defining the Caregiving System. Symposium Conducted at the Biennial Meeting of the Society for Research in Child Development, New Orleans*.

<sup>150</sup> Baudry, F. (1984) Character: A concept in search of an identity. *Journal of the American Psychoanalytic Association*, 32(3), 455–477, p. 463.

<sup>151</sup> See, for example, Kernberg, O. (1983) Object relations theory and character analysis. *Journal of the American Psychoanalytic Association*, 31, 247–271; McCarthy, J. B. (1990) Abusive families and character formation. *American Journal of Psychoanalysis*, 50(2), 181–186.

<sup>152</sup> Main, M. (1991) Metacognitive knowledge, metacognitive monitoring, and singular (coherent) vs. multiple (incoherent) models of attachment: Some findings and some directions for future research. In P. Marris, J. Stevenson-Hinde, & C. Parkes (eds), *Attachment across the Life Cycle* (pp. 127–159). New York: Routledge, p. 145.

<sup>153</sup> The expectation that it is localised vulnerabilities that especially matter, rather than coping in the face of multiple challenges, is built into the coding system for the AAI: 'AAI coding conventions stipulate that the unresolved classification reflects the highest U score achieved for any specific lapse. Consequently, the classification system is incapable of distinguishing participants who make a single U lapse during a lengthy discussion of multiple losses from speakers who make several similar lapses during a much shorter discussion. It seems likely, however, that the former speaker is more capable of maintaining an organized state of mind while discussing traumatic events and, relatedly, also more capable of maintaining an organized caregiving strategy in the face of stressful circumstances.' Finger, B. (2006) Exploring the intergenerational transmission of attachment disorganization. Unpublished doctoral dissertation, University of Chicago, p. 153.

rather than acute and unexpected events.<sup>154</sup> Indeed, in the 1990s, anomalous findings were beginning to accumulate where the unresolved category had not been successful in discriminating clinical need or seemed a poor fit for data from high-adversity samples.<sup>155</sup> This was something Main and Hesse had also begun to notice as they were asked to code or consult on Adult Attachment Interviews conducted with high-adversity samples in the late 1980s and early 1990s. Hesse responded with the development of a 'Cannot Classify' classification for the AAI, to encompass more pervasive disruptions in processing regarding attachment-relevant information.<sup>156</sup> However Hesse's starting point was the identification of AAI transcripts that could not be plausibly coded with existing protocols. On the analogy of the Strange Situation categories, Cannot Classify was situated as equivalent to the more pervasive forms of disorganized attachment where an organized pattern is not readily visible, in contrast to most disorganized behaviours which briefly interrupt or disturb an infant's coordinated efforts to achieve direct or conditional availability from their caregiver. In starting with a residuum, Hesse was at a disadvantage. First, there were few such transcripts available, since the existing categories could be used for most transcripts, even if this sometimes entailed some strain. Secondly, the purported psychological process generating such transcripts was presumed to be just a more pervasive version of the conditions for unresolved states of mind, but this was difficult to prove or specify.

Cannot Classify status is certainly associated with mental pathology. However, researchers found it difficult to get inter-lab reliability on the Cannot Classify category. Furthermore, high-risk samples still only documented a few cases of Cannot Classify, which remained rare. Ultimately, the research community did not generally appear to regard the Cannot Classify category as theoretically or methodologically elaborated enough to capture the states of mind of populations with chronic experiences of trauma and adversity, and it has been little discussed in the research literature.<sup>157</sup>

### New Categories for the AAI

In this context, Lyons-Ruth supported a Harvard doctoral student, Gwendolyn Atwood, to develop new categories for the AAI suitable to characterize individuals with chronic childhood trauma.<sup>158</sup> These AAIs had been collected when children in the sample were 7–9 years old. Yet a problem with the AAI questions for this purpose was that there were few probes for the topic of trauma. Composed shortly after the publication of Bowlby's book on loss, and shaped by the personal interests of Main and Kaplan, the questions focused much more on potential bereavements and separations. Lyons-Ruth therefore added additional questions about trauma. These were adapted from work by Herman, Perry, and van der Kolk, and reflected the preoccupations of US psychology in the 1980s, with a focus on physical and sexual abuse, and no questions about neglect, emotional abuse,

<sup>154</sup> Lyons-Ruth, K. & Block, D. (1996) The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal*, 17(3), 257–275, p. 273.

<sup>155</sup> Levine, L. V. & Tuber, S. B. (1993) Measures of mental representation: Clinical and theoretical considerations. *Bulletin of the Menninger Clinic*, 57(1), 69; Carol, A. S. & Davies, F. (1995) Attachment organization and adaptation in sexually-abused women. *The Canadian Journal of Psychiatry*, 40(5), 234–240.

<sup>156</sup> Hesse, E. (1996) Discourse, memory, and the Adult Attachment Interview: A note with emphasis on the emerging cannot classify category. *Infant Mental Health Journal*, 17(1), 4–11.

<sup>157</sup> Though see Speranza, A. M., Nicolais, G., Maggiora Vergano, C., & Dazzi, N. (2017) Emerging criteria for the low-coherence cannot classify category. *Attachment & Human Development*, 19(6), 613–634.

<sup>158</sup> Atwood, G. C. (1995) Adult attachment disorganization: A new classification and scoring scheme for the Adult Attachment Interview. Unpublished doctoral thesis, Graduate School of Education of Harvard University.

or parental substance use. Some research groups subsequently kept Main and colleagues' questions. Others have followed Lyons-Ruth's lead here and added additional questions about trauma.<sup>159</sup>

Adopting a batch version of 'guess and uncover' (Chapter 1), Atwood and Lyons-Ruth began with 10 interview transcripts identified at random from the Harvard Family Pathways Study sample. On the basis of a review of the literature on attachment and trauma, codes were developed for relevant features of the transcripts suggestive of 'particular degrees and kinds of disorganization, which may reflect degrees and kinds of post-traumatic response to relational trauma.'<sup>160</sup> It was then revealed whether or not the speakers were from dyads classified as disorganized in the Strange Situation, and she refined the set of codes: 'By discussing our impressions of the subjects both before and after we were made aware of the disorganization status of their children—our external criterion for disorganization—we were able to develop further our thinking about the qualities of disorganized interviews that distinguish them from those of organized subjects. Our description of those disorganized subjects' transcripts became more detailed, dynamic and organized as this process continued.'<sup>161</sup>

Lyons-Ruth had available maternal reports of trauma symptoms, maternal reports of lifetime traumatic experiences, and observational measures of atypical parenting. Lyons-Ruth had tremendously granular knowledge of each case in her sample, and no doubt this information fed her discussions with Atwood about the 10 interview transcripts. Nonetheless Atwood and Lyons-Ruth refined their codes based specifically on associations with the infant's Strange Situation classification. This was the way that 'guess and uncover' had been used by the Berkeley group. It meant that ultimately what Atwood and Lyons-Ruth were studying was adult autobiographical discourse associated with conflicted, confused, or apprehensive expectations about them held by their offspring.

On the basis of the 10 transcripts, Atwood and Lyons-Ruth identified various kinds of marker:

- Anger or fear as prevailing affects in the transcript
- Confusion of self and others
- Sense of intrinsic personal badness or worthlessness
- Characterization of a caregiver as entirely malevolent
- Adopting the behaviours of caregivers characterized as malevolent
- Laughing while talking about painful experiences
- Attempts to break off entirely relationships with caregivers

They felt that these markers distinguished two kinds of transcript:

1. A first kind of transcript was termed 'Identification with a Malevolent Caregiver'. Here the speaker was 'judged to be massively defended against vulnerability and

<sup>159</sup> Bailey, H. N., Moran, G., & Pederson, D. R. (2007) Childhood maltreatment, complex trauma symptoms, and unresolved attachment in an at-risk sample of adolescent mothers, *Attachment & Human Development*, 9(2), 139–161; Harari, D., Bakermans-Kranenburg, M. J., De Kloet, C. S., Geuze, E., Vermetten, E., Westenberg, H. G. M., & Van IJzendoorn, M. H. (2009) Attachment representations in Dutch veterans with and without deployment-related PTSD. *Attachment & Human Development*, 11(6), 515–536.

<sup>160</sup> Atwood, G. C. (1995) Adult attachment disorganization: A new classification and scoring scheme for the Adult Attachment Interview. Unpublished doctoral thesis, Graduate School of Education of Harvard University, p. 89.

<sup>161</sup> *Ibid.*, 99.

yet intensely preoccupied with childhood experiences, and to demonstrate clear evidence of having adopted attitudes and behaviors of the caregivers that were initially experienced by the subject as injurious. These subjects evidencing Identification with the Malevolent Figure were predicted to have Disorganized/avoidant infants.<sup>162</sup> Atwood observed that speakers might be 'massively defended against vulnerability and derogating of attachment, and yet intensely preoccupied with childhood experiences, which may be related in a vivid, detailed fashion with notably discrepant affective labelling.'<sup>163</sup> She also noticed that 'at the same time that these subjects may strike the reader as quite egocentric, they also seem to feel quite powerless in the world. They tend to have an external locus of control and to see themselves as acted upon rather than as active agents. They do not tend to see themselves as particularly capable of making life better for themselves or others, although they often appear to have tried hard to do so.'<sup>164</sup>

2. A second kind of transcript was termed 'Fearful/helpless'. The speaker 'evidenced a stance of helpless vulnerability'.<sup>165</sup> These speakers 'describe vividly negative childhood experiences, and typically evoked strong emotional responses in the reader of her transcript', in response to their 'fearful, vulnerable experiences in attachment relationships'.<sup>166</sup> There seemed to be identification with a helpless or overwhelmed caregiver. 'Fearful/helpless' transcripts were, however, less well characterized than 'Identification with a Malevolent Caregiver'. The idea of 'Fearful/helpless' transcripts resonated with Solomon and George's earlier work on feelings of helplessness among the mothers in dyads classified as disorganized. However, whereas Solomon and George's focus was on feelings of being out of control in the role of caregiver, Atwood and Lyons-Ruth emphasized that what they were seeing were transcripts characterized by helpless vulnerability in adult's accounts of their own early attachment relationships.

Other kinds of transcript were also identified and matched with disorganized attachment in the Strange Situation. In all cases, 'the subject's transcript indicates the presence of at least one malevolently-represented attachment figure in the subject's mental world, even though the indications may be subtle'.<sup>167</sup> Indeed, across adult transcripts linked to infant disorganized attachment, 'the experience of malevolence in a caregiver appears to have generalized to others, including strangers generally. These subjects may speak about not trusting others in a global sense, and about teaching their children not to trust or depend on anyone'.<sup>168</sup> Across adult transcripts linked to infant disorganized attachment Atwood and Lyons-Ruth also observed the near-ubiquity of a sense of intrinsic personal badness or worthlessness, an observation which she tied to the powerful role of the malevolently represented attachment figure in the subject's mental world. Many speakers also described breaking off relationships with their caregivers.

For instance, 'another subtype of the disorganized subjects seen in this sample was an extremely constricted subject, with no indicators of preoccupied speech. On close examination, subtle evidence of malevolent representations and identification with the aggressor

<sup>162</sup> Ibid., 101.

<sup>163</sup> Ibid., Appendix 3.

<sup>164</sup> Ibid.

<sup>165</sup> Ibid., 102.

<sup>166</sup> Ibid., 125.

<sup>167</sup> Ibid., Appendix 3.

<sup>168</sup> Ibid.

could be seen in this transcript, although occurring at a much lower frequency and in a more subdued form than usually encountered, since the subject was so constricted in her discourse.<sup>169</sup> A further pattern seen clearly in three of the 10 transcripts was 'subjects who idealized their past and who spoke of themselves as "clones" of their parents. These subjects tended to describe themselves as "enemies, and the best of friends" with their parents, with whom they constantly "battled" as a form of contact in these "perfect" relationships. One had the sense that much of what really happened in childhood was left out of the subject's account.'<sup>170</sup>

However, Atwood and Lyons-Ruth ultimately settled on a focus on two forms: Identification with the Malevolent Figure, and Fearful/helpless. In the first case, the speaker identifies with the malevolent figure and affirms their values (e.g., harsh parenting was justified, as it is, ultimately, a hard world that in turn requires strength and hard work); in the second, the speaker continues to feel fearful and helpless in the wake of this figure and/or identifies with a helpless or overwhelmed caregiver (e.g., there is nothing to be done in the face of victimization, as it is, ultimately, how the world works). The reason these two forms were preferred to the other two, especially the subtype that characterized three out of 10 participants, is not provided by Atwood and Lyons-Ruth. Identification with the Malevolent Figure and Fearful/helpless correspond directly to the categories set out in Lyons-Ruth and Block's 1993 symposium paper. It may be that Atwood and Lyons-Ruth came to these largely inductively. This is the general impression offered by the thesis, though this may be an artefact of genre expectations on a doctoral thesis to signal the original contribution of the graduate student.

It may have been that the selection of the Identification with the Malevolent Figure and Fearful/helpless categories was influenced by the broader literature. As we have seen, Lyons-Ruth was influenced by early work by Crittenden which had highlighted themes of hostility/intrusiveness and helplessness in caregiver behaviour and assumptions about relationships. Crittenden had subsequently published a chapter in the prominent 1988 book *Clinical Implications of Attachment*, edited by Belsky and Nezworski, which argued that fear and dysregulation could lead to displays of helplessness and/or of dominance and aggression.<sup>171</sup> Psychoanalytic writers in the period were likewise offering similar observations, especially in clinical studies of depression.<sup>172</sup>

Alternatively, it may have been that the informed speculation in 'guess and uncover' was oriented specifically by the hypotheses of Lyons-Ruth and Block. This is suggested by the fact that Atwood and Lyons-Ruth propose that 'Identification with a Malevolent Caregiver' would be associated with disorganized-avoidant attachment, but no prediction is made for 'Fearful/helpless', despite the use of disorganized attachment as the criterion for development of codes. This corresponds to Lyons-Ruth and Block's paper, where physical abuse is associated with hostile-intrusive caregiving and infant disorganized attachment, whereas no assessment is reported of association between sexual abuse and the Strange Situation. That said, Atwood and Lyons-Ruth did not mention sexual abuse as an anticipated part

<sup>169</sup> Ibid., 126.

<sup>170</sup> Ibid., Appendix 3.

<sup>171</sup> For example, Crittenden, P. M. (1988) Relationships at risk. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 136–174). Hillsdale, New Jersey: Lawrence Erlbaum.

<sup>172</sup> For example, Jukes, A. (1993) Violence, helplessness, vulnerability and male sexuality. *Free Associations*, 4(29, Pt 1), 25–43. Nonetheless, direct attention to the links between aggression and helplessness in the psychoanalytic literature was hindered by the legacy of early psychoanalytic theory, which aligned 'masculinity' and 'activity', opposed to 'femininity' and 'passivity'. The psychoanalytic literature had generally begun to distinguish helplessness from femininity and passivity by the 1970s. See, for example, Stolar, D. & Fromm, E. (1974) Activity and passivity of the ego in relation to the superego. *International Review of Psycho-Analysis*, 1(3), 297–311.

of the aetiology of Fearful/helpless discourse. Instead, they characterized Fearful/helpless speakers as 'struggling with intense, unmanageable and unmanaged feelings of rage, fear and guilt in relation to experiences of caregiver(s) who are mentally represented by the subject as malevolent, often but not necessarily in response to childhood experiences of parental abuse, rejection, and/or incompetence and helplessness'.<sup>173</sup>

### Reflective Function

Atwood and Lyons-Ruth noticed that the Malevolently Identified transcripts were distinctively associated with difficulties noticing and understanding their own and others' mental states: 'These subjects tend to be notably unpsychologically-minded in their explanations of their own and others' behaviors and motivations. As with many dismissing subjects, they tend to favor physical or concrete explanations of psychological events ("My mother left my father because she wanted lawn furniture." "She was my father's favorite because they were born on the same day." "She preferred to live with my grandparents since they were rich."').'<sup>174</sup> This seemed akin to observations by Fonagy, Steele, and Steele, who had termed this 'reflective function' in their 1991 paper on an alternative approach to coding the AAI.<sup>175</sup>

Ten further transcripts were identified at random by Lyons-Ruth from her sample. These, together with the original 10 transcripts, were coded using the emerging system by a research assistant. The transcripts were also coded for reflective function by a different member of the team. There was no association between the two measures. Atwood and Lyons-Ruth concluded that this reflected poorly on the reflective functioning scale: 'In light of the overall impression that the disorganized subjects in this study gave (of being at best unintegrated in their psychological thinking and at worst quite concrete, simplistic and not psychologically-minded), it appears that the non-significant finding from this study with regard to RSF [reflective functioning] is more probably a function of the lack of development of the RSF scale for use by researchers other than its originators than it is a reflection of relatively high RSF in our disorganized subjects'.<sup>176</sup>

One important commonality between the Hostile and Helpless subtypes, for Lyons-Ruth, is the difficulty for speakers to think about their own and other minds, without being derailed by negative affects or contradictory ideas. Looking at the coding manuals for the Hostile/Helpless classification and reflective functioning, there are both similarities and differences. In the reflective functioning manual, Fonagy and colleagues note that 'when reflective-functioning is absent or ineffectual, quite distinct, readily classifiable, patterns of responses tend to emerge'.<sup>177</sup> One pattern is rejection of reflective functioning, with the prompts in the interview to think about childhood experiences and the intentions of attachment figures responded to in a hostile way by the speaker. This seems well aligned with

<sup>173</sup> Atwood, G. C. (1995) Adult attachment disorganization: A new classification and scoring scheme for the Adult Attachment Interview. Unpublished doctoral thesis, Graduate School of Education of Harvard University, Appendix 3.

<sup>174</sup> Ibid.

<sup>175</sup> Fonagy, P., Steele, H., & Steele, M. (1991) Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development*, 62(5), 891–905.

<sup>176</sup> Atwood, G. C. (1995) Adult attachment disorganization: A new classification and scoring scheme for the Adult Attachment Interview. Unpublished doctoral thesis, Graduate School of Education of Harvard University, p. 129.

<sup>177</sup> Fonagy, P., Target, M., Steele, H., & Steele, M. (1998) *Reflective Functioning Manual*, version 5. London: UCL/Anna Freud Centre.



Hostile discourse. However, Fonagy, Steele, and Steele keep to a single scale for reflective functioning: they do not empirically operationalize such subtypes. There is also no mention of helpless discourse, so this seems to be capturing something distinct.

Examination of the manuals for the two coding systems suggest other material differences. The coding of reflective function appears to give special weight to the capacity of the speaker to identify change in their perspective over time. The coding of reflective function is concerned with whether the speaker understands mental states as relevant for making sense of behaviour. By contrast, the Hostile/Helpless manual is more concerned with whether speakers' attributions focus on others' malevolence or their own helplessness.

Subsequent to Atwood's doctoral study, one study has coded Adult Attachment Interviews for both Hostile/Helpless classification and reflective functioning. Barone and Carone studied a sample of adult women comprised of 23 mothers who had murdered their child, recruited through psychiatric hospitals, and 23 mothers matched by age and recruited from treatment waiting lists at mental health facilities. The filicidal mothers self-reported more experiences of maltreatment, and their AAIs were independently scored as lower for reflective functioning and higher for the Hostile/Helpless classification. There was a very sizeable negative association between the two measures ( $r = -0.41$ ).<sup>178</sup> Barone and Carone provide some initial indication that the scores for Hostile/Helpless and scores for reflective functioning make non-redundant contributions in distinguishing filicidal mothers from the comparison group. However, the relationship between the two constructs for coding the Adult Attachment Interview remains a largely unresolved question.

### The Meaning of Helplessness

Atwood's initial system was further developed and formalized by Lyons-Ruth and graduate students Yellin and Melnick into the Hostile/Helpless coding system for the AAI. In the manual for coding these categories, Lyons-Ruth and colleagues offered the general reflection that:

Transcripts of individuals with a Hostile-Helpless state of mind are characterized by unintegrated mental contents that are manifested in particular forms of contradiction in the protocol, i.e. opposing evaluations of central relationships are left to stand unrecconciled and uncommented upon for considerable portions of the record. A hallmark of the Hostile-Helpless state of mind is the coder's impression that the individual has not engaged in reflection adequate to bring these contradictions to a conscious level and has not reworked the representation of self and others to a point where the individual can think and feel differently about them than he or she did as a child.<sup>179</sup>

Though elaborated and better pinned down, the manual's characterization of Hostile and Helpless transcripts remains generally in line with Atwood's doctoral thesis. This includes the comparative weakness of the delineation of the Helpless subtype, which remains less clearly characterized in terms of markers than the Hostile subtype. A reason for this may

<sup>178</sup> Barone, L. & Carone, N. (2021) Childhood abuse and neglect experiences, Hostile-Helpless attachment, and reflective functioning in mentally ill filicidal mothers. *Attachment & Human Development*, 23(6), 771–794.

<sup>179</sup> Lyons-Ruth, K., Melnick, S., Atwood, G., & Yellin, C. (2019) Pervasively unintegrated hostile-helpless states of mind on the Adult Attachment Interview. Classification and Coding Manual Version 4.0. Unpublished document, Harvard Medical School, Cambridge, MA.

lie in what Hostile and Helpless states of mind were actually conceived to be. They were developed by Atwood and Lyons-Ruth on the basis of the idea that chronically traumatized populations would not show brief interruptions or disturbances of coherent speech, but rather would need to have developed pervasive defences—‘characterologically ingrained adaptations to fear’<sup>180</sup>—which would be reflected across the transcripts. The Hostile subtype fits this well: the speaker’s attention is fixed on hostility towards their caregiver, omitting the painful feelings or consequences they faced and giving indications, in fact, of invulnerability, for instance through denial of dependence on others. Lyons-Ruth and colleagues remarked that ‘it appears that the difficulties in early relationships were too encompassing to be dealt with by lack of memory or by consistent idealization and caregivers were often too frightening or vulnerable to risk any anger, so the difficulties are presented as matter of fact.’<sup>181</sup>

Though Lyons-Ruth’s general emphasis is on the psychodynamic image of identification with the aggressor as an intra-psychic process, she also described the intra-psychic as emerging from negotiation with developmental processes of intersubjective exchange. Lyons-Ruth held that a child subjected to harsh/tyrannical or unresponsive caregiver behaviour would in fact learn *both sides* of the ‘dominant/submissive’ role.<sup>182</sup> She perceived a permeable boundary between the Hostile and Helpless subtypes rather than a strict distinction, as individuals experience a ‘larger array of unintegrated, or mentally segregated, behavioral and mental phenomena that are related to unbalanced dominant/submissive dyadic processes.’<sup>183</sup> Nonetheless, in the preschool years, Lyons-Ruth supposed that one or the other role would likely come to dominate, with for instance a dominant and hostile stance stabilizing as what Main and Cassidy observed as controlling-punitive behaviour. Lyons-Ruth agreed with Main and Cassidy that such behaviour may be regarded as a social adaptation used to manage self and other in a context where the classic conditional strategies of avoidance or resistance had not proven viable.

As we can see, there are then two explanatory levels in Lyons-Ruth’s account: a first accounted for Hostile/Helpless discourse as a characterological defence against fear; a second accounted for Hostile/Helpless discourse as reflecting a social adaptation to the developmental environment. The first is especially dominant in texts from the 1990s and also the Hostile/Helpless coding manual, presumably due to its roots in the 1990s. The second is more dominant in the 2000s. From the 2010s, Lyons-Ruth has tended to integrate the positions, treating them as the same claim but at different levels of analysis.

This integration makes good sense of the Hostile subtype, which seems to fit the idea both of a characterologically ingrained defence against fear and of a learnt adaptation to dominant/submissive interactions. The individual identifies with their harsh caregiver, taking on their values, and seeking to dominate relationships and assert their own power, which then offers a feeling of control. However, the Helpless subtype does not fit as well and cannot be readily characterized as a pervasive defence, since the fear ostensibly ‘defended’

<sup>180</sup> Lyons-Ruth, K. & Block, D. (1996) The disturbed caregiving system: Relations among childhood trauma, maternal caregiving, and infant affect and attachment. *Infant Mental Health Journal*, 17(3), 257–275, p. 273.

<sup>181</sup> Lyons-Ruth, K., Yellin, C., Melnick, S., & Atwood, G. (2005) Expanding the concept of unresolved mental states: Hostile/helpless states of mind on the Adult Attachment Interview are associated with disrupted mother–infant communication and infant disorganization. *Development and Psychopathology*, 17(1), 1–23.

<sup>182</sup> An influence here was Liotti, G. (1999) Understanding the dissociative processes: The contribution of attachment theory. *Psychoanalytic Inquiry*, 19, 757–783.

<sup>183</sup> Lyons-Ruth, K. (2002) The two-person construction of defenses: Disorganized attachment strategies, unintegrated mental states, and hostile/helpless relational processes. *Journal of Infant, Child, and Adolescent Psychotherapy*, 2(4), 107–119, p. 118.

against is entirely central to experience and behaviour.<sup>184</sup> Nor does Lyons-Ruth effectively characterize what social adaptation is entailed by helplessness. Proposals have been made by others—including Crittenden, Shaver and Mikulincer, and Talia—for the development of helpless behaviour as a means of eliciting care in the service of attachment needs, where an individual lacks a sense of trust that attachment needs will be met.<sup>185</sup> For instance, Crittenden described helplessness as an attachment strategy that is deployed when ‘the source of fear is unclear and the outcome is generalised defeat’, such that ‘it is more often the absence of clear and predictable safety, rather than the presence of threat, that is the source of arousal’.<sup>186</sup>

Rarely, Lyons-Ruth pointed to Hostile and Helpless states of mind as adaptive strategies for mothers who risk otherwise not coping to conserve resources in ways that would not be possible if they were attending to their infant’s cues and needs. However, she has usually tended to characterize helplessness as a failure of adaptation and the absence of strategies:

Janie was acutely aware of some of the hurt she felt growing up and was consciously committed to never inflicting fear or abandonment on Brad; however, she had no inner representations available to her of a middle ground between her father’s frightening and sadistic anger and her mother’s passivity and abandonment. Additionally, she was unaware of the way her signals to Brad were subtly contradictory, so that her feeling of always submitting to his needs was overtly caring but tinged with aggravation, resentment, and fear.... Janie felt compelled to ‘choose’ a position of helpless compliance with her infant because the only other model available in her experience was both sadistically aggressive and abandoning.<sup>187</sup>

As discussed in [Chapter 1](#), one of the risks of guess-and-uncover, as a semi-inductive process, is overfitting of a coding system to its development sample, resulting in eccentric elements of the coding system and divergence between theory and method.

In the case of the Hostile/Helpless coding system, for example, it is not evident whether or not the Helpless subtype is actually a ‘state of mind’ in Main’s technical definition, as a manner of information-processing and communication about attachment-related experiences ([Chapter 1](#)). It is certainly a notable phenomenon coded on the Adult Attachment Interview, and therefore the appeal to Main’s terminology is understandable. But the specific lines of impeded and unimpeded flow of attachment-relevant information are not as sharply delineated as for the categories in Main, Goldwyn, and Hesse, or for the Hostile subtype. Overall, as in Atwood’s thesis, in the Hostile/Helpless coding manual, there remains a sense of the Helpless subtype as a category developed semi-inductively, somewhat conceptually brackish, without a pinned-down account of its inner logic.

<sup>184</sup> Pitillas, C. (2024) *Caminar sobre las huellas: vínculos, trauma y desarrollo humano*. Bilbao: Desclée de Brouwer, Table 8.

<sup>185</sup> Crittenden, P. M. (1993) An information-processing perspective on the behavior of neglectful parents. *Criminal Justice and Behavior*, 20(1), 27–48; Shaver, P. R., Segev, M., & Mikulincer, M. (2011) A behavioral systems perspective on power and aggression. In P. R. Shaver & M. Mikulincer (eds), *Human Aggression and Violence: Causes, Manifestations, and Consequences* (pp. 71–87). Washington, DC: American Psychological Association; Talia, A., Duschinsky, R., Mazzarella, D., Hauschild, S., & Taubner, S. (2021) Epistemic trust and the emergence of conduct problems: Aggression in the service of communication. *Frontiers in Psychiatry*, 12, 710011.

<sup>186</sup> Crittenden, P. M. & Landini, A. (2011) *Assessing Adult Attachment: A Dynamic-Maturational Approach to Discourse Analysis*. New York: W. W. Norton, p. 203.

<sup>187</sup> Lyons-Ruth, K. & Spielman, E. (2004) Disorganized infant attachment strategies and helpless-fearful profiles of parenting: Integrating attachment research with clinical intervention. *Infant Mental Health Journal*, 25(4), 318–335, p. 329.

## Empirical Studies Using the Hostile/Helpless System

A first study using the new Hostile/Helpless system was published by Lyons-Ruth, Yellin, Melnick, and Atwood in 2003. The paper was full of notable, and potentially explosive, findings. The system was applied by Yellin and Melnick to 45 Adult Attachment Interview transcripts, presumably including the 10 transcripts used in the development of the system. These transcripts were also separately coded using the standard Main, Goldwyn, and Hesse system by a coder from the Jacobvitz lab, certified as reliable by Main and Hesse (including on the Cannot Classify classification). No second coder was involved in coding using the Main, Goldwyn, and Hesse system. There was barely any association between the two coding systems ( $r = 0.15$ ), and no association between unresolved/Cannot Classify and any of the markers for the Hostile/Helpless classification (e.g., sense of self as bad; recurrent laughter at pain).

There were 38 participants who had experienced the loss of an attachment figure growing up. Of these, 10 were classified as unresolved or Cannot Classify. Among the sample, 23 self-reported abuse or neglect in their childhood. Yet only three of these were classified as unresolved or Cannot Classify. Lyons-Ruth and colleagues reflected that 'if unresolved states of mind have no reliable relation to the severity of experiences of loss or trauma, then the etiological role of those particular experiences will need to be questioned and other etiological factors assessed.'<sup>188</sup> By contrast, severity of self-reported abuse and neglect was clearly associated with scores for Hostile/Helpless ( $r = 0.46$ ).

Exploring reasons for the poor performance of the Main and Goldwyn system, Lyons-Ruth and colleagues found that 80% of mothers of disorganized–approach infants were classified unresolved, but only 23% of mothers of disorganized–avoidant infants were classified unresolved—whereas 53% were classified autonomous/secure. By comparison 75% of disorganized–avoidant dyads included mothers classified as Hostile/Helpless.<sup>189</sup> Lyons-Ruth and colleagues tentatively proposed that such findings, if replicated, would imply that the Main and Goldwyn system is not as well suited to characterizing the difficulties in resolving experiences of abuse faced by caregivers in high-risk samples, who may be especially likely to be part of disorganized–avoidant dyads.<sup>190</sup>

<sup>188</sup> Lyons-Ruth, K., Yellin, C., Melnick, S., & Atwood, G. (2003) Childhood experiences of trauma and loss have different relations to maternal unresolved and hostile-helpless states of mind on the AAI. *Attachment & Human Development*, 5(4), 330–352, p. 332.

<sup>189</sup> Similar findings were reported by Frigerio, A., Costantino, E., Ceppi, E., & Barone, L. (2013) Adult attachment interviews of women from low-risk, poverty, and maltreatment risk samples: Comparisons between the hostile/helpless and traditional AAI coding systems. *Attachment & Human Development*, 15(4), 424–442. By contrast, associations between the Hostile/Helpless classification and the unresolved classification were based more evenly on trauma and loss in Finger, B., Byun, S., Melnick, S., & Lyons-Ruth, K. (2015) Hostile–Helpless states of mind mediate relations between childhood abuse severity and personality disorder features. *Translational Developmental Psychiatry*, 3(1), 28785.

<sup>190</sup> Lyons-Ruth, K., Yellin, C., Melnick, S., & Atwood, G. (2005) Expanding the concept of unresolved mental states: Hostile/helpless states of mind on the Adult Attachment Interview are associated with disrupted mother–infant communication and infant disorganization. *Development and Psychopathology*, 17(1), 1–23: 'Because the criteria for U states of mind were originally developed for loss experiences and only subsequently extended to abuse experiences, current criteria for lack of resolution may be more sensitive to processes involved in integrating loss and less sensitive to processes involved in integrating abuse. Abused mothers of D infants who were not captured by the U abuse scale included those who either consistently denied occurrence of abusive events, for example, "She abused all the other kids but she didn't hit me because I was too fast" ~not a believable statement to those who work with abusive families!, or those who fit the profile described above where negative experiences are frankly and vividly and concisely described, for example, "Did you consider it abusive?" "Sure, it was abusive." The essential problem is likely to be that "unresolved" abuse presents in discourse in very different ways than does unresolved loss' (18).

The association between Hostile/Helpless states of mind and disorganization in the Strange Situation was statistically significant ( $r = 0.35$ ), whereas the association between unresolved states of mind and disorganization was not ( $r = 0.05$ ).<sup>191</sup> Lyons-Ruth and colleagues presented a regression reporting the respective contribution to infant disorganized attachment of four variables: severity of self-reported trauma, whether a parent had died during childhood, unresolved state of mind, and the Hostile/Helpless classification. Lyons-Ruth and colleagues reported that for Strange Situations conducted at 12 months, the regression indicated no contribution to disorganized infant attachment was made by self-reported trauma or the Hostile/Helpless classification.

This was a surprising finding given that the Hostile/Helpless category had been developed on part of the sample, through identification of features of transcripts associated with infant disorganized attachment. However, the findings of the regression do not necessarily mean that there was no link between Hostile/Helpless states of mind and infant disorganized attachment at 12 months; to know this we would require a presentation of the bivariate correlations. What the findings could mean is that unresolved states of mind, entered earlier in the regression, share variance with Hostile/Helpless states of mind in predicting disorganized attachment. That is to say, they are tapping much the same thing for parents with 12-month-old children.

Yet for Strange Situations conducted at 18 months the only factor in the regression accounting for variance was the Hostile/Helpless classification. This finding is difficult to interpret without the bivariate correlations: even if the earlier variables did not account for a significant proportion of variance, they might change the way in which Hostile/Helpless affected disorganized attachment. Based on the regression results, Lyons-Ruth and colleagues concluded that the findings show that the contribution of the Hostile/Helpless classification was unique. The team reflected that 'the influence of maternal trauma on infant attachment may become more prominent at 18 months as the infant makes the transition to toddlerhood. Among mothers exposed to violence or abuse, the infant's increased mobility and agency, including the new capacity to say "no", may be a particularly potent trigger for the mother's feelings of both helplessness and hostility related to past abuse.'<sup>192</sup> Lyons-Ruth and colleagues also emphasized that their findings suggest that loss and trauma 'leave different legacies in relation to maternal states of mind and maternal interaction with the infant', raising queries about whether they should be folded together within a single unresolved category, which may mask problems of measurement invariance between low- and high-risk samples.<sup>193</sup>

Following up the ideas developed in Lyons-Ruth and Block, in their 2003 paper Lyons-Ruth and colleagues also examined whether parental report of physical and sexual abuse had different associations with the Hostile/Helpless classification. For physical abuse, the results were decisive, with a very considerable association with the overall category ( $r = 0.53$ ) and equivalent associations for every one of the markers measured: Identification with a hostile caregiver; global devaluation of caregiver; sense of self as bad; recurrent references to fearful affect; recurrent laughter at pain; ruptured attachments in

<sup>191</sup> Lyons-Ruth, K., Yellin, C., Melnick, S., & Atwood, G. (2005) Expanding the concept of unresolved mental states: Hostile/helpless states of mind on the Adult Attachment Interview are associated with disrupted mother-infant communication and infant disorganization. *Development and Psychopathology*, 17(1), 1–23, Table 2.

<sup>192</sup> Lyons-Ruth, K., Yellin, C., Melnick, S., & Atwood, G. (2003) Childhood experiences of trauma and loss have different relations to maternal unresolved and hostile-helpless states of mind on the AAI. *Attachment & Human Development*, 5(4), 330–352, p. 348.

<sup>193</sup> *Ibid.*, 349.

adulthood. Reported sexual abuse in childhood was similarly associated with the Hostile/Helpless category. However, there were no associations of sexual abuse with the markers of identification with a hostile caregiver; global devaluation of caregiver; sense of self as bad; recurrent references to fearful affect. No report was made on whether physical abuse distinctively predicted the Hostile subscale, and sexual abuse predicted the Helpless subscale.

### Research Using the Hostile/Helpless Coding System in Other Samples

A first empirical validation of the Hostile/Helpless category on a different sample was reported in a 2006 doctoral thesis by Brett Finger. The sample comprised 149 low-income African American infant–mother dyads: half of the participants were currently receiving methadone maintenance treatment for heroin addiction, and the other half were matched on demographic characteristics. Finger began his thesis by criticizing attachment research for loss of interest in discovery after Main's work, as if the task now was solely to work within and validate her model. In particular, he felt it was disappointing that 'attachment research has been slow to identify other important parental characteristics contributing to infant disorganized attachment'.<sup>194</sup>

Finger trained and was certified as reliable in the Main, Goldwyn, and Hesse method for coding the AAI. He had hoped to identify features of autonomous narratives that might aid understanding of factors related to resilience in the sample. However autonomous states of mind in the sample had few relevant correlates among any of the other data collected. The classifications were also forced: 'interviews were not especially coherent but were classified as such, in part, because they lacked forms of incoherence characterizing the existing non-autonomous classifications'.<sup>195</sup> As he was coding, Finger was also struck by the frequency of dismissing speech that was not 'employed in the service of minimizing affect and preserving a rigid but stable identity' but instead occurred 'in conjunction with heightened affect and unexamined contradictory representations'.<sup>196</sup>

Finger therefore undertook training with Lyons-Ruth and colleagues in coding the Hostile/Helpless category and has subsequently served as the primary trainer for the coding system. Around half of participants received a Hostile/Helpless classification, and around half received an unresolved classification. There was some concordance: 51% of unresolved participants also received a Hostile/Helpless classification. It should be kept in mind that they were coded by the same person. Nonetheless, the pattern of agreement and disagreement was interesting. Agreement was based on the high scores both systems gave to maternal experience of abuse. However, there was no association between the Hostile/Helpless classification and lack of resolution for loss. An unexpected finding was that 71% of preoccupied participants also received a Hostile/Helpless classification.

Finger also undertook training in the Strange Situation with Alan Sroufe and Betty Carlson and was certified as reliable. In fact, he impressed Carlson as one of the best coders of disorganization she had seen.<sup>197</sup> There was no association between unresolved states

<sup>194</sup> Finger, B. (2006) Exploring the intergenerational transmission of attachment disorganization. Doctoral dissertation, University of Chicago, p. viii.

<sup>195</sup> Ibid., 62. See also Behrens, K. Y. (2016) Reconsidering attachment in context of culture: Review of attachment studies in Japan. *Online Readings in Psychology and Culture*, 6(1), 7. Behrens argues that this strain does not undermine the validity of the AAI classifications, as the coder can and should take these discursive differences into account when coding.

<sup>196</sup> Ibid., 49.

<sup>197</sup> E. Carlson, personal communication, November 28, 2016.

of mind and the infant disorganized strange situation category. By contrast, 28 of the 38 mothers from dyads classified as disorganized in the Strange Situation were assigned a Hostile/Helpless classification, compared to only 39 of the remaining 111 mothers ( $r = 0.37$ ). The individual markers for the Hostile/Helpless category were generally in the expected direction, but there were no strong associations, and the overall category seemed more important.<sup>198</sup> The association between Hostile/Helpless scores and disorganization was moderated by socioeconomic risk, with a stronger association for dyads facing more socioeconomic adversity.<sup>199</sup>

Finger asked participants to report on experiences of physical and sexual assault in childhood and adulthood, with questions drawn from the National Crime Victim Survey. As in the Harvard Family Pathways Study, self-reports of physical abuse ( $r = 0.30$ ) and family violence ( $r = 0.21$ ) were associated with the score for Hostile/Helpless, but there was no association with sexual assault. Scores for Hostile/Helpless were also weakly associated with a self-report measure of personality disorder traits, across most of the types of personality disorder. That said, Finger acknowledged that there may be limitations on the validity of the self-report measure of personality disorder, since mistrust, aggression, and fear of abandonment might well be quite reasonable and adaptive responses to the threatening circumstances encountered by many of the mothers in the sample.

Half of the participants who received a Hostile/Helpless classification were identified as primarily hostile. Only seven were classified as primarily helpless. However, 26 were classified as mixed between hostile and helpless, albeit with helplessness as the primary impression. Finger reflected that 'the helpless state of mind features are more often observed in conjunction with hostility than is true for the reverse.'<sup>200</sup> He proposed that displays of helplessness and vulnerability are incompatible with the invulnerable stance towards difficult life experiences characteristic of the Hostile subtype. On the other hand, 'speakers who are overwhelmed by a pervasive sense of helplessness are particularly likely to display a range of intense emotions, including overt hostility toward attachment figures that are perceived as a source of their helpless predicament.'<sup>201</sup>

Finger reported that self-report indications of sadistic and antisocial personality disorder were not elevated for participants with a Hostile subtype. To the extent that the self-report measure can be depended upon, Finger observed that this finding raised questions about the target of the hostility in the Hostile subtype. The coding system operationalizes Hostile state of mind when an individual mentally represents at least one attachment figure in contradictory and malevolent ways; but Lyons-Ruth conceived of this as a characterological defence and/or form of social adaptation, which would be expected to be pervasively applied, including in parenting interactions, interactions with psychological professionals, as well as with others.

Finger's interpretation is that, as a characterological defence, the Hostile subtype would be associated with limited recognition and/or admission of psychological difficulties, making self-report for this group likely to represent a considerable underestimate. An implication of this argument is that the Helpless pattern might not be a characterological defence. In line with this position, scores for self-reported symptoms of Post-Traumatic

<sup>198</sup> The best-performing of the markers was one that Finger added: Idealization of the self, especially in representations of the self as invulnerable to suffering.

<sup>199</sup> Reported in Honde, C. K. (2007) The relation of atypical maternal behavior ('disrupted communication') to maternal risk factors and infant attachment. Unpublished doctoral thesis, The University of Chicago.

<sup>200</sup> Finger, B. (2006) Exploring the intergenerational transmission of attachment disorganization. Doctoral dissertation, University of Chicago, p. 141.

<sup>201</sup> *Ibid.*, 171.

Stress Disorder were the same for participants with the Hostile subtype as they were for the rest of the sample. Yet participants with exclusively or predominantly Helpless discourse had elevated scores for symptoms of Post-Traumatic Stress Disorder. The Helpless discourse did not seem to be a defence against traumatic experiences.<sup>202</sup>

Across the Harvard Family Pathways Study and Finger's doctoral research, the repeated finding of low scores of participants with the Hostile subtype on self-report measures of psychological need are of considerable theoretical importance. A social learning perspective on attachment, such as advocated by Bowlby<sup>203</sup> and more recently Bosmans, Bakermans-Kranenburg, Van IJzendoorn, and colleagues (Chapter 4), might regard the characterological defence as an unnecessary psychoanalytic speculation. A more direct explanation might be simply that a child exposed to physical violence themselves or who observes physical violence in their home learns to respond with aggression in close relationships when aroused: this can be seen in the hostility shown towards memories of attachment figures in the Adult Attachment Interview, and the hostile-intrusive behaviour shown towards infants at home. However, a social learning approach would need to stretch to account for the low scores of participants with the Hostile subtype on self-report measures of psychological need. This fits better with the idea of a characterological adaptation, as does the presence of laughing whilst talking about painful experiences in these transcripts and the characterization of the self as impervious to pain.<sup>204</sup> That said, it is hard to judge whether subsequent research has supported the finding of low scores of participants with the Hostile subtype on self-report measures of psychological need, as the Hostile and Helpless subtypes are almost always reported together.

A systematic review of research using the Hostile/Helpless coding system by Turgeon and colleagues was reported in 2022.<sup>205</sup> This review was able to discuss 19 papers using the coding system. The vast majority of studies used the Hostile/Helpless coding system as an add-on rather than alternative to the Main, Goldwyn, and Hesse system. Across the studies reviewed, there was considerable evidence convergent with Lyons-Ruth's original study and Finger's doctoral dissertation. Researchers have found that the Hostile/Helpless classification is associated with more self-report of traumatic experiences, and with more harsh or maltreating caregiving behaviours observed by researchers or social service agencies. The classification is, as expected, rare in low-risk community samples.

An intriguing use of the Hostile/Helpless coding system was recently reported by Terry, Finger, Lyons-Ruth, Sadler, and Slade.<sup>206</sup> As part of a trial of the Minding the Baby intervention, a sample of 200 mothers living in poverty and facing considerable adversity were

<sup>202</sup> Ibid., 142.

<sup>203</sup> Melges, F. T., & Bowlby, J. (1969) Types of hopelessness in psychopathological process. *Archives of General Psychiatry*, 20(6), 690–699; Bowlby, J. (1973) Letter to Scott Henderson, 30 July 1973, PP/Bow/J.9/98: 'I strongly suspect that the particular form of atypical care-eliciting behaviour selected by a patient is greatly influenced by modelling, the term introduced by Bandura, and roughly equivalent to identification, to describe adopting the same behaviour that one has observed engaged in by others ... More and more in work with parents I have been struck by the extent to which they have adopted the same disciplinary procedures towards their children as they themselves were subjected to—often despite their wish to behave quite otherwise.'

<sup>204</sup> Sauvé and colleagues found that participants with a Hostile/Helpless classification reported mental health difficulties in their children. However this would not be contrary to the idea that the Hostile subtype is association with minimization of awareness or report of personal difficulties. Indeed, attribution of difficulties to the speaker's child—for instance reporting higher levels of behavioural problems—might be regarded as entirely commensurate with a Hostile state of mind. Sauvé, M., Cyr, C., St-Laurent, D., Amédée, L. M., Dubois-Comtois, K., Tarabulsy, G. M., ... & Moss, E. (2022) Transmission of parental childhood trauma to child behavior problems: Parental hostile/helpless state of mind as a moderator. *Child Abuse & Neglect*, 128, 104885.

<sup>205</sup> Turgeon, J., Milot, T., St-Laurent, D., & Dubois-Comtois, K. (2022) Hostile-helpless states of mind: A scoping review of risk factors, correlates, and consequences. *Infant Mental Health Journal*, 43(4), 597–623.

<sup>206</sup> Terry, M., Finger, B., Lyons-Ruth, K., Sadler, L. S., & Slade, A. (2021) Hostile/Helpless maternal representations in pregnancy and later child removal: A pilot study. *Infant Mental Health Journal*, 42(1), 60–73.



asked to complete an interview during their pregnancy about their thoughts and feelings towards their unborn child. Of this sample, 13 mothers had their child removed by social services before the age of two. Working on the assumption that Hostile/Helpless states of mind are applied across close relationships, the Hostile/Helpless coding system was adapted to address hostility or helplessness towards the unborn child, not the speaker's early attachment figures. The pregnancy interviews of these 13 mothers were compared to a matched comparison group. Terry and colleagues found that the pre-natal scores for Hostile/Helpless were considerably higher for the mothers whose child would be removed. Qualitative analysis of the transcripts identified that the foetus, the father of the baby, and the woman's own attachment figures were variously represented as hostile and helpless for women who received high scores for Hostile/Helpless, in line with the idea that these states of mind affect perception and behaviour generally within close relationships.

### **The AMBIANCE Coding System**

#### **The Early Development of AMBIANCE**

As we saw earlier, a source of inspiration for Lyons-Ruth was Bowlby's claims about the potential harm to child development from major caregiver absence, loss, or emotional neglect. Another source of inspiration for Lyons-Ruth in this regard was Ainsworth. Ainsworth had developed scales for interfering, rejecting, and ignoring caregiver behaviour, which had distinguished between avoidant and resistant attachment in her sample. The Ainsworth neglect scale in particular resonated with Lyons-Ruth's interest in unresponsive caregiving behaviour.<sup>207</sup> However Lyons-Ruth felt that the Ainsworth scales were not adequate, as they had not been developed for use with samples facing adversity. While good at describing positive features of caregiving, the scales were less well articulated in their characterization of poor caregiving. What was described in the scales did not correspond well to what Lyons-Ruth was seeing in her tapes.

Lyons-Ruth supervised a doctoral student, Elizabeth Parsons, to begin work on a new scale for assessing forms of caregiving behaviour associated with disorganized infant attachment in the Strange Situation. She had home observation data available, with at least 40 minutes recorded for each dyad. However rather than recode these observations, Lyons-Ruth advised Parsons to develop the scale by coding the caregiver's behaviour in the Strange Situation. This decision might appear surprising, given that the observations are of caregiving behaviour in the same context as the child's attachment behaviour, potentially leading to elevated concordance. Indeed, Lyons-Ruth has been criticized on this point by other researchers.<sup>208</sup> Furthermore, the filming of the Strange Situation in Lyons-Ruth's sample, like others, focused very much on the infant, and so relevant aspects of caregiver behaviour were not infrequently barely in shot or in fact entirely out of shot.

<sup>207</sup> Lyons-Ruth, K., Bureau, J. F., Easterbrooks, M. A., Obsuth, I., Hennighausen, K., & Vulliez-Coady, L. (2013) Parsing the construct of maternal insensitivity: Distinct longitudinal pathways associated with early maternal withdrawal. *Attachment & Human Development*, 15(5–6), 562–582. 'Ainsworth captures key elements of maternal withdrawal: "She [the mother] finds the demands implicit in the baby's signals an intolerable threat to her precarious balance. It is necessary, in order to hold herself together, to 'tune out' the baby's signals" (Ainsworth, 1969, p. 9)' (564).

<sup>208</sup> Madigan, S., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Moran, G., Pederson, D. R., & Benoit, D. (2006) Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment & Human Development*, 8(2), 89–111.

Lyons-Ruth decided to code caregiver behaviour in the Strange Situation for three reasons.<sup>209</sup> Firstly, she wanted to develop a standardized observational framework that could be used by other research groups. It was rare to have 40 minutes of home observation data. But many attachment researchers were using the Strange Situation, so it was a more ready source of observational data. Secondly, the home observations of the Harvard Family Pathways Study were of highly disrupted and chaotic settings, with high levels of variability between families. Other children and other family members were coming in and out and took the mothers' attention. In some homes the mother was not in the same room as the child for much of the allocated time for observation. Although more ecologically valid than laboratory-based observations, the degree of disruption and variability in the observations made Lyons-Ruth worried that what was caught on film reflected more noise than signal regarding the caregiver's general way of interacting with the child in the study.

Thirdly, Lyons-Ruth felt the more stressful environment of the Strange Situation was a better window into the kind of regulating and comforting presence the caregiver could offer in seeking to modulate infant arousal. Other attachment researchers in the period felt that coding caregiver behaviour in the Strange Situation was unwise since instructions to caregivers rather standardized their behaviour.<sup>210</sup> In fact, Lyons-Ruth and her collaborators felt that the Strange Situation might possibly reveal more than the home environment regarding the behaviour used by the caregiver to respond to their child's attachment needs: 'Perhaps the Strange Situation cannot show every behavior that might have been exhibited if instructions were not given. However, the differences in behavior observed are all the more striking because there were instructions rather than in spite of it.'<sup>211</sup>

Parsons and Lyons-Ruth undertook a close examination of 10 videotapes of Strange Situations chosen at random. These comprised four securely attached and six classified as disorganized-avoidant, all of male infants aged 18 months. Parsons and Lyons-Ruth used 'guess and uncover' to identify three kinds of behaviours of particular interest, which feature in the six recordings of Strange Situations classified as disorganized. These are controlling/hostile maternal behaviour; withdrawing maternal behaviour; and disruptions of affective signalling, such as contradictory or inappropriate response to clear infant signals.

Controlling/hostile behaviour had already been identified by Lyons-Ruth's earlier scales for home observations. Withdrawal may have been partially inspired by the earlier concern with non-responsive caregiver behaviour, but now seen in a more active and salient form when displayed by a caregiver directly in the face of their infant's bids for contact in the Strange Situation. Disruptions of affective signalling represented a new departure in terms of psychological assessment. However, it may be placed with reference to Lyons-Ruth's career-long interest in intersubjective dialogue, already present in the early 1990s in her writings on psychoanalytic theory. Lyons-Ruth has also reflected that her own experiences as a parent were influential for her attention to disruptions of affective signalling.<sup>212</sup>

Three kinds of disruption of affective signalling were identified. First, when a caregiver offered two messages in contradiction with one another, such as signalling anger to their

<sup>209</sup> Lyons-Ruth, personal communication, November 16, 2023.

<sup>210</sup> For example, Pederson, D. R. & Moran, G. (1996) Expressions of the attachment relationship outside of the strange situation. *Child Development*, 67(3), 915–927.

<sup>211</sup> Bronfman, E. T. (1994) The relation between maternal behavior ratings and disorganized attachment status in eighteen-month-old infants. Unpublished doctoral thesis. Boston College, p. 14. For later empirical support, see Behrens, K. Y., Hart, S. L., & Parker, A. C. (2012) Maternal sensitivity: Evidence of stability across time, contexts, and measurement instruments. *Infant and Child Development*, 21(4), 348–355.

<sup>212</sup> K. Lyons-Ruth, personal communication, September 4, 2023.

child with a sweet voice. Second, the complete absence of response to a clear child signal of need that the coder is certain the caregiver would have seen. Third, a wholly unrelated response to a clear child signal of need (e.g., laughing as if responding to humour towards a crying child).

In five of the six dyads who received a disorganized classification, Parsons and Lyons-Ruth noted a 'a rigid repetition of either a controlling or withdrawing sequence that was remarkable for (1) its uniformity within a particular mother's repertoire; (2) physical contact that is absent or overbearing, but not warm or mutual; (3) the inability of the infant's behavior to modify or interrupt it.'<sup>213</sup> Parsons and Lyons-Ruth were struck that the repetition indicates 'a lack of flexibility on the part of the mother, who is unable to establish mutual interaction contingent on the infant's cues.'<sup>214</sup> Parsons and Lyons-Ruth were interested that the mothers in dyads who received a disorganized classification often displayed confusion and disruption of affective signalling prior to a controlling/hostile or withdrawing sequence. Caregivers seemed to run aground, not being able to interpret their infant's cues and continue the interactive dialogue. They acted, instead, from their own point of reference, in either an overly intrusive or overly withdrawn way. Parsons and Lyons-Ruth reflected that controlling/hostile and withdrawing behaviour may occur on the basis of a prior disruption in affective attunement:<sup>215</sup>

One has the feeling, in watching these mothers with their infants, that the directive or avoidant behaviors following the apparent confusion are the result of repeated failures to connect with their children. It is as though they have given up trying to discover, from the child, what the child is asking for and must decide on their own what to do. It is this feeling of hopelessness around unsuccessful connection at times of emotional need that most strikes the observer in watching these mothers. One senses, in their moments of most directive or most fearful responding, that the Type D mothers are very much alone. In the mother's uncertainty, both mother and infant are equally abandoned.<sup>216</sup>

Whereas Main and Hesse tended to describe alarming caregiving behaviour as resulting from the intrusion of traumatic memories, interrupting the functioning of the caregiving system, Parsons and Lyons-Ruth characterized controlling/hostile and withdrawing behaviour and disruption of affective signalling as defences against overwhelming feelings. For caregivers who are already experiencing significant struggles with their own day-to-day coping, their child's distress may be especially challenging and may elicit responses that do not attune to this distress. Controlling/hostile behaviour preempts the child's expression of their needs; withdrawing behaviour ducks the child's communications; and disturbances of affective signalling engage with quite other cues to the ones the child is offering. Parsons and Lyons-Ruth argued that the mother's experiences have 'left her unable to adopt the fundamental parental attitude of emotional availability and tolerance, it is beyond her ability to imagine or survive. It is important to understand her behavior towards her infant as both reasonable and unavoidable within her psychological framework.'<sup>217</sup>

<sup>213</sup> Parsons, E. (1991) Maternal behavior and disorganized attachment: Relational sequelae of traumatic experience. Unpublished doctoral dissertation, Massachusetts School of Professional Psychology, Dedham, MA, 125.

<sup>214</sup> *Ibid.*, 145.

<sup>215</sup> *Ibid.*, 180.

<sup>216</sup> *Ibid.*, 181.

<sup>217</sup> *Ibid.*, 196.

## Formalization and First Applications

Yet Lyons-Ruth and colleagues were mindful of limitations to this pilot study. Parsons's thesis had included only a limited number of tapes. She had only looked at mother–son dyads, and excluded organized–insecure dyads, which left open the possibility that the markers identified were not specific to disorganized dyads. She also included no disorganized–approach infants from her study, which left open the possibility that the markers may not apply equally to this group. The observations remained impressionistic: Parsons was the only coder, and her observations did not amount to a scheme that would permit inter-rater reliability.

A doctoral study by Bronfman sought to integrate markers of parental behaviour that might predict disorganized attachment from across the available literature. Bronfman reported that Main and Hesse had shared with Lyons-Ruth a manuscript of the Frightened/Frightening (FR) coding system (Chapter 1), developed to code caregiver behaviour anticipated to alarm a young child. In the manuscript shared with Lyons-Ruth, the system included coding for frightening, frightened, and dissociative caregiver behaviours.<sup>218</sup> The items from the FR coding system were integrated with items from other sources by Bronfman, including Crittenden's masters study and from Parsons' doctoral thesis.

Another set of codes were taken from work by Sroufe and colleagues at Minnesota on role-confused behaviour by parents, where caregivers seek emotional support from their infants.<sup>219</sup> Bronfman and Lyons-Ruth acknowledged that 'Main and Hesse record role reversing behaviors as troublesome but exclude these behaviors from scoring,'<sup>220</sup> and the Minnesota group had not examined their association with the Strange Situation categories. Nonetheless, Bronfman and Lyons-Ruth felt it would be worth including them, especially given emergent evidence from Minnesota that this form of caregiver–child interaction was associated with later social and mental health difficulties.<sup>221</sup> Effacing distinctions between the contributions of different groups, Bronfman and Lyons-Ruth pooled these contributions and looked for qualitative coherence: 'After listing these behaviors, they were grouped together descriptively and then organized into dimensions of atypical behavior.'<sup>222</sup>

Some codes were also taken from work on disruptions of child–caregiver interactive synchrony by Belsky's group (Chapter 3).<sup>223</sup> At first sight, this seems a surprising decision if Bronfman and Lyons-Ruth had the goal of identifying caregiver behaviour predictive of

<sup>218</sup> Lyons-Ruth, K. (2024) Continuing the legacy of Mary Main: Insights from other species on attachment and the development of stress-sensitive brain regions in human infancy. *Attachment & Human Development*, early view.

<sup>219</sup> Sroufe, L. A., Jacobvitz, D., Mangelsdorf, S., DeAngelo, E., & Ward, M. J. (1985) Generational boundary dissolution between mothers and their preschool children: A relationship systems approach. *Child Development*, 56(2), 317–325.

<sup>220</sup> Bronfman, E. T. (1994) The relation between maternal behavior ratings and disorganized attachment status in eighteen-month-old infants. Unpublished doctoral thesis. Boston College, citing Main, M. (Unpublished). Coding disorganizing/disorganized interaction. Unpublished manuscript, University of California at Berkeley.

<sup>221</sup> For example, Hiester, M. (1993) Generational boundary dissolution between mothers and children in early childhood and early adolescence, Unpublished doctoral dissertation, University of Minnesota.

<sup>222</sup> Bronfman, E. T. (1994) The relation between maternal behavior ratings and disorganized attachment status in eighteen-month-old infants. Unpublished doctoral thesis, Boston College, p. 47. A comparison in this regard may be drawn with the Experiences in Close Relationships scale, which drew items from across the social psychological tradition to identify a set of underlying dimensions: Brennan, K. A., Clark, C. L., & Shaver, P. R. (1998) Self-report measurement of adult romantic attachment: An integrative overview. In J. A. Simpson & W. S. Rholes (eds), *Attachment Theory and Close Relationships* (pp. 46–76). New York: Guilford.

<sup>223</sup> Isabella, R. & Belsky, J. von Eye (1989) Origins of infant–mother attachment: An examination of interactional synchrony during the infant's first year. *Developmental Psychology*, 25(1), 12–21.

disorganized infant attachment. Belsky and colleagues had reported that such disruptions were associated with organized insecure attachment, in particular the resistant classification. Their data had been coded by Jude Cassidy and Donna Weston, who had been unable to agree on which infants should be classified as disorganized, so Belsky and colleagues made no report on this. However, Bronfman and Lyons-Ruth anticipated that disruptions of child-caregiver interactive synchrony would be associated with disorganized attachment, since they reasoned that conflicting caregiver signals should be associated with conflicting child attachment behaviour.

The inclusion of the items from the work of Belsky's group illustrates a feature of how Bronfman and Lyons-Ruth approached the identification of items: regarding their work as exploratory, they picked out items that might be related to disorganized infant attachment, *even if these items had varying degrees of promise for distinguishing disorganized and organized insecure attachment*. It was anticipated that the same behaviour, if more or less intense or pervasive, could lead to different attachment outcomes. The coder would need to judge whether behaviour such as role confusion or disruptions of synchrony would be moderate enough to lead to organized insecurity, or pervasive and intense enough to 'leave the infant without ways to involve the caregiver in regulating his/her own states.'<sup>224</sup> For example, if the caregiver shows the behaviour directly in response to heightened infant distress, this would be anticipated to be associated with disorganization.

Bronfman and Lyons-Ruth assembled the items into six scales. A scale for *affective communicative errors* was drawn from items developed by Parsons, Crittenden, Belsky's group, and some items from Main and Hesse. *Role/boundary confusion* was predominantly taken from items from the Minnesota group, but also from the observations by Main and Hesse excluded from the FR system, and some observations by Parsons. *Disorientation* items were drawn mostly from Main and Hesse's disorientation scale, but also some items from the Main and Hesse frightened scale. No justification is offered in Bronfman's thesis for taking fearful behaviour as indicating disorientation, though it may reflect the inference that a caregiver displaying fear of their infant suggests psychological confusion. Bronfman and Lyons-Ruth later expressed regret that they had made this decision.<sup>225</sup>

A scale for *withdrawal* was based on Parsons' items and a few items from Main and Hesse's frightened scale. In both items in the disorientation and withdrawal scales, the caregiver may be unresponsive or back away from their infant, but with the withdrawal items 'there is typically the sense that the caregiver is conscious of the external environment and actively chooses not to respond', rather than, as in disorientation, losing responsiveness to events in the external environment due to disorientation and/or fear.<sup>226</sup> Withdrawal can be physical, such as holding the infant awkwardly at a distance or offering a crying infant a toy rather than contact. It can also be verbal, coded if the caregiver offers verbal dismissal of the infant's bids for contact or fails to greet the infant on reunion. Bronfman and Lyons-Ruth do not make clear how the construct of withdrawal relates to earlier ideas in attachment theory, such as in Bowlby and Main, regarding caregiving attentional strategies, in which caregivers may minimize awareness of child attachment signals. The items

<sup>224</sup> Bronfman, E. T., Madigan, S., & Lyons-Ruth, K. (2009) Atypical Maternal Behavior Instrument for Assessment and Classification. Manual for Coding Disrupted Affective Communication. Harvard Medical School, Cambridge.

<sup>225</sup> Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999) Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, 64(3), 67–96, p. 86.

<sup>226</sup> Bronfman, E. T., Madigan, S., & Lyons-Ruth, K. (2009) Atypical Maternal Behavior Instrument for Assessment and Classification. Manual for Coding Disrupted Affective Communication. Harvard Medical School, Cambridge.

selected by Bronfman and Lyons-Ruth suggest that withdrawal is not merely minimization of awareness of child signals, but active attempts by the caregiver to use their behaviour or speech to disengage from these signals.

*Intrusiveness/negativity* took items from Main and Hesse's frightening scale, Crittenden's 'abusive' scale, and the hostile elements of Parsons' observations of hostile-controlling behaviour. The items taken from Main and Hesse tended to reflect outright frightening and alarming behaviours, whereas the items added from Crittenden and Parsons 'include less striking behavior which, when taken as a whole, produce a pervasive sense that the parent is frequently in opposition to the infant's initiatives.'<sup>227</sup> Finally a scale for *controlling* behaviour was drawn from Crittenden's masters' thesis and the controlling elements of Parsons' observations of hostile-controlling behaviour. However, this last scale was soon dropped, as coders could not reach inter-rater reliability about what constituted controlling caregiver behaviour. Bronfman and Lyons-Ruth also made a general category of 'atypical caregiving,' based on the scale scores.

Bronfman and a colleague coded 15 Strange Situations from the Harvard Family Pathways Study for reliability using the coding system. Validation analyses were then conducted on 53 dyads, initially excluding the 11 that were blind coded in developing the coding system. Subsequent to the validation analyses, all 65 tapes were used in analyses. The general association between the atypical caregiving category and disorganized infant attachment was  $r = 0.40$ . However, a post hoc comparison revealed that the disorganized-approach group had no greater association with the general atypical caregiving category than the organized-insecure dyads did. Looking at the specific scale scores, Bronfman and Lyons-Ruth found that both disorganized-avoidant and disorganized-approach dyads showed affective communicative errors. But intrusiveness/negativity was associated only with disorganized-avoidant dyads. Withdrawal behaviours tended to be more characteristic of the caregivers in disorganized-approach dyads.

Bronfman and Lyons-Ruth interpreted their findings as suggesting that in general disorganized attachment was predisposed by affective communicative errors, which lead to conflict and confusion for infants. However, the hostile behaviour of some caregivers towards their infants results in the infant keeping their distance from the caregiver when distressed, whereas the non-hostile unresponsiveness of others leads the infants to seek them despite conflict and confusion. This account aligned with Parsons' observation that controlling/hostile and withdrawing behaviour tended to be preceded by confusion or some other form of affective misattunement.

Bronfman and Lyons-Ruth further revised the scales based on the results, excising items that were not associated with disorganized attachment, giving greater emphasis to those that performed well, and adding some items arising from salient qualitative observations on the additional 53 tapes. In particular, the withdrawal scale received fine-tuning. The resulting system was named the Atypical Maternal Behavior Instrument for Assessment and Classification (AMBIANCE), the name perhaps reflecting Lyons-Ruth's concern with measuring the intersubjective field between child and caregiver.

In subsequent years, AMBIANCE was formalized as a coding manual. This primarily remained consistent with the system from Bronfman's doctoral thesis. Two modifications might be noted. The Bronfman coding system depended on the identification and counting of specific behaviours (e.g., the number of withdrawing behaviours). This resulted in considerable skew, not least since a count does not do justice to some behaviours, such as a sustained period of withdrawal. The issue was resolved by the development of rating

<sup>227</sup> Ibid.

scales by Sheri Madigan as her masters thesis. Rather than counting behaviours, scores were given by coders based on a characterization of the extent of, for instance, withdrawing behaviour. While the content of the scales remained the same, this shift improved the psychometric properties of the coding system.

A second adjustment was the greater prominence of ameliorating behaviours. Bronfman's advice for coders system urged that identification of any caregiver behaviour needed to consider the context of child–caregiver interaction, given how central this context is to the meaning of behaviour. She developed a basic scale for 'failure to repair', scored 1–3, when caregivers did not adjust their actions based on the infant's response to disrupted caregiver behaviour. Bronfman was ultimately pessimistic about the value of the scale.<sup>228</sup> However, the basic idea was developed further into formalized advice to coders on ameliorating behaviour. When seen, the manual advises a coder to place less weight on a disruptive interaction. The need to consider ameliorating behaviour was also emphasized to coders of disorganization and FR by Mary Main in the late 1990s, though Main's advice remained informal and unpublished (Chapter 1).<sup>229</sup> In the AMBIANCE coding manual, the importance of ameliorating behaviour was formalized. The manual advises that six forms of ameliorating behaviour should be considered:

1. the pleasure a parent takes in interacting with their child;
2. provision of tender and comfortable physical contact;
3. prompt and appropriate response to the baby's cues;
4. monitoring of the infant's focus of attention;
5. following and supporting the child's initiatives; and
6. taking the initiative when the child needs help.

In Main's advice on ameliorating behaviour, she wrote merely: 'consider what the baby does next, namely, if baby goes to the parent as though for comfort after a little bit of disorganization (i.e., stereotypes then comforted) (If they become organized quickly, discount the D behaviour).'<sup>230</sup> Amelioration for Main seems to entail successful provision of a safe haven. Ultimately, if the child can access a safe haven, the infant disorganization or alarming caregiver behaviour may be regarded as less of a concern, or even not coded. Ameliorating behaviour in AMBIANCE reflects a different theoretical model of what is important for child–caregiver attachment: behaviours are ameliorating in AMBIANCE if they suggest continuity in the intersubjective field, with the caregiver available to help the infant regulate his or her own states and feel wanted and safe.

A caregiver's pleasure in interacting with their child suggests that the intersubjective field has had some happiness smiled into it, and in turn is in a position to reward the caregiver

<sup>228</sup> 'Failure to repair' was also found to be extremely highly correlated ( $r = 0.73$ ) with the overall Level of Disrupted Communication Scale, which led to questions about its redundancy as a separate scale. Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999) Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, 64(3), 67–96.

<sup>229</sup> Marvin likewise emphasized ameliorating and 'repair' behaviours in his trainings in the preschool Strange Situation. Opie, J., Bant, S., & McIntosh, J. (2015) Pearls of wisdom for coding preschool attachment behaviour in the strange situation: From training with Bob Mavin. Unpublished manuscript, Jessica Opie personal archive: 'Was there a repair? To the outside there is no repair if the pattern is insecure. However, within the dyad it feels like a sub-repair that keeps them in their narrative and accomplishes what the attachment system needs to accomplish, but at a cost.'

<sup>230</sup> Main, M. (undated; c.1995) Disorganised/disoriented classification scheme: Major considerations. Unpublished manuscript. Received from Elizabeth Carlson, and cited with her permission.

for their efforts.<sup>231</sup> Provision of tender and comfortable physical contact suggests that the caregiver can navigate the physical aspects of the intersubjective field smoothly, attentive to the independence and interdependence of their child. Prompt and appropriate response to cues—the Ainsworth definition of sensitivity—suggests caregiver responsiveness to signals about the infant's states, and engagement in the dance of reciprocal interaction that constitutes the intersubjective field. Monitoring of the infant's focus of attention suggests proactive engagement with the child's experience and possibilities for experience, and attunement to what, following Main, may be a key psychological process for the modulation of the infant states. Following and supporting the child's initiatives, but willingness to take the initiative, suggest the caregiver is engaged with the infant's feelings and intentions within the rhythm of their reciprocal interaction.

### Published Reports of AMBIANCE in the Harvard Family Pathways Study

In 1997, at the Biennial Meeting of the Society for Research in Child Development, in Washington, DC, Lyons-Ruth first presented findings for associations between AMBIANCE and disorganization for the Harvard Family Pathways Study dataset. The other papers in the symposium were reports from Jacobvitz and colleagues,<sup>232</sup> and Schuenkel and colleagues, about associations with disorganization for FR in the Texas and Leiden samples. Lyons-Ruth, Bronfman, and Parsons published their findings in 1999, excluding the Parsons development sample from the initial validation analyses.<sup>233</sup> The paper appeared in a special issue of the *Monographs of the Society for Research in Child Development* addressing 'Atypical Attachment in Infancy and Early Childhood Among Children at Developmental Risk'. The editors, Barnett and Vondra, situated the special issue as an attempt to explore and re-evaluate ideas from Bowlby, Ainsworth, and Main from the perspective of attention to the attachment relationships of children perceived as at potential developmental risk.<sup>234</sup>

In the Monograph report, affective communication errors was the best-performing subscale for associations with disorganized attachment, with hostile-intrusive behaviours predicting disorganized-avoidant and withdrawal linked to disorganized-approach. The overall AMBIANCE classification also predicted disorganized infant attachment. In the full sample at 18 months, infant disorganized attachment was associated with both Main and Hesse's FR system and AMBIANCE score, with associations around  $r = 0.34$ .

In a later study, Lyons-Ruth and colleagues reported that maternal Hostile/Helpless scores on the AAI were also associated with AMBIANCE scores at 18 months ( $r = 0.39$ ).

<sup>231</sup> Blehar, M. C., Lieberman, A. F., & Ainsworth, M. D. S. (1977) Early face-to-face interaction and its relation to later infant-mother attachment. *Child Development*, 48(1), 182–194; True, M. M. (1994) Mother-infant attachment and communication among the Dogon of Mali. Unpublished doctoral thesis, University of California, Berkeley.

<sup>232</sup> Jacobvitz, D., Hazen, N., & Riggs, S. (1997, April) Disorganized mental processes in mothers, frightening/frightened caregiving, and disoriented/disorganized behavior in infancy. Paper presented at the Biennial Meeting of the Society for Research in Child Development, Washington, DC.

<sup>233</sup> Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999) Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, 64(3), 67–96.

<sup>234</sup> Barnett, D., Vondra, J. I., & Butler, C. M. (1999) Atypical patterns of early attachment: Discussion and future directions. *Monographs of the Society for Research in Child Development*, 64(3), 172–192.



Yet regression analysis indicated that HH made no contribution to disorganized attachment once AMBIANCE scores were included in the model. From this, Lyons-Ruth and colleagues concluded that the association between HH and disorganized attachment is mediated by the behaviour scored by AMBIANCE.<sup>235</sup> (That said, the test for mediation used by Lyons-Ruth was the Baron and Kenny procedure, a form of repeated regression analysis.<sup>236</sup> This was the prevailing approach within psychological science in the period. In interpreting Lyons-Ruth's results, it should be held in mind that, from the perspective of contemporary statistical methods, the Baron and Kenny procedure is not especially dependable.<sup>237</sup>)

Beneath the level of the overall AMBIANCE score, several of the coding system's individual scales were found by Lyons-Ruth and colleagues to be associated with disorganized attachment. Affective communication errors, disorientation, and hostile-intrusive behaviour all had equivalent strength associations ( $r = 0.31$ ). Withdrawal was associated with a disorganized-approach classification ( $r = 0.44$ ), but not disorganized-avoidance. It was also associated with security, suggesting perhaps that caregiver withdrawal was generally a prompt for infant approach behaviour as well as a source of disorganization for many infants. However, Lyons-Ruth and her team noted that infants who display no avoidance, resistance or proximity-seeking on reunion with their caregiver (e.g., dazed wandering, putting head down on the floor) were also more likely to have caregivers who showed withdrawing behaviour. The mothers in disorganized-approach dyads also had moderate scores on the Main and Hesse frightened scale. This was not captured by AMBIANCE, as frightened caregiver behaviour had been folded in as part of the dissociation scale. Lyons-Ruth and colleagues considered that caregiver displays of withdrawal and fear towards the infant may reflect the 'helpless' stance described by Solomon and George.

The role confusion scale was associated with a disorganized-avoidant classification ( $r = 0.42$ ), but not disorganized-approach. Hostile-intrusive behaviour likewise predicted disorganized-avoidance better than disorganized-approach. There was considerable intercorrelation between role confusion and hostile-intrusive behaviour. Lyons-Ruth and colleagues also observed that infants who showed both avoidant and resistant behaviour in the Strange Situation were more likely to have mothers who exhibit disoriented behaviour at high levels. Role-reversed and dissociated behaviour almost never occurred in the absence of behaviour from the other scales.

In the 1999 paper, Lyons-Ruth and her team reported that the association between AMBIANCE and disorganized attachment remained even if the items taken from Main and Hesse were removed, offering support for the relevance of the additional AMBIANCE items. However, in a later paper Lyons-Ruth acknowledged some potentially qualifying findings. In fact, there were no cases in the sample with a high score for FR, without a high

<sup>235</sup> Lyons-Ruth, K., Yellin, C., Melnick, S., & Atwood, G. (2005) Expanding the concept of unresolved mental states: Hostile/helpless states of mind on the Adult Attachment Interview are associated with disrupted mother-infant communication and infant disorganization. *Development and Psychopathology*, 17(1), 1–23.

<sup>236</sup> Baron, R. M. & Kenny, D. A. (1986) The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173.

<sup>237</sup> Specifically, the Baron and Kenny procedure has a high risk of false positive and false negative findings. Furthermore, it has been common practice to use the procedure without a power calculation to assess the legitimacy of a mediation analysis on the available sample. Given the small size of most studies in developmental psychology, the tacit understanding appears to have been that questions of statistical power would be waived for the mediation analysis. The Baron and Kenny procedure is also highly sensitive to which variables are (and are not) in the design.

score also for AMBIANCE—and 86% of dyads with high scores on both systems, a fifth of the sample, received a disorganized classification.

For cases with a high score for AMBIANCE but a low score for FR, only 33% of dyads received a disorganized classification.<sup>238</sup> Such findings raise the possibility that it is primarily when FR items co-occur with AMBIANCE items that the latter are associated with disorganized attachment, raising questions about the specificity of the non-FR items. Yet the withdrawal scale takes very few items from Main and Hesse, and 64% of dyads where caregivers showed withdrawal received a disorganized classification. This provided initial evidence that some of the AMBIANCE items are offering incremental prediction over and above the original Main and Hesse coding system.

Lyons-Ruth and colleagues also reported on associations among the AMBIANCE subscales.<sup>239</sup> Affective errors had significant associations with several other scales: 0.33 for disorientation; 0.39 for hostile–intrusive; and 0.44 for withdrawal. Affective errors seemed to operate to an extent as a central dimension, with the other scales as offshoots. The correlation between the frequency count for maternal atypical behaviors and the rating for level of disrupted communication was  $r = 0.83$ . Disorientation was also significantly related to hostile–intrusive behaviour ( $r = 0.33$ ). There was a strong association between hostile–intrusive behaviour and role confusion,  $r = 0.54$ . Both hostile–intrusive behaviour and role confusion were negatively associated with withdrawal, indicating, as Bronfman had hypothesized, that these are to some extent alternative forms of disrupted behaviour. These results would later be supported by Khoury, Lyons-Ruth, and colleagues using data from the MIND cohort study, where a clear distinction was found between withdrawal and the other scales using a principal components analysis at four months.<sup>240</sup>

Lyons-Ruth's team were able to update their report on the antecedents of child externalizing behaviour at ages five and seven.<sup>241</sup> The most famous finding from the Harvard Family Pathways Study is the association between the Strange Situation and child externalizing behaviour. Yet with the hostile–intrusive scale from AMBIANCE available, Shi, Lyons-Ruth, and colleagues reported that caregiver behaviour was a more incisive and enduring predictor of child behavioural problems than the Strange Situation. Despite its importance, this finding only appears in a table in a paper on a different topic, where it was not discussed by the authors, and has not been mentioned by subsequent researchers. It appears to have been too incendiary to go back to revisit one of the findings that helped establish the legitimacy of the disorganized attachment category. Decades later, the question of respective prediction of child outcomes from the Strange Situation and observed caregiver behaviour would be revisited by Lyons-Ruth's protégé, Sheri Madigan and her team (Chapter 5).

<sup>238</sup> Lyons-Ruth, K. (2003) Dissociation and the parent–infant dialogue: A longitudinal perspective from attachment research. *Journal of the American Psychoanalytic Association*, 51(3), 883–911, Figure 1.

<sup>239</sup> Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999) Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, 64(3), 67–96, Table 10.

<sup>240</sup> Khoury, J. E., Bosquet Enlow, M., Patwa, M. C., & Lyons-Ruth, K. (2020) Hair cortisol in pregnancy interacts with maternal depressive symptoms to predict maternal disrupted interaction with her infant at 4 months. *Developmental Psychobiology*, 62(6), 768–782.

<sup>241</sup> Shi, Z., Bureau, J. F., Easterbrooks, M. A., Zhao, X., & Lyons-Ruth, K. (2012) Childhood maltreatment and prospectively observed quality of early care as predictors of antisocial personality disorder features. *Infant Mental Health Journal*, 33(1), 55–69, Table 3.

## Research with AMBIANCE in Other Samples

Prompted by Lyons-Ruth's 1997 talk at the Society for Research in Child Development in Washington, Benoit and Goldberg at the University of Toronto decided to code AMBIANCE on data they had collected.<sup>242</sup> Jacobvitz and Schuengel had also reported findings for FR in the same symposium. However, Benoit and Goldberg chose to code AMBIANCE, perhaps because of its resonance for them as clinicians, and perhaps because Main and Hesse were not offering further FR training. Lyons-Ruth and Bronfman came to Toronto in September 1999 to teach the coding system to the group. This included Sheri Madigan (Chapter 5) who had been hired by Goldberg as a research assistant to learn and code AMBIANCE, after a successful summer internship coding family drawings.<sup>243</sup>

In one of the Toronto datasets, 28 mother–infant dyads were randomized to one of two interventions for children with feeding problems. One intervention focused on improving caregiver sensitivity. The other provided advice on feeding techniques. There was no clear indication that either intervention improved infant feeding. But there was a marked decrease in AMBIANCE scores for the dyads who received the sensitivity intervention, whereas scores were stable for the dyads who received feeding advice. Though conducted on a small sample, these findings provided initial experimental evidence in support of AMBIANCE. Since Main, researchers have generally distinguished insensitive and alarming caregiving behaviours and treated them as quite distinct. Nonetheless, the sensitivity intervention may have decreased scores on AMBIANCE because caregiver awareness and responsiveness to infant cues nonetheless also helps reduce alarming caregiver behaviours. However, an additional explanation could be that, in contrast to the FR system which is focused on alarming behaviours, AMBIANCE codes both insensitive and alarming caregiver behaviours.

A second study by Goldberg and colleagues reported data from 197 infant–mother dyads from two Toronto-based community samples, where AAIs and Strange Situations had been collected.<sup>244</sup> The AAIs were coded with the Main and Goldwyn system. The Strange Situations were coded for the Ainsworth classifications and disorganization, and for AMBIANCE. Unresolved states of mind on the AAI were significantly associated with higher AMBIANCE scores. AMBIANCE scores were, in turn, associated with disorganized attachment (especially disorganized–avoidant and disorganized–resistant classifications) and with resistant attachment.<sup>245</sup> Maternal withdrawal was especially associated with the disorganized–approach classification, though inter-rater reliability on the AMBIANCE subscales was not excellent. Use of the Baron and Kenny procedure indicated that associations between unresolved states of mind and disorganized attachment were only mediated to a small extent by the behaviours identified by AMBIANCE. These findings were congruent with the ‘transmission gap’ identified by Van IJzendoorn (Chapter 4), in which

<sup>242</sup> Benoit, D., Madigan, S., Lecce, S., Shea, B., & Goldberg, S. (2001) Atypical maternal behavior toward feeding-disordered infants before and after intervention. *Infant Mental Health Journal*, 22(6), 611–626; Madigan, S., Hawkins, E., Goldberg, S., & Benoit, D. (2006) Reduction of disrupted caregiver behavior using modified interaction guidance. *Infant Mental Health Journal*, 27(5), 509–527.

<sup>243</sup> Later published as Madigan, S., Ladd, M., & Goldberg, S. (2003) A picture is worth a thousand words: Children's representations of family as indicators of early attachment. *Attachment & Human Development*, 5(1), 19–37.

<sup>244</sup> Goldberg, S., Benoit, D., Blokland, K., & Madigan, S. (2003) Atypical maternal behavior, maternal representations, and infant disorganized attachment. *Development and Psychopathology*, 15(2), 239–257.

<sup>245</sup> Madigan, S., Benoit, D., & Moran, G. (2007) Can a measure of disrupted caregiver behavior discriminate infant disorganized attachment from insecure-organized attachment? *Psychology Presentations*, 15. <https://ir.lib.uwo.ca/psychologypres/15>.

associations between the AAI and Strange Situation were only partially mediated by caregiver sensitivity.

In one of the Toronto samples, 34 of fathers were also seen with their infant in the Strange Situation and completed the AAI.<sup>246</sup> There was no association between maternal and paternal AMBIANCE scores or disorganized attachment classifications. Fathers' unresolved status on the AAI predicted disorganized attachment in the Strange Situation. However, fathers' unresolved status was not associated with AMBIANCE scores, and AMBIANCE scores were not associated with disorganized attachment classifications. These findings are from a small study, but nonetheless raise questions about whether the AMBIANCE items are equally suitable for fathers as for mothers, or whether the antecedents and sequelae of fathers' behaviour towards their children are different than for mothers. A later report by the Hazan/Jacobvitz group at Texas likewise found no association between unresolved status on the AAI and fathers' FR behaviour during 30 minutes of semi-structured home observation of play, changing clothes, and feeding. There was also no association between the FR score and disorganized attachment in the Strange Situation.<sup>247</sup>

The Moran/Pederson group based at the University of Western Ontario conducted a study investigating the effect of a video-feedback intervention to support caregiver sensitivity for 69 adolescent mothers.<sup>248</sup> The sample was experiencing multiple adversities. Home observation data was collected at six and 12 months. The researchers found that the intervention improved caregiver sensitivity and increased the proportion of children classified as secure in the Strange Situation, though not for mothers classified as unresolved on the AAI. As part of her doctoral research, Madigan coded the home observations at 12 months.<sup>249</sup> Caregivers reported on child behavioural problems at 24 months. Rates of disrupted caregiver behaviour and disorganized attachment were each high (58%). Unresolved status on the AAI was associated with AMBIANCE score ( $r = 0.28$ ) and with disorganized attachment ( $r = 0.30$ ). AMBIANCE scores from Madigan's coding of home observations had a very substantial association with disorganized attachment ( $r = 0.52$ ). These associations were not moderated by whether or not the dyad had received the sensitivity intervention.

In a structural equation model containing all these variables, the association between unresolved status on the AAI and disorganized attachment was no longer significant with AMBIANCE in the model. From this Madigan and colleagues concluded that caregiver behaviour mediates the association between unresolved states of mind and disorganized infant attachment. Whereas Lyons-Ruth had found that both hostile caregiver behaviour and disorganized attachment predicted teacher-reported child behavioural problems at five years, Madigan and colleagues reported that only disorganized attachment predicted parent-reported behavioural problems at two years ( $r = 0.28$ ). Though the conclusions from Madigan's structural equation model need to be treated with some caution as structural equation modelling with categorical variables is a dicey business. Madigan and

<sup>246</sup> Madigan, S., Benoit, D., & Boucher, C. (2011) Exploration of the links among fathers' unresolved states of mind with respect to attachment, atypical paternal behavior, and disorganized infant-father attachment. *Infant Mental Health Journal*, 32(3), 286–304.

<sup>247</sup> Hazen, N., McFarland, L., Jacobvitz, D., & Boyd-Soisson, E. (2010) Fathers' frightening behaviours and sensitivity with infants: Relations with fathers' attachment representations, father-infant attachment, and children's later outcomes. *Early Child Development and Care*, 180(1–2), 51–69.

<sup>248</sup> Moran, G., Pederson, D. R., & Krupka, A. (2005) Maternal unresolved attachment status impedes the effectiveness of interventions with adolescent mothers. *Infant Mental Health Journal*, 26(3), 231–249.

<sup>249</sup> Madigan, S., Moran, G., Schuengel, C., Pederson, D. R., & Otten, R. (2007) Unresolved maternal attachment representations, disrupted maternal behavior and disorganized attachment in infancy: Links to toddler behavior problems. *Journal of Child Psychology and Psychiatry*, 48(10), 1042–1050.

colleagues would have had the option of using the scale scores for the AAI, disorganized attachment, and AMBIANCE, which would have made for a more persuasive model, but presumably were drawn to categorical variables by the dominance of categories within the attachment research literature.

The Moran/Pederson group also found a very substantial association between caregiver insensitivity and disorganized attachment ( $r = 0.44$ ).<sup>250</sup> This was contrary to Main and Hesse's proposal that caregiver insensitivity would be associated with avoidance and resistance, whereas alarming caregiver behaviours would be associated with disorganization (Chapter 1). It was also contrary to a 1999 meta-analysis by Van IJzendoorn and colleagues, which found a smaller association ( $r = 0.10$ ) between insensitivity and disorganization—albeit an association suppressed by null findings from the large NICHD study, potentially stemming from coding problems (Chapter 3).<sup>251</sup>

The Moran/Pederson findings were, however, in line with Lyons-Ruth's position that some forms of insensitivity may alarm children and repeatedly or pervasively hinder their capacity to regulate states and use their caregiver for comfort when needed.<sup>252</sup> Other research groups were beginning to report unexpected associations between insensitive care and disorganized attachment, including results from a doctoral study by True, supervised by Main (suppressed at the time, but eventually published in 2021).<sup>253</sup> (As we shall see in Chapter 5, the association between insensitivity and disorganization would later be confirmed in a 2024 meta-analysis by Madigan and collaborators.)

In the data coded by Madigan from the sample of adolescent mothers, AMBIANCE was associated more with disorganization, but also to a considerable extent with insecurity, especially resistance ( $r = 0.37$ ). AMBIANCE was also associated with insensitivity ( $r = 0.49$ ). Moran and colleagues reflected that AMBIANCE is picking up insensitive as well as alarming caregiving behaviours. Perhaps especially for populations facing multiple adversities, insensitivity too may have a role to play in contributing to disorganized attachment, as Lyons-Ruth proposed.<sup>254</sup>

This approach may come at a price, since AMBIANCE may not be adept at distinguishing the child–caregiver interactions that contribute to disorganized and resistant attachment.<sup>255</sup> The inclusion of insensitive behaviours that cause children to dysregulate may help identify more disorganization, but it may also reduce specificity of the measure to distinguish disorganization from resistance.<sup>256</sup> That said, there has been growing

<sup>250</sup> Moran, G., Forbes, L., Evans, E., Tarabulsky, G. M., & Madigan, S. (2008) Both maternal sensitivity and atypical maternal behavior independently predict attachment security and disorganization in adolescent mother–infant relationships. *Infant Behavior and Development*, 31(2), 321–325.

<sup>251</sup> Van IJzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999) Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, 11(2), 225–250.

<sup>252</sup> See also Bernier, A. & Meins, E. (2008) A threshold approach to understanding the origins of attachment disorganization. *Developmental Psychology*, 44(4), 969.

<sup>253</sup> True, M. M. (2021) New correlates of disorganization from a West-African dataset, and shared rhythmic touch as a hidden pathway to infant attachment security. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 240–259), New York: Wiley.

<sup>254</sup> Duschinsky, R. (2018) Disorganization, fear and attachment: Working towards clarification. *Infant Mental Health Journal*, 39(1), 17–29.

<sup>255</sup> Levy, G., Oppenheim, D., Koren-Karie, N., Ariav-Paraira, I., Gal, N., & Yirmiya, N. (2020) Disrupted maternal communication and attachment disorganization in children with autism spectrum disorder. *Attachment & Human Development*, 22(5), 568–581; Ariav-Paraira, I., Oppenheim, D., & Sagi-Schwartz, A. (2021) Disrupted affective communication characterizes mothers of infants with disorganized but also ambivalent attachments: An Israeli study. *Child Development*, 93(1), 59–70.

<sup>256</sup> Madigan, S., Moran, G., & Pederson, D. R. (2006) Unresolved states of mind, disorganized attachment relationships, and disrupted interactions of adolescent mothers and their infants. *Developmental Psychology*, 42(2), 293–304.

concern among attachment researchers that the resistant classification, at least in infancy, may not in fact be adding value to attachment research, given its paucity of relevant correlates (Chapter 4). Even Van IJzendoorn and Sroufe have come to question its value.<sup>257</sup> The Haifa group have questioned the value of distinguishing between resistance and disorganization.<sup>258</sup>

After Madigan and the Benoit/Goldberg group, the second research group to receive training in AMBIANCE was Slade's group at the City University of New York. Slade, a clinical psychologist and clinical educator, was impressed by the ideas and measures coming from Berkeley.<sup>259</sup> But she also felt that Main's four-category system was difficult to connect to clinical concerns.<sup>260</sup> Like Lyons-Ruth, she was interested in renewing dialogue between psychoanalytic theory and developmental science to empirically examine potential distortions in parents' perceptions of their child's intentions, and how this might shape their engagement with their child.<sup>261</sup> She was therefore particularly interested in disruptions in mother–infant affective communication, as well as disengaged and withdrawn caregiver behaviours.

Slade and colleagues interviewed a sample of 45 middle-class mothers when their children were 10 months old about their perceptions of their child and their child's experience.<sup>262</sup> These interviews were coded for parental reflective functioning, the ability of the caregiver to attend to and make sense of their child's intentions and feelings.<sup>263</sup> When the infants were 14 months old, they were observed in the Strange Situation, and caregiver behaviours in the Strange Situation were also coded with AMBIANCE. A large association was found between caregiver reflective function and AMBIANCE scores ( $r = 0.48$ ), suggesting that the caregiver's ability to consider their child's intentions and feelings may help mothers provide more integrated responses to their infant's distress.

AMBIANCE was, in turn, associated with infant attachment classifications: secure and avoidant dyads had low scores on AMBIANCE (mean: 2.8 out of 9), whereas disorganized dyads scored considerably higher (mean: 4.5). There were four dyads classified as resistant but not disorganized in the sample, and their AMBIANCE scores were the same as for the dyads classified as disorganized. The Baron and Kenny procedure was used, which indicated that much of the association between reflective function and disorganized attachment was mediated by AMBIANCE scores, though some direct association remained.

<sup>257</sup> In 2016 it was remarkable to see Alan Sroufe writing to acknowledge that 'there also are very few data regarding experiences that lead to resistant versus avoidant attachment. There is a modicum of data suggesting that avoidance results from rejection precisely when the infant signals a tender need (e.g., Ainsworth et al., 1978; Isabella, 1993), but the origins of these two patterns—if indeed they are coherent and distinctive—is not really established.' Sroufe, L. A. (2016) The place of attachment in development. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications*, (3rd ed., pp. 997–1011), New York: Guilford, p. 1008. See also van IJzendoorn, M. H. & Makino, N. (2023) In defense of unresolved attachment: Re-modelling intergenerational transmission of attachment. *Attachment & Human Development*, 25(2), 311–321.

<sup>258</sup> Alkalay, S. & Sagi-Schwartz, A. (2024) The legacy of Mary Main in attachment and developmental research in Israel. *Attachment & Human Development*, early view.

<sup>259</sup> Slade, A. & Cohen, L. J. (1996) Processes of parenting and the remembrance of things past. *Infant Mental Health Journal*, 17, 217–238.

<sup>260</sup> Slade, A. (2004) The move from categories to process: Attachment phenomena and clinical evaluation. *Infant Mental Health Journal*, 25(4), 269–283. See also Slade, A. (2014) Imagining fear: Attachment, threat, and the dynamics of psychic experience. *Psychoanalytic Dialogues*, 24, 254–266.

<sup>261</sup> Slade, A. (1999) Representation, symbolization and affect regulation in concomitant treatment of a mother and child: Attachment theory and child psychotherapy. *Psychoanalytic Inquiry*, 19, 797–830.

<sup>262</sup> Grienberger, J., Kelly, K., & Slade, A. (2005) Maternal reflective functioning, mother–infant affective communication, and infant attachment: Exploring the link between mental states of observed caregiving behavior in the intergenerational transmission of attachment. *Attachment and Human Development*, 7, 99–311.

<sup>263</sup> Duschinsky, R., & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press.

As another part of her doctoral research, Madigan also led work on a meta-analysis with Bakermans-Kranenburg, Van IJzendoorn, Moran, Pederson, and Benoit, published in 2006. The meta-analysis brought together findings from research examining links between unresolved states of mind, anomalous caregiver behaviour, and disorganized attachment. By this point, findings for these variables could be drawn from studies by Main's Berkeley group (Chapter 1), the Benoit/Goldberg group at Toronto study, the Hazan/Jacobvitz group at Texas (adapting FR to include verbal threats), the Moran/Pederson group in Western Ontario, and the Van IJzendoorn/Bakermans-Kranenburg group at Leiden (Chapter 4). Slade's group had reported associations between AMBIANCE and the Strange Situation.

The Grossmanns' group in Germany also had unpublished data from undergraduate theses by Büttner and Hieber, which had been presented at a small conference in Vienna in 1997. However, a miscommunication appears to have occurred. Madigan and colleagues seem to have understood from the poster that the Grossmann data was coded with FR, and this is how it is treated in their meta-analysis. In fact, Büttner and Hieber were barely able to identify any FR behaviours in the sample. The behaviours described by AMBIANCE were somewhat more frequent. So, without training in either measure, Büttner and Hieber coded any FR or AMBIANCE behaviours. Their amalgamated coding system also incorporated some elements of Ainsworth's acceptance vs rejection scale.<sup>264</sup>

The Büttner and Hieber system was used to code the caregiver behaviour in 36 Strange Situations, composed of equal numbers of dyads classified as organized and disorganized. These observations were drawn from the Grossmanns' wider Regensburg sample of 106 infant-mother dyads. There was no association between the scale and Strange Situations classifications, though this was not all that surprising: the rates of all of the scaled behaviours were very low, and what behaviours were identified were often marginal (e.g., ambiguous, possible instances of role confusion). Since higher base rates have been found in other middle-class samples, such as Slade's, and alarming caregiver behaviours can often be subtle, it may be suspected that there were coding problems. The Grossmanns did not regard the work as publishable, and were not aware their findings had been incorporated into Madigan's meta-analysis.<sup>265</sup> Madigan and colleagues found no significant difference between FR and AMBIANCE in terms of prediction of infant disorganized attachment. However, it is possible this finding was affected by the misclassification of the Grossmanns study.

Accepting this limitation in one of the included studies, the primary findings from the meta-analysis were a moderate effect sizes for the associations between unresolved states of mind and FR/AMBIANCE ( $r = 0.26$ ), unresolved states of mind and infant disorganized attachment relationships ( $r = 0.21$ ), and FR/AMBIANCE and disorganized attachment relationships ( $r = 0.34$ ). Studies of mediation generally revealed that FR/AMBIANCE was partially, but not wholly, mediating associations between unresolved states of mind and disorganization.

Findings for the stability of AMBIANCE score were strong ( $r = 0.56$ ), even with assessments as much as seven years apart. There were no reports of stability for FR. For studies coding caregiver behaviour in the Strange Situation, the combined effect size was  $r = 0.30$ , whereas for studies coding home observation the combined effect size was  $r = 0.41$ . It

<sup>264</sup> Büttner, A. (1997) Mütterliches Verhalten von Kindern mit desorganisierter Bindung in der Fremden Situation: Vergleiche mit Feinanalysen. Unpublished Diplomarbeit, University of Regensburg. Copy received from the author.

<sup>265</sup> Klaus and Karin Grossmann, personal communication, November 22, 2023.



might be thought that this effectively countered concerns that the associations between AMBIANCE and disorganized attachment was based on coding of the same situation. However, the difference was not statistically significant and could easily have been confounded by other moderators. Madigan and colleagues acknowledged that 'the number of studies was small and its power to find significant moderator effects correspondingly low. More studies are needed to settle issues around caregiver and context of assessment. The study designs diverged, and sub-sets defined by moderators consequently included even smaller numbers of participants and studies. The current review and meta-analysis provide a description of the momentary state-of-the-art, and should be considered heuristic.'<sup>266</sup>

In the discussion, Madigan and colleagues conclude that their results 'do not allow for an evidence-based choice between the AMBIANCE and FR system.'<sup>267</sup> There is then an abrupt change in tone, and the written style and syntax suddenly is that of Van IJzendoorn: 'With equal predictive validity, the principle of Occam's razor favors a measure that includes the smallest number of dimensions connected in the most coherent way because it implies a more frugal explanatory model of, in this case, disorganization of infant attachment based on dissociative and otherwise frightening dimensions of parenting.'<sup>268</sup> It was therefore argued that FR is the superior coding system, since it has fewer items and therefore greater parsimony. In turn, this implies support for the greater importance of alarming caregiver behaviours over the broader set of alarming and insensitive behaviours included in AMBIANCE. It was added that 'the important question here is whether they are equally effective in differentiating disorganized attachments, not only from secure attachments, but also from the various types of organized, insecure attachments, in particular from insecure-resistant attachments,' pointing to the findings of Slade and colleagues.<sup>269</sup>

In fact, this advocacy for FR was in vain. Main and Hesse provided no further training in the measure from the 2000s due to Main's ill health (Chapter 1). The studies using FR cited in Madigan's 2006 meta-analysis largely remain the sum of those carried out to date. By contrast, the provision of training in AMBIANCE, and research using the measure, have continued apace since 2006.

One study using AMBIANCE was a doctoral project by Honde completed in 2007, using the same Chicago data as Finger discussed above.<sup>270</sup> In both cases, publication of the doctoral theses appears to have been stymied by the principal investigator, which is a great shame as each of these studies is of considerable interest. Honde coded the sample for AMBIANCE, using the new 2004 Madigan rating scales. No second coder was available. There was a small, significant association between Hostile/Helpless status on the AAI and AMBIANCE scores. Analysis of subscores revealed that this association stemmed from affective communication errors, role-boundary confusion, disorientation, and—especially—hostile intrusiveness. There was no association for the withdrawal subscale.

<sup>266</sup> Madigan, S., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Moran, G., Pederson, D. R., & Benoit, D. (2006) Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment & Human Development*, 8(2), 89–111, p. 106.

<sup>267</sup> *Ibid.*, 105.

<sup>268</sup> *Ibid.*, parentheses suppressed.

<sup>269</sup> *Ibid.* Reflecting the tensions in the period following the meta-analysis, the 2008 chapter in the *Handbook of Attachment* by Jacobvitz (friends with Mary Main, and trained in FR) and Lyons-Ruth described many of the results of Madigan and colleagues, but left out mention of equivalence in prediction of disorganization or any of the points raised about incremental validity. Lyons-Ruth, K., & Jacobvitz, D. (2008) Attachment disorganization: Genetic factors, parenting contexts, and developmental transformation from infancy to adulthood. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (2nd ed., pp. 666–697). New York: Guilford Press.

<sup>270</sup> Honde, C. K. (2007) The relation of atypical maternal behavior ('disrupted communication') to maternal risk factors and infant attachment. Unpublished doctoral thesis, University of Chicago.



The AMBIANCE disorientation scale had associations with most self-reported mental health symptoms.<sup>271</sup>

An association was found between AMBIANCE scores and disorganized attachment ( $r = 0.23$ ), considerably smaller than the association between Hostile/Helpless status and disorganized attachment ( $r = 0.37$ ). Of the AMBIANCE subscales, the disruption of affective communication scale was associated with disorganized attachment. In a regression model with both Hostile/Helpless states and AMBIANCE included, the association between AMBIANCE and disorganization disappeared. Indeed, there was no evidence that the association between Hostile/Helpless status and disorganization was affected by any other factor. In a regression model with sociodemographic risk, methadone use, self-reported trauma experience, and AMBIANCE included, the association between Hostile/Helpless status and disorganized attachment remained entirely unchanged.

Reflecting the concerns expressed by Madigan—or perhaps Van IJzendoorn—a year earlier, Honde found that what association could be identified between AMBIANCE and disorganization in fact stemmed from the relationship between AMBIANCE and resistant attachment, which frequently co-occurred with disorganization. A logistic regression entering AMBIANCE as the dichotomous dependent variable, and the Strange Situation categories as the independent variables, revealed a strong link between AMBIANCE and resistant attachment, and no link to disorganized attachment once the insecure classifications were taken into account. The mothers in resistant dyads also displayed more disrupted affective communication than mothers in dyads classified as disorganized.

Honde's doctoral study represented the fourth report of difficulties for AMBIANCE in distinguishing between disorganization and resistance. It might be possible to question Honde's coding. But these findings have also been reported on two samples coded by Madigan, acknowledged as an expert coder and subsequently an accredited trainer for the AMBIANCE coding system. Similar findings have also been reported in subsequent studies. In one subsequent US study, AMBIANCE was only associated with resistance.<sup>272</sup> In three studies by Oppenheim and Sagi-Schwartz's Haifa group, AMBIANCE was associated with both disorganization and resistance.<sup>273</sup> The Haifa samples were double coded by coders trained by Elisa Bronfman, with inter-laboratory reliability established. Looking at subscales, across the Haifa samples there was a stronger association between hostile-intrusive caregiver behaviours and resistance than with disorganization. As we saw above, items such as intrusiveness and role confusion were included in AMBIANCE by Bronfman and Lyons-Ruth knowing that these items might predict both disorganization and organized insecurity. The coding manual requires a coder to make a judgement call about whether the intensity of the caregiver behaviour is sufficient to disorganize the child.

<sup>271</sup> The strongest association was with self-reports of dissociative symptoms, suggesting that disoriented caregiver behaviours are related to a broader profile of such symptoms, of which individuals themselves are aware. That said, this runs counter to findings by Schuengel and colleagues that self-report dissociative symptoms are not associated with the FR dissociation scale. Schuengel, C., Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (1999) Frightening maternal behavior linking unresolved loss and disorganized infant attachment. *Journal of Consulting and Clinical Psychology*, 67(1), 54–63.

<sup>272</sup> Safyer, M. P. (2013) When good enough mothering is not good enough: A study of mothers' secure base scripts, atypical and disrupted caregiving and the transmission of infant attachment quality. Unpublished doctoral thesis, University of Michigan. The sample was single-coded by Elisa Bronfman.

<sup>273</sup> Levy, G., Oppenheim, D., Koren-Karie, N., Ariav-Paraira, I., Gal, N., & Yirmiya, N. (2020) Disrupted maternal communication and attachment disorganization in children with autism spectrum disorder. *Attachment & Human Development*, 22(5), 568–581; Ariav-Paraira, I., Oppenheim, D., & Sagi-Schwartz, A. (2022) Disrupted affective communication characterizes mothers of infants with disorganized but also ambivalent attachments: An Israeli study. *Child Development*, 93(1), 59–70; Ariav-Paraira, I., Oppenheim, D., Sagi-Schwartz, A., & Zreik, G. (2023) Disrupted maternal communication and disorganized attachment in the Arab society in Israel. *Infant Mental Health Journal*, 44(3), 335–347.

Van IJzendoorn and Bakermans-Kranenburg have criticized AMBIANCE for an inability to distinguish disorganization and resistance, suggesting that this reflects both a weakness in the measure and in Lyons-Ruth's underlying theory that led her to include a broader range of items than Main and Hesse's FR coding system.<sup>274</sup> Disorganized infant attachment was used as the criterion for the development of FR and AMBIANCE, which leads to the assumption that distinguishing disorganization and organized insecurity would be important. Yet two points should be made. A first is that no formal test has been conducted of the ability of FR to distinguish disorganization and resistance, only to distinguish disorganization from non-disorganization. Secondly, as we saw in [Chapter 1](#), Main and Hesse themselves wondered whether the importance of disorganized attachment might be considered as an indirect marker of alarming caregiver behaviour, rather than having predictive value in itself. Based on research to date, it still remains unclear the extent to which distinguishing between disorganization and resistance is a decisive advantage for a coding system.

### Coding AMBIANCE from Interviews

An intriguing development of the AMBIANCE coding system was pioneered by Crawford and Benoit. The Working Model of the Child Interview classifies caregivers' perceptions of their child and relationship with the child.<sup>275</sup> Whereas the AAI classifies speakers based on their autobiographical narratives about their childhood, the Working Model of the Child Interview classifications are based on caregivers' narratives about their current or a potential future child, and the extent of recognition of the child's needs, experience, and feelings. Drawing on data from a subsample of the large Toronto-based community sample discussed earlier, Crawford and Benoit coded 35 Working Model of the Child Interviews, conducted prenatally, using the codes from the AMBIANCE coding system.<sup>276</sup> For instance, narrative descriptions of disengagement with the future child and disinclination to think about them were coded as withdrawal; narrative descriptions of irritation with the future child were coded as hostility. Crawford and Benoit also coded, not just content, but the way that speakers conveyed their narrative. As such, withdrawal might be coded if a caregiver failed to describe anything she might do to protect her child in the face of threats; hostility might be coded if the speaker seemed angry when talking about their foetus, even if they did not state that they were angry. They called the resulting system the Working Model of the Child Interview- Disorganization scale (WMCI-D).

The association between WMCI-D and coded observations of caregiver behaviour was remarkably high ( $r = 0.64$ ), suggesting that Crawford and Benoit had truly captured the same construct. Use of the Baron and Kenny procedure indicated that the WMCI-D also fully mediated associations between unresolved states of mind on the AAI and disorganized attachment. This was in contrast to AMBIANCE coded on observational data, which only mediated a small fraction of this relationship. The Baron and Kenny procedure was

<sup>274</sup> For example, Out, D., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2009) The role of disconnected and extremely insensitive parenting in the development of disorganized attachment: Validation of a new measure. *Attachment & Human Development*, 11(5), 419–443.

<sup>275</sup> Zeanah, C. H., Benoit, D., Hirshberg, L., Barton, M. L., & Regan, C. (1994) Mothers' representations of their infants are concordant with infant attachment classifications. *Developmental Issues in Psychiatry and Psychology*, 1(1), 1–14.

<sup>276</sup> Crawford, A., & Benoit, D. (2009) Caregivers' disrupted representations of the unborn child predict later infant-caregiver disorganized attachment and disrupted interactions. *Infant Mental Health Journal*, 30(2), 124–144.

**Table 2.2** Application of AMBIANCE behaviours to the WMCI-D scale

| Dimension of Disrupted Behavior         | AMBIANCE                                                                                                                                                                            | WMCI-D                                                                                                                                                                                                                                                  |
|-----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Affective Communication Errors          | Contradictory signalling to the infant (e.g., directs infant to do something and then not to do it)                                                                                 | Contradictory signalling to the infant (e.g., over the course of the interview, contradicts something said related to the infant (process))                                                                                                             |
|                                         | Failure to initiate responsive behaviour to infant's cues (e.g., does not attempt to soothe infant when distressed)                                                                 | Failure to initiate responsive behaviour to infant's cues (e.g., describes response to infant distress that indicates would not soothe infant (content))                                                                                                |
|                                         | Inappropriate responding to infant's cues (e.g., laughs while infant is crying or distressed)                                                                                       | Inappropriate responding to infant's cues (e.g., describes laughter as a response to infant distress (content), or laughs during interview when describing infant distress (process))                                                                   |
| Role/Boundary Confusion                 | Role confusion (e.g., repeats self references)                                                                                                                                      | Role confusion (e.g., when asked questions pertaining to infant, repeatedly references self (process))                                                                                                                                                  |
|                                         | Treats child as sexual/spousal partner (e.g., overemphasizes infant's sexuality)                                                                                                    | Treats child as sexual/spousal partner (e.g., when describing infant, or in questions pertaining to infant, uses sexual terms, language, or content (content/process))                                                                                  |
| Fearfulness/Dissociation/Disorientation | Fearful behaviour (e.g., exhibits frightened, tense, ghostlike, or stammering voice)                                                                                                | Fearful behaviour (e.g., during interview uses frightened, tense, ghostlike, or stammering voice (process))                                                                                                                                             |
|                                         | Disorientation or dissociative behaviour (e.g., handles infant as though inanimate)                                                                                                 | Disorientation or dissociative behaviour (e.g., during interview, speaks of infant as though inanimate, (process))                                                                                                                                      |
| Intrusiveness/Negativity                | Physical communication (e.g., pushes, restrains, or grabs infant)                                                                                                                   | Physical communication (e.g., describes response to infant that includes pushing, restraining, or grabbing (content))                                                                                                                                   |
|                                         | Verbal communication (e.g., mocks or teases infant)                                                                                                                                 | Verbal communication (e.g., describes response to infant that is mocking/teasing (content), or describes infant this way during interview (process))                                                                                                    |
|                                         | Inappropriately attributes negative feelings or motivation to infant (e.g., ascribes negative feelings to infant)<br>Exerts control using objects (e.g., withholds toy from infant) | Inappropriately attributes negative feelings or motivation to infant [e.g., uses negative term to describe infant's personality (content/process)]<br>Exerts control using objects (e.g., describes instance where withholds toy from infant (content)) |

| Dimension of Disrupted Behavior | AMBIANCE                                                                                                 | WMCI-D                                                                                                                                                                                 |
|---------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Withdrawal                      | Creates a physical distance from infant (e.g., directs infant to move away from self)                    | Creates a physical distance from infant (e.g., describes instance where infant is placed at a distance (e.g., in another room) (content))                                              |
|                                 | Use of verbal communication to maintain distance (e.g., dismisses infant's need for contact)             | Use of verbal communication to maintain distance (e.g., either describes an interaction where infant's need for contact is dismissed (content), or does so during interview (process)) |
|                                 | Directs infant away from self via toys (e.g., redirects infant to toys as substitute for closer contact) | Directs infant away from self via toys (e.g., describes examples where toys are used in place of physical contact (content))                                                           |

also used to explore the potential contributions of the prenatal WMCI-D and AMBIANCE coding of child–caregiver interaction. Results suggested that observed caregiver behaviour on AMBIANCE partly mediated the association between WMCI-D and disorganized attachment, but that the WMCI-D also made an independent contribution. These findings indicate that alarming and dysregulating caregiver behaviours may be shaped by disrupted expectations and perceptions of their child, which can be identified *even before that child is born*. The findings also suggest that these disrupted expectations and perceptions are related to child development even above what is captured by an observation of caregiving behaviour. This could imply that they also shape other relevant aspects of care and interaction beyond those captured by AMBIANCE, or perhaps that the WMCI-D is a less noisy measure than AMBIANCE.

A replication of these intriguing results was published by Guyon-Harris and colleagues.<sup>277</sup> Prenatal interviews were conducted with 109 women, and these were coded for WMCI-D. AMBIANCE was coded at 12 months, and mothers reported on child behavioural difficulties at 12 and 24 months. If reduced from the original Crawford and Benoit paper, the association between WMCI-D and AMBIANCE was still robust ( $r = 0.37$ ), and associations with child behavioural difficulties for the two measures were essentially identical. The Baron and Kenny procedure again suggested that the association between WMCI-D and child development outcomes is partially mediated by AMBIANCE. Guyon-Harris and colleagues reflect that consideration of WMCI-D indicators in caregivers' speech about their child, as will routinely occur in therapy contexts, may have relevance for clinicians in helping them identify potential targets for intervention. This would be an advantage of the availability of five scales in AMBIANCE and WMCI-D compared to an undifferentiated 'disorganized' classification.

<sup>277</sup> Guyon-Harris, K. L., Ahlfs-Dunn, S. M., Madigan, S., Bronfman, E., Benoit, D., & Huth-Bocks, A. C. (2022) Disrupted caregiving behavior as a mediator of the relation between disrupted prenatal maternal representations and toddler social–emotional functioning. *Development and Psychopathology*, 34(3), 755–763.

### Intervention Research

In recent years, three studies have reported the results of interventions based on attachment theory, using AMBIANCE to assess the effect of the intervention on caregiving. This experimental evidence is especially valuable as it provides support for causal claims about the factors that contribute to disrupted caregiving behaviours. Part of the attraction of AMBIANCE for researchers evaluating interventions to support parenting has been the capacity of AMBIANCE to capture both highly insensitive and alarming caregiver behaviours, in contrast to measures of sensitivity.

Tereno and colleagues conducted a randomized control trial of a home visiting programme in Paris, from 27 weeks of pregnancy to the child's second year.<sup>278</sup> The home visitor used video-feedback techniques to help enhance sensitive parenting and reduce alarming parenting behaviours. Families were eligible for the intervention based on one or more psychosocial risks, such as qualification for social welfare due to low income, single parenthood, or poor educational attainment. Over half were first generation immigrants. The sample included 117 families, who were split between an intervention group or care as usual. It is worth noting that in France, care as usual is much more extensive than in many other countries, including free access to mother–child support, mental health services, and preventative services up until the child's third birthday.

Infants were seen once in the Strange Situation, between 12 and 17 months. These were coded for the Ainsworth categories by the Grossmanns' group, and for disorganization by Van IJzendoorn. In a footnote Van IJzendoorn cautioned that the separations in the Strange Situation were too long, resulting in overstress and likely some spurious disorganized classifications, which is a limitation of the study. AMBIANCE was coded from the Strange Situation recordings. The authors state that, rather than FR, AMBIANCE was chosen due to evidence of its stability over time. Though it is unclear that the authors would have been able to access training in FR in any case.

Tereno found significantly reduced AMBIANCE scores in the intervention group compared to the control group ( $r = 0.22$ ). It also reduced the frequency of disorganized classifications, though frequencies were low in both groups (8% compared to 21%) by international norms despite the excessively long separation episodes. The effect of the intervention on disorganized attachment was found to be partially mediated by AMBIANCE scores. In a subsequent paper, Tereno and colleagues reported that low income (< EUR 834 month) was associated with AMBIANCE scores (54% classified as disrupted compared to 33.4%), and this link remained after taking into account the effects of the intervention.<sup>279</sup> They argue that 'the present results also underline the particular importance of seeing socioeconomic vulnerability as a risk factor for maternal disruptive communication, with poverty directly influencing parental behavior quality'. In fact, the home visitors themselves felt that 'sometimes the better strategy for protecting the child was to prioritize socioeconomic issues. Only after the caregiver's contextual or psychological stress was addressed, could a fruitful focused effort to enhance parenting skills be possible.'<sup>280</sup>

<sup>278</sup> Tereno, S., Madigan, S., Lyons-Ruth, K., Plamondon, A., Atkinson, L., Guedeney, N., ... & Guedeney, A. (2017) Assessing a change mechanism in a randomized home-visiting trial: Reducing disrupted maternal communication decreases infant disorganization. *Development and Psychopathology*, 29(2), 637–649.

<sup>279</sup> Tereno, S., Greacen, T., & Guedeney, A. C. (2022) A controlled trial evaluating the impact of a home-visiting program on maternal disruptive communication in a vulnerable population. *Children*, 9(8), 1166.

<sup>280</sup> Ibid.

A second intervention study by Vischer and colleagues reported from a small study of 28 Dutch families under investigation from child protective services, who were assessed with AMBIANCE based on observations towards the start and end of an inpatient family preservation intervention programme.<sup>281</sup> AMBIANCE scores trended clearly downwards at second assessment, though this was not statistically significant, likely due to the small sample. In 16 cases social services subsequently concluded that the child could remain with the family, and in 12 cases the child was removed. For the families who kept their child, mean scores across all the AMBIANCE scales fell in the non-disrupted range. For the families where the child was removed, the overall AMBIANCE score and the affective communication errors subscale fell in the disrupted range. The two groups of families were different on every subscale except hostile–intrusive behaviour, with particular differences on the affective communication errors and fearful/disoriented subscales. Vischer and colleagues argued that child protective services concerns and low AMBIANCE scores need to be understood in terms of parents' adverse circumstances, such as poverty, lack of social support and domestic partner violence. However, these were either not measured or not reported by the researchers.

A third experimental study was reported by Yarger and colleagues from a randomized-control trial of the Attachment and Biobehavioral Catchup (ABC) intervention, conducted with 105 mother–child dyads in the United States.<sup>282</sup> All families had been referred to child protective services, generally for neglect. Families either received Attachment and Biobehavioral Catchup, a 10-session home-visiting intervention focused on video-feedback for insensitive and alarming caregiving behaviours, or a control intervention of equal length focused on supporting stimulating parenting and child cognitive development. Dyads were seen in the Strange Situation soon after the last intervention session. Other reports by the authors have shown that ABC intervention has a profound impact on rates of disorganized attachment and on later child development.<sup>283</sup> Here, Yarger and colleagues reported results from coding AMBIANCE on their Strange Situation data.

They found that families who received ABC showed lower levels of parental withdrawal behaviour, and a structural equation model revealed that this reduction mediated the effectiveness of the intervention on the number of child–caregiver dyads classified as disorganized. Since the large majority of the sample had experience of neglect, changes in withdrawal behaviour are especially notable. There were no other associations either for the overall AMBIANCE score or for any of the subscales. However, these findings need to be treated with caution. Scale scores for fearful/disoriented behaviour and role/boundary confusion were too low to meaningfully test change. Furthermore, as mentioned above, structural equation models using categorical variables may not be dependable, with increased risk of false positive and false negative results. Again, it is a shame Yarger and colleagues treated disorganization categorically and did not use the 1–9 scale for disorganization in their model, as have Yarger's collaborators in other reports.

<sup>281</sup> Vischer, A. F. W., Post, W. J., Grietens, H., Knorth, E. J., & Bronfman, E. (2020) Development of atypical parental behavior during an inpatient family preservation intervention program. *Infant Mental Health Journal*, 41(1), 5–23.

<sup>282</sup> Yarger, H. A., Bronfman, E., Carlson, E., & Dozier, M. (2020) Intervening with attachment and biobehavioral catch-up to decrease disrupted parenting behavior and attachment disorganization: The role of parental withdrawal. *Development and Psychopathology*, 32(3), 1139–1148.

<sup>283</sup> Dozier, M. & Bernard, K. (2019) *Coaching Parents of Vulnerable Infants: The Attachment and Biobehavioral Catch-up Approach*. New York: Guilford Publications.

## Contributors to Mothers' Disrupted Caregiving

Several recent studies have used AMBIANCE in addressing factors contributing to the mother's disrupted caregiving behaviours. One is another report from Guyon-Harris and colleagues.<sup>284</sup> Participants were interviewed about any experiences they had growing up of child maltreatment. Home observations when infants were 12 months were coded with AMBIANCE. AMBIANCE scores were associated with severity of reported abuse in childhood and with the experience of multiple forms of abuse. Among the subscales, higher scores for affective communication errors and role confusion were more frequent for participants who reported multiple forms of abuse. Differences were not observed for fearful/disoriented or hostile–intrusive caregiver behaviour, suggesting that the impact of multiple forms of abuse on caregiving may not have been identified if the data had been coded with FR.

## Indiscriminate Behaviour

### Rating of Infant–Stranger Engagement

Another line of research undertaken by Lyons-Ruth was into indiscriminate attachment behaviour. An important prompt for this work was the study of 99 adolescent mothers by the Moran/Pederson group, mentioned above in the context of AMBIANCE coding. The home observations for this sample were also coded with the Attachment Q-Sort (AQS), a measure of child use of the caregiver as a secure base and safe haven (Chapter 1). Moran, Pederson, and colleagues conducted a latent class analysis on the AQS items, and found three classes.<sup>285</sup>

One class, representing 44% of the sample, described children who were generally harmonious in their use of their mother as a secure base and safe haven, and enjoyed physically affectionate moments with their mothers. This factor was highly correlated with the criterion sort for the prototypically secure child. An equal number of children were represented by the second class, which contained items indicating that the child seemed to prefer interacting with the researcher than their mother. The remaining children were represented by a third class, who seemed to have little inclination to interact with either the visitor or their mother and did not approach adults even when they were distressed. They often seemed sad or rather serious.

The second class, preference for the visitor, was found to be associated with unresolved states of mind on the mother's AAI ( $r = 0.41$ ) and with disorganization in the Strange Situation ( $r = 0.37$ ). By contrast, a study by Moran, Pederson, and colleagues conducted with a low-risk sample did not find classes two or three, suggesting that they may signal forms of clinically relevant need.<sup>286</sup>

These findings resonated with a clinical literature on 'disinhibited attachment', which otherwise had been rather tangential to the main body of attachment research. 'Attachment

<sup>284</sup> Guyon-Harris, K. L., Madigan, S., Bronfman, E., Romero, G., & Huth-Bocks, A. C. (2021) Prenatal identification of risk for later disrupted parenting behavior using latent profiles of childhood maltreatment. *Journal of Interpersonal Violence*, 36(23–24), NP13517–NP13540.

<sup>285</sup> Bailey, H. N., Moran, G., Pederson, D. R., & Bento, S. (2007) Understanding the transmission of attachment using variable- and relationship-centered approaches. *Development and Psychopathology*, 19(2), 313–343.

<sup>286</sup> Bailey, H. N., Waters, C. A., Pederson, D. R., & Moran, G. (1999) Ainsworth revisited: An empirical analysis of interactive behavior in the home. *Attachment & Human Development*, 1(2), 191–216.

disorder' had been introduced to the American Psychiatric Association Diagnostic and Statistical Manual of Mental Disorders in the 1980s, based largely on Bowlby's work of the 1950s, and in a manner bizarrely cut off from his subsequent work or from empirical research on attachment. Bowlby was baffled, and no empirical study used the 'attachment disorder' category until after his death.<sup>287</sup> The primary use of the DSM classification in the 1990s was to describe children reared in institutional care, where two profiles could sometimes be seen: withdrawal from all caregivers, and indiscriminate attachment behaviours shown towards caregivers and non-caregivers. Over subsequent years, the latter has been redescribed as disinhibited social engagement disorder. Yet its standing as a diagnosis remains unsteady, in part due to the relatively small research base and lack of clarity about its meaning among clinicians, resulting in inconsistencies in its application in clinical practice.<sup>288</sup>

The primary available measure for assessing disinhibited attachment behaviour was a clinical interview with the child's caregiver, the Disturbance of Attachment Interview, developed by Zeanah and colleagues in the late 1990s.<sup>289</sup> In the 2000s Zeanah and colleagues introduced an observational measure, Stranger at the Door, where a stranger comes to the child's house, and the child's response is observed to the stranger's invitation to come with them.<sup>290</sup> Around the same time, Minnis and colleagues introduced a brief caregiver self-report measure, the Reactive Attachment Disorder Questionnaire.<sup>291</sup>

Several attachment researchers, among them Sroufe, Van IJzendoorn, and Bakermans-Kranenburg, expressed exasperation with the attachment disorder diagnosis, given its ill-fit with Bowlby's attachment theory or the predominant categories used in mainstream attachment research.<sup>292</sup> Lyons-Ruth felt that efforts were needed to bridge clinical systems of diagnosis and the non-diagnostic categories of attachment, which had hindered the informed integration of attachment research into diagnosis-focused clinical services and clinical training. The findings of the Moran/Pederson group also suggested that indiscriminate attachment behaviours could be seen in home-reared children, with associations with caregiver states of mind regarding attachment and with Strange Situation classification. This was consistent with work by Minnis and colleagues, who had found that harsh caregiver behaviour was associated with scores on the Reactive Attachment Disorder Questionnaire in a large community sample of home-reared children.<sup>293</sup>

Lyons-Ruth had seen instances of attachment behaviour displayed towards the stranger in the Strange Situations in her sample. She made a bold decision: to attempt to integrate attention to indiscriminate attachment behaviours within the Strange Situation, the foundational methodological and theoretical frame for attachment theory and research. This

<sup>287</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 1.

<sup>288</sup> Allen, B., & Schuengel, C. (2019) Attachment disorders diagnosed by community practitioners: A replication and extension. *Child and Adolescent Mental Health*, 25, 4–10.

<sup>289</sup> Lieberman, A. F., & Zeanah, C. H. (1995) Disorders of attachment in infancy. *Child and Adolescent Psychiatric Clinics of North America*, 4(3), 571–587.

<sup>290</sup> Gleason, M. M., Fox, N. A., Drury, S., Smyke, A., Egger, H. L., Nelson III, C. A., ... & Zeanah, C. H. (2011) Validity of evidence-derived criteria for reactive attachment disorder: Indiscriminately social/disinhibited and emotionally withdrawn/inhibited types. *Journal of the American Academy of Child & Adolescent Psychiatry*, 50(3), 216–231.

<sup>291</sup> Minnis, H., Rabe-Hesketh, S., & Wolkind, S. (2002) Development of a brief, clinically relevant, scale for measuring attachment disorders. *International Journal of Methods in Psychiatric Research*, 11(2), 90–98.

<sup>292</sup> For example, Sroufe, L. A., Duggal, S., Weinfield, N., & Carlson, E. (2000) Relationships, development, and psychopathology. In A. J. Sameroff, M. Lewis, & S. M. Miller (eds), *Handbook of Developmental Psychopathology* (pp. 75–91). New York: Kluwer Academic/Plenum Publishers, p. 83.

<sup>293</sup> Minnis, H., Reekie, J., Young, D., O'Connor, T., Ronald, A., Gray, A., & Plomin, R. (2007) Genetic, environmental and gender influences on attachment disorder behaviours. *The British Journal of Psychiatry*, 190(6), 490–495.



seemed to offer opportunities for engagement and potential rapprochement between psychiatry and developmental psychology around the meaning of indiscriminate attachment behaviours. Two undergraduate students recoded the Harvard Family Pathways Study for extent of preferential friendliness, or even attachment behaviour, towards the stranger compared to the mother in the Strange Situation.<sup>294</sup> The coding system was called the Rating of Infant–Stranger Engagement (RISE). A score of 5 indicated at least equal engagement with the stranger compared with the mother.

In the Harvard Family Pathways Study the average score was 4.65 at 12 months and 4.34 at 18 months (standard deviations around 2), which is considerably higher than what might have been expected from Ainsworth's descriptions of her Strange Situations.<sup>295</sup> Infant–stranger engagement seems to have been common in the Harvard sample. It was also relatively stable between 12 and 18 months ( $r = 0.31$ ). Infants in both insecure–organized and disorganized dyads received somewhat higher scores on the RISE, but ultimately there was no significant association.

These findings might be compared with an earlier study by Thompson and Lamb (Chapter 1), which had found that infant–stranger sociability in the Strange Situation was associated with security.<sup>296</sup> This suggests that the RISE was not measuring a child's confidence—though additional psychometric research on the RISE will be needed in the future to examine the respective contributions of friendliness towards the stranger and attachment behaviour towards the stranger, which are both coded by the RISE.

Lyons-Ruth and her students found that infants who had experienced maltreatment or who had mothers with a history of psychiatric illness received higher scores on the RISE. This association was mediated at 18 months by the caregiver's AMBIANCE score. The association between RISE and AMBIANCE was  $r = 0.31$ , with the disorientation subscale  $r = 0.42$ . There was generally no association between caregiver report of depression and RISE, but there was a link with caregiver diagnosis of clinical depression. Associations with home observation scales were not statistically significant, though hostile intrusiveness was just short of conventional significance ( $r = 0.27$ ;  $p > 0.07$ ).<sup>297</sup> There was no association with any demographic variables.

In terms of sequelae, RISE scores predicted teacher report of hostile behaviour at age five at least as well as infant disorganization and were a considerably better predictor of teacher general concern about the child. After controlling for demographic variables, classmate mean level of problematic behaviour, and disorganization, the association between RISE and problematic child behaviour was  $r = 0.44$ . Teacher report of hostile behaviours and hyperactivity at age five was also predicted by an increase in RISE from 12 to 18 months. Since RISE and attachment disorganization were independent predictors of teacher report of concerns, they seemed to represent quite different constructs.<sup>298</sup>

<sup>294</sup> Lyons-Ruth, K., Bureau, J. F., Riley, C. D., & Atlas-Corbett, A. F. (2009) Socially indiscriminate attachment behavior in the Strange Situation: Convergent and discriminant validity in relation to caregiving risk, later behavior problems, and attachment insecurity. *Development and Psychopathology*, 21(2), 355–372. Appendix A.

<sup>295</sup> For example, Ainsworth, M. (1992) A consideration of social referencing in the context of attachment theory and research. In S. Feinman (eds), *Social Referencing and the Construction of Reality in Infancy*, New York: Plenum Press, pp. 349–367.

<sup>296</sup> Thompson, R. A., & Lamb, M. E. (1983) Security of attachment and stranger sociability in infancy. *Developmental Psychology*, 19(2), 184–191.

<sup>297</sup> Atlas-Corbett, A. F. (2005) Infants preference for and engagement with a stranger in the Strange Situation: Relations with disturbance in mother–infant interactions. Unpublished senior honors thesis. Brandeis University.

<sup>298</sup> Smyke and colleagues found that the effects of placement in foster care of institutionalised children were different for attachment disorganization and indiscriminate attachment behaviour. See Smyke, A. T., Zeanah, C. H., Fox, N. A., Nelson, C. A., & Guthrie, D. (2010) Placement in foster care enhances quality of attachment among young institutionalized children. *Child Development*, 81(1), 212–223.

Indiscriminate attachment behaviour had previously been regarded as characteristic primarily of children with highly disrupted caregiving experiences or histories of institutionalization. Lyons-Ruth and colleagues were struck that a scale for indiscriminate attachment behaviour, applied to a set of home-reared infants, also seemed to be relevant, both in terms of associations with caregiver variables and child developmental outcomes. Such behaviour may be more common than previously thought, including more moderate forms, captured by RISE. They reflected that 'indiscriminate behavior toward others may have more to do with the depth of emotional engagement of caregivers during critical early periods of attachment formation than with the presence of physical neglect or rotating caregivers per se. In addition, depth of emotional engagement may be somewhat independent of the insensitive or frightening caregiver behavior typically associated with traditionally assessed forms of insecure infant attachment.'<sup>299</sup>

Most researchers have continued to rely on the Disturbances in Attachment Interview, the most established measure of disinhibited attachment behaviour. However, some groups have applied the RISE. That said, findings from research with the RISE are not widely known by the international attachment research community, in part as many reports are unpublished, in French, or both.

The first laboratory to use the RISE was Soares's group in Portugal, who applied the RISE to a sample of 74 institutionalized toddlers aged 11 to 30 months.<sup>300</sup> The children generally received good-quality medical, nutritional, and general care in their institutions, though there was instability in who had responsibility for the care of a child and quite high child-caregiver ratios. The toddlers were seen in the Strange Situation with their most familiar caregiver. The caregiver also reported on whether they had seen indiscriminate attachment behaviour. As anticipated, and supporting the validity of the measure, a little more than half the sample received a score of 5 or more on the RISE, which was higher than for the Harvard Family Pathways Study as a whole, though similar to families in the sample with maltreatment documented by social services or a history of psychiatric illness. RISE scores were significantly correlated with ratings of the Disturbances of Attachment Interview for indiscriminate behaviour ( $r = 0.36$ ). RISE scores were also associated with evidence of emotional neglect of the children who were raised by a family before coming into institutional care. Age at admission and length of time in the institution were not associated with RISE.

Unpublished findings from the study indicated that around a third of the sample received a classification of disorganized attachment in the Strange Situation with their familiar caregiver.<sup>301</sup> There was no association between RISE scores and disorganized attachment. Whereas RISE scores were associated with evidence of emotional neglect of the children prior to institutionalization, disorganized attachment was associated with social services involvement for abuse. Indiscriminate attachment behaviours, but not disorganized attachment, was weakly associated with caregivers' report of child behavioural problems.

<sup>299</sup> Lyons-Ruth, K., Bureau, J. F., Riley, C. D., & Atlas-Corbett, A. F. (2009) Socially indiscriminate attachment behavior in the Strange Situation: Convergent and discriminant validity in relation to caregiving risk, later behavior problems, and attachment insecurity. *Development and Psychopathology*, 21(2), 355–372, p. 368.

<sup>300</sup> Oliveira, P. S., Soares, I., Martins, C., Silva, J. R., Marques, S., Baptista, J., & Lyons-Ruth, K. (2012) Indiscriminate behavior observed in the strange situation among institutionalized toddlers: Relations to caregiver report and to early family risk. *Infant Mental Health Journal*, 33(2), 187–196.

<sup>301</sup> Ribeiro da Silva, J. M. (2011) Attachment disorganization and attachment disordered behaviors in a group of Portuguese institutionalized children. Unpublished doctoral thesis, Universidade do Minho.

The next research group to use the RISE was a team from the University of Quebec and University of Montreal, who had examined caregiver sensitivity among 117 adolescent mothers.<sup>302</sup> Of the sample, 23 lived in group homes for adolescent mothers at risk of maltreating their infant; the other 94 attended a school for adolescent mothers. The mother–child dyads were seen in the laboratory at four months, and their behaviour coded using Crittenden's CARE Index for sensitivity/insensitivity. The sample were seen in the Strange Situation at around 15 months. A report from the use of RISE was published in French.<sup>303</sup> The average score on RISE in the sample was 3.35, considerably lower than the Harvard Family Pathways Study; a quarter had a score of 5 or above. Again, in general there was no association between RISE and disorganized attachment. However, disorganized children with an alternative avoidant or resistant classification were more likely to score 5 or above on RISE, in contrast to those with a disorganized–approach subclassification. There were no associations between RISE and maternal income, mother's age at the birth of her child, the mother's ethnicity or marital status, or mothers' depression symptoms. However, RISE scores were predicted by professionals' concerns about mothers' neglect of their child, observed disengaged caregiving on the CARE Index, and mothers' report of lack of social support.

A masters study by Delbarre at the University of Montreal conducted the Strange Situation with 29 mother–child dyads (ages 23–71 months) open to child psychiatry services.<sup>304</sup> The sample had few families experiencing financial or social stress. Two-thirds of the sample were classified as secure in the Strange Situation. Only two children were classified as disorganized. Four of the sample received a score of 5 or more on the RISE; mean scores were 3.34. In contrast to earlier studies, Delbarre found an association between RISE and attachment classifications: RISE was negatively associated with secure attachment. Consistent with the findings of the Harvard Family Pathways Study, RISE scores were positively associated with scores across the sample for disorganization, treated as a dimension. As in other studies, RISE scores were not associated with maternal self-report of mental health difficulties. It was also not associated with maternal report of life stress.

In 2018 Kliewer-Neumann and colleagues published a study comparing RISE to the Disturbances of Attachment Interview, Stranger at the Door, and the Reactive Attachment Disorder Questionnaire. A sample of 55 German children were recruited for the study, aged between 12 and 82 months. They were in foster care following exposure to neglect and maltreatment in their biological families. The children had spent 78 days on average in their present foster families.

To the surprise of the researchers, only three children received a score of 5 or more on the RISE. In comparison, 30% of caregivers reported disinhibited behaviour on the Disturbances of Attachment Interview, and 58% of the children agreed to go with the Stranger at the Door. There were considerable and consistent associations between the RISE, Disturbances of Attachment Interview and Stranger at the Door measures ( $r = 0.40$  to  $0.42$ ). The Reactive Attachment Disorder Questionnaire was not related to other measures of disinhibited attachment behaviour. These findings offer support to each measure by suggesting that they are to a reasonable extent pointing to the same construct. Kliewer-Neumann

<sup>302</sup> Paquette, D., Zoccolillo, M., Bigras, M., Labelle, M. E., Azar, R., & Emery, J. (2004) A comparative study of parental sensitivity between three groups of adolescent mothers. *Journal of Emotional Abuse*, 4(1), 85–104.

<sup>303</sup> Lalande, C., Cyr, C., Dubois-Comtois, K., Losier, V., Paquette, D., & Emery, J. (2014) Les comportements d'attachement indiscriminé chez les enfants de mères adolescentes: Étiologie et facteurs de risque. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 46(2), 73.

<sup>304</sup> Delbarre, M. (2017) Comportements d'attachement et de désinhibition sociale d'enfants consultant en pédiopsychiatrie: lien avec des caractéristiques maternelles. Unpublished masters thesis, Université de Montréal.

and colleagues reflect that in their view, the RISE seems to underestimate indiscriminate behaviour whereas the Stranger at the Door overestimates this behaviour.

In 2019, Lyons-Ruth and colleagues published a study reporting from findings with the RISE on two samples.<sup>305</sup> A first sample was a subsample of 15 depressed mothers and three mothers with borderline personality disorder from the Harvard Family Pathways Study. A second was a group of 10 mothers with a diagnosis of borderline personality disorder and a control group of 22 mothers who had no history of psychiatric disorder but who were matched for demographic characteristics.<sup>306</sup> Across the two studies there were 13 mothers with a diagnosis of borderline personality disorder and 15 with a diagnosis of depression. Borderline personality disorder diagnosis was strongly associated with RISE ( $r = 0.57$ ). By contrast, the rates among children of mothers with a diagnosis of depression were the same as for the rest of the sample. This association was found to be mediated by AMBIANCE scores in both samples, with maternal frightened/disoriented behaviour playing a key role. Both maternal borderline diagnosis and maternal frightened/disoriented behaviour also made additional direct contributions to infant RISE score with the other controlled.

A final study to have used the RISE to date was reported in 2021 by Zephyr and the Montreal group.<sup>307</sup> This was a study of 67 children (aged 1–5 years old) and their biological parent, recruited through child protective services and with a history of substantiated maltreatment, in most cases neglect. In the Strange Situation, 17 children were classified as secure, 11 as insecure-avoidant, five as insecure-ambivalent, and 34 as insecure-disorganized, a distribution convergent with other samples of maltreated children (Chapter 5). The Strange Situations were also coded for alarming caregiver behaviours with a combination of the FR and AMBIANCE coding systems. As in the study by Kliwer-Neumann, only 4% of the sample received a score of 5 or more on the RISE. The mean score was 2.96.

No association was found between RISE and insecure or disorganized attachment. There was, nonetheless, a moderate association between the RISE and observed alarming caregiver behaviour ( $r = 0.34$ ). Potentially the forms of alarming caregiver behaviour observed were not ones contributing to disorganized attachment, and instead to indiscriminate behaviour. Child protection records indicated that emotional abuse or neglect were associated only with insecurity, not with disorganization or RISE. Neglect had a modest association with RISE ( $r = 0.24$ ), and a better association with observed alarming caregiver behaviours ( $r = 0.37$ ), in particular with caregiver withdrawn behaviour. Physical and sexual abuse had no association with any attachment assessments. Where children had experienced multiple forms of abuse, this was associated with insecurity ( $r = 0.26$ ) and disorganization ( $r = 0.32$ ).

Zephyr and colleagues concluded that their findings support Lyons-Ruth's claim that indiscriminate behaviour may stem from emotional disengagement by caregivers during early critical periods, more than child neglect per se. Actually, their findings do not offer unqualified support for this claim. True, mothers facing extreme adversity in the Harvard

<sup>305</sup> Lyons-Ruth, K., Riley, C., Patrick, M. P., & Hobson, R. P. (2019) Disinhibited attachment behavior among infants of mothers with borderline personality disorder, depression, and no diagnosis. *Personality Disorders: Theory, Research, and Treatment*, 10(2), 163–172.

<sup>306</sup> Hobson, R. P., Patrick, M., Crandell, L., García-Pérez, R., & Lee, A. (2005) Personal relatedness and attachment in infants of mothers with BPD. *Development and Psychopathology*, 17, 329–347; Hobson, R. P., Patrick, M. P., Hobson, J. A., Crandell, L., Bronfman, E., & Lyons-Ruth, K. (2009) How mothers with borderline personality disorder relate to their year-old infants. *The British Journal of Psychiatry*, 195, 325–330.

<sup>307</sup> Zephyr, L., Cyr, C., Monette, S., Langlois, V., Cyr-Desautels, L., & Archambault, M. (2021) Disinhibited social engagement behaviors in young maltreated children: Dysfunctional behavior of biological parents and child attachment. *Child Abuse & Neglect*, 111, 104791.

Family Pathways Study and the caregivers in Portuguese institutions may, for very different reasons, show a higher level of emotional disengagement with the infants in their care. Yet if indiscriminate behaviour stems from emotional disengagement, then this would imply that children who have experienced outright abuse and neglect (in their sample and in Kliewer-Neumann's sample) had experienced dramatically *less* emotional disengagement than, for example, the adolescent mothers from the Quebec study where a quarter of the sample received a RISE score of 5 or more.

There is no report of inter-laboratory reliability, so it could simply be that the coders in the Kliewer-Neumann and Zephyr studies were more stringent in applying the coding system. Especially since maltreatment was associated with higher scores on RISE in the Harvard Family Pathways Study. Nonetheless these discrepant findings raise questions about exactly how and when emotional disengagement by caregivers in fact leads to indiscriminate behaviour. Furthermore, Lyons-Ruth has argued that caregiver emotional disengagement is associated with disorganized–approach behaviour and with indiscriminate attachment behaviour. Yet there is no evidence of an association between these forms of infant behaviour, again suggesting that this explanation has further to go.

Overall, the RISE appears to be a potentially promising supplementary form of analysis for the Strange Situation. RISE has been found to converge with other validated measures of indiscriminate attachment behaviour. It is comparatively low resource to code, with a straightforward coding scheme which is orders of magnitude less demanding and labyrinthine than Main and Solomon's system for disorganized attachment. Other research on indiscriminate behaviour in children has documented prospective associations with poorer psychosocial outcomes, depending on children's access to a stable home environment.<sup>308</sup> However, so far the only evidence of prospective correlates from RISE comes from its development sample, which is a fundamental limitation of research to date. However, scores on the RISE have been repeatedly shown to be distinct from insecure and disorganized attachment, picking out a different construct, one with a materially different set of associations with caregiver behaviour. Research using the RISE and other measures of indiscriminate attachment behaviour with home-reared samples has considerable potential to contribute to efforts to bridge psychiatry and developmental science by exploring the meaning and implications of this form of behaviour beyond institutionalized children.

A few studies have examined how and when indiscriminate behaviour relates to the attachment classifications usually used in attachment research, and where their correlates are similar or different.<sup>309</sup> However, in contrast to other measures of indiscriminate behaviour, RISE is particularly well set to explore how and when indiscriminate behaviour relates to the attachment classifications usually used in attachment research, and where their correlates are similar or different. If this research agenda bears fruit, the many research groups with data from the Attachment Q-Sorts could also follow the lead of

<sup>308</sup> For example, Guyon-Harris, K. L., Humphreys, K. L., Fox, N. A., Nelson, C. A., & Zeanah, C. H. (2018) Course of disinhibited social engagement disorder from early childhood to early adolescence. *Journal of the American Academy of Child & Adolescent Psychiatry*, 57(5), 329–335; Schröder, M., Lüdtke, J., Fux, E., Izat, Y., Bolten, M., Gloger-Tippelt, G., ... & Schmid, M. (2019) Attachment disorder and attachment theory—Two sides of one medal or two different coins? *Comprehensive Psychiatry*, 95, 152139.

<sup>309</sup> Zimmermann, P. & Soares, I. (2019) Recent contributions for understanding inhibited reactive attachment disorder. *Attachment & Human Development*, 21(2), 87–94; Cuyvers, B., Vervoort, E., & Bosmans, G. (2020) Reactive attachment disorder symptoms and prosocial behavior in middle childhood: The role of Secure Base Script knowledge. *BMC Psychiatry*, 20(1), 1–13.

the Moran/Pederson group and make use of the Q-sort items marking preference for the researcher over the mother in the home. Most laboratories engaged in a sustained way with attachment research have either Strange Situations, AQS observations, or both. In re-analysis of existing data or use in contemporary studies, the option would be available to bring attention to indiscriminate behaviour into the mainstream of attachment research, contributing to the growth of knowledge and supporting clinicians as they seek to make sense of children's behaviour.

### Debating Indiscriminate Behaviour

Until 2013, indiscriminate behaviour was classified in the *Diagnostic and Statistical Manual of Mental Disorders* as Reactive Attachment Disorder-Indiscriminate Type. The fifth edition of the manual changed the name to Disinhibited Social Engagement Disorder. This was justified on the basis that there was little evidence that indiscriminate friendliness, trust, and care-seeking to familiar and unfamiliar adults had its basis in disruption of the attachment relationship specifically. Children who showed friendliness, trust, and care-seeking to strangers might also show these behaviours towards a primary caregiver, which again raised the question of whether there was anything necessarily wrong with the relationship with the primary caregiver. Indiscriminate behaviour may persist even after previously institutionalized children form attachments to adoptive parents.<sup>310</sup>

Zeanah and Gleason had been involved in the discussions resulting in this change. They argued that friendliness, trust, and care-seeking with strangers does not represent a disturbance in the attachment relationship, but is better explained by problems in the development of typical stranger wariness.<sup>311</sup> This is why indiscriminate behaviour is seen so often in institutionalized children and formerly institutionalized children, as they have not had the opportunity to develop typical stranger wariness. Zeanah and Gleason cautioned clinicians against assigning a diagnosis of Disinhibited Social Engagement Disorder for children without extreme disruptions of care, such as institutionalization or placement breakdowns. They argued that these behaviours could not be expected to have a related meaning when seen in children reared in stable home environments.

Lyons-Ruth wrote a dissenting opinion to Zeanah and Gleason, expressing concern at the removal of the term 'attachment' from the title of the disorder. She argued that an attachment perspective offers 'the clearest theoretical formulation' for making sense of when and how children display friendliness, trust, and care-seeking to strangers. Firstly, she observed that this behaviour is seen across samples, both institutionalized and home-reared, where children have experienced serious emotional disengagement by their caregivers. Lyons-Ruth also highlighted that indiscriminate behaviour declines in frequency and intensity when children have an opportunity to form relationships with emotionally engaged caregivers. The opportunity to develop typical stranger wariness is

<sup>310</sup> Chisholm K. (1998) A three-year follow-up of attachment and indiscriminate friendliness in children adopted from Romanian orphanages. *Child Development*, 69, 1092–1106; O'Connor, T. G., Marvin, R. S., Rutter, M., Olrick, J. T., & Britner, P. A. (2003) Child–parent attachment following early institutional deprivation. *Development and Psychopathology*, 15, 19–38.

<sup>311</sup> Zeanah, C. H. & Gleason, M. M. (2015) Annual research review: Attachment disorders in early childhood—clinical presentation, causes, correlates, and treatment. *Journal of Child Psychology and Psychiatry*, 56(3), 207–222.

not, therefore, the key factor. It cannot explain why indiscriminate behaviour can be seen in both institutionalized and home-reared samples. It also cannot explain why it declines when formerly institutionalized children are in stable and engaged adoptive families, or at least a reorganization of the attachment motivational system is at least as plausible an explanation.<sup>312</sup>

Zeanah and Gleason replied that the research evidence to date was insufficient to establish problems with the attachment motivational system as the cause of friendliness, trust, and care-seeking to strangers.<sup>313</sup> Whilst they accepted that their proposal for emphasis on opportunity to develop typical stranger wariness was also speculative, they argued that in the meantime it was more appropriate to have a descriptive title for the behaviour, rather than one that assumed a known cause. Since the behaviour is shown towards strangers rather than attachment figures, it seems premature to claim that it is an effect of attachment without clear evidence. They also argued that indiscriminate behaviour is ultimately ill-fitted with the ways in which attachment is characterized by the academic community: it 'may occur in children who lack attachment figures, those who have insecure or disorganized attachments to caregivers, or even in children who are securely attached to caregivers. Although conceding this finding, Lyons-Ruth questions whether the children with indiscriminate behavior and secure attachments are actually securely attached, as evidenced by their indiscriminate behavior. In our view, this seems tautological.'<sup>314</sup>

In a recent paper, Zeanah and colleagues revisited some of these questions.<sup>315</sup> They drew data from two samples. A first was 158 children from the Bucharest Early Intervention Project, in which institutionalized children were randomly assigned to care-as-usual in the institution or placement into a foster care system. The second sample was 350 Romanian children recruited from public outpatient paediatric clinics in Bucharest. Caregivers for the children responded to the Disturbances of Attachment Interview when the children were 54 months. The children completed a psychiatric assessment at the same time. The researchers found that disinhibited behaviours clustered with different groups of symptoms between the two samples. In the community sample disinhibited symptoms companionably clustered with other mental health difficulties. Among children with experiences of institutionalization, disinhibited behaviours were not as closely linked to other mental health difficulties: they seemed to represent a different issue. These findings raise questions about whether disinhibited behaviours have the same meaning and the same correlates between children with experiences of institutionalization and those only home-reared. They also suggest that among children in community samples, disinhibited behaviours may be generally expected among children with other mental health difficulties, rather than reflecting one distinct cause. The authors acknowledged, though, that there is much more to learn about the causes, meaning, and implications of disinhibited behaviours.

<sup>312</sup> Lyons-Ruth, K. (2015) Commentary: Should we move away from an attachment framework for understanding disinhibited social engagement disorder (DSED)? A commentary on Zeanah and Gleason (2015). *Journal of Child Psychology and Psychiatry*, 56(3), 223–227.

<sup>313</sup> Zeanah, C. H., & Gleason, M. M. (2015) Commentary: A response to Lyons-Ruth (2015) *Journal of Child Psychology and Psychiatry*, 56(3), 224–225.

<sup>314</sup> Ibid.

<sup>315</sup> Guyon-Harris, K. L., Plamondon, A., Humphreys, K. L., Wade, M., Gleason, M. M., Tibu, F., ... & Zeanah, C. H. (2023) Structure of psychopathology in Romanian preschool-aged children in an epidemiological and a high-risk sample. *JAACAP Open*, 1(3), 173–183.

## Measures of Attachment in Middle Childhood and Adolescence

### The Middle Childhood Disorganization and Control (MCDC) Scales

When participants in the Harvard Family Pathways Study were between seven and nine years old, Easterbrooks led a new round of data collection. The sample consisted of a high proportion of single mothers, so no attempt was made to call in fathers. As we have seen, at this point the AAI was conducted with the mothers. The children completed the Kaplan Separation Anxiety Test.<sup>316</sup> Of the original 82 families, 43 attended the follow-up. Easterbrooks filmed the reunion of children and caregivers after the hour or so apart. Though the children were a little older, it might have seemed logical to code this data with the Main and Cassidy six-year reunion system. Indeed, the mother and child had been separated to do exactly the same assessments as had been conducted in Berkeley—the situation was remarkably similar.

However the Main and Cassidy system had been functionally discontinued. Main was experiencing escalating mental and physical health difficulties and provided no training in the coding system. She also did not make the manuscript of the coding system available to researchers outside her laboratory. Research with the Main and Cassidy coding system was continued by Main's student Kazuko Behrens,<sup>317</sup> who has also very recently started offering training.

For decades, besides Behrens, the only research to have used the coding system was by Moss and colleagues at the University of Montreal.<sup>318</sup> Moss and colleagues received opprobrium from other attachment researchers for using the coding system without Main's agreement.<sup>319</sup> The incident offers a microcosm of the broader difficulties for attachment research, highlighted elsewhere in this chapter, caused by the hegemony of Main's theory and measures combined with her limited availability to support the development of attachment research from the mid-1990s.

Following graduate studies with Moss, Bureau was offered postdoctoral positions at Harvard with Lyons-Ruth and at Leiden with Van IJzendoorn and Bakermans-Kranenburg. Weighing his options, he spoke to Van IJzendoorn, who encouraged him to take the post with Lyons-Ruth. Van IJzendoorn suggested that Bureau would likely learn more as the only postdoctoral researcher in Lyons-Ruth's group, working closely with her, thinking and watching recordings together, than he would in the large Leiden laboratory.<sup>320</sup>

<sup>316</sup> Lyons-Ruth and colleagues also recorded a conversation between child and caregiver about a potential conflictual topic. A new coding system, the Middle Childhood Attachment Strategies (MCAS), was developed for coding these interactions based on Main's four categories, but distinguishing punitive, controlling and disoriented forms of disorganization. The system worked adequately with this development sample, though the ambivalent/resistant category did not have expected correlates. However, an attempted replication by Gastelle found no associations with caregiver behaviour or with the AAI, and the measure has not subsequently been used by other laboratories. Brumariu, L. E., Giuseppe, K. R., Kerns, K. A., Van de Walle, M., Bureau, J. F., Bosmans, G., & Lyons-Ruth, K. (2018) Middle childhood attachment strategies: Validation of an observational measure. *Attachment & Human Development*, 20(5), 491–513; Gastelle, M. (2021) *Validation of a Behavioral Measure of Attachment for Middle Childhood and Early Adolescence*. Kent, OH: Kent State University.

<sup>317</sup> For example, Behrens, K. Y. (2024) Longitudinal study of attachment in Japan. *Attachment & Human Development*, forthcoming.

<sup>318</sup> Moss, E., Cyr, C., Bureau, J. F., Tarabulsy, G. M., & Dubois-Comtois, K. (2005) Stability of attachment during the preschool period. *Developmental Psychology*, 41(5), 773–783.

<sup>319</sup> For example, Solomon, J. & George, C. (2008) The measurement of attachment security and related constructs in infancy and early childhood. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (2nd ed., pp. 383–416). New York: Guilford Press.

<sup>320</sup> J. F. Bureau, personal communication, January 29, 2024.



With Lyons-Ruth, Bureau developed the Middle Childhood Disorganization and Control (MCDCC) scales for assessing the 7–9-year-old reunions in the Harvard Family Pathways Study.<sup>321</sup> This focus on scaling different forms of disorganization was aligned with the core interests of both Bureau and Lyons-Ruth. It may have had the political advantage of not appearing to redevelop or appropriate the Main and Cassidy four-category system. However, it is clear that Bureau and Lyons-Ruth did not want to assume that a system developed on the Berkeley sample, recruited to be especially low-risk, would be transferable to the Harvard high-risk sample. This was important to their decision to develop a new measure. Bureau and Lyons-Ruth were persuaded by Fraley and Spieker that scales were more appropriate than categories for measuring individual differences in attachment.<sup>322</sup> The use of scales also offered greater statistical power, an advantage for work on this relatively small sample.

Bureau and colleagues reviewed 99 episodes (reunions and free play sessions) of 44 mother–child dyads from one low-risk and two high-risk independent samples. From this review, they developed three categories of behaviour. Two reflected Main and Cassidy's work: a controlling-punitive and a controlling-caregiving category. They also developed a scale for disruptions of a child's form of relating to their caregiver by conflict, confusion, or apprehension, similar to the Main and Solomon infant coding system, though updated to include additional age-relevant behaviours such as extreme self-negating comments or self-injurious behaviour.<sup>323</sup> They also included preferential friendliness or attachment behaviour towards the researcher, which Lyons-Ruth had treated as a distinct construct in infancy, among the indices of disorganization in middle childhood. No explanation is provided for this choice, which suggests that the disorganization construct was here serving as something of a catch-all for behaviour assumed to represent disturbances of the attachment relationship.

Bureau and colleagues found that AMBIANCE scores in infancy predicted controlling-punitive behaviour on reunion at follow-up. The AMBIANCE hostile–intrusive behaviour made no contribution, suggesting that the child's punitive behaviour was not simply learnt from the caregiver, but represented an adaptation to a broader disrupted interactional context with their attachment figure. In line with this, controlling-punitive behaviour towards the caregiver alone was not associated with mother-report of conduct problems. Teacher-reports of child behaviour were also available, but this appears to have been affected by slightly more missing data,<sup>324</sup> which may have contributed to dependence on mother-report. The mother-report data disagrees with Moss's results from teacher-reported conduct problems for controlling-punitive behaviour, where there was a marked association.<sup>325</sup> The difference in reporters makes it hard to interpret these diverging findings.

<sup>321</sup> Bureau, J. F., Ann Easterbrooks, M., & Lyons-Ruth, K. (2009) Attachment disorganization and controlling behavior in middle childhood: Maternal and child precursors and correlates. *Attachment & Human Development*, 11(3), 265–284.

<sup>322</sup> Fraley, R. C. & Spieker, S. J. (2003) Are infant attachment patterns continuously or categorically distributed? A taxometric analysis of strange situation behavior. *Developmental Psychology*, 39(3), 387–404.

<sup>323</sup> Bureau, J. F., Ann Easterbrooks, M., & Lyons-Ruth, K. (2009) Attachment disorganization and controlling behavior in middle childhood: Maternal and child precursors and correlates. *Attachment & Human Development*, 11(3), 265–284.

<sup>324</sup> Lyons-Ruth, K., Easterbrooks, M., & Cibelli, C. D. (1997) Infant attachment strategies, infant mental lag, and maternal depressive symptoms: Predictors of internalizing and externalizing problems at age 7. *Developmental Psychology*, 33(4), 681–692, p. 683.

<sup>325</sup> Moss, E., St-Laurent, D., Tarabulsy, G. M., & Bureau, J.-F. (2011) Understanding disorganized attachment at preschool and school age: Examining divergent pathways of disorganized and controlling children. In J. Solomon & C. George (eds), *Disorganized Attachment and Caregiving* (pp. 52–79). New York: The Guilford Press.

Controlling-punitive behaviour at age eight was predicted by observed maternal hostile behaviour at home in infancy ( $r = 0.40$ ), and maternal retrospective report of physical abuse of their child ( $r = 0.39$ ).<sup>326</sup> This suggests that the behaviour may reflect social learning, or coercive cycles with the parent. However, other findings suggested a more complicated story to Bureau and colleagues. Controlling-punitive behaviour was also predicted by maternal disrupted communication in the Strange Situation ( $r = 0.38$ ), by disorganized infant attachment ( $r = 0.29$ ), and by maternal unresolved state of mind on the Adult Attachment Interview. The researchers therefore suggested that a controlling-punitive strategy may be elicited when children experience an environment that disrupts the functioning of the attachment motivational system and makes the child doubt they have other approaches available for ensuring caregiver attention and a degree of responsiveness.

Scores on the disorganization scale at age eight were also considerably higher for the clinically referred group than for the comparison group. The disorganized scale had considerable associations with mothers' report of financial/legal problems ( $r = 0.38$ ) and family violence or dysfunction ( $r = 0.34$ ) in the past three years. It was also associated with maternal negative perception of the role of caregiver ( $r = 0.53$ ), maternal report of domestic violence ( $r = 0.54$ ), and maternal report of physical abuse of her child ( $r = 0.35$ ). Disorganization on reunion at age eight was strongly associated with caregiver report of child internalizing ( $r = 0.55$ ), externalizing ( $r = 0.53$ ) and total difficulties ( $r = 0.61$ ). The association between early caregiving risk (referral from clinical services) and total mental health difficulties was fully mediated by disorganization on reunion at age eight.

Child controlling-caregiving at age eight was predicted by maternal withdrawal during the Strange Situation ( $r = 0.43$ ) and inversely related to maternal responsiveness at home ( $r = -0.40$ ). However, there was a modest negative association between disorganized attachment in infancy and a controlling-caregiving strategy ( $r = -0.25$ ), which was contrary to expectations from Main and Cassidy. Controlling-caregiving was less strongly associated with disorganization on the Separation Anxiety Test than controlling-punitive or disorganized behaviour. It was also associated with fewer maternal reported mental health difficulties. Children's own report of their mental health difficulties generally agreed, though there were associations with depression ( $r = 0.27$ ) and low self-worth ( $r = 0.31$ ).<sup>327</sup> These associations were strengthened for children whose mothers showed withdrawal in the Strange Situation. Bureau and colleagues reflected that controlling-caregiving may represent a less disrupted profile responding to a less pervasively disrupted caregiving environment.

The MCDC has not been used by other research laboratories. Though there was some interest, Bureau and colleagues had difficulty assembling a set of training tapes. The MCDC was also overshadowed by the Main and Cassidy system, which has remained the standard reference point for attachment in middle childhood, despite being almost entirely out of commission as a living coding system. Here we may see some of the price paid by

<sup>326</sup> Bureau, J. F., Ann Easlerbrooks, M., & Lyons-Ruth, K. (2009) Attachment disorganization and controlling behavior in middle childhood: Maternal and child precursors and correlates. *Attachment & Human Development*, 11(3), 265–284; Martin, J., Tupper, R. J., Bureau, J-F., Easterbrooks, M. A., & Lyons-Ruth, K. (2009) The role of disorganized attachment in middle childhood as a potential mediator between family risk and behavioural problems. Presented at the meetings of the Society for Research in Child Development, Denver; Bureau, J-F., Easterbrooks, M. A., & Lyons-Ruth, K. (2009) The association between middle childhood controlling and disorganized attachment and family correlates in young adulthood. Paper presented at the biennial meeting of the Society for Research in Child Development, Denver, CO.

<sup>327</sup> Bureau, J-F., Martin, J., Yurkowski, K., Lyons-Ruth, K., Meier, M., & Easterbrooks, A. (2014) Is caregiving role-reversal detrimental? An examination of the interplay between childhood caregiving, maternal emotional availability, and childhood depressive symptoms. Unpublished manuscript. Jean-François Bureau personal archive.

Lyons-Ruth's work for the attempt to elaborate and build upon Main's ideas and methods, where the use of Main's work as a starting point also curtailed how far the research could go. The community of researchers engaged with issues of attachment may not have had access to the Main and Cassidy system, but they appear to have not felt authorized to want to use anything else, given the hegemonic standing of the Berkeley measures for the field, even those measures that had been mothballed by Main.

### The Goal-Corrected Partnership in Adolescence Coding Scales

Nonetheless, work with the MCDC helped provide proof of concept for development of coding scales for observational assessments beyond early childhood. Of the 75 families in the original study, 56 were re-recruited at age 20, around the turn of 2000. An additional 64 families were recruited during late adolescence and were matched to the longitudinally studied families on adolescent age, ethnicity, and mothers' relationship status. The additional sample was generally of higher income and maternal education level.

During the laboratory visit at age 20, adolescents and their mothers went to separate rooms to complete interviews and questionnaires. The 20-year follow-up included conduct of a formal psychiatric assessment, adolescent self-report measures (e.g., Adolescent Assessment of Personality Functioning; Adolescent Dissociative Experiences Scale) and maternal-report (e.g., Child Behavior Checklist). Building on an approach developed by Kobak (with input from Ainsworth) for studying adolescent-parent interaction,<sup>328</sup> the adolescent and parent each completed a checklist for potential sources of disagreement in their relationship. Based on comparison of parent and child checklists, a topic was selected for discussion. The adolescent recorded a short statement of their views. The parent and adolescent were then reunited, the adolescent's statement was viewed together. They were then asked to have a discussion of the topic of the disagreement, which was left to run for about 10 minutes. This approach was intended to offer an analogue for the Strange Situation. Whereas a short separation between adolescent and parent was no longer expected to offer moderate stress to the adolescent, the addition of the interaction around an issue of potential conflict was expected to achieve this moderate stress by engaging a challenge relevant to adolescence as a stage of development.

Lyons-Ruth and colleagues reviewed 45 adolescent-caregiver discussions from three independent datasets.<sup>329</sup> From this they generated five-point scales, termed the Goal-Corrected Partnership in Adolescence Coding Scales (GPACS). Scales rated adolescent, parent and dyadic behaviour on a variety of dimensions. A factor analysis revealed four underlying behavioural constructs: cooperative, controlling-punitive, caregiving/role-confused, and disoriented.<sup>330</sup>

<sup>328</sup> Kobak, R. R., Cole, H. E., Ferenz-Gillies, R., Fleming, W. S., & Gamble, W. (1993) Attachment and emotion regulation during mother-teen problem solving: A control theory analysis. *Child Development*, 64(1), 231–245.

<sup>329</sup> Allen, J. P., & Hauser, S. T. (1996) Autonomy and relatedness in adolescent-family interactions as predictors of young adults' states of mind regarding attachment. *Development and Psychopathology*, 8(4), 793–809; Powers, S. I. & Welsh, D. P. (1999) Mother–daughter interactions and adolescent girls' depression. In M. J. Cox & J. Brooks-Gunn (eds), *Conflict and cohesion in families: Causes and consequences* (pp. 243–282), Mahwah, NJ: Erlbaum; Kobak, R., Zajac, K., & Levine, S. (2009) Cortisol and antisocial behavior in early adolescence: The role of gender in an economically disadvantaged sample. *Development and Psychopathology*, 21(2), 579–591.

<sup>330</sup> Obsuth, I., Hennighausen, K., Brumariu, L. E., & Lyons-Ruth, K. (2014) Disorganized behavior in adolescent–parent interaction: Relations to attachment state of mind, partner abuse, and psychopathology. *Child Development*, 85(1), 370–387.

Cooperation in discussing a topic of potential disagreement represents a challenge for use of the caregiver as a safe base and flexibility in attention and communication in discussing feelings about and in an attachment relationship.<sup>331</sup> For a high score on communication:

Both the parent and the adolescent elaborate their positions in a comfortable, constructive, and spontaneous manner. Both seem confident and open about expressing opinions and eliciting the opinions of the other. Both seem to try to actively understand and have respect for each other's views, feelings and behaviors. The pair works smoothly and productively, maintaining interest in and staying focused on the discussion. Both the parent and the adolescent seem satisfied with the process and may have clearly reached a deeper understanding of the issues at hand.<sup>332</sup>

Controlling-punitive behaviour represents hostile or devaluing behaviour by the adolescent towards their parent during the discussion. Following Main and Cassidy, theoretically these behaviours can be assumed to offer a means for a young person to gain some feeling of control in the relationship, but Lyons-Ruth and colleagues did not operationalize the construct directly on this basis. Instead, the focus is on behaviours that are punitive or demean the parent. This includes 'making angry, critical, hurtful, mocking, demeaning, blaming, or rejecting comments about the parent', 'sharply dictating how the parent should behave', 'sharp laughter while or after saying something hurtful' or 'interrupting, ignoring, or discrediting the parent'.<sup>333</sup>

By comparison, caregiving/role-confused behaviour is explicitly operationalized around behaviour that controls and regulates the caregiver through provision of support. The scale 'measures the extent to which the adolescent tries to manage, advise, take care of, and/or appease the parent by assuming responsibility for structuring the task at hand and/or by giving guidance on life tasks in general'. As part of this, the young person 'may seem watchful or highly attuned to the state of the parent, and may try to monitor and control the situation by reading and regulating the parent's own signs of vulnerability, discomfort, distress, or anger'. The young person may display behaviours such as offering 'reassuring comments, using authoritative voice tones, gently chiding or scolding the parent, offering food or other comforts to the parent, asking how the parent is feeling or what the adolescent can do for the parent'.<sup>334</sup>

Disoriented behaviour is coded somewhat differently to the MCDC. In the MCDC at age eight, reunion behaviour is coded as disoriented if it is conflicted, confused, apprehensive, self-disparaging/harming, or attachment behaviour is shown towards the researcher. The model is clearly disorganization in the Strange Situation reunions, with some developmentally relevant additions, plus indiscriminate attachment behaviour. In the GPACS, disorientation is coded when behaviour is odd or out-of-context in the discussion and leads the coder to infer lack of regulation or lapses in attention or reasoning. Disorientation of affect is coded on the basis, for instance, of 'stilted affect', 'incongruent affect

<sup>331</sup> Lyons-Ruth, K., Hennighausen, K., Holmes, B., & Obsuth, I. (2022) Goal-Corrected Partnership Adolescent Coding System (GPACS). Version 07/18/2022. Unpublished coding manual, Harvard University: 'In our observations, a secure base in adolescence involves a core sense of freedom to explore thoughts and ideas with the parent in a collaborative way. Parental affective communications that are frightened, frightening, or otherwise disrupted in infancy fail to provide this base and become elaborated over time into particularly unbalanced disorganized/controlling structures for dyadic communication.'

<sup>332</sup> Ibid.

<sup>333</sup> Ibid.

<sup>334</sup> Ibid.

(e.g., smiling while saying something hostile), or 'rapid shifts of affect'. Disorientation of behaviour is coded on the basis, for instance, of 'sudden shifts of intention or behavior', 'mistimed movements', or 'appearing "tuned out" or staring into space for a prolonged time and then snapping back'. Disorientation of speech is coded on the basis of behaviour such as 'unusual and out-of-context shifts away from the topic' or 'strange or inappropriate remarks, laughter or giggling'.

Overall, the emphasis in the GPACS disorientation scale is on behaviour suggesting breakdown of the integration of behaviour, affect, and attention, appearing as conflict, confusion, or outright dissociation, as the young person attempts to discuss a topic with their parent that evokes strong feelings for them. Whereas MCDC is closer to the Main and Solomon system, disorientation in GPACS seems closer to unresolved status on the AAI, as another narrative measure, though integrating Lyons-Ruth's interest in states of lack of regulation. That said, there is a similarity to the Strange Situation in that higher scores are given by the GPACS to 'odd/out-of-context behaviors or remarks that occur during particularly stressful moments'.<sup>335</sup>

Applied to the Harvard Family Pathways Study, there were very substantial negative associations between dyadic cooperation and adolescent controlling punitive, caregiving/role-confused and disoriented behaviour ( $r = -0.45$ – $-0.51$ ). The strength of these associations suggests that these behaviours do not represent interruptions of dyadic cooperation—as in disorganized attachment in the Strange Situation or unresolved states of mind in the AAI, which can briefly interrupt an otherwise coherent interaction between child and parent, or adult and interviewer. Instead, compared to cooperative dyadic communication, adolescent controlling punitive, caregiving/role-confused, and disoriented behaviour seem to characterize substantially different modes of interaction between child and caregiver. From Main and Cassidy's work, this might have been expected of punitive and caregiving behaviour, but it is interesting that disorientation too is just as negatively associated with cooperative dyadic communication rather than representing a localized interruption and running orthogonally to it.

Vulliez-Coady, Lyons-Ruth, and colleagues found modest positive associations between controlling-punitive, disoriented, and caregiving/role-confused behaviour (ranging from  $r = 0.25$  to  $0.34$ ). This suggested that they assess somewhat related but complementary constructs.<sup>336</sup> However, the team found that controlling-punitive behaviour shared variance with low dyadic collaboration in associations with other measures, in contrast to disorientation and caregiving/role-confused behaviour, suggesting a particularly close inverse association between these variables.<sup>337</sup> It may be that controlling-punitive behaviour is specifically and strategically oriented to undermine dyadic cooperation, on the basis of distrust in the caregiver as a partner for such cooperation.

The adolescents also completed a clinical assessment for mental health difficulties. Associations were relatively modest. There was a slight association between mental health difficulties and controlling-punitive ( $r = 0.19$ ) and caregiving/role-confused behaviour

<sup>335</sup> Ibid.

<sup>336</sup> Vulliez-Coady, L., Obsuth, I., Torreiro-Casal, M., Ellertsdottir, L., & Lyons-Ruth, K. (2013) Maternal role confusion: Relations to maternal attachment and mother-child interaction from infancy to adolescence. *Infant Mental Health Journal*, 34(2), 117–131, Table 2.

<sup>337</sup> Obsuth, I., Hennighausen, K., Brumariu, L. E., & Lyons-Ruth, K. (2014) Disorganized behavior in adolescent-parent interaction: Relations to attachment state of mind, partner abuse, and psychopathology. *Child Development*, 85(1), 370–387.

( $r = 0.16$ ).<sup>338</sup> Suicidal distress and self-harm were associated with disorientation ( $r = 0.21$ ) and caregiving/role-confused behaviour ( $r = 0.24$ ).<sup>339</sup>

Young adults who displayed disoriented behaviour during the interaction were no more likely to receive a mental health diagnosis in the clinical assessment. However, their scores on self-reported symptoms of dissociation were considerably higher ( $r = 0.37$ ). This suggests that participants were aware of the disoriented behaviour that was also picked up by the observational assessment and could identify such difficulties in other aspects of their lives.<sup>340</sup> Observed disorientation on the GPACS mediated associations between self-report of abuse and neglect and self-report of symptoms of dissociation.<sup>341</sup>

There were small associations between young people's self-report of abuse and neglect and a reduction in observed collaborative behaviour ( $r = -0.24$ ) and increases in punitive ( $r = 0.23$ ) and disoriented behaviour ( $r = 0.28$ ). There was no association between self-reported abuse and observed caregiving/role-confused behaviour, aligned with earlier reflections, stemming from work with MCDC, that children who display this behaviour have experienced a less disrupted caregiving environment.<sup>342</sup>

The young adults' behaviour during the discussion had important associations with their AAI classifications.<sup>343</sup> There were significant associations between cooperative behaviour and a secure/autonomous classification on the AAI, and between disoriented behaviour and an unresolved classification on the AAI. There was no association with either controlling-punitive or caregiving behaviour, contrary to what might be assumed from Main when she referred to unresolved states of mind and punitive/caregiving behaviour all under the rubric of 'disorganization'.

Hostile/Helpless scores were negatively associated with collaborative behaviour ( $r = -0.36$ ), and positively associated with controlling-punitive behaviour ( $r = 0.24$ ).<sup>344</sup> Such findings indicate that the disruptions in communication characterized by the AAI are clearly predicted by disrupted patterns of interaction between parent and child visible in 10 minutes of interaction. Hennighausen, Lyons-Ruth, and colleagues argued that this represents a causal relationship: 'disrupted patterns of communication with caregivers around emotionally arousing topics in childhood and adolescence lead to similar disruptions in communication with the interviewer around emotionally arousing topics during

<sup>338</sup> Ibid.

<sup>339</sup> Lyons-Ruth, K., Brumariu, L. E., Bureau, J. F., Hennighausen, K., & Holmes, B. (2015) Role confusion and disorientation in young adult-parent interaction among individuals with borderline symptomatology. *Journal of Personality Disorders*, 29(5), 641–662.

<sup>340</sup> Convergent findings have been documented by studies showing associations between unresolved states of mind on the AAI and self-reported dissociative symptoms e.g. Gribneau, N. I. (2006) Event-related potentials to cemetery images distinguish electroencephalogram recordings for women unresolved for loss on the Adult Attachment Interview. Unpublished doctoral dissertation, University of California, Berkeley, CA.

<sup>341</sup> Byun, S., Brumariu, L. E., & Lyons-Ruth, K. (2016) Disorganized attachment in young adulthood as a partial mediator of relations between severity of childhood abuse and dissociation. *Journal of Trauma & Dissociation*, 17(4), 460–479.

<sup>342</sup> Lyons-Ruth, K., Brumariu, L. E., Bureau, J. F., Hennighausen, K., & Holmes, B. (2015) Role confusion and disorientation in young adult-parent interaction among individuals with borderline symptomatology. *Journal of Personality Disorders*, 29(5), 641–662.

<sup>343</sup> Obsuth, I., Hennighausen, K., Brumariu, L. E., & Lyons-Ruth, K. (2014) Disorganized behavior in adolescent-parent interaction: Relations to attachment state of mind, partner abuse, and psychopathology. *Child Development*, 85(1), 370–387.

<sup>344</sup> Ibid.

the AAI.<sup>345</sup> The disruptions of communication in the AAI stem from an internalization of problems in the child–caregiver intersubjective field.

However, this intersubjective field was not static over time. Analysis of bivariate correlations reported in tables suggest that there were few associations between AMBIANCE in infancy and GPACS. The exceptions were that hostile–intrusive caregiver behaviour in infancy had a considerable association with caregiver disorientation during discussion with their adolescent ( $r = 0.39$ ); and disoriented caregiver behaviour in infancy was associated with controlling–punitive behaviour by the caregiver during the discussion with their adolescent ( $r = 0.30$ ). As ever, caution is needed in interpreting these results. Given the number of associations examined by the researchers, these effect sizes could represent chance. Indeed, Lyons-Ruth’s team offered no comment on them; the findings rather went against the separation they tended to want to make between these kinds of caregiving behaviour. Nonetheless, to the extent they are meaningful, the findings suggest a kind of heterotypic continuity: caregiver hostility and disorientation may have a relatively porous boundary when caregivers experience dysregulation in response to the challenges of different stages of their child’s development.

However homotypic continuity was found for disorganized infant attachment in the Strange Situation, which was a notable predictor of disorientation in the adolescent–caregiver interaction (Odds Ratio 1.47). Disorganized infant attachment did not predict controlling–punitive or caregiving/role-reversed behaviour. This finding ran contrary to expectations, based on Main and Cassidy, that disorganized attachment would become a controlling strategy (Chapter 1). However, these results align with the meta-analytic findings from Madigan’s group (Chapter 5) that by far the most common form of disorganization identified in the pre-school assessment is disorientation and conflict, rather than controlling–punitive or caregiving behaviour. Lyons-Ruth argued that such findings highlight the value of coding for disorientation in observational assessments of attachment, rather than assuming that, as a child develops, all disorganization will appear as controlling–punitive or caregiving behaviour, as might be assumed from some statements in Main’s work.

Brumariu, Obsuth, and Lyons-Ruth reported on associations between the AAI, GPACS, and young adults’ self-report of difficulties with friendships, romantic relationships, and at school.<sup>346</sup> An unusual aspect of the paper by Brumariu was more attention than usual to sociodemographic variables. Ethnicity was found to be unrelated to any of the observational assessments. However, family income was clearly related to the score for the Main, Goldwyn, and Hesse system ( $r = -0.41$ ), Hostile/Helpless score ( $r = -0.21$ ), disorientation in interaction with the caregiver on the GPACS ( $r = -0.31$ ) and role confusion ( $r = -0.21$ ). Yet the role of family income as a contributor to these observations was not investigated further. Instead, it was controlled for in subsequent analyses.

The measure offering best prediction of young people’s self-report of difficulties was the Main, Goldwyn, and Hesse coding system for the AAI. Brumariu and colleagues turned the classifications given by this coding system into a semi-ordinal scale, where 1 represented a secure/autonomous classification, 2 represented a dismissing or preoccupied classification,

<sup>345</sup> Hennighausen, K. H., Bureau, J.-F., David, D. H., Holmes, B. M., & Lyons-Ruth, K. (2011) Disorganized attachment behavior observed in adolescence: Validation in relation to adult attachment interview classifications at age 25. In J. Solomon & C. George (eds), *Disorganized Attachment and Caregiving* (pp. 207–244). Washington: The Guilford Press, p. 230.

<sup>346</sup> Brumariu, L. E., Obsuth, I., & Lyons-Ruth, K. (2013) Quality of attachment relationships and peer relationship dysfunction among late adolescents with and without anxiety disorders. *Journal of Anxiety Disorders*, 27(1), 116–124.

and 3 represented unresolved status. This scale offered impressive association with young adults' report of difficulties at school ( $r = 0.45$ ), as well as associations with difficulties with friendships ( $r = 0.27$ ) and romantic relationships ( $r = 0.26$ ).

The Hostile/Helpless scores also offered considerable prediction of young adult's report of difficulties at school ( $r = 0.39$ ), and better prediction of difficulties with their friendships ( $r = 0.35$ ) than the Main and colleagues coding system. There was no association with self-report of difficulties in romantic relationships. As with all associations between Hostile/Helpless scores and self-report measures, these findings are somewhat difficult to interpret. As seen above, participants with a Hostile subtype are expected to downplay difficulties on self-report measures. Participants with a Helpless subtype might be expected to offer higher reports of difficulties on self-report measures. Lyons-Ruth and colleagues offer no mention in any published work of the relative proportions of Hostile and Helpless subtypes in their young adult data. As such, associations between young adults' report and the aggregate Hostile/Helpless score are possibly uninterpretable, and suggestive at best.

The GPACS was the least relevant measure of the three. Adolescents who scored highly on caregiving/role-confused interaction reported more difficulty in their romantic relationships ( $r = 0.33$ ). As we have seen, caregiving/role-confused interaction had no association with either coding system for the AAI, so this likely represented an independent relationship, and potentially a different mechanism. The classifications of the AAI suggest a disruption of adaptation across contexts, especially manifest in young adults' perceptions of their functioning at school. This was quite different to caregiving/role-confused interaction, which had no association with young adults' perceptions of their functioning at school. The problem appeared to be localized to romantic relationships and, to a small extent, friendships ( $r = 0.20$ ). It may be that the demands of acting in a caregiving role towards a parent hinder comfortable access to the feelings, disposition or skills for romantic relationships in young adulthood.

The GPACS has begun to be used by other laboratories. In 2022, Schneider and colleagues reported an exploratory study with 39 adolescents and one of their parents from Besançon in France.<sup>347</sup> The dyads were asked to complete the discussion task for the GPACS. They also completed a new eye-tracking measure, where attention is assessed for different pictures representing threat and comfort. Parental role-confused behaviour was associated with less time spent looking at pictures representing comfort by the adolescent. This was in line with the expectation that parental role-confused behaviour might disrupt adolescents' experiences of their caregiver as a safe haven. Schneider and colleagues also found that adolescent display of disoriented behaviour during the discussion was also associated with less time spent looking at the comfort pictures, aligned with the idea that these disoriented behaviours signal disruption in the attachment relationship.

Overall, the GPACS again seems to have potential promise as a measure, and a good case is made for distinguishing controlling-punitive, disoriented, and caregiving/role-confused behaviour. The GPACS appears embedded within a set of correlations with other attachment measures, such as disorganization in the Strange Situation and unresolved states of mind on the AAI, which offer support for its validity. However, it also offers some independent prediction above and beyond other attachment measures, such as of young adult report of difficulty in their romantic relationships. The associations with clinically assessed mental ill health were modest in the Harvard Family Pathways Study, though there were

<sup>347</sup> Schneider, M., Obsuth, I., Szymanska, M., Mathieu, J., Nezelof, S., Lyons-Ruth, K., & Vulliez-Coady, L. (2022) Attachment-based parent-adolescent interaction linked to visual attention and autonomic arousal to distress and comfort stimuli. *BMC Psychology*, 10(1), 1–14.



some other more material associations such as with suicidal distress. It will be interesting to see whether other studies find associations between the GPACS and concurrent and prospective mental health, to help clarify whether the relational difficulties picked up by the measure have clinical relevance.

Before closing, one GPACS mother–child discussion might be mentioned as of particular interest, relayed in a doctoral thesis by DiPalma:

Gail's parents both drank heavily and fought often. In an early FPP interview she recalls, 'I remember times when my mother kicked my father down the stairs and collapsed one of his lungs, and of him breaking a beer bottle over her head.' Her parents divorced when her father discovered her mother was having an affair with his best friend. Gail was 10 years old at the time. Her dad moved out of their family home and went to live with his own mother. He lost himself in alcohol for the next ten years. Her mother eventually married the man who had been her husband's friend. Gail never had much of a relationship with her brother; her two older sisters spent their teen years involved with drugs and other trouble. One of her sisters made a serious suicide attempt while still in high school.<sup>348</sup>

On the AAI, Gail was classified unresolved. Gail had her daughter Rosie when she was 15. In home observations, Gail was observed to be highly uninvolved with her daughter. However, Rosie was cherished by her grandparents and aunt, and in turn loved spending time at their house rather than with her parents.

In the young adult follow-up, Rosie was classified as autonomous/secure on the AAI, able to talk in a balanced and coherent way about her mother:

Rosie characterizes her relationship with her mother as a friendship, 'We were always just like friends ... probably because she was really young when she had me, but even when we were younger we were always friends....' She describes 'fun times' they had together like going to carnivals and to the beach. Rosie admits that her mother has never really disciplined her. 'My Mom would say that I was punished and it would last like an hour before I got on her nerves and she just told me to go outside....' Rosie has always been her mother's confidant; she took on the role of family caregiver at a very early age.<sup>349</sup>

During the young adult follow-up, Gail and Rose were asked to discuss an issue of contention in their relationship:

Gail begins the discussion by stating that she thinks 'chores' is their hot topic of contention, referencing Rosie's tendency to be 'a slob.' When Rosie interjects that she rated 'drugs' as their biggest issue of concern, her mother sounds baffled. 'Why would you say drugs?' Neither Gail nor the researchers who designed this instrument anticipated that a teen might hone in her mother's risk behaviors as points of contention. Rosie backs off quickly when she sees Gail's disapproving look. 'I guess it isn't such a big problem anymore,' she concedes, acknowledging her mother's recent discharge from a drug rehab facility.<sup>350</sup>

The attachment prompts in the laboratory then lead 'Rosie to tell her mother about a film she watched in a psychology class about babies orphaned by war and living in deplorable conditions':

<sup>348</sup> DiPalma, L. M. (2004) *Shades of wisdom: Portraits of attachment in families at risk*. Unpublished doctoral thesis, Harvard University, p. 99.

<sup>349</sup> *Ibid.*, 105.

<sup>350</sup> *Ibid.*, 114.

She explains to Gail how these children received 'so little nurturance' that their growth was actually stunted and they experienced psychological damage. I am amazed as I observe this videotape of Rosie sitting in the FPP laboratory explaining to her mother that 'children need to have secure attachments.' She goes on to tell how these orphan studies have been compared to research with baby monkeys who were shown to cling to cloth covered wire mesh dolls in an effort to find some semblance of comfort. Gail laughs at the notion of comparing babies to monkeys, but Rosie persisted, 'No, really.' Gail responds to Rosie's impassioned discussion by asking, 'Did you ever see that video of you [as a baby] when they had me leave the room and then come back in and all that?' Rosie is curious, 'No, me, here?' 'Yes,' says Gail. 'You didn't even bat an eye when I left; you just watched me walk out.'<sup>351</sup> Rosie musters a half-hearted laugh and then a pensive thought, 'Maybe I was just independent at a young age.' Gail starts to change the direction of the conversation, but Rosie can't let go yet. 'Now I'm concerned, because kids end up screwed up when they don't have secure attachments.' Gail reassures her daughter, 'You probably just knew in your mind that I'd be back.'<sup>352</sup>

It is thought provoking to see ideas about attachment used by a participant in responding to the challenges of the research setting and reflects the position of attachment theory as a wider cultural discourse as well as a subject of academic study. The GPACS discussion can be seen here raising key questions for Rosie about her relationship with Gail. Not only do these lead to activation of attachment-related expectations about her mother, they also prompt reflection on attachment theory and research, which she has learnt in school. Having raised her worries about her mother's drug use, Rosie attempts to use ideas from attachment theory and research to speak to her mother about the pain children can experience if they are unsure of their caregiver's availability.

When beginning work to track down the family two years later for a subsequent follow-up, Lyons-Ruth and colleagues had difficulty finding Gail and Rosie. Finally, 'after trying several auxiliary contact numbers, the FPP received a phone call from one of Rosie's uncles. He reported that Gail had died; she and her new husband both overdosed on heroin and died shortly after their first wedding anniversary.'<sup>353</sup>

## Early Care and Development into Young Adulthood

### Theorizing Long-Term Development

In part stemming from her clinical work at Cambridge hospital, Lyons-Ruth had a long-standing interest in personality disorder. As we have seen, already in the 1990s she was thinking about characterological defences, an idea in psychoanalytic theory that was largely succeeded by concern with personality disorder from the end of the 1990s. She had argued that chronic exposure to trauma predisposes defensive mental processes to prevent individuals from continual exposure to overwhelming distress. This was the basis for her proposal of hostile and helpless states of mind, though only the hostile subtype seemed to fit the image of a defence against distress. From the late 1990s, Lyons-Ruth applied these ideas to personality disorder and dissociative symptomatology, two frequently occurring mental

<sup>351</sup> Gail's account does not agree with the recording of the Strange Situation: 'When Gail sets out to leave, Rosie attempts to follow, but catches her own foot underneath herself as she tries to get up from the floor. She blops from her knees to her belly and lets out a little whimper as her mother moves out the door' (ibid., 102).

<sup>352</sup> Ibid., 116.

<sup>353</sup> Ibid., 117.

health difficulties. As Fonagy and colleagues observed at the time, personality disorders and dissociation have 'evoked intense theorizing among psychoanalysts, behaviourists, psychiatrists, and others', in each case 'perhaps because of its clinical difficulty and variability, that it represents a battlefield on which many of the controversies and schisms are played out'.<sup>354</sup>

Lyons-Ruth sided with Fonagy and colleagues in arguing that personality disorders and dissociation were predisposed by early relationships.<sup>355</sup> She also agreed that they are interpersonal disorders.<sup>356</sup> However her stance was also more qualified than Fonagy and colleagues, both in the greater role she assigned to constitutional factors and in the less direct role assigned to disorganized attachment. Setting out this position, in a 2008 paper Gunderson and Lyons-Ruth argued that some children may have a constitutional sensitivity, such as reactivity to interpersonal stressors or heightened need for closeness (e.g., due to differences in expression of serotonin).<sup>357</sup> In families where there is considerable threat and conflict this reactivity may contribute to an escalation of problematic interactions. For example, a disorganized–ambivalent or disorganized–avoidant attachment relationship may form, reflecting the child's difficulties in being able to use the caregiver as a source of regulation. In turn, this may contribute to the development of behaviours by the child that result in further difficulties, such as conduct problems at home or a controlling-punitive attachment pattern. In turn, these may prompt or solidify a parent's helplessness withdrawal, or experiences of fearfulness, or frustration and hostility towards the child.

Gunderson and Lyons-Ruth argued for the importance of:

1. sensitivity to interpersonal stressors or heightened need for closeness,
2. adverse early caregiving experiences, and
3. unchecked problematic spirals in the child's relationships.

They felt that the interaction between these factors would lay the ground for feelings of overwhelming distress. As such, they proposed that problems within early attachment relationships are of considerable importance as a fundamental context within which states of arousal are modulated or not, and in which the child's responses to dysregulation escalate or not. Borderline personality disorder as a set of symptoms reflects sensitivity to interpersonal stressors or heightened need for closeness; it reflects the expectations about self and other that stem from adverse early care; and it reflects the challenges of behaviours that reflect and contribute to spirals of dysregulation. However, Gunderson and Lyons-Ruth emphasized that borderline symptomatology is also a kind of defence: it helps keep overwhelming and uncontained feelings at bay, especially through attribution of suffering from past experiences to present-day relationships.

The Gunderson and Lyons-Ruth paper was warmly cited by Fonagy and colleagues, who write that it influenced their work. However, in fact their position can be contrasted to that of Fonagy and colleagues, who assigned a directly causal role for disorganized attachment.

<sup>354</sup> Bateman, A. W. & Fonagy, P. (2003) The development of an attachment-based treatment program for borderline personality disorder. *Bulletin of the Menninger Clinic*, 67, 187–211, p. 188.

<sup>355</sup> For a later review, see Vonderlin, R., Kleindienst, N., Alpers, G. W., Bohus, M., Lyssenko, L., & Schmahl, C. (2018) Dissociation in victims of childhood abuse or neglect: A meta-analytic review. *Psychological Medicine*, 48(15), 2467–2476.

<sup>356</sup> Cf. Wright, A. G., Ringwald, W. R., Hopwood, C. J., & Pincus, A. L. (2022) It's time to replace the personality disorders with the interpersonal disorders. *American Psychologist*, 77(9), 1085–1099.

<sup>357</sup> Gunderson, J. G., & Lyons-Ruth, K. (2008) BPD's interpersonal hypersensitivity phenotype: A gene-environment-developmental model. *Journal of Personality Disorders*, 22(1), 22.

In recent years Fonagy and colleagues have abandoned this position.<sup>358</sup> In abandoning this position, they have disparaged attachment as overrated in importance. By contrast, from the start Lyons-Ruth placed less faith than Fonagy in the explanatory significance of Strange Situation categories such as disorganized attachment, treated as intrinsic and causal properties of individual children. Her emphasis was, and has remained, on the importance of child-caregiver interaction within attachment relationships.

For instance, borderline personality disorder is conceptualized as stemming from a combination of:

1. Heritable hypersensitivity to interpersonal stress and/or heightened need for closeness;
2. Adverse early caregiving relationships characterized by distress, needs felt to be unmet, and concern about abandonment;
3. Unchecked problematic spirals in family relationships (and later friendships, romantic relationships, and relationships with service providers).<sup>359</sup>

Fed by the interaction between these processes, borderline symptomatology is conceptualized as a pervasive defence against feelings of overwhelming distress, where these feelings become located, and to an extent contained, in the conflict about need for closeness and fears of abandonment in relationships with others.

Gunderson and Lyons-Ruth pointed to empirical studies (including previous work by Gunderson) showing that when patients with borderline personality disorder experience positive interpersonal events, this is associated with remittance of their symptoms; and when symptoms get worse, a particularly potent factor are real or imagined slights in romantic difficulties.<sup>360</sup>

In her thinking about both personality disorder and dissociative symptoms, Lyons-Ruth was reflecting on the cases she had worked with as a clinician. A case study of one of her patients with dissociation was reported in an unpublished presentation at the Society for Research in Child Development in Tampa, Florida in 2003.<sup>361</sup> As with other patients with dissociative symptoms with whom she had worked, the patient's story was relayed to her in a 'sketchy and affectively detached presentation', which nonetheless was shaped by 'pain-filled representations of attachment':

The patient is a well-to-do and high-achieving man who runs his own business who I first saw at age 28. He had been hospitalized quite suddenly at age 4½ for 6 weeks with a disorder called Legg Perthes Syndrome. LPS is a disorder in early childhood in which the hip joint inexplicably begins to deteriorate. The treatment is to immobilize the hip joint for a period of a year or two until the condition resolves. So at age 4½ this little boy was told by his mother that the family was going for a drive, and, with no explanation, he

<sup>358</sup> Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press.

<sup>359</sup> See also Lyons-Ruth, K., & Brumariu, L. E. (2021) Emerging child competencies and personality pathology: Toward a Developmental Cascade model of BPD. *Current Opinion in Psychology*, 37, 32–38.

<sup>360</sup> Citing Links, P. S., & Heslegrave, R. J. (2000) Prospective studies of outcome: Understanding mechanisms of change in patients with borderline personality disorder. *Psychiatric Clinics of North America*, 23(1), 137–150; Pagano, M. E., Skodol, A. E., Stout, R. L., Shea, M. T., Yen, S., Grilo, C. M., ... & Gunderson, J. G. (2004) Stressful life events as predictors of functioning: Findings from the Collaborative Longitudinal Personality Disorders Study. *Acta Psychiatrica Scandinavica*, 110(6), 421–429.

<sup>361</sup> Lyons-Ruth, K. (2003) Discussion for symposium: *Coding the Adult Attachment Interview with Adults Who Experienced Catastrophic Parental Loss During Childhood*. Biennial conference of the Society for Research in Child Development, Tampa, Florida, 2003. Karlen Lyons-Ruth personal archive.

was left in the hospital immobilized in bed in a half-body cast for 6 weeks. His mother didn't drive so he was visited a week later on Sunday by his parents, and for each Sunday thereafter. After coming home from the hospital, he had to remain in a prone position in a half-body cast for six more months and then in a leg brace for an additional year.

Twenty-three years later, the patient, whom I'll call Alan, came to psychotherapy to talk about his difficulties feeling emotionally connected to others. The fact of his hospitalization was mentioned in passing as part of my history-gathering early in the treatment. Alan did not remember much about it, had little affect in discussing it, and didn't consider it relevant to his concerns. He came into the session and said, 'I think I forgot my mother when I was in the hospital,' referring to the hospitalization when he was 4. He said, 'I slipped out through a crack when she was visiting me.' Then he continued to tell me that as he came into my office that day and was taking off his coat, there were two of him inside the coat, one person named Buddy and one person named Max. Buddy was the injured child who contained all of his feeling life, and Max was the emotionally numb protector personality, who took care of Buddy and drove away anyone who got too close emotionally. He ended that session, which came after four very involved years of treatment, by saying, 'I just want you to know that if I left treatment today, I wouldn't remember who you were.'

After that day, the whole tenor of the treatment sessions changed. For the next 4 years, we were immersed in his flashbacks of being in the hospital, his memories of his subsequent angry struggles with his mother, and his clear sense that his emotional connections with both himself and his family had been severed in a way that he had never recovered from.

Main and Hesse tended to characterize dissociation as the glitching of working memory under the pressure of unprocessed loss and trauma (Chapter 1). By contrast, Lyons-Ruth—like Bowlby—regarded dissociative symptomatology as a kind of defence, an attempt to wall off overwhelming and uncontained feelings.<sup>362</sup> It is an attempt at a solution to a problem in the context of relational experiences, and reflective of the disruption of affective communication in this relational situation. In fact, when operating as a pervasive defence, Lyons-Ruth argues that 'the thoroughness of this defensive process works against the possibility of visible lapses in monitoring, either on the AAI or for prolonged initial periods of clinical treatment.'<sup>363</sup> Some individuals who have needed to make a life with experiences of chronic trauma may display markers of unresolved states of mind on the AAI. However, others may show helplessness, pervasive hostility, or other potential patterns of defence, such as pervasive numbing and flat affect.<sup>364</sup>

An example of dissociative symptoms was reported as a case study by Lyons-Ruth and colleagues in 1991.<sup>365</sup> The family comprised Sharon, aged 22, her boyfriend Mike, and their two daughters, Rita, aged 20 months, and Erin, aged six months.

<sup>362</sup> Lyons-Ruth, K., and Jacobvitz, D. (1999) Attachment disorganization: Unresolved loss, relational violence, and lapses in behavioral and attentional strategies. In J. Cassidy and P. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Implications* (pp. 520–554), New York: Guilford. Clear similarities can be seen to Bowlby, J. ([1962] 2019) Defences that follow loss: Causation and function. In Duschinsky, R. & White, K. (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 17–65). London: Routledge.

<sup>363</sup> Lyons-Ruth, K. (2003) Discussion for symposium: *Coding the Adult Attachment Interview with Adults Who Experienced Catastrophic Parental Loss during Childhood*. Biennial conference of the Society for Research in Child Development, Tampa, Florida, 2003.

<sup>364</sup> Koren-Karie, N., Sagi-Schwartz, A., & Joels, T. (2003) Absence of attachment representations (AAR) in the adult years: The emergence of a new AAI classification in catastrophically traumatized Holocaust child survivors. *Attachment & Human Development*, 5(4), 381–397.

<sup>365</sup> Lyons-Ruth, K., Kaufman, M., Masters, N., & Wu, J. (1991) Issues in the identification and long-term management of Munchausen by Proxy Syndrome within a clinical infant service. *Infant Mental Health Journal*, 12(4), 309–320.

In the AAI, Sharon reported no memories of her childhood before age 11, when her father died of meningitis. This loss prompted her brother to become psychotic. He would display threatening behaviour and was eventually institutionalized in a psychiatric hospital. At age 16, Sharon dropped out of school. At age 19, she met Mike and became pregnant with Rita:

In the initial home visits, Sharon appeared unable to focus on any needs except her own. The affect of both mother and children was flat and monotonous, relieved only by angry interchanges. Although Sharon spoke incessantly, the content was repetitive, consisting of her dissatisfaction with her sporadically abusive boyfriend and her medical concerns for the children. The children did not appear to be physically abused or neglected, but they were frequently left alone in their playpens. Their Bayley test scores were in the normal range. The older child, Rita, made little eye contact and did not approach Sharon or others for interaction. In the standard Ainsworth attachment assessment, Rita's attachment behaviors were classified as both avoidant and disorganized.<sup>366</sup>

Sharon claimed that Rita frequently had seizures, which included stopping breathing, turning blue, and vomiting blood. However, Mike reported he had never seen this, and medical examination of Rita identified no problems.

The home visitor focused initially on building trust with Sharon. After five months of home visits, Sharon overcame her fears about attending the parents' group and became a regular participant. Sharon seemed to gain a lot from the parents' group. As she became more confident in identifying and describing her feelings in the group, there were fewer visits to the emergency room with her children for problems the doctors could not identify. Though these visits did not cease, Lyons-Ruth and colleagues reflected that the death of Sharon's father and the frightening experiences with her brother represented significant unresolved traumas, which had been excluded from awareness, and contributed to both dissociative defences and personality disorder: 'In our view, long-term resolution of the sources of her symptoms would require resolving her excessive self-involvement, damaged self-esteem, and profound dissociation from her own inner affective states.'<sup>367</sup>

## Personality Disorder

As we have seen, at age five and seven, the best predictor of child mental health in the Harvard Family Pathways Study was the AMBIANCE hostile-intrusive scale at 18 months. However, intriguing and quite different findings were reported when Lyons-Ruth and colleagues conducted assessments of the mental health of their child participants when they reached 20 years old. Despite performing well in prediction of child mental health in middle childhood, there was little or no prediction of young adult mental health from caregiver hostile-intrusive or disoriented behaviour at 18 months. This was contrary to Main and Hesse's hypothesis that FR caregiver behaviours would be most associated with a child's development and mental ill health. By contrast, maternal withdrawal at 18 months was a powerful predictor across a host of mental health difficulties.

<sup>366</sup> Ibid., 314.

<sup>367</sup> Lyons-Ruth, K., Kaufman, M., Masters, N., & Wu, J. (1991) Issues in the identification and long-term management of Munchausen by Proxy Syndrome within a clinical infant service. *Infant Mental Health Journal*, 12(4), 309-320, p. 318.

One such finding was a considerable association ( $r = 0.42$ ) between maternal withdrawal at 18 months and symptoms of borderline personality disorder at 20 years.<sup>368</sup> This association remained robust when controlling for experiences of abuse and maltreatment. There was no such association for disorganized attachment, suggesting that this disorganization might be a correlate of developmental risk, but was not causal in itself, at least for this set of symptoms.<sup>369</sup> The effect was also stronger than the association with referral to clinical services in infancy ( $r = 0.35$ ).<sup>370</sup>

Lyons-Ruth and colleagues were struck that caregiver withdrawal at 18 months appeared to have a direct effect on young adult borderline symptomatology. The association was not mediated by childhood disorganized attachment, childhood abuse, or childhood behaviour problems. Controlling attachment behaviour by children towards their parents in middle childhood and self-reported abuse in childhood were both also associated with borderline symptomatology; however the variance accounted for by these two factors appeared to be overlapping, which suggests that, in line with Lyons-Ruth's expectations, the controlling attachment behaviour may have been an attempt to respond to a child's experience of inadequate care.

During the young adulthood follow-up, participants completed the AAI.<sup>371</sup> Finger, Byun, Melnick, and Lyons-Ruth reported that, as in previous studies, unresolved states of mind were associated with borderline symptomatology and self-report of child abuse. However, they were able to clarify that this was due to unresolved trauma: there were no associations for unresolved loss. Hostile/Helpless scores on the AAI were associated with borderline symptomatology, symptoms of antisocial personality disorder, and self-reported child abuse. The Hostile/Helpless score mediated the association between self-reported child abuse and personality disorder symptoms. This was not the case for unresolved states of mind. The authors conclude that borderline and antisocial personality disorder may be more likely to emerge among people who experienced abuse in childhood who retain pervasive distortions in their processing of attachment-related experiences, such as identification with a hostile/tyrannical caregiver. Finger and colleagues claim that these findings suggest that previously reported associations between unresolved states of mind and borderline symptomatology are due to unresolved trauma rather than lack of resolution generally, and that, in fact, the impact of trauma on Hostile/Helpless states may underlie these findings and represent a more foundational and important contributor to the development of symptoms.

Lyons-Ruth and colleagues also found an association between caregiver withdrawal at 18 months and suicidal distress at 20 years ( $r = 0.30$ ).<sup>372</sup> To a lesser extent, there was also prediction from disorganized–approach behaviour in the Strange Situation; the other Strange Situation classifications were not predictive. Contrary to the conventional expectation that caregiving would influence attachment, which in turn would influence outcomes,

<sup>368</sup> Lyons-Ruth, K., Bureau, J. F., Holmes, B., Easterbrooks, A., & Brooks, N. H. (2013) Borderline symptoms and suicidality/self-injury in late adolescence: Prospectively observed relationship correlates in infancy and childhood. *Psychiatry Research*, 206(2–3), 273–281, Table 2.

<sup>369</sup> Ibid., Table 3.

<sup>370</sup> Lyons-Ruth, K., Holmes, B. M., Sasvari-Szekely, M., Ronai, Z., Nemoda, Z., & Pauls, D. (2007) Serotonin transporter polymorphism and borderline/antisocial traits among low-income young adults. *Psychiatric Genetics*, 17(6), 339.

<sup>371</sup> Finger, B., Byun, S., Melnick, S., & Lyons-Ruth, K. (2015) Hostile–helpless states of mind mediate relations between childhood abuse severity and personality disorder features. *Translational Developmental Psychiatry*, 3(1), 28785.

<sup>372</sup> Lyons-Ruth, K., Bureau, J. F., Holmes, B., Easterbrooks, A., & Brooks, N. H. (2013) Borderline symptoms and suicidality/self-injury in late adolescence: Prospectively observed relationship correlates in infancy and childhood. *Psychiatry Research*, 206(2–3), 273–281.

this was not what Lyons-Ruth and colleagues found. Both caregiver withdrawal and children's disorganized-approach behaviour in infancy made independent contributions to suicidal distress and self-injury in young adulthood. This suggests that both early caregiver unavailability and children's early expectations about caregiver unavailability make independent contributions to suicidal distress and self-injury in young adulthood.

## Conduct Problems

Another distinction was that caregiver withdrawal, but not the Strange Situation, predicted conduct problems in young adulthood ( $r = 0.40$ ).<sup>373</sup> At age five a social learning theory account could have been accepted, in which hostile caregiver behaviour predicts hostile child behaviour. Yet in the young adult data this explanation offered a poor fit, since it was caregiver withdrawal that was predicting young adult behavioural problems. Instead, Lyons-Ruth suggests that such varied prediction from early withdrawal behaviours suggests that this form of caregiver behaviour represents a particularly acute challenge within the child-caregiver attachment relationship. Withdrawal within the early attachment relationship appears to contribute to a broad vulnerability across diagnostic boundaries, much like abuse (Chapter 4), which aligns with Lyons-Ruth's earlier proposals about emotional unavailability as a hidden form of trauma. It is striking that caregiver withdrawal behaviours at 18 months was associated with internalizing difficulties such suicidality, which are not generally visible until much later in childhood or adolescence.<sup>374</sup>

The importance of caregiver withdrawal behaviours has also been demonstrated with other measures besides AMBIANCE. Brumariu, Owen, Dyer, and Lyons-Ruth reanalysed data from the large NICHD dataset (Chapter 3).<sup>375</sup> They conducted a latent class analysis of the items used to code sensitivity at 54 months. A four-class model provided best fit to the data. A first class, accounting for a third of caregivers, indexed sensitive, responsive, and involved parenting. A second class, accounting for nearly half of caregivers, were similar, but offered less support for their child's exploration. About a sixth of caregivers were identified as 'withdrawn': they offered little 'supportive presence' or assistance to their child. Finally, around 5% of caregivers were characterized especially by hostility and intrusive behaviour towards their child. Scores for supportive presence and quality of assistance were as low as for the withdrawn group. Brumariu found that the first class, with especially high sensitivity, were less likely to show behavioural difficulties across primary school. The withdrawn class was distinctive in an association with report of impulsivity, uncontrolled anger, substance abuse, risky sexual behaviour, disturbed eating, suicidal thoughts, and disturbed peer relationships at age 15.

These findings on a large, community sample offer support for the significance of caregiver withdrawal identified in the Harvard Family Pathways Study. More broadly, they align with Bowlby's original concern with emotional neglect as a predictor of conduct problems (Chapter 1). They also align with convergent research evidence that deprivation of support has different and additional implications for child development than hostile

<sup>373</sup> Lyons-Ruth, K., Bureau, J. F., Easterbrooks, M. A., Obsuth, I., Hennighausen, K., & Vulliez-Coady, L. (2013) Parsing the construct of maternal insensitivity: Distinct longitudinal pathways associated with early maternal withdrawal. *Attachment & Human Development*, 15(5–6), 562–582, Figure 1.

<sup>374</sup> For similar findings for substance use, see Pechtel, P., Woodman, A., & Lyons-Ruth, K. (2012) Early maternal withdrawal and nonverbal childhood IQ as precursors for substance use disorder in young adulthood: Results of a 20-year prospective study. *International Journal of Cognitive Therapy*, 5(3), 316–329.

<sup>375</sup> Brumariu, L. E., Owen, M. T., Dyer, N., & Lyons-Ruth, K. (2020) Developmental pathways to BPD-related features in adolescence: Infancy to age 15. *Journal of Personality Disorders*, 34(B), 104–129.



caregiving behaviours.<sup>376</sup> Lyons-Ruth and Yarger have highlighted that the effects of low caregiver nurturance have been documented in both observational studies in humans, and randomized studies in rodents, where exposure to inadequate nesting materials contributes to less licking and grooming of pups, which in turn is associated with increased neuroendocrinal measures of stress, neurological changes, more aggressive and anxiety-like behaviours, and less nurturing behaviour towards their own offspring.<sup>377</sup> Over and above FR, the withdrawal scale on AMBIANCE captures caregiving behaviours that may be of particular importance for child development.

## Dissociation

In the mid-1990s, a doctoral study by Lissa Dutra examined the antecedents of self-reported dissociative symptoms in young adulthood in the Harvard Family Pathways Study, with Lyons-Ruth on the advisory committee. They took note of findings from Minnesota that caregiver emotional unavailability in infancy was a potent predictor of later self-report of dissociative symptoms in young adulthood, as was, to a lesser extent, infant disorganized attachment. Minnesota examined a variety of later variables, including later child abuse, but it was these infancy measures that proved predictive.<sup>378</sup> Sroufe and Minnesota colleagues supposed that caregiver emotional unavailability may contribute to disorganized attachment which in turn may undermine the basic integration of behaviour, affect, and cognition, contributing to later dissociative symptoms.

In the Harvard Family Pathways Study, it was measures from infancy again which were important for predicting self-report of dissociative symptoms. This prediction was unmediated by any subsequent measure. Subsequent measures with associations with dissociation, such as GPACS which was conducted concurrently, were nonetheless not as strong predictors as assessments conducted nearly two decades earlier. This was a stunning finding, since developmental science usually expects that early experiences affect later outcomes through indirect influence or ‘domino effects’, with multiple small influences operating at multiple points in development. However, in the Minnesota and Harvard studies, Dutra, Lyons-Ruth, and their collaborators were amazed that experiences of early care were directly associated with young adult mental health—in fact, much as Bowlby had predicted.<sup>379</sup>

Of 56 participants, eight reported extensive symptoms of dissociation, anticipated to be in the clinical range. However, some dissociative symptomatology was common at subclinical levels. These symptoms in early adulthood were predicted by AMBIANCE score for the Strange Situation ( $r = 0.38$ ). All AMBIANCE subscales contributed to the overall prediction of dissociation. There was no prediction from demographic factors, child protection

<sup>376</sup> McLaughlin, K. A., Sheridan, M. A., & Lambert, H. K. (2014) Childhood adversity and neural development: Deprivation and threat as distinct dimensions of early experience. *Neuroscience & Biobehavioral Reviews*, 47, 578–591.

<sup>377</sup> Lyons-Ruth, K., & Yarger, H. A. (2022) Developmental costs associated with early maternal withdrawal. *Child Development Perspectives*, 16(1), 10–17.

<sup>378</sup> Ogawa, J. R., Sroufe, L. A., Weinfield, N. S., Carlson, E. A., & Egeland, B. (1997) Development and the fragmented self: Longitudinal study of dissociative symptomatology in a nonclinical sample. *Development and Psychopathology*, 9(4), 855–879.

<sup>379</sup> Lyons-Ruth, K. (2003) Dissociation and the parent–infant dialogue: A longitudinal perspective from attachment research. *Journal of the American Psychoanalytic Association*, 51, 883–911, p. 897.

services involvement in early childhood, or self-reported abuse. In contrast to Minnesota, infant disorganized attachment also did not predict dissociation in the Harvard sample.<sup>380</sup>

In general after the introduction of AMBIANCE, Lyons-Ruth did not conduct further analysis of her home observation data, as AMBIANCE tended to perform better in concurrent and prospective prediction, and she wanted to minimize additional statistical tests given that the risk of effects of chance from multiple testing was already high. However, other members of Dutra's advisory committee wanted her to take an exploratory approach, so she also analysed the home observation data.<sup>381</sup> It was found that maternal flatness of affect in the home ( $r = 0.40$ ) also predicted dissociative symptoms in young adulthood. Furthermore, maternal positive affective involvement in the home observations was an independent protective factor ( $r = -0.34$ ).<sup>382</sup>

There were high rates of neglect, sexual, and physical abuse in the sample, and an association with dissociative symptoms ( $r = 0.26$ ).<sup>383</sup> Together trauma, gender, and demographic risk explained 17% of variance in dissociative symptoms 18 years later (corresponding to  $r = 0.41$ ). With the infancy measures included, 67% of variance could be explained (corresponding to  $r = 0.82$ ). This is wild. It essentially implies that maternal flat or lack of positive affect in infancy and dissociation in young adulthood are the same construct, just measured in different ways, or with an extremely tight causal relationship. That said, the finding comes from a linear regression, where it is usual to expect 10 individuals for every parameter estimated, to avoid significant risk of erroneous findings. Yet this would have required twice the sample actually at the researchers' disposal. As with Ainsworth's findings (Chapter 1), given the small sample the associations by Lyons-Ruth and colleagues should be interpreted as an intriguing line for future research to offer support or qualification.

Assuming the findings are dependable, it is interesting that lack of maternal responsive involvement at home was a better predictor of self-report of dissociative symptoms than withdrawal in the Strange Situation, given that the latter measure usually outperformed the former in predictive power. The association between the two was modest ( $r = 0.29$ ), suggesting that they are related, but not capturing quite the same things.<sup>384</sup> It is possible that the much longer home observational period allowed more opportunity to track the pervasiveness of the behaviour, which may be important for dissociation given the proposals of Sroufe regarding the role of emotional unavailability in obstructing the integration of behaviour, affect, and cognition. Indeed, this may be why the total AMBIANCE score was most predictive, rather than any particular subscale, as this again would index the pervasiveness of disruption, rather than isolate the role of a specific form of behaviour.

Lyons-Ruth and colleagues reflected that in the Minnesota study, disorganized attachment may have been serving as an indirect metric for experiences of care better captured by

<sup>380</sup> Cf. Haltigan, J. D. & Roisman, G. I. (2015) Infant attachment insecurity and dissociative symptomatology: Findings from the NICHD Study of Early Child Care and Youth Development. *Infant Mental Health Journal*, 36(1), 30–41.

<sup>381</sup> Dutra L. (2008) Quality of early care and childhood trauma: Developmental pathways to dissociation. Unpublished doctoral thesis. Boston University.

<sup>382</sup> Dutra, L., Bureau, J. F., Holmes, B., Lyubchik, A., & Lyons-Ruth, K. (2009) Quality of early care and childhood trauma: A prospective study of developmental pathways to dissociation. *The Journal of Nervous and Mental Disease*, 197(6), 383–390, Table 2. Positive affective involvement was a construct that emerged from a principal components analysis. The construct had negative loadings at >.50 for maternal disengagement, anger, and time spent out of the room; and positive loadings for maternal sensitivity, warmth, verbal communication, quality and quantity of comforting touching, and quantity of caretaking touching.

<sup>383</sup> *Ibid.*, Table 2.

<sup>384</sup> Lyons-Ruth, K., Bronfman, E., & Parsons, E. (1999) Maternal frightened, frightening, or atypical behavior and disorganized infant attachment patterns. *Monographs of the Society for Research in Child Development*, 64(3), 67–96, p. 87.

the more extensive measures of early caregiving available for their Harvard sample. They agreed with Sroufe and colleagues that adverse early experiences may lay the ground for dissociative symptoms later in life. However, to account for this they argued that there was no need to appeal to disorganized attachment as an individual, intrapsychic process:

The etiology of dissociation does not lie in an individual, intrapsychic process but represents a dynamic, interactive dialogic process that originates in the interchange between the self and the other. That which occurs in this dialogic process may then become intrapsychic by way of internalization. In the case of primary failure of the parent-infant dialog, the child is faced with a lack of integrated affective, symbolic, and interactive dialog with the parent so that this lack of integration, in the form of dissociation, is eventually internalized by the child.<sup>385</sup>

In contrast to more discrete traumatic events, disrupted parental behaviours, flat affect, and unresponsiveness are more day-in-day-out features of a child's experience. This may explain why they have different sequelae. Lyons-Ruth and colleagues reflected that they may also have different implications in clinical work with adults: 'the resolution of discrete traumatic events in treatment may come about more quickly than the resolution of long-standing patterns of role-reversal, disorientation, and disrupted forms of affective communication.'<sup>386</sup> For clinical work with families, Lyons-Ruth and colleagues emphasize the imperative for therapeutic approaches that help parents explore new ways of interacting with their child, 'bringing both the mother's and the infant's most painful and helpless feelings into a collaborative and containing verbal and interactive dialogue.'<sup>387</sup>

## Neuroscientific Research

### Theory

As we saw above, Lyons-Ruth was intensely interested in 'the quality of psychobiological regulation available within primary attachment relationships.'<sup>388</sup> She criticized Bowlby for an over-narrow image of the attachment motivational system, which focused primarily on the desire to achieve proximity with the caregiver when alarmed, and downplayed or missed out the role of interaction between child and attachment figure for psychobiological regulation when the child is not necessarily alarmed. She was therefore tremendously excited by advances in neuroscientific research, including neurobiology, structural, and functional magnetic resonance imaging (MRI) studies, molecular genetics, and epigenetics. In the mid-2000s, researchers had begun to show, in humans and animals, that experiences in early life are associated with physiological and neurobiological changes.<sup>389</sup>

<sup>385</sup> Lyons-Ruth, K., Dutra, L., Schuder, M. R., & Bianchi, I. (2006) From infant attachment disorganization to adult dissociation: Relational adaptations or traumatic experiences? *Psychiatric Clinics*, 29(1), 63–86, p. 75.

<sup>386</sup> Ibid.

<sup>387</sup> Lyons-Ruth, K. (2003) Dissociation and the parent–infant dialogue: A Longitudinal Perspective from Attachment Research. *Journal of the American Psychoanalytic Association*, 51, 883–911, p. 906.

<sup>388</sup> Schuder, M. & Lyons-Ruth, K. (2004) 'Hidden trauma' in infancy: Attachment, fearful arousal, and early dysfunction of the stress response system. In Osofsky, J. (ed.), *Young Children and Trauma* (pp. 69–104). New York: Guilford Press, p. 69.

<sup>389</sup> Cohen, R. A., Grieve, S., Hoth, K. F., Paul, R. H., Sweet, L., Tate, D., ... & Williams, L. M. (2006) Early life stress and morphometry of the adult anterior cingulate cortex and caudate nuclei. *Biological Psychiatry*, 59(10), 975–982.

Lyons-Ruth felt that such research offered a powerful demonstration that relational constructs are not ephemera but relate in important ways to processes measurable with the tools of biomedical science. In one sense, this was a tactical attempt to hook caregiving and attachment constructs, ever subject in developmental science to criticism as too dyadic and fluffy, to the credibility of 'hard' science. Yet besides the rhetorical power of biomedical evidence of psychological processes, Lyons-Ruth was also motivated by a sincere interest in the processes that mediate psychobiological regulation. A parallel can be drawn with Bowlby's interest in ethology. Bowlby felt that ethology could serve as a credible observational science within which to hook and preserve some core psychoanalytic insights. However, he was also sincerely excited by the potential for ethology to help articulate the organization of infant behaviour, and push beyond what specification was possible on the basis of psychoanalytic theory or clinical observation.

Physiological and neurobiological processes are often characterized as 'underlying' behaviour. Lyons-Ruth regarded this as a fallacy. Associations between physiological and neurobiological processes and human behaviour do not, in themselves, indicate causal priority to one or the other. Sometimes changes in the infant's experience of their caregiving environment causally drive many neurobiological adaptations; sometimes neurobiological processes may shape experience and behaviour. Leading up to the much larger MIND study (discussed below), Lyons-Ruth began to include in her inquiry the role of a hormone (cortisol) and the volume of two brain regions (the amygdala and hippocampus) anticipated to be of particular importance for the regulation of emotional arousal and fearful affect in the context of close relationships.

### Initial Neuroendocrinological Inquiries

Research in the 1990s and early 2000s in neuroendocrinology had characterized stressful circumstances as generally leading to elevated secretion of cortisol, but for individuals experiencing depression and/or chronic stress, a blunted and reduced cortisol response to stressful circumstances might be seen.<sup>390</sup> Bjarne Holmes, formerly the laboratory manager for Lyons-Ruth's group, joined Heriot-Watt University in Edinburgh in 2005. He conducted a study with 63 mother–infant dyads living in poverty in Scotland.<sup>391</sup> When the infants were four months old, Holmes, Lyons-Ruth, and colleagues recorded infant–caregiver interaction during and following the Still-Face Procedure, in which the caregiver gazes at their infant without responding to their cues.<sup>392</sup> Infant and mother salivary cortisol was taken before, during, and after this stressful situation for the infant. AMBIANCE was coded in the course of the five minutes of interaction during the recovery period following the Still-Face Procedure. Holmes and colleagues found that high scores on AMBIANCE were associated with lower levels of maternal cortisol, suggesting that these mothers had not been physiologically stressed by their infants' distress. AMBIANCE was also associated with greater divergence between mothers' and infants' cortisol levels.

<sup>390</sup> Burke, H. M., Davis, M. C., Otte, C., & Mohr, D. C. (2005) Depression and cortisol responses to psychological stress: A meta-analysis. *Psychoneuroendocrinology*, 30(9), 846–856.

<sup>391</sup> Crockett, E. E., Holmes, B. M., Granger, D. A., & Lyons-Ruth, K. (2013) Maternal disrupted communication during face-to-face interaction at 4 months: Relation to maternal and infant cortisol among at-risk families. *Infancy*, 18(6), 1111–1134.

<sup>392</sup> Tronick, E., Als, H., Adamson, L., Wise, S., & Brazelton, T. B. (1978) Infants response to entrapment between contradictory messages in face-to-face interaction. *Journal of the American Academy of Child and Adolescent Psychiatry*, 17, 1–13.

The finding that AMBIANCE scores were associated with lower maternal cortisol also ran against Main and Hesse's theory that alarming caregiver behaviours would occur when caregivers were reexperiencing traumatic memories. Instead, they resonated with Lyons-Ruth's ideas about AMBIANCE behaviours representing forms of defence by caregivers who might otherwise face feelings they experience as overwhelming, if they were to acknowledge their own or their infant's distress. Rather than solely a defence at the level of attention or cognition, the defensive blunting of responsiveness to distress appeared woven also into neuroendocrinology, with a blunted cortisol response contributing to a blunting of the caregiver's access to her own affective experience, including affective experience of and empathy for her infant's distress.<sup>393</sup>

Another collaboration, this time with Susanne Harder's Danish group, continued Lyons-Ruth's interest in cortisol.<sup>394</sup> A sample of 30 women with severe mental disorders and 14 nonclinical controls were assessed for hair cortisol concentration during the third trimester of their pregnancy and four months postpartum. Participants were asked to report on experiences of abuse in their childhood and their experience of mental health difficulties. When their infants were four months, they were seen in the Still-Face Procedure, and the mothers' responses coded with AMBIANCE.

By now, there was growing recognition of the limitations of the Baron and Kenny procedure, so Lyons-Ruth and colleagues utilized a more contemporary, and likely more dependable, assessment of mediation developed by Preacher and Hayes.<sup>395</sup> For both childhood abuse and current mental health difficulties, cortisol levels mediated associations with AMBIANCE. These were striking findings, as they suggested that part of how experiences of abuse and mental health difficulties affect parenting is through chronic caregiver psychobiological stress. This aligned with Lyons-Ruth's longstanding concern with unregulated distress, situated as a common mechanism through which diverse psychological and social challenges experienced by a caregiver influence their behaviour towards their child.

Khoury, Enlow, Plamondon, and Lyons-Ruth undertook a meta-analysis of 26 studies that had examined associations between adversity and hair cortisol.<sup>396</sup> Most of the studies investigated adversities experienced in adulthood, where adversity was associated with higher levels of hair cortisol, which indexed the repeated or protracted states of physiological arousal individuals faced in response to these adversities. These findings were moderated by race, with samples with more non-white participants showing larger positive associations between adversity and hair cortisol. Enlow had elsewhere argued that different races may respond differently to stress exposure.<sup>397</sup> However, Khoury and colleagues alternatively suggested that, in the societies where the research was conducted, non-white race may signal additional adversity, in the face of racism and exclusion.

<sup>393</sup> Cf. Reijman, S., Alink, L. R., Compier-de Block, L. H., Werner, C. D., Maras, A., Rijnberk, C., ... & Bakermans-Kranenburg, M. J. (2015) Salivary  $\alpha$ -amylase reactivity to infant crying in maltreating mothers. *Child Psychiatry & Human Development*, 46, 589–599.

<sup>394</sup> Nyström-Hansen, M., Andersen, M. S., Khoury, J. E., Davidsen, K., Gumley, A., Lyons-Ruth, K., ... & Harder, S. (2019) Hair cortisol in the perinatal period mediates associations between maternal adversity and disrupted maternal interaction in early infancy. *Developmental Psychobiology*, 61(4), 543–556.

<sup>395</sup> Hayes, A. F. (2009) Beyond Baron and Kenny: Statistical mediation analysis in the new millennium. *Communication Monographs*, 76, 408–420; Hayes, A. F. (2013) Mediation, moderation, and conditional process analysis. In *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*. New York: Guilford Publications.

<sup>396</sup> Khoury, J. E., Enlow, M. B., Plamondon, A., & Lyons-Ruth, K. (2019) The association between adversity and hair cortisol levels in humans: A meta-analysis. *Psychoneuroendocrinology*, 103, 104–117.

<sup>397</sup> Brunst, K. J., Enlow, M. B., Kannan, S., Carroll, K. N., Coull, B. A., & Wright, R. J. (2014) Effects of prenatal social stress and maternal dietary fatty acid ratio on infant temperament: Does race matter? *Epidemiology*, 4(4).

In contrast to the studies that reported positive associations between adversity and hair cortisol, four studies reported exactly the opposite. In all four cases the adversity in question was maltreatment beginning in childhood. Khoury and colleagues suggest that here chronic stress may have led to hypo-activation of the cortisol response, after having been trapped at a high level throughout childhood. They also reflected that the timing of the maltreatment may have been important. A child has fewer psychobiological means to regulate distress, and often fewer social means to escape or deflect it. Neuroendocrinal systems are also still maturing in childhood, and other researchers had found that adverse experiences can lead to modifications in their development.<sup>398</sup>

### Neuroendocrinological Research with the Harvard Family Pathways Study

At age 29, 33 participants from the Harvard Family Pathways Study were relocated and screened for involvement in a study of brain structure. Participants were excluded if they reported a significant medical or neurological condition, had used substances in the past six months, or would not be safe in a magnetic resonance imaging scan (e.g., use of a pacemaker). This left 18 participants. These participants did not differ from the original sample on demographic or mental health variables.

Together with 33 matched comparison participants, they completed a structural magnetic resonance imaging scan and the Maltreatment and Abuse Chronology of Exposure scale. A quality of this scale, in contrast to many other such instruments, is that it casts a wide net, including peer verbal abuse and witnessing violence to siblings as forms of maltreatment. Pechtel, Lyons-Ruth, and colleagues were interested in examining the size of participants' amygdala, a part of the brain with particular responsibilities for processing emotions.<sup>399</sup> The left hemisphere of the amygdala has a particular role in processing feelings of reward, satisfaction, or lack of satisfaction. The right hemisphere of the amygdala has a particular role in processing fear and negative emotions. The right amygdala increases in volume over a longer time period than the left amygdala, meaning that the latter may be more specifically impacted by experiences in early childhood than the former.

Severity of maltreatment accounted for 27% of the variance in right amygdala volume, where greater severity was associated with larger volume.<sup>400</sup> The researchers also examined whether abuse in different periods would have more or less impact. They found that during early adolescence less classic forms of abuse, such as peer verbal abuse or witnessing violence to siblings, had as much effect on right amygdala size as more classic forms of abuse such as parental physical abuse or neglect. There was no association between childhood abuse and left amygdala volume.

However, in 2016 Lyons-Ruth and colleagues reported that overall AMBIANCE in infancy had a large association with left amygdala volume at 29 years ( $r = 0.60$ ), but not right amygdala volume.<sup>401</sup> Of the AMBIANCE subscales, the two with associations with

<sup>398</sup> For example, Danese, A., & McEwen, B. S. (2012) Adverse childhood experiences, allostasis, allostatic load, and age-related disease. *Physiology & Behavior*, 106(1), 29–39.

<sup>399</sup> See also Lyons-Ruth, K., Chasson, M., Khoury, J., & Ahtam, B. (2024) Reconsidering the nature of threat in infancy: Integrating animal and human studies on neurobiological effects of infant stress. *Neuroscience & Biobehavioral Reviews*, early view.

<sup>400</sup> Pechtel, P., Lyons-Ruth, K., Anderson, C. M., & Teicher, M. H. (2014) Sensitive periods of amygdala development: The role of maltreatment in preadolescence. *Neuroimage*, 97, 236–244.

<sup>401</sup> Lyons-Ruth, K., Pechtel, P., Yoon, S. A., Anderson, C. M., & Teicher, M. H. (2016) Disorganized attachment in infancy predicts greater amygdala volume in adulthood. *Behavioural Brain Research*, 308, 83–93.

left amygdala volume were affective communication errors and withdrawal. Infant disorganized attachment was also associated with left amygdala volume ( $r = 0.54$ ). Later stressors, including self-report of childhood maltreatment and the GPACS observational measure of attachment disturbance in adolescence, were not significantly related to left amygdala volume. Left amygdala volume was also strongly associated with dissociative symptoms ( $r = 0.59$ ). The sample was too small for Lyons-Ruth and colleagues to detect whether left amygdala volume mediated associations between early disrupted attachment relationships and dissociative symptoms. Perhaps wishing to reduce the number of statistical tests in such a modest sample, Lyons-Ruth did not differentiate abuse from neglect in this report. Thus, it was not assessed to what extent neglect in childhood might be associated with larger left amygdala volume.

Reflecting on these findings, Lyons-Ruth and colleagues suggested that caregiver withdrawal and affective communication errors may promote infant hypervigilance to the availability of the mother, leading to hyperactivation and growth of the left amygdala in the early years. The team speculated that ‘when the mother is withdrawn or inattentive, the adaptive response is to increase the intensity of the distress signal to the parent and to pursue proximity and contact with the parent, that is, to seek and squeak rather than to fight or flee.’<sup>402</sup> When the caregiver is abusive over the course of childhood, then Lyons-Ruth and colleagues suggested that this may result in hyperactivation and growth of the right amygdala, associated with processing fear and negative emotions.<sup>403</sup> However, the authors acknowledged that the small sample size here makes this a very preliminary study that needs replication.

Besides the amygdala, another area of the brain examined by Khoury, Lyons-Ruth, and colleagues in the small Family Pathways follow-study at age 29 was the hippocampus. The hippocampus has a role in the emotional processing entailed in forming new memories and remembering past events. Left hippocampal volume at age 29 was strongly associated with maternal withdrawal in infancy ( $r = 0.64$ ), but not the other AMBIANCE subscales.<sup>404</sup> These findings align with other studies, including Generation R, which have found that left hippocampal volume is associated with trauma and disorganized infant attachment (Chapter 5).<sup>405</sup> In the Harvard Family Pathways Study, Khoury, Lyons-Ruth, and colleagues reported that left hippocampal volume was also associated with increased traits of borderline personality disorder ( $r = 0.55$ ) and suicidal distress and self-harm ( $r = 0.58$ ). Left hippocampal volume was not found to mediate associations between maternal withdrawal

<sup>402</sup> Ibid., 90.

<sup>403</sup> See also Bernier, A., Dégeilh, F., Leblanc, É., Daneault, V., Bailey, H. N., & Beauchamp, M. H. (2019) Mother–infant interaction and child brain morphology: A multidimensional approach to maternal sensitivity. *Infancy*, 24(2), 120–138.

<sup>404</sup> Khoury, J. E., Pechtel, P., Andersen, C. M., Teicher, M. H., & Lyons-Ruth, K. (2019) Relations among maternal withdrawal in infancy, borderline features, suicidality/self-injury, and adult hippocampal volume: A 30-year longitudinal study. *Behavioural Brain Research*, 374, 112139.

<sup>405</sup> Tupler, L. A., & De Bellis, M. D. (2006) Segmented hippocampal volume in children and adolescents with posttraumatic stress disorder. *Biological Psychiatry*, 59(6), 523–529; Hidalgo, A. P. C., Muetzel, R., Luijk, M. P., Bakermans-Kranenburg, M. J., El Marroun, H., Vernooij, M. W., ... & Tiemeier, H. (2019) Observed infant–parent attachment and brain morphology in middle childhood—A population-based study. *Developmental Cognitive Neuroscience*, 40, 100724. However, van Hoof and colleagues have reported that unresolved status on the AAI is associated with smaller hippocampal volume. Such findings align with Lyons-Ruth’s longstanding concern that Main tended to treat unresolved states of mind as a natural sequel of disorganised infant attachment, when in fact they may be expected to have quite different correlates. van Hoof, M. J., Riem, M., Garrett, A., Pannekoek, N., van der Wee, N., van IJzendoorn, M., & Vermeiren, R. (2019) Unresolved–disorganized attachment is associated with smaller hippocampus and increased functional connectivity beyond psychopathology. *Journal of Traumatic Stress*, 32(5), 742–752.

in the Strange Situation and borderline personality disorder traits in adulthood. However, enlarged left hippocampus did partially mediate associations between early maternal withdrawal and suicidal distress and self-harm.

These interesting, but preliminary, findings motivated Lyons-Ruth to join with two other research groups at McLean Hospital and Boston Children's Hospital to conduct a much larger study of maternal childhood maltreatment, mother–infant interaction, infant cortisol responses, and their relations to infant brain development during the first two years of life: the MIND study.

### The Mother–Infant Neurobiological Development (MIND) Study

The central objective of the Mother–Infant Neurobiological Development (MIND) study was to identify mechanisms contributing to the intergenerational transmission of the effects of maltreatment from mother to child, with a particular focus on the early development of stress-responsive regions of the infant brain. For Lyons-Ruth, these questions about early brain development were embedded in a fundamental question for attachment theory and research: what causes infants to feel alarm or threat in the context of their attachment relationships? Research on cortisol expression and amygdala volume in animals as clues to stress had been reaching a growing maturity. Lyons-Ruth was interested to examine these markers in human infants, in the context of measures of caregiving and maternal history of childhood maltreatment.

The Mother–Infant Neurobiological Development (MIND) study recruited 181 socioeconomically diverse mother–infant dyads, stratified for mother's history of childhood maltreatment. Mothers were assessed for types of childhood maltreatment and mothers and infants were assessed in the Still Face Paradigm at four months for cortisol output (mother and infant), maternal disrupted interaction, and infants responsiveness and distress. MRI scans were obtained on 57 infants between four and 24 months of age, with mothers and infant in the MRI sample similar to the larger sample on sociodemographic variables and maltreatment history. Brain imaging for mothers was conducted. Measures of epigenetic aging were also obtained from DNA extracted from saliva. Much of the data analysis from this extensive study is still ongoing.

The first publications from the study were from a small sub-study of 51 women assessed in the third trimester of pregnancies. Those 51 women were assessed for hair cortisol during the third trimester of pregnancy and also seen for the Still-Face Procedure at four months with their infant and assessed with AMBIANCE. At four months mothers were also asked to report depression and PTSD symptoms and experiences of maltreatment during their childhood.

Controlling for income, Khoury and colleagues found an interaction between hair cortisol and depressive symptoms. Most forms of AMBIANCE behaviour were associated with high levels of hair cortisol in pregnancy in the context of report of no or minimal maternal depressive symptoms. These findings correspond to Lyons-Ruth's early work with the Harvard Family Pathways Study, which found that mothers who reported no depressive symptoms rated particularly highly for hostility and interfering behaviour in interaction with their 12-month-old infants. Lyons-Ruth suspected that the zero scores represented lack of insight or avoidance of negative feelings, corresponding also to the low scores for self-reported depression of the Hostile subtype on the AAI.

By contrast, caregiver withdrawal was associated with high levels of hair cortisol in pregnancy in the context of high depressive symptoms at four months. For caregivers with high



levels of stress in their lives, and conscious awareness of feelings of distress and low mood, their child's distress may be felt to be overwhelming, prompting withdrawal behaviours. The interaction found between hair cortisol and self-reported depression signals again the value of differentiating withdrawal and hostile-intrusive behaviour, rather than absorbing both under a single scale like insensitivity.

Mothers' report of neglect, but not abuse, in their childhood was negatively associated with maternal hair cortisol concentration ( $r = -0.31$ ).<sup>406</sup> In turn, maternal hair cortisol was negatively associated with Child Protective Services involvement with the family ( $r = -0.35$ ), and mediated the relation between a mother's childhood neglect and her current CPS involvement. Maternal childhood abuse was significantly associated with higher depressive symptoms but not with hair cortisol concentrations. Since chronic stress can eventually result in hypo-activation of the cortisol system, the researchers speculated that the blunted cortisol response they observed may indicate 'dampened maternal physiological responsiveness', which could impede caregiver protective actions. As such, it 'may contribute to a family environment in which the child is not protected, rather than to maternal abuse directly'.<sup>407</sup>

Using the larger sample available at four months, the first sets of findings explored the effects of the mother's childhood maltreatment on mother-infant interaction and infant cortisol regulation at four months of age. Khoury and colleagues conducted a latent class analysis of self-report childhood maltreatment data.<sup>408</sup> They identified three classes of childhood maltreatment: low maltreatment (59% of the sample), emotional abuse (29%), and multiple forms of abuse and neglect (12%). When mothers in the multiple maltreatment class were compared both to mothers in the low maltreatment class and to mothers in the emotional abuse class, mothers in the multiple maltreatment class displayed significantly more withdrawal, role confusion and disorientation when interacting with their four-month-old infants during the Still-Face Procedure. A further analysis of the data, using variable-based regression analyses, indicated that physical neglect was associated with role confusion in mother-infant interaction (i.e., asking for attention or affection from the infant) ( $r = 0.26$ ), and that physical abuse was somewhat associated with hostile intrusiveness ( $r = 0.18$ ).

Next, Khoury and colleagues conducted a latent profile analysis on the AMBIANCE data, a person-centred statistical method that explores whether there are meaningful subgroups of participants who are identified by a particular measure. The researchers' goals were exploratory: they wanted to consider whether there might be subgroups of mothers who show profiles of co-occurring disrupted behaviours across the different AMBIANCE scales.

The analysis identified four maternal profiles derived from the five dimensions of the AMBIANCE.<sup>409</sup> A first profile (termed 'optimal'), characterizing a third of the sample, had low levels of maternal disrupted behaviour across all five AMBIANCE dimensions. A second profile (termed 'negative-intrusive'), characterizing 43% of the sample, were high

<sup>406</sup> Penner, F., Khoury, J. E., Enlow, M. B., & Lyons-Ruth, K. (2023) Threat versus deprivation in mother's childhood: Differential relations to hair cortisol and psychopathology in pregnancy. *Child Abuse & Neglect*, 139, 106107.

<sup>407</sup> Ibid.

<sup>408</sup> Khoury, J. E., Dimitrov, L., Enlow, M. B., Haltigan, J. D., Bronfman, E., & Lyons-Ruth, K. (2022) Patterns of maternal childhood maltreatment and disrupted interaction between mothers and their 4-month-old infants. *Child Maltreatment*, 27(3), 366–377.

<sup>409</sup> Khoury, J. E., Cunningham, M., Jenkins, E., Enlow, M. B., & Lyons-Ruth, K. (2023) Latent profiles of maternal disrupted communication: Relations to affect and behaviour in early infancy. *British Journal of Developmental Psychology*, 41(2), 99–116.

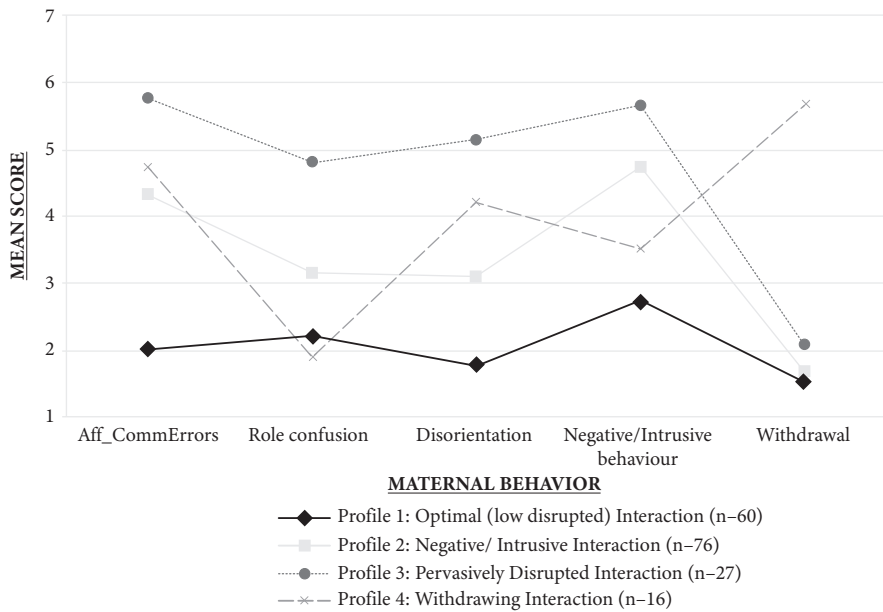


**Figure 2.1** Four profiles of maternal disrupted behaviour identified by latent profile analysis unconditional model. Y-axis indicates mean scores of type of maternal behaviour subscale of the AMBIANCE. Aff\_ Comm errors = affective communication errors.

Khoury, J. E., Cunningham, M., Jenkins, E., Enlow, M. B., & Lyons-Ruth, K. (2023) Latent profiles of maternal disrupted communication: Relations to affect and behaviour in early infancy. *British Journal of Developmental Psychology*, 41(2), 99–116, Figure 2.1.

on hostile–intrusive behaviours with moderate levels of affective errors. A third profile (termed ‘pervasively disrupted’) was seen in 15% of the sample displayed high levels of all the AMBIANCE scales, with the exception of low levels of withdrawing behaviour. And a final profile (termed ‘withdrawal’), characterizing 9% of the sample, were high on withdrawal, accompanied by moderate scores for affective errors and disorientation.

It is striking that all the profiles besides the first had moderate-to-high levels of affective communication errors; and that affective errors did not differentiate among the three disrupted profiles so additional AMBIANCE dimensions were needed to distinguish among them. These results aligned well with Bronfman’s original observations in the Harvard Family Pathways Study and suggest that affective communication errors are a shared characteristic of mothers who show other determinate patterns of disrupted interaction.

Compared to the optimal profile, infants of mothers in the withdrawing profile exhibited less social engagement and less positive affect. Infants of mothers in the negative/intrusive profile initiated fewer social bids towards their mothers and displayed more negative affect, though they did not differ in positive affect. Infants of mothers in the pervasively disrupted profile were observed to display less responsivity, less social engagement, more negative affect, and less positive affect towards their mothers. Khoury and colleagues were interested that the negative/intrusive and pervasively disrupted profiles seemed to elicit different overall patterns of behaviour from infants, suggesting that they should be distinguished in future work (Figure 2.1).

Khoury and colleagues also examined salivary cortisol before and after (20 minutes; then 40 minutes) the Still-Face Procedure, and assessed this in relation to mothers’ report

of maltreatment during their childhoods.<sup>410</sup> The researchers found that mothers who reported little or no maltreatment had infants whose salivary cortisol decreased over time, showing no cortisol response to the stress of the Still-Face Procedure. This finding is consistent with cortisol data in the Still-Face Procedure in other low risk cohorts.<sup>411</sup> The salivary cortisol of these mothers was also convergent with that of their infant. By contrast, the infants of mothers who reported high levels of maltreatment had high cortisol levels throughout and even 40 minutes after the Still-Face Procedure. These levels also diverged from their mothers, whose cortisol responses were comparatively low during the Still-Face Procedure. These findings support the idea that prior experiences of maltreatment may reduce a caregiver's affective experience of and empathy for their infant's distress. They also align with Lyons-Ruth's idea that maltreatment may hinder a caregiver's capacity to help their child regulate distress, leaving the infant alone with feelings the caregiver does not acknowledge.<sup>412</sup>

A subsequent analysis by Chasson, Khoury, Bosquet Enlow, and Lyons-Ruth examined the potentially different effects of the mother's childhood abuse and childhood neglect on infant cortisol and looked at the interplay between maternal childhood maltreatment and maternal caregiving behaviours in shaping infant stress regulation.<sup>413</sup> The research team found that neglect in the mother's childhood was associated with elevated infant cortisol in the Still-Face Paradigm, but only in the presence of maternal disoriented caregiving behaviours. Chasson and colleagues reflected that maternal disorientation may serve as one signal of maternal neglect to the infant stress response system. Lyons-Ruth and collaborators laid out the similarities between this set of findings and the large body of controlled rodent studies that find that low maternal care/unpredictability is associated with elevated offspring cortisol.<sup>414</sup>

The researchers also found that abuse in the mother's childhood was associated with *lower* infant cortisol in the Still-Face Paradigm, but only in the presence of maternal hostile-intrusive behaviour. This aligns with evidence from animal models, indicating that there is a hypo-responsive period to aversive (pain-related) maternal stimuli among rodent pups.<sup>415</sup> This hypo-responsive response is thought to protect pups' early bonding to the mother, regardless of abusive behaviour.

Lyons-Ruth's team were interested that infant cortisol hyper- and hypo-responsiveness seemed to require *both* a maternal prenatal experience and a postnatal behavioural pattern. They theorized that hyper- and hypo-responsiveness are potentially costly responses

<sup>410</sup> Khoury, J. E., Beeney, J., Shiff, I., Bosquet Enlow, M., & Lyons-Ruth, K. (2021) Maternal experiences of childhood maltreatment moderate patterns of mother-infant cortisol regulation under stress. *Developmental Psychobiology*, 63(5), 1309–1321.

<sup>411</sup> For example, Middlemiss, W., Granger, D. A., Goldberg, W. A., & Nathans, L. (2012) Asynchrony of mother-infant hypothalamic-pituitary-adrenal axis activity following extinction of infant crying responses induced during the transition to sleep. *Early Human Development*, 88(4), 227–232; Atkinson, L., Gonzalez, A., Kashy, D. A., Santo Basile, V., Masellis, M., Pereira, J., ... & Levitan, R. (2013) Maternal sensitivity and infant and mother adrenocortical function across challenges. *Psychoneuroendocrinology*, 38(12), 2943–2951.

<sup>412</sup> See also Nofech-Mozes, J. A. L., Jamieson, B., Gonzalez, A., & Atkinson, L. (2020) Mother-infant cortisol attunement: Associations with mother-infant attachment disorganization. *Development and Psychopathology*, 32(1), 43–55.

<sup>413</sup> Chasson, M., Khoury, J., Bosquet Enlow, M., Lyons-Ruth, K. (2024) Maternal caregiving moderates relations between maternal childhood maltreatment and infant cortisol regulation. Submitted for review.

<sup>414</sup> Lyons-Ruth, K., Chasson M., Khoury, J., Ahtam, B. (2024) Reconsidering the nature of threat in infancy: Integrating animal and human studies on neurobiological effects of infant stress. *Neuroscience and Biobehavioral Reviews*, 163, 105746.

<sup>415</sup> For example, Moriceau, S., Roth, T. L., & Sullivan, R. M. (2010) Rodent model of infant attachment learning and stress. *Developmental Psychobiology*, 52(7), 651–660; Sullivan, R. M., & Opendak, M. (2020) Defining immediate effects of sensitive periods on infant neurobehavioral function. *Current Opinion in Behavioral Sciences*, 36, 106–114.

unless used in the appropriate environment. They may therefore have two ‘gates’ to activation. One gate would be epigenetic and gestationally based, perhaps based on signals received by the infant in utero from the mother’s own gestational cortisol.<sup>416</sup> The other gate would be based on caregivers’ postnatal behaviour. Chasson, Lyons-Ruth, and colleagues considered that ‘such need for redundancy in prenatal and postnatal environments would build resilience into the infant system, such that neither prenatal nor early postnatal adverse environments would be sufficient in themselves to alter the infant’s stress physiology in a sustained way.’<sup>417</sup>

As part of the MIND study, a subsample of 57 infants, between the ages of four and 24 months, completed an MRI scan under natural sleep without sedation.<sup>418</sup> Lyons-Ruth and colleagues investigated links between maternal childhood abuse and neglect and infant grey matter volume, white matter volume, amygdala volume, and hippocampal volume. It was found that maternal history of neglect, but not abuse, was significantly associated with lower infant grey matter volume.<sup>419</sup> This effect was not moderated by the age at which the MRI took place. Lyons-Ruth and colleagues considered this a concerning finding: grey matter volume increases rapidly during the first two years of life, with relatively small increases after that. Future research would need to examine whether or not the very early reductions found in their study are remedied in subsequent development.

In contrast, maternal abuse, but not neglect, was significantly associated with smaller volume of the right amygdala, though only after 18 months of age.<sup>420</sup> Consistent with the rodent studies, the later onset of amygdala effects was interpreted by Lyons-Ruth and colleagues as related to the early hyporesponsive period to mother-associated aversive stimuli, the evolutionary function of which may have been to protect the infant’s developing attachment to his or her mother.

Bringing together many of the threads of their work, Khoury, Lyons-Ruth, and colleagues examined relationships between maternal childhood maltreatment, AMBIANCE, cortisol, and amygdala and hippocampus volume in the MIND sample.<sup>421</sup> Controlling for child age, they found that maternal overall disrupted interaction was associated with infant total cortisol output. In addition, higher infant cortisol output was related to enlarged bilateral amygdala and hippocampal volumes. Finally, infant cortisol output mediated an indirect relation between maternal disoriented interaction and greater infant amygdala

<sup>416</sup> Buss, C., Entringer, S., Moog, N. K., Toepfer, P., Fair, D. A., Simhan, H. N., ... & Wadhwa, P. D. (2017) Intergenerational transmission of maternal childhood maltreatment exposure: Implications for fetal brain development. *Journal of the American Academy of Child & Adolescent Psychiatry*, 56(5), 373–382; Moog, N. K., Heim, C. M., Entringer, S., Simhan, H. N., Wadhwa, P. D., & Buss, C. (2022) Transmission of the adverse consequences of childhood maltreatment across generations: Focus on gestational biology. *Pharmacology Biochemistry and Behavior*, 215, 173372; Nazzari, S., Fearon, P., Rice, F., Molteni, M., & Frigerio, A. (2022) Maternal caregiving moderates the impact of antenatal maternal cortisol on infant stress regulation. *Journal of Child Psychology and Psychiatry*, 63(8), 871–880.

<sup>417</sup> Chasson, M. C., Khoury, J., Bosquet Enlow, M., Lyons-Ruth, K. (2024) Maternal caregiving moderates relations between maternal childhood maltreatment and infant cortisol regulation. Submitted for review.

<sup>418</sup> Lyons-Ruth, K., Ahtam, B., Li, F. H., Dickerman, S., Khoury, J. E., Sisitsky, M., ... & Grant, P. E. (2023) Negative versus withdrawn maternal behavior: Differential associations with infant gray and white matter during the first 2 years of life. *Human Brain Mapping*, 44(12), 4572–4589.

<sup>419</sup> Lyons-Ruth, K., Li, F. H., Khoury, J. E., Ahtam, B., Sisitsky, M., Ou, Y., ... & Grant, E. (2023) Maternal childhood abuse versus neglect associated with differential patterns of infant brain development. *Research on Child and Adolescent Psychopathology*, 51(12), 1919–1932, Figure 6.

<sup>420</sup> *Ibid.*, Figure 7.

<sup>421</sup> Khoury, J. E., Ahtam, B., Ou, Y., Jenkins, E., Klengel, T., Enlow, M. B., ... & Lyons-Ruth, K. (2023) Linking maternal disrupted interaction and infant limbic volumes: The role of infant cortisol output. *Psychoneuroendocrinology*, 158, 106379; Chasson, M., Khoury, J., Ahtam, B., Ou, Y., Bosquet Enlow, M., Grant, E., & Lyons-Ruth, K. (2024) Maternal disorientation mediates indirect associations between maternal childhood neglect, infant cortisol, and limbic volumes. Paper delivered at the International Attachment Conference, Rouen, France, July 2024.

volume. Once again, these findings were consistent with controlled studies of rodent pups and non-human primates that demonstrate a causal link between increased glucocorticoid output and enlarged amygdala volume.<sup>422</sup>

Most of the effect of early maternal disrupted interaction could be attributed specifically to the disorientation scale. Furthermore, maternal disoriented behaviour was predicted by maternal experience of childhood neglect: the disorientated behaviours may reflect distancing behaviours from affects related to mothers' own experiences of abandonment, leading to the odd affects, ghostly whispers, and frenetic and disconnected behaviour coded by the disorientation scale. In turn these behaviours contribute to infant dysregulated stress and cortisol output.

Clinically, this is an important conclusion since it suggests that the maternal behaviours that most alarm infants are subtle forms of disorientation. That is to say, they are *not* those that child welfare professionals are generally trained to pick up. Khoury, Lyons-Ruth, and colleagues reflected that 'in the early months of life, caregiver–infant face-to-face communication has been shown to involve the exchange of mutually contingent affective signals. Thus, it is notable that the dimension of maternal behavior most strongly associated with infant cortisol output was the dimension indexing forms of odd or false maternal affect and affectively disconnected behavior that would block effective affective communication between mother and infant.'<sup>423</sup>

However, this post hoc valorization by Lyons-Ruth's team of the disorientation scale as the most important blockage of affective communication rings a somewhat hollow note. Studies with the Harvard sample had certainly found maternal disorientated behaviour linked to offspring disturbance (e.g., indiscriminate attachment behaviour; borderline symptomatology).<sup>424</sup> However, it was previously *caregiver withdrawal* that had been assigned pride of place in blocking affective communication and contributing to dysregulated fear. This is in contrast to Main and Hesse, who situated dissociation as central to dysregulated fear.<sup>425</sup> Though in making this comparison it should of course be acknowledged that the AMBIANCE disorientation scale includes items beyond the Main and Hesse dissociation scale, including from their frightened behaviour scale.

To highlight the importance of disorientation, Khoury, Lyons-Ruth, and colleagues pointed out that maternal disorientation was associated in the MIND study with maternal self-report of maltreatment in their childhood.<sup>426</sup> However the bivariate association

<sup>422</sup> Sanchez, M. M., McCormack, K. M., & Howell, B. R. (2015) Social buffering of stress responses in nonhuman primates: Maternal regulation of the development of emotional regulatory brain circuits. *Social Neuroscience*, 10(5), 512–526.

<sup>423</sup> Khoury, J. E., Ahtam, B., Ou, Y., Jenkins, E., Klengel, T., Enlow, M. B., & Lyons-Ruth, K. (2023) Linking maternal disrupted interaction and infant limbic volumes: The role of infant cortisol output. *Psychoneuroendocrinology*, 158, 106379, parentheses suppressed.

<sup>424</sup> For example, Lyons-Ruth, K., Bureau, J. F., Riley, C. D., & Atlas-Corbett, A. F. (2009) Socially indiscriminate attachment behavior in the strange situation: Convergent and discriminant validity in relation to caregiving risk, later behavior problems, and attachment insecurity. *Development and Psychopathology*, 21(2), 355–372; Hobson, R. P., Patrick, M. P., Hobson, J. A., Crandell, L., Bronfman, E., & Lyons-Ruth, K. (2009) How mothers with borderline personality disorder relate to their year-old infants. *The British Journal of Psychiatry*, 195(4), 325–330.

<sup>425</sup> Main, M. & Morgan, H. (1996) Disorganization and disorientation in infant strange situation behavior: Phenotypic resemblance to dissociative states. In L. K. Michelson & W. J. Ray (eds), *Handbook of Dissociation: Theoretical, Empirical, and Clinical Perspectives* (pp. 107–138). New York: Plenum Press. For an attempt to recoup disorientation for Lyons-Ruth's conceptualization of low nurturance, and away from Main's focus on threat, see Lyons-Ruth, K. (2024) Continuing the legacy of Mary Main: Insights from other species on attachment and the development of stress-sensitive brain regions in human infancy. *Attachment & Human Development*, early view.

<sup>426</sup> Khoury, J. E., Dimitrov, L., Enlow, M. B., Haltigan, J. D., Bronfman, E., & Lyons-Ruth, K. (2022) Patterns of maternal childhood maltreatment and disrupted interaction between mothers and their 4-month-old infants. *Child Maltreatment*, 27(3), 366–377, Table 1.

was with physical neglect specifically and small ( $r = 0.19$ ), smaller than for role confusion ( $r = 0.26$ ).<sup>427</sup> Regardless, such specific concerns do not undermine the pioneering importance of findings regarding cortisol as a mediator between disrupted caregiving behaviour and child neurological development. The work of Lyons-Ruth's group needs to be seen as a kind of pointillism: offering glimmers of how child-caregiver relationships might be operating, rather than pinning down causal processes with confidence.

Furthermore, providing support for their conclusions, the team have also recently found convergent evidence when examining maternal maltreatment history. Analyses indicated that maternal childhood neglect was associated with increased infant cortisol output, and infant cortisol was further associated with increased volumes of several stress-sensitive subcortical brain regions involved in emotion regulation, including the amygdala. Khoury and colleagues found that infant cortisol output mediated an indirect relation between maternal history of childhood neglect and greater infant amygdala volume.<sup>428</sup> Khoury and colleagues considered that greater infant amygdala volume might contribute to short-term benefits in the context of a less protective caregiving environment, they also pointed to evidence suggesting that it may also limit the developmental window for brain plasticity and so have negative longer-term effects.<sup>429</sup>

Overall, Lyons-Ruth and colleagues concluded that young children's experiences of threat of lack of care and threat of attack should be modelled separately as sources of alarm within attachment relationships, with the expectation of different sensitive periods, different endocrinal and neurological implications, and distinct effects for child development.<sup>430</sup> They have called this the Developmental Salience Model of Threat. Lyons-Ruth and colleagues have argued that maternal behaviours signalling neglect are the most alarming to the stress system in infancy, and that maternal behaviours signalling threat of attack are the most alarming after infancy. This aligns with Bowlby's emphasis on the threat posed by neglect, and his evolutionary perspective: the strongest survival threat to an infant in the environment in which humans evolved was likely separation from or neglect by their caregiver. So, it would make sense that signals suggesting lack of care would be prioritized by the infant stress system, in contrast to different priorities after infancy. It is exciting to have studies, such as MIND, start to put observations of early care, the neuroendocrinology of stress, and brain structure within the same frame, and to explore interrelationships. It remains to be seen what findings will replicate in other samples. But the endeavour is one that likely holds considerable promise and would have absolutely thrilled Bowlby.

<sup>427</sup> Disoriented caregiver behaviour was uniquely associated with exposure to domestic violence ( $r = 0.25$ ). But there was no relation with domestic violence with all other types of maltreatment controlled, suggesting that domestic violence may contribute to disoriented caregiver behaviour in the context of other forms of maltreatment. Maternal disorientation was somewhat more common for mothers who reported multiple forms of maltreatment in their childhood compared to emotional abuse alone, but no more common than for mothers who reported no maltreatment in their childhoods.

<sup>428</sup> Khoury, J. E., Chasson, M., Ahtam, B., Fleming, L. L., Ou, Y., Bosquet Enlow, M., ... & Lyons-Ruth, K. Maternal experience of childhood neglect is linked to increased infant cortisol levels and amygdala volumes. Submitted for review.

<sup>429</sup> For example, VanTieghem, M., Korom, M., Flannery, J., Choy, T., Caldera, C., Humphreys, K. L., ... & Tottenham, N. (2021) Longitudinal changes in amygdala, hippocampus and cortisol development following early caregiving adversity. *Developmental Cognitive Neuroscience*, 48, 100916.

<sup>430</sup> Lyons-Ruth, K., Chasson, M., Khoury, J., & Ahtam, B. (2024) Reconsidering the nature of threat in infancy: Integrating animal and human studies on neurobiological effects of infant stress. *Neuroscience & Biobehavioral Reviews*, 105746.

## Contexts

### Social and Economic Contexts

One limitation of much of the research conducted with AMBIANCE to date is researchers have not adequately explored associations with mothers' social and economic context. A criticism raised by Grey of attachment research has been that researchers have not treated caregivers' behaviour as strategic, like the infant conditional strategies, as an attempt to cope with and respond to their environment. Although this has been acknowledged in principle, Grey alleged that researchers have not been serious about empirically measuring caregiver adaptation to their environment. He added that attachment measures have generally not been well adapted for doing so, for instance with caregiving interviews not asking parents about this context or not coding their responses.<sup>431</sup> It may be considered a kind of condescension to caregivers' anger and fear not to examine the proximal features of their lives that might evoke such feelings, and look only to their accounts of their experiences in childhood.

For her part, Lyons-Ruth held the theoretical stance that caregivers' insensitive and alarming behaviour can and should be understood with reference to their circumstances; above all, their behaviour should not be treated as an individual blameworthy quality of the parent. Lyons-Ruth and colleagues write about the predicament of the mothers with considerable tenderness and sympathy, attentive to the weariness, sorrow, and desperation in their lives that might contribute to uninvolved or hostile-intrusive behaviours towards their child. In line with life history theory (Chapter 3), they held that caregivers may be making reasonable compromises based on the social, economic, and psychological resources available to them.

For example, in accounting for uninvolved caregiver behaviour, they considered that a caregiver may reduce socioemotional interaction with their child in order to keep psychologically afloat, and able to provide what care they can to their child in the long run: 'if the parent is psychologically vulnerable, decreased involvement in the parenting role may also be important to maintain the functioning of the parent.'<sup>432</sup> Just as minimizing of attachment behaviour may be a conditional strategy for infants that is adaptive to an environment where the caregiver may not be available and responsive, minimizing of socioemotional interaction with the child may be conceptualized as a conditional caregiving strategy under conditions of constrained resources.<sup>433</sup>

Yet the Harvard Family Pathways Study was quite demographically homogenous. In the 1990s Lyons-Ruth and colleagues did examine socioeconomic risk as a predictor, but

<sup>431</sup> Grey, B (2023) Beyond sensitivity: Understanding caregiving compromises in adverse contexts using the Meaning of the Child Interview. In S. Chrzastowski & A. Vetere (eds), *Safety, Danger, and Protection in the Family, Community, and the World: A Systemic and Attachment-Informed Approach*. London: Routledge. See also Pitillas, C. (2021) *El Daño que se Hereda: Comprender y abordar la transmisión intergeneracional del trauma*. Bilbao: Desclée De Brouwer.

<sup>432</sup> Henninghausen, K. & Lyons-Ruth, K. (2005) Disorganization of behavioral and attentional strategies toward primary attachment figures: From biologic to dialogic processes. In S. Carter, L. Ahnert, et al. (eds), *Attachment and Bonding: A New Synthesis* (pp. 269–301). Cambridge, MA: The MIT Press, p. 272.

<sup>433</sup> For discussions of conditional caregiving strategies see Main, M. (1979) The 'ultimate' causation of some infant attachment phenomena: Further answers, further phenomena, further questions. *Behavioral and Brain Sciences*, 2, 640–643; Hrdy, S. B. (2001) Mothers and others. *Natural History*, 110(4), 50–62; Grey, B (2023) Beyond sensitivity: Understanding caregiving compromises in adverse contexts using the Meaning of the Child Interview. In S. Chrzastowski & A. Vetere (eds), *Safety, Danger, and Protection in the Family, Community, and the World: A Systemic and Attachment-Informed Approach*, London: Routledge

there was little variance, and associations were negligible. She had data available on maternal social support, but did not explore whether this contributed to disrupted caregiving behaviours. The maternal family history interview asked questions about the family's context, but these aspects of the interview are rarely reported. Already undertaking many exploratory statistical tests, perhaps it was inevitable that particular lines of attention were compensated for, or structured by, particular opacities.

An exception is the report by Bureau, Easterbrooks, and Lyons-Ruth that disorganized behaviour on reunion at age eight was associated with caregiver report of financial/legal difficulties and with family violence.<sup>434</sup> In her young adult data, family income was a notable predictor of AAI classifications and adolescent-caregiver interaction.<sup>435</sup> But this was not investigated further. At times, especially in concern with Hostile/Helpless characterological adaptations, Lyons-Ruth's lens focused on the pathological personality of the parent as the explanation of their child's suffering or difficulties.<sup>436</sup> As Lyons-Ruth's doctoral student DiPalma observed, this handling of the data veers towards pathologizing in a way far distant from Lyons-Ruth's intentions.<sup>437</sup>

After the Harvard Family Pathways Study, several other samples assessing Hostile/Helpless states of mind or AMBIANCE have also had relatively little socioeconomic heterogeneity, whether recruited as community or high-risk samples. Honde reported in her doctoral thesis that the association between Hostile/Helpless scores and disorganization was moderated by socioeconomic risk, with a stronger association for dyads facing more adversity. And Tereno found that AMBIANCE scores were associated with poverty. Other samples with diverse participants have generally not examined socioeconomic risk. As we have seen, an exception is the MIND sample, where Khoury and colleagues reported associations between non-white ethnicity and income with AMBIANCE of equivalent size to level of clinical concern about the family or self-reported abuse and neglect.<sup>438</sup> However Khoury and colleagues downplayed this finding. And in the wake of Lyons-Ruth's work with the Harvard Family Pathways Study, subsequent researchers have not examined prediction from social support, even when they had measures available.

An exception was the MIND sample, which had considerable sociodemographic heterogeneity. Khoury and colleagues were therefore able to assess the relationship between sociodemographic factors and the AMBIANCE scales. There were potent associations between non-white ethnicity ( $r = 0.40$  to  $0.44$ ) and lower income ( $r = 0.31$  to  $0.33$ ) and

<sup>434</sup> Bureau, J. F., Ann Easterbrooks, M., & Lyons-Ruth, K. (2009) Attachment disorganization and controlling behavior in middle childhood: Maternal and child precursors and correlates. *Attachment & Human Development*, 11(3), 265–284.

<sup>435</sup> Brumariu, L. E., Obsuth, I., & Lyons-Ruth, K. (2013) Quality of attachment relationships and peer relationship dysfunction among late adolescents with and without anxiety disorders. *Journal of Anxiety Disorders*, 27(1), 116–124.

<sup>436</sup> For example, Byun, S., Brumariu, L. E., & Lyons-Ruth, K. (2016) Disorganized attachment in young adulthood as a partial mediator of relations between severity of childhood abuse and dissociation. *Journal of Trauma & Dissociation*, 17(4), 460–479: 'Our results underscore the importance of the quality of the parent-child relationship in mediating the effects of abuse on dissociation. That is, what the parent allows into the early and continuing affective dialogue may have an important relation to what the child allows himself or herself to think about in later life' (475, *italics added*). The language of the parent 'allowing in' suggests an external context, for instance partner violence, which the caregiver is expected to buffer. The discursive framing here places emphasis on this 'allowing in' process as the basis for the child's mental health difficulties, rather than on what the caregiver is facing and asked to buffer.

<sup>437</sup> DiPalma, L. (2004) *Shades of wisdom: Portraits of attachment*. Unpublished doctoral thesis, Harvard University.

<sup>438</sup> Khoury, J. E., Bosquet Enlow, M., Patwa, M. C., & Lyons-Ruth, K. (2020) Hair cortisol in pregnancy interacts with maternal depressive symptoms to predict maternal disrupted interaction with her infant at 4 months. *Developmental Psychobiology*, 62(6), 768–782.



AMBIANCE scale scores. Though mentioned only in passing by the authors, in identifying the need to control for income in subsequent analyses, these are important findings. These associations are *equivalent in size to the relationship between clinical concern about the family and AMBIANCE scores* in the Harvard Family Pathways Study ( $r = 0.36$ ), and between self-reported abuse and the withdrawal scale ( $r = 0.39$ ), with the other scales not significant.<sup>439</sup> This raises the prospect that AMBIANCE may reflect economic hardship and discrimination in a caregiver's present, as well as additional effects of maltreatment and caregiving history. Both remained significant when controlling for the other. This has considerable bearing for the ambitions of Madigan and colleagues to have AMBIANCE used within applied child welfare practice (Chapter 5).

The role of socioeconomic factors and social support as predictors of AMBIANCE was also addressed incidentally by a US study by Ostler, Zhan, and Bronfman, though it was far from the focus of the study.<sup>440</sup> The researchers recruited 66 mothers and their young children (aged 1–6) who had sought help with their parenting from local support and mental health services. AMBIANCE was coded on 10 minutes of free play, and mothers answered interview and survey questions. Ostler and colleagues found that mothers with income under \$32,000 had somewhat higher levels of disrupted parenting behaviour than those with income higher than \$53,000. The researchers also reported strong findings for the role of social support. Mothers who reported a good number of supportive relationships in their lives had very low AMBIANCE scores (average score: 1.8), and only 12% received a disrupted parenting classification. By contrast mothers had much higher AMBIANCE scores if they had only one (average 4.9) or no (5.9) relationship they regarded as supportive, and 82% received a disrupted parenting classification. It is to be hoped that these findings encourage researchers to attend further to socioeconomic factors, social support, and other contextual variables in analysing contributors to caregivers disrupted behaviours towards their children.

### A Qualitative Perspective: DiPalma's Thesis

A doctoral study by DiPalma, supervised by Lyons-Ruth, offered qualitative case studies of families from the Harvard Family Pathways Study.<sup>441</sup> DiPalma's research was conducted in the early 2000s, looking at the first 20 families recruited to the 20-year follow-up of the sample, though she also had access to interview transcripts, psychological assessments, and observational records from earlier periods. DiPalma was highly appreciative of the achievements of the longitudinal study. However, her qualitative methodology also led her to highlight features of the families and their context not well captured by the measures used by Lyons-Ruth and colleagues, which largely focus on dyadic interaction or individual psychology.<sup>442</sup>

<sup>439</sup> Shi, Z., Bureau, J. F., Easterbrooks, M. A., Zhao, X., & Lyons-Ruth, K. (2012) Childhood maltreatment and prospectively observed quality of early care as predictors of antisocial personality disorder features. *Infant Mental Health Journal*, 33(1), 55–69, Table 2.

<sup>440</sup> Ostler, T., Zhan, M., & Bronfman, E. (2022) A support-based measure of adult attachment: Links between the Attachment Style Interview and an observational measure of parenting in a sample of at-risk mothers. *Adoption & Fostering*, 46(4), 437–454.

<sup>441</sup> DiPalma, L. M. (2004) *Shades of wisdom: Portraits of attachment in families at risk*. Unpublished doctoral thesis, Harvard University.

<sup>442</sup> A parallel blunting of attention beyond the dyad may be seen in Lyons-Ruth's writings with the Boston Change Process Study Group, where the 'order or shared direction in the interaction' is formed out of 'elements assembled are themselves formed during the process of the interchange'. The role of elements from outside the

Lyons-Ruth's analyses often examined associations between early maternal care and functioning in early adulthood. However, of the first 20 participants to be interviewed in the young adult follow-up, DiPalma was struck by how many of them had experienced significant periods away from their mothers' care, often in the context of serious problems such as maternal suicide attempts, psychiatric hospitalization, drug addiction, and the involvement of social services with the family. DiPalma reports from the interviews with the young adults that 'serial trips to family court to have custody arrangements reevaluated, or seeing a mother taken away by ambulance after cutting her wrists, were powerful examples of relational experiences that left a mark on these adolescents' lives.'<sup>443</sup>

Two were raised by custodial fathers. Five had spent at least a year living with a grandparent; several more had spent shorter periods living with grandparents. More broadly across the sample, 'the important role of grandparents, specifically grandmothers, appears central in the lives of these research participants.' For instance, 'one son who perceived both of his parents as struggling to negotiate their own lives said, "So, if I really need to talk to people I go talk to my grandparents"'<sup>444</sup> Where grandparents relied on for support had died, participants reported this as an absolutely devastating loss.

Six of the young adults had spent time in foster care or residential care, including two participants who had spent five or more years in out-of-home care. The young adults identified a wide circle of caregivers, often described as serving the function of attachment figures, to substitute for or supplement the secure base and safe haven availability of their mother. Beyond grandparents this included step-parents, uncles and aunts, teachers, and the parents of friends. On the one hand, DiPalma noted the limitation of Lyons-Ruth's focus on the mother-child relationship in the context of this wider attachment network. On the other hand, she was all the more struck by the associations reported by Lyons-Ruth between early maternal care and young adult functioning, given the extent of subsequent disruption—or even rupture—in this care.

DiPalma also observed that substance use was a profound theme in the lives of the families. Of the first 20 families in the young adult follow-up, half of the mothers and half of the young adults had problems with substance or alcohol use, though only in four cases was this the same mother and adolescent. Lyons-Ruth documented that early maternal withdrawal behaviour predicted young adult substance use.<sup>445</sup> However she did not examine associations with maternal prior or concurrent substance use. More generally, DiPalma's qualitative descriptions situate substance use as shaping family life at multiple levels, especially including high rates of substance use among fathers. The role of fathers was not pursued by Lyons-Ruth, as comparatively few remained a constant in the life of their child, resulting in small numbers for any analyses.

There was a tremendous amount of violence in the environment of participants. Of the first 20 young adult participants recruited to the follow-up, three had a close friend or relative murdered, one had witnessed a drive-by killing, and another robbed at gunpoint. Three families lost their home to fires. One mother was kidnapped. Three parents had been in jail, and two of these were on convictions of assault. This ambient experience of

interchange are by no means precluded, but equally not given a place to help keep them in view. Boston Change Process Study Group. (2005) The 'something more' than interpretation revisited: Sloppiness and co-creativity in the psychoanalytic encounter. *Journal of the American Psychoanalytic Association*, 53(3), 693–729, pp. 699, 701.

<sup>443</sup> DiPalma, L. M. (2004) Shades of wisdom: Portraits of attachment in families at risk. Unpublished doctoral thesis, Harvard University, p. 44.

<sup>444</sup> *Ibid.*, 38, 51.

<sup>445</sup> Pechtel, P., Woodman, A., & Lyons-Ruth, K. (2012) Early maternal withdrawal and nonverbal childhood IQ as precursors for substance use disorder in young adulthood: Results of a 20-year prospective study. *International Journal of Cognitive Therapy*, 5(3), 316–329.

violence was described by participants as an important part of their lives. DiPalma suspected that encounters with violence would have had relevance for parents' AMBIANCE behaviour towards their children, and for the development of children's mental health difficulties, including dissociative tendencies. Some of the traits of borderline personality disorder measured by Lyons-Ruth and colleagues might be regarded as adaptive responses to a threatening social environment.<sup>446</sup> Yet contextual violence was not directly addressed by Lyons-Ruth, as her measures focused on the psychology of the mother–child dyad.

DiPalma was also critical of the priority given to difficulties in the mother–child dyad, and in the mental health of the children. This reflected the priorities of developmental science during the period of Lyons-Ruth's data collection, and perhaps also her interests as a clinician. However, DiPalma felt that this left unexplored the extent of the family's strengths and resilience factors, which may not be simply reducible to the absence of difficulties. She suspected that access to social support, religious faith, or a strong extended family might provide supplementary and/or supportive sources of secure base and safe haven provision.

DiPalma criticized Lyons-Ruth for a deficit-focused account, which neglects attention to the ways that a caregiver can offer their child a secure base, encouragement, and support.<sup>447</sup> This is mostly fair, though not entirely. Secure base provision is acknowledged in the AMBIANCE coding manual, in the consideration of ameliorating behaviour; when ameliorating behaviour is present, the score for disruptive behaviour is lowered. It is also acknowledged in Lyons-Ruth's theoretical emphasis on affective communication in ordinary situations, not just when the child is distressed. True, behaviours such as secure base provision or taking pleasure in the child are not coded by AMBIANCE. Still, this may well have been because Lyons-Ruth regarded AMBIANCE as a complement to the Ainsworth sensitivity scale—albeit in her samples and others only AMBIANCE or sensitivity is usually coded, for reasons of resource. Beyond infancy, when developing assessment of caregiver–adolescent interaction, secure base provision and pleasurable interaction were captured by Lyons-Ruth and colleagues with the dyadic cooperation scale on the GPACS.

## Concluding Remarks

Ziv and Hotam have argued that in the wider context of academic psychology, overarching theories have become rare, increasingly looked down on as departing or even distracting from the empirical task of psychological research. They observed that, within the field of attachment research, 'scholars use the research tool as their guide, and, probably unintentionally, as the theory's surrogate', authorized by the predictive power of the methods.<sup>448</sup> Ziv and Hotam have alleged that attachment research has become largely a hunt for the correlates of the Strange Situation and Adult Attachment Interview two measures: further theoretical development have been blocked by the identification of methodological tools with theoretical constructs, combined with the conviction that the methodology cannot be refined without undermining the basis for a cumulative research paradigm.<sup>449</sup>

<sup>446</sup> Bevington, D., Fuggle, P., Cracknell, L., & Fonagy, P. (2017) *Adaptive Mentalisation-Based Integrative Treatment: A Guide for Teams to Develop Systems of Care*. Oxford: Oxford University Press, p. 63.

<sup>447</sup> For aligned concerns see Posada, G. & Lu, T. (2011) Child–parent attachment relationships: A Lifespan phenomenon. In K. L. Fingerman, C. Berg, J. Smith, & T. Antonucci (eds), *Handbook of Life-Span Development* (pp. 87–115). New York: Springer, pp. 87–88.

<sup>448</sup> Ziv, Y. & Hotam, Y. (2015) Theory and measure in the psychological field: The case of attachment theory and the strange situation procedure. *Theory & Psychology*, 25(3), 274–291, p. 278.

<sup>449</sup> *Ibid.*, 283.

A certain interpretation of attachment theory, and the work of Mary Main in particular, has stabilized and been stabilized by the Strange Situation categories. In the previous chapter I referred to this interpretation as main-stream attachment research in the developmental tradition. This has contributed to the solidity of the tradition of attachment research over time, supporting the accumulation of research to permit meta-analytic studies and increasingly dependable knowledge (Chapter 4). However, in other regards this also limited the field, both in hindering innovation and in sustaining the circulation of taken-for-granted assumptions. It is plausible, as Ziv and Hotam have argued, that attachment research has partially circumvented the decline of theory in academic psychology by embodying theory within methodology, *protecting* theoretical propositions whilst *supplanting* the need to explicitly acknowledge or discuss them.

The development of new coding systems by Lyons-Ruth and her team unstitched theory and method. This has not only pressed for reopening the context of discovery in attachment research, the roving, exploratory phase of scientific inquiry. It has also pressed for reopening the context for thinking and theorizing, rather than resting on prevailing assumptions.

Delaney has argued that ‘every time a cliché is said or heard, a live and insightful observation about the world-that-is-the-case is not being said or heard.’<sup>450</sup> Not all of the theoretical proposals, methodological innovations, or empirical findings of Lyons-Ruth and colleagues have been taken up by other researchers. But their work has been an important counterweight to cliché and assumption within attachment research. To take one example: the distinction between disorganized–approach and disorganized avoidance has barely been examined by other laboratories. However, the proposal has been one of the few to have countered the hazy and absorptive notion of disorganization which, to the dismay of Main and Solomon’s themselves, has often circulated within and repetitively confined attachment research within developmental science.<sup>451</sup> Or to take another example: many attachment researchers have faithfully echoed Hesse and Main’s characterization of disorganized attachment as caused by ‘fright without solution.’<sup>452</sup> However, Lyons-Ruth has been one of the few researchers to attempt to scope out what kinds of experience produce what kinds of fear, and the bearing of these differences for attachment relationships.

Since Bowlby and Ainsworth, developmental attachment research has always been a field organized by basic and applied poles, and academic and clinical forms of knowledge and concern.<sup>453</sup> The work of Lyons-Ruth and her team presumes upon the existence of a community of academic researchers who use the Strange Situation, the Adult Attachment Interview, and associated ideas, their perspicacity, and their authority. When Lyons-Ruth is cited, it is very often together with mention of Bowlby, Ainsworth, and/or Main.<sup>454</sup> Within this core intellectual space of attachment theory, Lyons-Ruth and collaborators

<sup>450</sup> Delany, S. R. (2015) *Occasional Views: More about Writing and Other Essays*. Middletown, CT: Wesleyan University Press, p. 10.

<sup>451</sup> Solomon, J., Duschinsky, R., Bakkum, L., & Schuengel, C. (2021) Issues of method in the assessment of disorganized attachment. In E. Waters, B. E. Vaughn, & H. S. Waters (eds), *Measuring Attachment: Developmental Assessments across the Lifespan* (pp. 170–193). New York: Guilford; Duschinsky, R. (2024) Mary Main: Portrait and tribute. *Attachment & Human Development*, early view.

<sup>452</sup> Hesse, E. & Main, M. (1999) Second-generation effects of unresolved trauma in nonmaltreating parents: Dissociated, frightened, and threatening parental behavior. *Psychoanalytic Inquiry*, 19(4), 481–540.

<sup>453</sup> Duschinsky, R., Bakkum, L., Mannes, J. M., Skinner, G. C., Turner, M., Mann, A., ... & Beckwith, H. (2021) Six attachment discourses: Convergence, divergence and relay. *Attachment & Human Development*, 23(4), 355–374.

<sup>454</sup> Schuengel, C., Bakkum, L., Madigan, S., & Fearon, P. (2024) Mary Main’s written legacy: A bibliometric analysis, preprint: <https://osf.io/preprints/psyarxiv/jcgfn>.

have sought to innovate to increase the pertinence of these methods and ideas for understanding attachment and caregiving in families facing adversities and clinical needs. In particular, Lyons-Ruth and colleagues have repeatedly used questions about Main's theory and methods to ask fundamental questions about the nature of attachment relationships and the challenges they face. Moreover, with a prevailing image of Main's theory and methods situated within developmental science as a symbol of attachment research itself, the questions asked by Lyons-Ruth and colleagues have raised for consideration the direction and possibilities of attachment research itself.

The US and Dutch academic developmental science communities have remained somewhat standoffish and conservative, rather lacking criteria for distinguishing innovation from the disfigurement of the field's core measures, though rarely publicly critical of Lyons-Ruth. For example, work on disturbances of the secure base script approach applied to the AAI has seemed unaware of Lyons-Ruth's relevant work on Hostile/Helpless AAIs.<sup>455</sup> Nonetheless, there has been considerable interest from researchers in Canada and in continental Europe.<sup>456</sup> Many psychodynamic and integrative clinicians have also taken notice of her work, and were always an audience Lyons-Ruth had in mind in her thinking and writing.<sup>457</sup> Lyons-Ruth's contributions have received particular praise from clinical-academic attachment researchers. Slade has emphasized the value of Lyons-Ruth's work in stimulating researchers and offering insight to clinicians, which 'cannot be overemphasised'.<sup>458</sup> Moore, a clinical supervisee of Bowlby's, has described Lyons-Ruth's as adding 'exponentially' to our understanding of attachment.<sup>459</sup>

In her methodological innovations, Lyons-Ruth has had something of a non-conformist stance towards main-stream developmental attachment research. This non-conformity has represented the freedom to engage with Main's work with methodological versatility and a different kind of seriousness. When the FR coding system was abandoned by Main, who was not mentally or physically well enough to train others in it or share it, considerable elements of FR were preserved and brought forward by AMBIANCE. When the six-year system was abandoned by Main, again Lyons-Ruth's group were one of the few to continue empirical investigations of controlling child behaviour. Main was interested in the respective contribution of alarming caregiver behaviour and disorganized attachment to later development, but Lyons-Ruth's group has been the primary laboratory to investigate this, as the field generally has been hypnotized by a reification of disorganized attachment.

<sup>455</sup> For example, Waters, T. E. A. & Facompré, C. R. (2021) Measuring secure base script knowledge in the adult attachment interview. In E. Waters, B. E. Vaughn, & H. S. Waters (eds), *Measuring Attachment: Developmental Assessment across the Lifespan*. New York: Guilford Press; Groh, A. M. & Haydon, K. C. (2024) The attachment script assessment: Introduction of a coding system to evaluate deactivation, hyperactivation, and anomalous content. *Attachment & Human Development*, 26(3), 203–211.

<sup>456</sup> See, for example, Pitillas, C. (2021) *El Daño que se Hereda: Comprender y abordar la transmisión intergeneracional del trauma*. Bilbao: Desclee De Brouwer; Dugravier, R. (2024) La théorie de l'attachement. Origines et perspectives. *Enfances & Psy*, (1), 107–119.

<sup>457</sup> For example, Arons, J. (2005) 'In a black hole': The (negative) space between longing and dread: Home-based psychotherapy with a traumatized mother and her infant son. *Psychoanalytic Study of the Child*, 60, 101–127; Gonzalez, Y. (2010) The impact of nightmares on the treatment of a 10-year-old girl. *Journal of Infant, Child & Adolescent Psychotherapy*, 9, 151–161; Markese, S. (2011) Dyadic trauma in infancy and early childhood: Review of the literature. *Journal of Infant, Child & Adolescent Psychotherapy*, 10, 341–378; VanDerHeide, N. (2012) The art of regulation: Therapeutic action in the shared implicit relationship. *International Journal of Psychoanalytic Self Psychology*, 7, 29–44; Constantini, A. & Coppola, G. (2023) Il valore euristico dei precursori genitoriali della disorganizzazione infantile per l'identificazione delle situazioni di pregiudizio per il minore. *Psicologia clinica dello sviluppo*, 27(1), 111–114.

<sup>458</sup> Slade, A., with Sadler, L. S., Eaves, T., & Webb, D. L. (2023) *Enhancing Attachment and Reflective Parenting in Clinical Practice: A Minding the Baby Approach*. New York: Guilford Press, p. 55.

<sup>459</sup> Moore, M. S. (2021) Importance of attachment in the presence of a perceived threat. In V. Sinason & R. Potgieter Marks (eds), *Treating Children with Dissociative Disorders* (pp. 27–33). London: Routledge, p. 30.

Studies by Lyons-Ruth's students have represented some of the very few continued uses of the guess-and-uncover methodology after Main. For all that it sometimes leads, as in many of Main's coding systems, to some categories built up inductively rather than according to a sharp and integral logic (e.g., the operationalization of the helpless subtype in Hostile/Helpless; disorientation in MCDC), guess-and-uncover has also contributed to vital discoveries, such as the implications of caregiver withdrawal behaviour.

The relationship between Lyons-Ruth and Main may be considered in terms of Bourdieu's field theory. Drawing on Max Weber, Bourdieu uses the metaphor of a Christian religious community to consider how power and authority work across sociological contexts.<sup>460</sup> A cadre of priests are invested with institutional authority to advise the community on good and acceptable practice, based on assumptions about their access to the truth. This claim to a truth and institutional authority organize the religious field, within which individuals' actions can take on religious meaning and within which struggles may take place for the definition of truth, control of the infrastructure, and access to followers.

However, in each generation individuals with a prophetic quality arise. They make use of the ideas and technical developments of the previous generation. But they claim an alternate truth, perhaps based on new revelation or a return to the sources, and on this basis make claims on the beliefs and behaviour of the community. The efforts of both priests and prophets help support the maintenance of the religious field, against its absorption by other fields and their priorities. Though there will be some religious actors more concerned to preserve the pure state of the field, and others more concerned to bend its resources towards practical concerns; a field benefits when synergies can be found between the two goals.<sup>461</sup> Bourdieu went on to apply this model to other fields of cultural production, in particular artistic work and academic research.

Descriptions of attachment theory and research as like a religion have been made by both attachment researchers and critics.<sup>462</sup> Generally, this is meant critically, to refer to the problems arising from in-group/out-group dynamics organized around use of specific measures and associated theory. With Bourdieu, the metaphor can also be extended descriptively.

In *Cornerstones*, I observed that subsequent attachment researchers inherited from Bowlby and Ainsworth a theory with (i) apparently intuitive and accessible elements, including positions on normative child rearing, integrated with (ii) subtle, technical distinctions in the use of concepts and theory (e.g., between attachment behaviour and the attachment behavioural system) and (iii) complex observational measures. This facilitated the development of a division between an inner core of specialized developmental researchers and a wide popular constituency of practitioners, parents, and policy-makers

<sup>460</sup> Bourdieu, P. ([1971] 1991) Genesis and structure of the religious field. *Comparative Social Research*, 13, 1–45; Bourdieu, P. ([1971] 1987) Legitimation and structured interests in Weber's sociology of religion. In S. Lash & S. Whimster (eds), *Max Weber, Rationality and Modernity* (pp. 119–136). London: Allen & Unwin.

<sup>461</sup> Bourdieu, P. (2005[1995]) The political field, the social science field, and the journalistic field. In R. Benson & E. Neveu (eds), *Bourdieu and the Journalistic Field* (pp. 29–47). Cambridge: Polity Press.

<sup>462</sup> From interview research: Spies, R. & Duschinsky, R. (2021) Inheriting Mary Ainsworth and the strange situation: Questions of legacy, authority, and methodology for contemporary developmental attachment researchers. *Sage Open*, 11(3), 21582440211047577: 'There was this dogmatism in the articulation of attachment theory and efforts to deviate, which means [work to] differentiate, modify, revise, rethink the dogma, was often treated as heresy' Mann, A., Thompson, M., Foster, S., Beckwith, H., Madigan, S., Fearon, R. P., ... & Duschinsky, R. (2023) The perspectives of senior researchers in applied disciplines on the current state of developmental attachment research: An interview study. *Sage Open*, 13(2), 21582440231179204: 'I think my problem with the, with the field of attachment is, I see too many ideologues and too much ideology. It's kind of like, this is what Mary said. This is what Bowlby said. This is what Sroufe said. So, it's almost like, you know, if you don't jump into that, then you're the equivalent of a Protestant.'

interested in attachment theory and research, with terms like ‘attachment’ and ‘security’ offering switchers and relays between these different domains. More than many other areas of psychological research, this predicament has contributed to a similar structure to clergy and laity.

Considered in this way, Bourdieu’s framework then helps highlight something curious about attachment research since the 1990s. Mary Main has been situated as Ainsworth’s successor, the method-giver. In Bourdieu’s terms, she has held the role of high priest, establishing the methodological infrastructure and beliefs that allow access to the truth of what attachment is and how it functions. This has helped structure and firm up attachment research as a field of inquiry, organize the training and goals of researchers, and negotiate felt access to these truths for the many audiences of attachment research. Bourdieu’s model would predict that a younger generation would come and, adapting these truths, in doing so make claims for changes to the beliefs and behaviour of the audiences of attachment research.

Applied to attachment research, the model is right and wrong in interesting ways. Main has had a role similar to high priest. And the esoteric aspect to her work, with manuscripts only shared on the basis of personal connection or connections with Main’s students, no doubt helped in some ways to solidify relations of authority. But rather than actually operating as high priest, Main has been increasingly absent over decades due to declining mental and physical health, with the machinery of attachment research whirring on regardless.<sup>463</sup> This contributed to a situation in which the version of attachment theory and methodology ascribed to Main, both by researchers and by non-academic audiences, has been discrepant in all kinds of ways from her actual views and hopes for her work. Furthermore, no training or copy of the coding manual has been available on most of the Berkeley measures, and in Main’s absence there has been a lack of clarity about the terms under which conceptual or technical innovations might be authorized.

In some regards, Lyons-Ruth aligns well with Bourdieu’s account of the prophetic role of the younger generation. Her work builds within the existing infrastructure, for instance with the Hostile/Helpless classification functionally an add-on or alternative for researchers already using the AAI. Her methodological adjustments to canonical measures have generated new research findings and suggest new directions for attachment research partly in terms of their relevance for clinical applications. Above all, her work encourages a shift ‘from an emphasis on mechanisms of physical proximity and protection to an emphasis on mechanisms of intersubjective exchange’ and the ‘continuous relational processes that regulate both positive engagement and the baby’s fearful responses to challenging events.’<sup>464</sup>

Yet Lyons-Ruth is also discrepant from Bourdieu’s model in notable ways. Bourdieu expects a cadre of members of a younger generation to offer alternative proposals for how to move the field forwards. To an extent this can be seen, for example with measures of reflective functioning, the secure base script, and other assessments ([Chapter 1](#)). However, there has been pressure to refrain from criticism of Main’s ideas and methods from major figures within attachment research. The research community in developmental science has generally remained loyal to what they understand to be Main’s theory and methods.

<sup>463</sup> Agamben, G. (2011) *The Kingdom and the Glory*, trans. L. Chiesa. Stanford: Stanford University Press, chapter 8.

<sup>464</sup> Lyons-Ruth, K. (2007) The interface between attachment and intersubjectivity: Perspective from the longitudinal study of disorganized attachment. *Psychoanalytic Inquiry*, 26(4), 595–616, p. 601.

Yet the community's access to Main's theory and methods has been limited. Lyons-Ruth has had a greater understanding of disorganized attachment than most other researchers. With Mary Main unable to write it, she and Debby Jacobvitz were given responsibility for writing the chapter on disorganized attachment in the *Handbook of Attachment*. The 1999 chapter is Lyons-Ruth's most cited text and is one of the few portraits of the concept that actually aligns with Main's own ideas. Furthermore, with the FR system out of commission, the primary alternate method for assessing alarming caregiver behaviour has been AMBIANCE, which preserved components of FR. Lyons-Ruth has in many ways acted as Bourdieu might expect, building on existing ideas and infrastructure and offering new and non-conformist theoretical and methodological proposals, with implications for applied practice. But the field she was seeking to stimulate and reform has been, in sociological terms, a strange one, seemingly unable to know what licence it has to innovate, but with limitations on its access to orthodox theory and methods.

A further proposal made by Bourdieu is that the system of categories used by the priest class help sustain, and in turn receive a tacit support from, the structure of the social field itself.<sup>465</sup> In our case, Bourdieu's proposal would suggest that the categories offered by Main and accepted by developmental attachment researchers would also offer a *kind of map* of the structure of the community invested in attachment knowledge.

At one pole of the field would be Main and other students of Ainsworth, secure in their access to the truth about attachment and right to make claims about it.<sup>466</sup> At the other pole would be researchers, social workers, clinicians and other stakeholders feeling confused, conflicted, or apprehensive about the implication for their work of the value they perceive in ideas about attachment, and whether they understand these ideas correctly.<sup>467</sup> As Lyons-Ruth has shown: confusion, conflict, and apprehension are expectable responses to a withdrawing caregiver—or, in this case, leader—who is ostensibly present but in fact does not provide support for development, help when needed, or facilitate regulation.

Attachment researchers have decried the disorganized understanding of attachment theory and methods among practitioner audiences.<sup>468</sup> Yet in fact such disorganization characterizes the research community too. There is considerable confusion, conflict, and apprehension about the meaning of foundational concepts such as 'attachment' and 'disorganization'.<sup>469</sup> As an illustration, Fonagy and colleagues use the term 'disorganization' in five different ways, without seeming to recognize the contradictions.<sup>470</sup> Access to the means for understanding these concepts can be scarce (e.g., depending on access to an in-group or unpublished manuscripts) and resource-intensive (e.g., requiring attendance at fortnight-long trainings).<sup>471</sup> In terms of theory as a kind of map of the social structure: the

<sup>465</sup> Bourdieu, P. (1977) *Outline of a Theory of Practice*, trans. R. Nice. Cambridge: Cambridge University Press.

<sup>466</sup> Though an analogy may be drawn between the way that sensitivity was assumed identical with and so subordinated to the Strange Situation within attachment theory, and the subterranean position of the 'security theory' within the work of Waters and collaborators in the 1990s and early 2000s—see [Chapter 1](#).

<sup>467</sup> Soberg Bjerre, L., Jacob Madsen, O., & Petersen, A. (2023) 'But what are we doing to that baby?' Attachment, psy-Speak and designed order in social work. *European Journal of Social Work*, 26(1), 54–65; Foster, S. (2023) Attachment and reflective functioning in child welfare practice. Unpublished doctoral thesis, Northumbria University.

<sup>468</sup> For example, Main, M., Hesse, E., & Hesse, S. (2011) Attachment theory and research: Overview with suggested applications to child custody. *Family Court Review*, 49(3), 426–463.

<sup>469</sup> Reijman, S., Foster, S., & Duschinsky, R. (2018) The infant disorganised attachment classification: 'Patterning within the disturbance of coherence'. *Social Science & Medicine*, 200, 52–58.

<sup>470</sup> Duschinsky, R., & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press, [Table 3.1](#) and p. 71ff.

<sup>471</sup> An analogy here may be seen with classic Marxist thinking about the 'lumpenproletariat'. This group was conceptualised as unemployed individuals, existing within capitalism but without access to its apparatuses, and so without the basis for knowledge of themselves and identification as part of the working class. Later social theory



depiction of confusion, conflict and apprehension as a categorical feature of practitioners (as opposed to researchers) can be regarded as corresponding to Main's operationalization of disorganization as a category, whilst acknowledging that in reality it is a spectrum.<sup>472</sup>

In terms of Bourdieu's idea of theoretical categories as a map of the community, Lyons-Ruth's position in the field, signs of insecure-avoidance might be seen in apparent decisions to avoid going head-to-head with Main. For instance, the Middle Childhood Disorganization and Control Scales seem to have been developed holding in mind the need to avoid trespass on the Main and Cassidy six-year system. Or to take another example, AMBIANCE was found to predict disorganized attachment even excluding the items taken from the FR system. The natural test would have been a hierarchical regression with FR entered first, to see whether and how much unique additional variance is predicted by AMBIANCE. That this test was not reported by Lyons-Ruth could be for various reasons, but one might be a sense of insecurity about potential backlash from Main's advocates. It may be, however, that Lyons-Ruth did not wish to push too far for AMBIANCE, claiming that it can supplant FR, on the basis only of the measure's development sample.

Yet there are also signs of security in Lyons-Ruth's position in the field. Her use of the Strange Situation and the AAI as canonical measures has supported her to offer proposals regarding the nature of attachment relationships. For instance, her claims for the importance of intersubjective communication within the attachment relationship have been supported by intriguing findings regarding the correlates of caregiver withdrawal and/or disorientation. Across her work, Lyons-Ruth has clearly felt that she can put forward new ideas about attachment relationships, especially for families facing adversity, and break new ground in examining potential antecedents and sequelae. Operating in the context of discovery, she has attempted to explore diverse lines of possible influence, listening for signals of those that might be worth further investigation by others. The truths produced are, in Phillips words, 'a raft, a rough-at-each-of-its-edges affair of many sturdinesses lashed together'.<sup>473</sup> They are far from unassailable, but they were not intended to be. Rather, they have been highly generative for theory and research on attachment.

has recognized that a categorical distinction between the lumpenproletariat and other workers under capitalism cannot be sustained on this basis, as dispossession of the apparatuses of capitalism, or at least precarious access to them, is also characteristic of employed workers too by degrees. Stallybrass, P. (1990) Marx and heterogeneity: Thinking the lumpenproletariat. *Representations*, 31, 69–95; Han, C. (2018) Precarity, precariousness, and vulnerability. *Annual Review of Anthropology*, 47(1), 331–343.

<sup>472</sup> Duschinsky, R., & Solomon, J. (2017) Infant disorganized attachment: Clarifying levels of analysis. *Clinical Child Psychology and Psychiatry*, 22(4), 524–538.

<sup>473</sup> Phillips, C. (2008) The raft. *The Yale Review*, 96(2), 87–87.

# Jay Belsky, the Pennsylvania Child and Family Development Project and the NICHD Study of Early Child Care and Youth Development

## Biographical Sketch

Jay Belsky pursued graduate studies with Urie Bronfenbrenner at Cornell. This included work on a narrative review of the effects of daycare on children.<sup>1</sup> The review was published in the same issue of the journal *Child Development* as the first follow-up study of children seen in the Strange Situation by Sroufe and Egeland.<sup>2</sup> Influenced by the Minnesota studies, in 1986 Belsky published a controversial further review, drawing on attachment theory and research to call attention to the potential risks of daycare in the first year of life. This controversy was central to the commissioning of the large NICHD study of the effects of childcare, for which Belsky was a co-investigator. In his first academic job at Penn State, Belsky and his team conducted four short-term longitudinal studies examining family relations, including parenting and attachment with community samples. Distinctive aspects of these studies included concern for the role of fathers and child temperament. Belsky developed important theoretical proposals about the ecological factors that influence parenting behaviour and child maltreatment and presented important commentary on the strengths and weaknesses of attachment theory and research. Over the years, Belsky has been a creative force, with a facility for turning innovative ideas into new forms of scientific research. This has included pioneering applications of evolutionary life history theory, and the development of new ideas about the interaction between environment and person in shaping human development. This work has had considerable impact within and beyond developmental science.

## Introduction

In this chapter I address the work of Jay Belsky relevant to attachment research. Bibliometric analysis has identified Belsky among the thousand most influential modern scientists across any discipline globally, and among the five most influential developmental psychologists.<sup>3</sup> I begin by describing Belsky's early conceptual work on factors that influence child development and child maltreatment. I then discuss the multi-wave longitudinal study that

<sup>1</sup> Belsky, J. & Steinberg, L. D. (1978) The effects of day care: A critical review. *Child Development*, 49(4), 929–949.

<sup>2</sup> Matas, L., Arend, R. A., & Sroufe, L. A. (1978) Continuity of adaptation in the second year: The relationship between quality of attachment and later competence. *Child Development*, 49(3), 547–556.

<sup>3</sup> Ioannidis, J. P. A. (2023) October 2023 data-update for 'Updated science-wide author databases of standardized citation indicators'. *Elsevier Data Repository*, V6, doi: 10.17632/btchxktzyw.6.

he and colleagues conducted at Pennsylvania State University, which provided early empirical evidence regarding how attachment relationships are shaped by the broader family context. Informed by his empirical work, Belsky then presented an account of attachment theory that integrated ideas from the developmental and social psychological traditions. The chapter then goes on to discuss a major longitudinal study in which Belsky was involved: the National Institute of Child Health and Human Development (NICHD) study of early child care and youth development. I discuss the key findings from the study and highlight methodological strengths and limitations that have bearing for how we interpret the results. In the final two sections of the chapter I discuss ways that Belsky has brought developmental science into dialogue with biology: through his theory of differential susceptibility; and his psychosocial acceleration hypothesis. This work has contributed to the liveliness of attachment theory and research and to its contemporary relevance.

To situate Belsky's later research on attachment and caregiving, I will first describe his background and early work. Belsky grew up in a middle-class family on Long Island, NY. His parents owned a luncheonette. He recalls that he was 'quite straight-laced and dutiful as a boy', and wanted to attend the prestigious United States Military Academy at West Point. Despite this long-term ambition, he enrolled in Georgetown's School of Foreign Service, where extra-academic experiences working in a nursery with young children led him to transfer to Vassar College, which had a nursery school on campus, to study child development.<sup>4</sup> Upon enrolling at Cornell, Belsky became excited by research, to which his long career attests.

Belsky's early work bears the clear mark of his graduate studies with Bronfenbrenner. Bronfenbrenner's ecological framework sought to place child development firmly within its context through systematic consideration of the nested nature of the child's experience of their family, community and wider society. Bronfenbrenner emphasized the critical role of interaction between factors at different levels in shaping individual experience, the individual's response to their environment, and his or her development over time, though Bronfenbrenner acknowledged that these interactions may be difficult to isolate and measure.<sup>5</sup>

During Belsky's time at Cornell, Bronfenbrenner undertook a critique of Bowlby and attachment theory, regarding it as overfocused on decontextualized aspects of relationships and specific behaviours: 'the science of the strange behavior of children in strange situations with strange adults for the briefest possible periods of time.'<sup>6</sup> For his part, Bowlby was impressed with Bronfenbrenner's work. He liked Bronfenbrenner's developmental and contextual focus, which raised profound questions of whether 'something living which has developed historically can ever be restructured without reference to its historical origins.'<sup>7</sup> Bowlby was particularly fascinated by the relationship between child and primary caregiver, which he regarded as essential to understand in order to help individuals in psychotherapy restructure their expectations of themselves and others. At the same time, he appreciated Bronfenbrenner's concern with other important relationships and institutional contexts.

<sup>4</sup> Belsky, J. (2003) The politicized science of day care: A personal and professional odyssey. *Family Policy Review*, 1, 23–40.

<sup>5</sup> Darling, N. (2007) Ecological systems theory: The person in the center of the circles. *Research in Human Development*, 4(3–4), 203–217. Obstacles to identification of interactional effects include the sample size required for adequate statistical power, restricted variability in measurement and sample, and difficulties tracking non-linear relationships.

<sup>6</sup> Bronfenbrenner, U. (1977) Toward an experimental ecology of human development. *American Psychologist*, 32(7), 513–531, p. 513.

<sup>7</sup> Bowlby, J. (c.1950) Marginalia on Bronfenbrenner's 'Toward an integrated theory of personality'. John Bowlby Archive, Wellcome Collections, PP/Bow/J.9/37.

Furthermore, Bowlby recognized the validity of questions Bronfenbrenner posed to attachment theory and research: 'By what criteria, it may be asked, are we categorizing certain persons as well integrated, secure, and mentally healthy, and others as not so? How valid are these criteria? Are we, perhaps, in judging certain personality characteristics favourably doing no more than apply middle-class standards in an area in which they have no relevance? Is there danger therefore that our results are at the best of no more than limited application and at the worst positively misleading?'<sup>8</sup> Bowlby's response was that 'it must therefore be strongly emphasized that, in concentrating on the one set of criteria to the exclusion of others, no claim is made that the criteria selected are the only ones of importance. The reason for so concentrating is that in the practice of psychiatry the issues that must be our first concern are those of mental health and ill health.'<sup>9</sup>

Inspired by the work on the aetiology of child abuse and neglect, including the Minnesota study, Belsky came to the conclusion that Bronfenbrenner's ecological approach could be integrated with empirical attachment research. Yet it led to a somewhat different point of insertion to the other developmental scientists entering attachment research in the 1980s. For Belsky, 'Bronfenbrenner's ecological framework provided a means for expanding the attachment research agenda. This is because it drew attention to issues not explicitly emphasized in attachment theory, but which seemed latent in the theory.'<sup>10</sup>

Belsky wished to explore how the same circumstances—whether the temperament of a child or the impact of a caregiver's behaviour—could have very different consequences depending on their context and their meaning within attachment relationships. This was quite a different image of how developmental science could and should operate in the conceptualization and treatment of variables:

Not only do processes of mediation need to be central to our understanding of the origins of individual differences in attachment (distal factors—> parent-child interaction—> attachment security), but so too do moderational ones, because the impact of one source of influence is highly likely to be contingent on another. As Bronfenbrenner (1979, p. 38) so astutely noted, in the ecology of human development, and thus with respect to the etiology of secure and insecure infant-parent attachment bonds, 'the principal main effects are likely to be interactions.'<sup>11</sup>

In fact, Belsky's interest in factors at different levels took him beyond Bronfenbrenner. He was inspired by Bowlby's thinking about biological and evolutionary processes, which were outside of Bronfenbrenner's theoretical frame. During the period of Belsky's graduate studies, there was also growing attention within and beyond developmental psychology to the causes of child abuse and neglect. The topic of maltreatment was clearly a preoccupation for Belsky. Though Bronfenbrenner's general focus was on normative development, his ecological model provided important inspiration for Belsky and other researchers in the 1980s and 1990s interested to understand the layered contexts that may contribute to child maltreatment.<sup>12</sup>

<sup>8</sup> Bowlby, J. (1973) *Separation*. London: Penguin, p. 326.

<sup>9</sup> *Ibid.*, 328.

<sup>10</sup> Belsky, J. (1999) Interactional and contextual determinants of attachment security. In J. Cassidy & P. Shaver (eds), *Handbook of Attachment* (pp. 249–265). New York: Guilford, p. 250.

<sup>11</sup> Belsky, J. (1999) Interactional and contextual determinants of attachment security. In J. Cassidy & P. Shaver (eds), *Handbook of Attachment Theory and Research*, (pp. 249–265). New York: Guilford, p. 260, citing Bronfenbrenner, U. (1979) *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harvard University Press.

<sup>12</sup> Belsky, J. & Stratton, P. (2002) An ecological analysis of the etiology of child maltreatment. In K. Browne, H. Hanks, P. Stratton, & C. Hamilton (eds), *Early Prediction and Prevention of Child Abuse: A Handbook* (pp.

For example, most developmental scientists in the period tended to treat happiness and distress as a spectrum between positive and negative, and assume they simply had inverse correlates. Among the primary exceptions were Ainsworth's circle and allies. As we saw in [Chapter 1](#), students of Ainsworth such as Waters and Bretherton sought to emphasize that the positive feelings sustained by secure base availability are not reducible to the opposite of alarm or anxiety, but have a distinct importance within attachment relationships.<sup>13</sup> As discussed in *Cornerstones of Attachment Research*, Sroufe and Minnesota colleagues were interested by both distress and delight by mothers and babies as specific kinds of cues for response within an attachment relationship, and not merely opposites on a spectrum.<sup>14</sup> Furthermore, Sroufe highlighted that distress and delight matured as affects on different schedules, again further evidence that they were not reducible to the reverse of one another.<sup>15</sup>

Likewise, Bronfenbrenner felt it was extremely important to conceptualize and study the specific correlates of positive and negative aspects of human life—whether distress and happiness, antisocial and prosocial behaviour, or other apparent ‘opposites’. Bronfenbrenner urged that in practice they would not be merely the inverse of one another as their meanings would be different in context.<sup>16</sup> Belsky coded both distress and happiness in his doctoral dissertation under Bronfenbrenner's supervision, a study of mother–father–infant triadic interaction.<sup>17</sup>

In 1980, Belsky published an account of child maltreatment applying Bronfenbrenner's perspective. This would become one of Belsky's most cited papers. Still today, it is regarded as a fundamental ‘breakthrough’ in moving beyond unifactorial models.<sup>18</sup> Belsky argued that there is not only no single cause of child maltreatment, but similarly no necessary or sufficient causes. Instead, whether or not maltreatment takes place, and its form, is ‘multiply determined by forces at work in the individual and the family, as well as in the community and the culture in which both the individual and the family are embedded’.<sup>19</sup>

Considering factors at a societal level that may be relevant to child maltreatment, Belsky's account reflected prevailing perspectives in 1980s reactionary right-wing politics. He argued that feminism and the women's movement had ‘denigrated the role of child care’ and ‘devalued the responsibilities of parenthood’. Furthermore, he pointed to a causal role in child maltreatment of ‘the narcissistic “me first” approach to life that seems to be rapidly enveloping contemporary American society’.<sup>20</sup> However, there is a sense that these macro-level factors are beyond Belsky's true interest.

95–110). Chichester, UK: Wiley: ‘Largely due to the seminal contribution of Bronfenbrenner, child maltreatment is now widely recognised to be multiply determined by a variety of factors’ (95).

<sup>13</sup> For example, Waters, E., Wippman, J., & Sroufe, L. A. (1979) Attachment, positive affect, and competence in the peer group: Two studies in construct validation. *Child Development*, 50(3), 821–829.

<sup>14</sup> Sroufe, L. A. & Waters, E. (1976) The ontogenesis of smiling and laughter: A perspective on the organization of development in infancy. *Psychological Review*, 83(3), 173–189; Sroufe, L. A., Schork, E., Motti, E., Lawroski, N., & LaFreniere, P. (1984) The role of affect in social competence. In C. Izard, J. Kagan & R. Zajonc (eds), *Emotion, Cognition and Behavior* (pp. 289–319). New York: Plenum; Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, [chapter 4](#).

<sup>15</sup> Sroufe, L. A. (1996) *Emotional Development*. Cambridge: Cambridge University Press.

<sup>16</sup> Bronfenbrenner, U. (1979) *The Ecology of Human Development: Experiments by Nature and Design*. Cambridge, MA: Harvard University Press.

<sup>17</sup> Belsky, J. (1979) Mother–father–infant interaction: A naturalistic observational study. *Developmental Psychology*, 15(6), 601–607.

<sup>18</sup> For example, Haque, M. A., Ratan, Z. A., Anjum, A., Fatema, K., Mashreky, S. R., & Moniruzzaman, S. (2023) Breaking the silence: Investigating the prevalence and key risk factors of child maltreatment among male working children in a rural community in Bangladesh. *New Directions for Child and Adolescent Development*, 2023.

<sup>19</sup> Belsky, J. (1980) Child maltreatment: An ecological integration. *The American Psychologist*, 35(4), 320–335, p. 320, parentheses suppressed.

<sup>20</sup> *Ibid.*

The central argument of the paper is that researchers need to examine individuals' and families' coping strategies, as well as the kinds of stress or adversity to which they are subject. Attempts to predict child maltreatment should take into account factors that undermine or contribute to parental coping across different levels, with theoretical and statistical models developed on the expectation that causes are ecologically nested within one another. It may be that parents with a temperamentally difficult or physically disabled child may only be more likely to display maltreating behaviours if there is a lack of social support from friends and relatives, or if the parent has themselves a history of adverse care when they were growing up.

## The Process Model

These ideas about child maltreatment fed into Belsky's broader thinking about child development, and how to conceptualize it as a process. Developmental psychology has faced a tension between two different principles. In one, the science of development attends to self-contained causes or effects, treating them as *static substances*. In another, the science of development addresses the interaction of *processes and their emergent properties*, composite and dynamic.<sup>21</sup> Part of what is distinctive about Belsky's work is the nature of the compromise he has made between these principles. He has disparaged over-simplified causal explanatory accounts and incorporated much more attention to process than many colleagues, though there have been striking limits to this incorporation.

In particular, influenced by his early studies with Bronfenbrenner, Belsky has been unusual in developmental psychopathology for his tendency to avoid reifying predictors and outcomes, recognizing that each is a composite, and potentially dynamic. Belsky has also been distinctive in often giving attention to interactions where others have assumed main effects. Both these points were recognized by attachment researchers in theory, and were overriding theoretical concerns for Sroufe,<sup>22</sup> but the perspective frequently got lost in attachment research, including in study design and interpretation of findings.

The case of Sroufe, Egeland, and the Minnesota group is interesting in reflecting tensions between process- and substance-oriented thinking. The Minnesota researchers tended to study individual differences in attachment as predicted by sensitive care, and as in turn predicting later outcomes; and sensitive care as predicted by contextual factors.<sup>23</sup> The emphasis in principle was on early care as a dynamic and multi-layered process, following Ainsworth.<sup>24</sup> Nonetheless, the statistical tests used by the Minnesota group, and their narrative accounting for their results, often tended to depict attachment as if it were a

<sup>21</sup> Cf. Rescher, N. (1996) *Process Metaphysics: An Introduction to Process Philosophy*. New York: State University of New York Press; Nicholson, D. J., & Dupré, J. (2018) *Everything Flows: Towards a Processual Philosophy of Biology*. Oxford: Oxford University Press; Van Geert, P. & de Ruiter, N. (2022) *Toward a Process Approach in Psychology: Stepping into Heraclitus' River*. Cambridge: Cambridge University Press.

<sup>22</sup> Sroufe, L. A. (1996) *Emotional Development*. Cambridge: Cambridge University Press.

<sup>23</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 4.

<sup>24</sup> This orientation can be seen from Ainsworth's earliest writings, for example Ham, A. W. & Salter, M. D. (1943) *Doctor in the Making: The Art of Being a Medical Student*. Montreal: J. B. Lippencott: 'Phenomena which can be understood properly only by thinking in terms of relations between processes' (62). Ainsworth's contributions as a process theorist have been argued explicitly by Sroufe and Waters, for example Waters, E. & Waters, T. E. A. (2024) Developmental change, bricolage, and how a lot of things develop: Mechanisms and changes in attachment across the lifespan. *Development & Psychopathology*. forthcoming: 'Mary Ainsworth's orientation was ethological and developmental. The ethological perspective in particular informed her intuitions about the complexity, organization, context sensitivity, and "meaning" of behavior. Her approach also incorporated a sensitivity to (1) the interrelatedness of psychological processes, (2) dynamic processes rather than static states, (3) multiple levels of analysis, (4) change and development, and (5) non-linear effects.' Unfortunately, the view of Sroufe and Waters is based in part on access to Ainsworth's ideas beyond her published works. The clearest statement by Ainsworth of her process orientation can be found in one of her most influential conference presentations, which

stable substance, and a property of the child. No doubt this may be attributed in considerable part to the genre conventions for explanation in developmental science in the period, supporting and supported by a repertoire of statistical tests focused on main effects.<sup>25</sup>

Like Bronfenbrenner and Sroufe, and in contrast to much other process thinking within the social sciences such as systems theory, Belsky has been fundamentally confident that scientific practice can isolate and measure causal processes:

The rhetoric of systems theory when applied to the family has all too often been used by clinical practitioners and investigators in ways that call into question its scientific utility. Indeed, it seems all too often that systems language is called on when the complex nature of the phenomenon is not well understood—or has not been empirically substantiated. With a few rare exceptions [here the example is given of Sroufe's integration of family systems and attachment theory] ... writings about family systems [are] confusing, if not obfuscatory, providing few tangible leads as to how to go about investigating the developing family system.<sup>26</sup>

An important early statement of this position was Belsky's 1984 paper, presenting a 'process model' of the determinants of parenting behaviour. This paper was published in a special issue of the journal *Child Development*, edited by Cicchetti, which established 'developmental psychopathology' as a discipline within developmental science. This would be, by far, Belsky's most cited paper—in fact, it is the most cited paper discussed in this book. It seems to have served a fundamental reference point, and source of conceptual support, for developmental psychopathology as an emerging movement, and for developmental psychology as a whole. It is widely characterized as 'a classic'<sup>27</sup> and as 'extremely influential'.<sup>28</sup> Looking back, Cicchetti and Aber have praised Belsky's article as having helped call 'attention to the importance of viewing the development of psychopathology within a continuously unfolding, dynamic, and ever changing context'.<sup>29</sup> Van IJzendoorn has praised the process model for its recognition of polyvalence, for instance how the same contextual factor (e.g., the involvement of a grandparent) may have both positive and negative implications for a family.<sup>30</sup>

circulated in manuscript form among her students and allies. Ainsworth, M. (1984) Attachment, adaptation and continuity. Paper presented at the International Conference on Infant Studies, April 1984, John Bowlby Archive, Wellcome Collections, PP/Bow/J.1/57. For report on and discussion of this conference paper, see Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press, chapter 7.

<sup>25</sup> Minnesota researchers also felt heavily their responsibilities in demonstrating the importance of early relationships, against the views of dismissive critics, which may have contributed to the pressure for straightforward statistical tests and a forceful and straightforward narrative. Work to pick apart the respective contributions of different aspects of care and emergent properties of the child-caregiver relationship required initial work to establish that care itself was relevant and important for development. Sroufe, A. (2020) *A Compelling Idea: How We Become the Persons We Are*. Brandon, VT: Safer Society Press.

<sup>26</sup> Belsky, J., Rovine, M., & Fish, M. (1989) The developing family system. In M. Gunnar & E. Thelen (eds), *Systems and Development: Minnesota Symposia of Child Psychology* (Vol. 22, pp. 119–166). Hillsdale, NJ: Erlbaum, p. 121.

<sup>27</sup> Taraban, L. & Shaw, D. S. (2018) Parenting in context: Revisiting Belsky's classic process of parenting model in early childhood. *Developmental Review*, 48, 55–81, p. 55.

<sup>28</sup> Kochanska, G. & An, D. (2024) Developmental psychopathology: Our welcoming, inclusive, and eclectic intellectual home. *Development and Psychopathology*, early view.

<sup>29</sup> Cicchetti, D., & Aber, J. L. (1998) Contextualism and developmental psychopathology. *Development and Psychopathology*, 10(2), 137–141.

<sup>30</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (1997) Intergenerational transmission of attachment: A move to the contextual level. In L. Atkinson & K. J. Zucker (eds), *Attachment and Psychopathology* (pp. 135–170). New York: Guilford Press; Liang, X., Lin, Y., Van IJzendoorn, M. H., & Wang, Z. (2021) Grandmothers are part of the parenting network, too! A longitudinal study on coparenting, maternal sensitivity, child attachment

The fundamental arguments of Belsky's 'process model of the determinants of parenting' are:

- '[that] parental functioning is multiply determined,
- that sources of contextual stress and support can directly affect parenting or indirectly affect parenting by influencing individual psychological well-being,
- that personality influences contextual support/stress, which feeds back to shape parenting,
- and that, in order of importance, the personal psychological resources of the parent are more effective in buffering the parent-child relation from stress than are contextual sources of support, which are themselves more effective than characteristics of the child'.<sup>31</sup>

Bronfenbrenner's ecological perspective is clearly evident in this concern for multiple determination and contextual factors. Still, three elements of this characterization were notable departures from, or revisions of, Bronfenbrenner. In part, these reflect the fact that though Belsky's process model addressed child development in general, he was primarily thinking about infancy, where child-caregiver relationships are especially central:

1. Communal and societal influences have dropped out of the model. Community violence, racism, structural inequalities—none of these factors are explicitly excluded as relevant to parenting behaviour, but neither are they given a position in the model. In retrospect Belsky has acknowledged this as 'clearly a mistake'.<sup>32</sup> Economic factors, such as poverty, are only treated as relevant to the extent that a parent's work or unemployment may cause them stress or affect their personality.
2. Belsky placed far greater emphasis on the personality of the parent than Bronfenbrenner, who had moved away from the concept as less a cause than an effect of other processes within the family. By contrast, in Belsky, the parent's personality had a critical role in mediating the effects of other stressors. He felt that the benefits for child development of family social support, such as the availability of friends and relatives, will be profoundly impacted by the parent's personality, which will determine the extent and how these are utilized.<sup>33</sup> Belsky's use of the term 'personality' has understandably been understood by readers of his work to mean the construct of personality traits. However, in the paper, he included depression under personality, and in [Table 3.1](#) the construct is characterized as 'parental personality and psychological wellbeing'. In retrospect, Belsky has clarified that 'I was really referring to

and behavior problems in a Chinese sample. *New Directions for Child and Adolescent Development*, 2021(180), 95–116.

<sup>31</sup> Belsky, J. (1984) The determinants of parenting: A process model. *Child Development*, 55(1), 83–96, p. 83. For a later presentation of the process model, incorporating findings from the Pennsylvania Child and Families Development Project and subsequent other literature, see Belsky, J. (1993) Etiology of child maltreatment: A developmental-ecological analysis. *Psychological Bulletin*, 114(3), 413–434. In the 1993 paper, the emphasis on personality is diminished, the emphasis on interactional effects has been further strengthened, and Belsky is able to point to more evidence for the causal effects of unemployment stress on maltreatment. However, in other respects, the model is retained.

<sup>32</sup> J. Belsky, personal communication, April 28, 2024.

<sup>33</sup> Belsky, J. (1984) The determinants of parenting: A process model. *Child Development*, 83–96, p. 91.



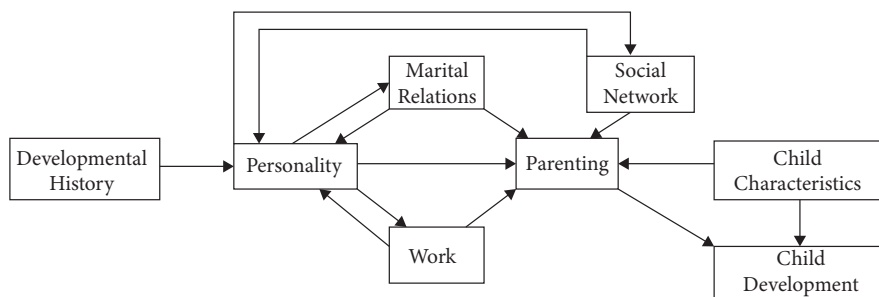


Figure 3.1 A process model of the determinants of parenting.

“psychological resources” of the parent, broadly conceived,<sup>34</sup> as a few readers have recognized.<sup>35</sup>

3. Bronfenbrenner spoke about the nesting of ecological causes, but this is a metaphor, and does not imply specific causal claims. In general, he held that regular forms of action and interaction between parents and children—which he termed proximal processes—exert a more powerful influence on developmental outcomes than contextual factors in which children may participate less directly.<sup>36</sup> Nonetheless, he still held that contextual factors would make small, independent contributions to development. Belsky departed from this position and offered a model with parenting as the fundamental mediator. He did not explicitly deny that other processes could be relevant. However, in his model, the only influence of sociological factors (e.g., schooling; cultural expectations) or family-level factors (e.g., parental conflict; insecure housing; parental illness; instability in who lives in the home) on child development was presumed to be through the parent’s direct behaviour towards their child. Parents’ behaviour was situated as both the most amenable and the most relevant target of interventions to support child development. Parental psychology was also given a prominent place in the paper, but ultimately it was assigned a distal role compared to parents’ behaviour, as in Figure 3.1.

As such, Belsky’s model encouraged greater attention to the interaction of processes and their emergent properties than was at all usual in developmental science at the time. Ramparts were then erected to protect these gains. In particular, the role of cultural and socioeconomic factors was functionally shut out from consideration except insofar as they contributed to parenting, constraining the kind of interaction and the extent of emergent properties considered relevant to child development.

Curiously, though not generally noticed by readers, one element of the paper ran in a contrary direction. This is Table 3.1, which suggests a model of cumulative risk, with equal causal weight given to different factors, rather than the assumption that influences on child development will occur through parents’ behaviour. Indeed, Table 3.1 suggests quite a different set of predictions to Figure 3.1.

<sup>34</sup> J. Belsky, personal communication, April 28, 2024.

<sup>35</sup> For example, Cassé, J. F., Finkenauer, C., Oosterman, M., van der Geest, V. R., & Schuengel, C. (2018) Family conflict and resilience in parenting self-efficacy among high-risk mothers. *Journal of Interpersonal Violence*, 33(6), 1008–1029.

<sup>36</sup> This claim would become especially prominent in Bronfenbrenner’s work from the mid-1990s. See Bronfenbrenner, U. (1995) Developmental ecology through space and time: A future perspective. In P. Moen, G. H.

**Table 3.1** Theoretical model of the relative probability of effective parental functioning in all possible conditions of parenting systems

| Relative probability of parent functioning competently | Conditions of the parental subsystems             |                                  |                       |
|--------------------------------------------------------|---------------------------------------------------|----------------------------------|-----------------------|
|                                                        | Parental personality and psychological well-being | Contextual subsystems of support | Child characteristics |
| Highest.....                                           | +                                                 | +                                | +                     |
|                                                        | +                                                 | +                                | –                     |
|                                                        | +                                                 | –                                | +                     |
|                                                        | –                                                 | +                                | +                     |
|                                                        | +                                                 | –                                | –                     |
|                                                        | –                                                 | +                                | –                     |
| Lowest.....                                            | –                                                 | –                                | +                     |
|                                                        | –                                                 | –                                | –                     |

Note : Plus sign (+) stands for supportive mode; minus sign (–) stands for stressful mode Belsky, J. (1984) The determinants of parenting: A process model. *Child Development*, 83–96, [Table 3.1](#)

In contrast to the predominant narrative in Belsky's paper, [Table 3.1](#) was more aligned with another contemporary theory of the causes of child maltreatment, Cicchetti's ecological/transactional model, discussed in *Cornerstones of Attachment Research*.<sup>37</sup> Like Belsky, Cicchetti regarded parental functioning as multiply determined, including both factors that may potentiate or ameliorate the likelihood of maltreatment. However, unlike Belsky, he distinguished between chronic sources of risk and acute circumstantial stressors (termed 'vulnerability factors' and 'challengers'). This distinction helped Cicchetti to consider in more detail the nature of chronic and acute factors. On this basis, he emphasized communal and societal processes—such as family poverty, or community violence—as having direct effects on child development, not only mediated through parental psychology and parenting behaviour.

Despite Cicchetti's leadership role within developmental psychopathology and prominent role within developmental psychology generally, Belsky's 'process model' has been substantially more widely cited. Commentators have observed that developmental psychopathology has followed Belsky's process model more than Cicchetti's theoretical work, including the diminished role for communal and societal processes in Belsky's work compared to Cicchetti's call to integrate these dimensions firmly into developmental research.<sup>38</sup>

Over the decades, and still today, Belsky's process model remains a source of inspiration for valuable research examining the transactional contribution of different factors to parenting, and a call for more process-oriented thinking. Part of the popularity of the 'process model' paper may stem from its combination of complexity and simplicity. On the one hand, Belsky urged attention to an expanded group of factors, such as the parent's social

Elder, Jr., & K. Luscher (eds), *Examining Lives in Context: Perspectives on the Ecology of Human Development* (pp. 619–647). Washington, DC: American Psychological Association.

<sup>37</sup> Cicchetti, D., & Rizley, R. (1981) Developmental perspectives on the etiology, intergenerational transmission, and sequelae of child maltreatment. *New Directions for Child and Adolescent Development*, 1981(11), 31–55; Cicchetti, D., & Lynch, M. (1993) Toward an ecological/transactional model of community violence and child maltreatment: Consequences for children's development. *Psychiatry*, 56(1), 96–118; Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, Chapter 4.

<sup>38</sup> For example, Valentino, K., & Edler, K. (2024) The next generation of developmental psychopathology research: Including broader perspectives and becoming more precise. *Development and Psychopathology*, Early View

network and marital relationship, which developmental science had tended to neglect. A place is also made for the parent's own developmental history, a growing concern within developmental psychology. The model entails an account of vulnerability and resilience, through attention to family-level, parent-level, and child-level factors that may help or hinder parenting behaviour. Against the treatment of predictors and outcomes as if they were stable and self-enclosed particles, the process model has helped researchers think about each as a composite, and potentially dynamic.

On the other hand, factors beyond the individual parent are treated as background. Primacy is given to the standard explanatory approach within developmental science, within which child development is principally, even if not exclusively, a product of child temperament and parental behaviour. Overall, Belsky has felt that his process model has had a generally positive effect on developmental science, redirecting attention away from socioeconomic factors and towards the more proximal 'social-contextual factors and forces that shape parenting', such as social support, occupational experiences, and marital relationships.<sup>39</sup>

Whilst highly cited by developmental science, the paper has not been much referenced by attachment researchers. The exception has been those attachment researchers particularly interested in adversity, social support, and parental coping such as Sue Spieker, Ross Thompson, and the VU Amsterdam group.<sup>40</sup> Looking at when and how it has been occasionally mentioned by attachment researchers, it seems that the paper's causal account proved functionally redundant for them: it was already congruent with Bowlby's account of attachment theory, with a central focus on parental behaviour, in turn influenced by potential stressors, perhaps most especially a parent's own childrearing history, in contributing to child development.<sup>41</sup>

## The Pennsylvania Child and Family Development Project

### Four Cohort Studies

In their writings, Bowlby, Ainsworth and other attachment researchers tended to focus almost exclusively on the child–mother relationship. Even so, they were clear that other factors were involved, both in shaping this relationship, and its effects on development. Belsky wanted to understand the wider nested context of both the child and the child–mother relationship, including the role of fathers, the marital relationship, occupational experience, social support, and daycare. Belsky felt that 'it is no longer acceptable to focus narrowly on parent–infant interaction. Such experience must be examined from the perspective of the family system.... The family too, though, needs to be examined within the wider ecology in which it is embedded.'<sup>42</sup>

<sup>39</sup> Belsky, J. (2014) Social-contextual determinants of parenting. In R. J. Tremblay, R. E. Barr, & R. Peters (eds), *Encyclopedia of Early Child Development*. Montreal, Quebec: Centre of Excellence for Early Childhood Development, p. 1.

<sup>40</sup> For example, Spieker, S. J., & Bensley, L. (1994) Roles of living arrangements and grandmother social support in adolescent mothering and infant attachment. *Developmental Psychology*, 30(1), 102–111; Cassé, J. F., Finkenauer, C., Oosterman, M., van der Geest, V. R., & Schuengel, C. (2018) Family conflict and resilience in parenting self-efficacy among high-risk mothers. *Journal of Interpersonal Violence*, 33(6), 1008–1029.

<sup>41</sup> For example, see the account of Belsky's process model in Steele, M. N. (1991) *Intergenerational patterns of attachment*. Unpublished doctoral dissertation, University College London.

<sup>42</sup> Belsky, J. (1981) Early human experience: A family perspective. *Developmental Psychology*, 17(1), 3–23, p. 19.

These ideas resonated with 'family systems' thinking, which had been introduced in the mid-1970s.<sup>43</sup> However, the approach adopted by Belsky was resolutely more empirically focused. He was impatient with concepts from family systems theory, such as that dynamics within the family unit will be self-stabilizing, as he felt they were resistant to empirical operationalization. He was likewise frustrated with the tendency of family systems thinking to offer characterizations of the family unit as a whole, in terms such as enmeshed, chaotic, or conflicted. Belsky felt such characterizations tended to flatten the relationship between processes at different levels within the family, and hinder the generation of specific causal claims, with implications for interventions.

To further investigate these matters empirically, a multi-wave cohort study addressing family relationships and child development was conducted by Belsky and collaborators at Penn State University.<sup>44</sup> All cohorts were married working- and middle-class families bearing and rearing their first child. Study I comprised 71 families,<sup>45</sup> Study II comprised 67 families,<sup>46</sup> and Study III had 117 families.<sup>47</sup> Families were largely recruited through birth announcements in a local newspaper in the semi-rural central Pennsylvania community, and around 50% of those contacted agreed to participate. An array of measures was used in this research, including multiple rounds of questionnaires, as well as naturalistic home observations, generally conducted in the early evening with both parents present. Studies I and II included a newborn behavioural examination as a measure of very early temperament.

Unlike many researchers of the era, Belsky did not fall foul of the apparent connotations of Bowlby's concept of monotropy and assume that he meant that infants form only one primary attachment relationship. Belsky pointed to passages in Bowlby's writings where he explicitly acknowledged the role of multiple attachment figures for the developing child. The Penn State group was one of the first to include assessments of both infant-mother and infant-father attachment. At 12/13 months, in Studies I, II, and III, infant-mother and infant-father dyads were seen in the Strange Situation, and caregivers asked again about use of childcare.<sup>48</sup> Study III also included the maternal report Attachment Q-Sort (Chapter 1).<sup>49</sup>

One of the priorities of Studies I-III was to examine the transition to parenthood. The first results reported by Belsky and his team were regarding marital satisfaction. In reaction to the legacy of behaviourism, and partly on the basis of early attachment research, there was generally growing interest in developmental psychology in the 1980s in affective-cognitive aspects of parents' experience as an influence on their parenting.<sup>50</sup>

<sup>43</sup> Bowen, M. (1974) Alcoholism as viewed through family systems theory and family psychotherapy. *Annals of the New York Academy of Sciences*, 233, 115-122.

<sup>44</sup> Belsky, J. (2005) Attachment theory and research in ecological perspective. In K. E. Grossmann, K. Grossmann, & E. Waters (eds), *Attachment from Infancy to Adulthood: The Major Longitudinal Studies* (pp. 71-97). New York: Guilford, Figure 4.1.

<sup>45</sup> Belsky, J., Spanier, G. B., & Rovine, M. (1983) Stability and change in marriage across the transition to parenthood. *Journal of Marriage and the Family*, 45(3), 567-577.

<sup>46</sup> Study II participants were randomised to a brief intervention to support parents' understanding and engagement with their child. This intervention had no identified effects. Belsky, J. (1985) Experimenting with the family in the newborn period. *Child Development*, 56, 407-414.

<sup>47</sup> Belsky, J., Rovine, M., & Fish, M. (1989) The developing family system. In M. Gunnar & E. Thelen (eds), *Systems and Development: Minnesota Symposia of Child Psychology* (Vol. 22, pp. 119-166). Hillsdale, NJ: Erlbaum.

<sup>48</sup> Belsky, J., Campbell, S. B., Cohn, J. F., & Moore, G. (1996) Instability of infant-parent attachment security. *Developmental Psychology*, 32(5), 921-924.

<sup>49</sup> Belsky, J., & Rovine, M. (1990) Q-sort security and first-year nonmaternal care. *New Directions for Child and Adolescent Development*, 49, 7-22.

<sup>50</sup> Mackinnon, C. E., Lamb, M. E., Belsky, J., & Baum, C. (1990) An affective-cognitive model of mother-child aggression. *Development and Psychopathology*, 2(1), 1-13.

With data from Study I, Belsky, Spanier, and Rovine reported that wives' appraisals of their marriages declined between the last trimester of pregnancy and when their infant was three months old.<sup>51</sup> Husbands' appraisals were unchanged. This difference corresponded to the relative degree of change in the activities of the marital partners: husbands' contributions to the household did not change with the arrival of the newborn. In the Pennsylvania sample, care for the household was still very largely regarded as the wife's responsibility, even just three months after the birth of the child. Even when the mothers were employed, after work 'mothers more frequently responded to, stimulated, expressed positive affection toward, and took basic care of their infants, while fathers spent more time reading or watching TV'.<sup>52</sup>

However, when couples were rank ordered in terms of satisfaction with their relationship before and after the birth of their child, the rank order barely changed despite the deterioration in wives' satisfaction. This suggested that whilst the addition of a child to the family had notable effects on mothers' experiences of their marital relationship, differences between couples remained relatively constant. The most satisfied couples remained the happiest after the transition to parenthood, even if wives in these couples were less happy than before. The least satisfied couples remained the unhappiest, and wives in these couples despaired of their husbands. The new arrival did not help the marital relationship.<sup>53</sup>

In 1987, Keith Crnic joined Penn State from the University of Washington, where he had been a collaborator of Ainsworth's former student Mark Greenberg. Crnic had also been part of the MacArthur Foundation Network that adapted the Strange Situation for use at preschool age. Crnic was especially interested in maternal stress and experience of daily hassles and their effects on parenting behaviour.<sup>54</sup> In turn, Belsky was especially interested in studying the family factors that contribute to aggression and conduct problems, which are more common in boys. Belsky and Crnic developed the idea for a grant focused on the 'terrible twos'. They applied for a grant together and won funding from the National Institute of Mental Health for a study, beginning in 1990, of the contribution of family stress to son-parent conflict.<sup>55</sup>

The resulting project, known as Study IV, comprised 125 toddler boys and their parents. Families were recruited through local birth announcements when children were around 10 months old. Study IV also entailed home observations (at age 15, 21, 27, and 33 months).<sup>56</sup> The children were also observed in the Strange Situation with their mother at 12 and 18 months, and with their father at 13 and 20 months. This was an unprecedented number of Strange Situations on the same sample. As mentioned in [Chapter 1](#), no report on disorganization was made from these Strange Situations as Jude Cassidy (then a young

<sup>51</sup> Belsky, J., Spanier, G. B., & Rovine, M. (1983) Stability and change in marriage across the transition to parenthood. *Journal of Marriage and the Family*, 45(3), 567–577.

<sup>52</sup> Belsky, J., Gilstrap, B., & Rovine, M. (1984) The Pennsylvania Infant and Family Development Project, I: Stability and change in mother–infant and father–infant interaction in a family setting at one, three, and nine months. *Child Development*, 55(3), 692–705, p. 702.

<sup>53</sup> Belsky, J. & Hsieh, K. H. (1998) Patterns of marital change during the early childhood years: Parent personality, coparenting, and division-of-labor correlates. *Journal of Family Psychology*, 12(4), 511–528.

<sup>54</sup> Crnic, K. A. & Greenberg, M. T. (1987) Maternal stress, social support, and coping: Influences on the early mother–infant relationship. In C. F. Z. Boukydis (ed.), *Research on Support for Parents and Infants in the Postnatal Period*. Norwood, New Jersey: Ablex, pp. 25–40.

<sup>55</sup> Belsky, J., Woodworth, S., & Crnic, K. (1996) Troubled family interaction during toddlerhood. *Development and Psychopathology*, 8(3), 477–495.

<sup>56</sup> These home observations were recorded in extremely detailed narrative records by the observers, supplemented by an audio-recording. Belsky, Crnic and colleagues then sought to turn this narrative material into scientific data, which led to several innovative approaches to studying interactive family processes. The study was an early pioneer of the study of co-parenting behaviours. Furthermore, the researchers chose to examine coercive cycles between child and caregiver, rather than focusing on child externalizing behaviour in isolation.

faculty member at Penn State) and Donna Weston (from Mary Main's group) were unable to establish reliability. The Adult Attachment Interview was conducted with the mothers when the children were 11 months old.

### Research with the Strange Situation

In 1984, Belsky, Rovine, and Taylor published an important study on 'The Origins of Individual Differences in Infant–Mother Attachment' in *Child Development*, reporting associations between home observations and the infant–mother Strange Situation with 60 families from Study I.

The 1984 paper was the first study after Ainsworth's group and Minnesota to describe results from observation of caregiving behaviour in the home and associations with the Strange Situation. Ainsworth's study was tiny. Moreover, as Lamb and colleagues had observed earlier that year (Chapter 1), Ainsworth 'already knew about the quality of care that the children received at home. Thus, her assessments of maternal sensitivity and attachment security were not independent and this compromised the confidence that could be placed in the results of what, in some respects, had to be regarded as a (remarkable) "pilot" study.<sup>57</sup> As the first community sample to examine the caregiving correlates of the Strange Situation after Ainsworth, it was therefore of the utmost importance for the standing of attachment theory and research. Unlike the Minnesota sample drawn from families in poverty, the Penn State study drew on a community sample. The Penn State sample had much more extensive home observations than Minnesota. Furthermore, whereas the Minnesota group were known to be allies and advocates of Ainsworth, Belsky was seen as more independent.

As in Ainsworth's research, there was no association between caregiver warmth towards their child and the Strange Situation classifications. The Penn State group likewise reported that less responsive care observed during the home observations at three and six months was associated with resistant child–caregiver attachment in the Strange Situation. Mothers in resistant dyads were less responsive to distress at three and nine months, and less responsive to vocalizations at nine months.

Belsky and colleagues reported no association between less physical contact and avoidant attachment, stating that this contradicted earlier findings reported by Ainsworth. In fact, the findings reported by Ainsworth, from work by Main, had been an association between avoidant attachment and caregiver rejection of infant bids for physical contact for comfort, which is not the same thing as infrequency of physical contact in general.<sup>58</sup>

In the paper on Study I, Belsky and colleagues criticized the Ainsworth sensitivity scale, which he regarded as requiring 'tremendous' subjective judgement from coders.<sup>59</sup> The team therefore developed a behavioural count of reciprocal interaction. They found that resistant attachment was associated with infrequency of dyadic interaction. Secure attachment was associated with intermediate levels. Finally, avoidant attachment was associated with high levels of dyadic interaction, which Belsky and colleagues interpreted as reflecting

<sup>57</sup> Belsky, J. (1999) Infant–parent attachment. In C. Tamis-LeMonda & L. Balter (eds), *Child Psychology: A Handbook of Contemporary Issues* (pp. 45–63). New York: Garland, p. 49.

<sup>58</sup> Main, M. & Stadtman, J. (1981) Infant response to rejection of physical contact by the mother. *Journal of the American Academy of Child Psychiatry*, 20(2), 292–307.

<sup>59</sup> Belsky, J., Taylor, D. G., & Rovine, M. (1984) The Pennsylvania Infant and Family Development Project, II: The development of reciprocal interaction in the mother–infant dyad. *Child Development*, 55(3), 706–717, p. 707. Isabella regarded the Ainsworth scales more favourably. See Isabella, R. A. (1993) Origins of attachment: Maternal interactive behavior across the first year. *Child Development*, 64(2), 605–621.

insensitive, intrusive, overstimulation of the infant. The assessment of reciprocal interaction may have been unsatisfactory, or too labour intensive, as ultimately Belsky returned to using the Ainsworth sensitivity scale for Study IV.<sup>60</sup> Though doubts about the sensitivity scale may have remained as he barely used the data, and at most folded it into a composite of positive caregiving behaviours.

In 1984, Belsky, Garduque, and Hrncir reported a study of the infants' play from a subsample of 22 families from Study I.<sup>61</sup> A comparison was made between the sophistication of the infant's free play and their play when supported by their caregiver. Belsky and colleagues supposed that a narrower gap between play in these two contexts suggested that the infants were able to play at their best even without direct caregiver help, since they experienced their caregiver as a secure base from which to explore. As predicted, secure attachment in the Strange Situation was associated with less difference between the sophistication of infants' free play compared to the play they could do with help from their caregiver.

In these papers by Belsky and colleagues, attachment theory was taken to stand or fall based on the correlates of the Strange Situation, with caregiver sensitivity not measured—or in the case of Study IV, not analysed independently. Overall, the findings offered broad support for research to date using the Strange Situation. Though associations were considerably less strong than those reported by Ainsworth's group, and used different assessments of caregiving behaviour, the Strange Situation was broadly associated with expectable caregiving correlates.

The assessments of caregiving were somewhat idiosyncratic. This was partly due to a preference for behavioural counts; partly due to use and aggregation of granular variables; and partly out of distrust of the more subjective measures developed by Ainsworth's group or Minnesota. Additionally, Belsky and collaborators wanted to capture a wider angle on caregiver behaviour than Ainsworth or the Minnesota group. They were interested in exploring the developing family system, focused on mothering, fathering, marriage, and coparenting.<sup>62</sup>

The fact that other laboratories rarely had observational data at multiple timepoints may be one factor that contributed to the relatively weak take-up of the Penn State assessments of caregiver behaviour by other laboratories. In any case, the findings were conceptually convergent with those of subsequent studies (and generally published in the same journal). Shortly after the report from Penn State, Smith and Pederson at the University of Western Ontario published aligned findings from a study of 48 mother–infant dyads. Caregiver interaction with their child in the laboratory setting was associated with Strange Situation

<sup>60</sup> Mentioned in Slade, A., Belsky, J., Aber, J. L., & Phelps, J. L. (1999) Mothers' representations of their relationships with their toddlers: Links to adult attachment and observed mothering. *Developmental Psychology*, 35(3), 611–619, p. 614. The measure of reciprocal interaction would not generally be used by subsequent researchers. An exception was Lambermon, M. W., & Van IJzendoorn, M. H. (1989) Influencing mother–infant interaction through videotaped or written instruction: Evaluation of a parent education program. *Early Childhood Research Quarterly*, 4(4), 449–458. In this study, the researchers used both the Belsky measure of reciprocal interaction and the Ainsworth sensitivity scale. The association was  $r = 0.23$ . The two scales loaded on different factors in a principal components analysis.

<sup>61</sup> Belsky, J., Garduque, L., & Hrncir, E. (1984) Assessing performance, competence, and executive capacity in infant play: Relations to home environment and security of attachment. *Developmental Psychology*, 20(3), 406–417.

<sup>62</sup> More often than reporting associations between variables, publications from the Pennsylvania Child and Family Development Project tended to report analysis of covariance to capitalise on the assessment at multiple timepoints, using an F-statistic to judge how likely the result was due to chance or could be regarded as statistically significant.

classifications, with intrusive caregiver behaviour linked to avoidance, unengaged caregiver behaviour linked to resistance, and responsive caregiver behaviour associated with security.<sup>63</sup>

In 1984, Goldberg and Easterbrookes and Durrett and colleagues both reported that marital satisfaction was associated with toddler–mother and toddler–father security in the Strange Situation.<sup>64</sup> Using data from Study II, Isabella and Belsky sought to explore further the role of marital satisfaction.<sup>65</sup> A first finding was that there was no association between prenatal marital satisfaction and the Strange Situation classifications. Secondly, there was no association between paternal report on relationship satisfaction postnatally and child–father attachment in the Strange Situation. After all, fathers’ satisfaction with their marriage was less affected by the transition to parenthood due to the gendered division of labour in these families.

However, postnatal maternal marital satisfaction was quite a potent predictor of infant–mother security in the Strange Situation. As we have seen, mothers’ satisfaction with their marriages in this sample declined notably with the arrival of the baby. Where mothers experienced:

- i) sharper declines in satisfaction in their marriage,
- ii) increased conflict, or
- iii) decreased effort to maintain the relationship by their husband,

mothers’ self-esteem declined and the infant–mother dyad was more likely to be classified as insecure in the Strange Situation.<sup>66</sup>

Where mothers experienced:

- i) shallower declines in satisfaction,
- ii) decreased conflict, or
- iii) increased effort from their husbands,

the infant–caregiver dyad was more likely to be classified as secure, and mothers’ self-esteem remained more stable. Belsky and Isabella reflected that associations between insecurity in the Strange Situation and child externalizing behaviours reported in the literature, for example by the Minnesota group, might not be a direct relationship. Instead, marital discord might in fact be predicting both insecure attachment and child behavioural problems.<sup>67</sup>

Mothers who based their reports on marital satisfaction on whether or not good aspects of the relationship were present were more likely to have shallower declines in satisfaction

<sup>63</sup> Smith, P. B., & Pederson, D. R. (1988) Maternal sensitivity and patterns of infant–mother attachment. *Child Development*, 59(4), 1097–1101. See also Lewis, M. & Feiring, C. (1989) Infant, mother, and mother–infant interaction behavior and subsequent attachment. *Child Development*, 60(4), 831–837.

<sup>64</sup> Goldberg, W. A. & Easterbrooks, M. (1984) Role of marital quality in toddler development. *Developmental Psychology*, 20(3), 504; Durrett, M. E., Otaki, M., & Richards, P. (1984) Attachment and the mother’s perception of support from the father. *International Journal of Behavioral Development*, 7(2), 167–176.

<sup>65</sup> Isabella, R. A. & Belsky, J. (1985) Marital change during the transition to parenthood and security of infant–parent attachment. *Journal of Family Issues*, 6(4), 505–522.

<sup>66</sup> Belsky, J., Rovine, M., & Fish, M. (1989) The developing family system. In M. Gunnar & E. Thelen (eds), *Minnesota Symposia of Child Psychology* (Vol. 22), *Systems and Development* (chap. 4, pp. 119–166). Hillsdale, NJ: Erlbaum, p. 152.

<sup>67</sup> Belsky, J. & Isabella, R. (1988) Maternal, infant and social-contextual determinants of infant–mother attachment. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 41–94). Hillsdale, NJ: Lawrence Erlbaum Associates, p. 79.



over time and to have infants who showed secure behaviour in the Strange Situation. By contrast, mothers who based their reports on marital satisfaction on whether or not negative aspects of the relationship were present, were more likely to have steeper declines in satisfaction over time and to have infants who showed insecure behaviour in the Strange Situation.

Isabella and Belsky suggest that 'such an orientation could well explain why it is that, in general, mothers of insecure babies, who base their overall satisfaction with the marriage more on negative than positive aspects of the relationship, continue to experience negative marital change even after the initial adjustment period whereas mothers of secure babies do not. By focusing on the positive, some women may buffer their marriages from stress.'<sup>68</sup> This distinction between focus on positive or negative aspects of marital satisfaction is intriguing, but has not been followed up on by subsequent studies, even when they had marital satisfaction data.

The analysis, rather, reflected Belsky's distinctive interest, following Sroufe and Bronfenbrenner, in contextual moderators that shift the meaning and effects of social relationships—here maternal focus on the positive or negative. Isabella and Belsky also examined differences in infants' expressions of distress and happiness, finding that decreasing expressions of happiness was a better predictor of attachment insecurity than increasing expressions of distress (not an analyses other research groups have sought to replicate).<sup>69</sup> As mentioned in [Chapter 1](#), in Study IV of the Pennsylvania Child and Family Development Project, Belsky and colleagues examined children's memories for narratives, finding that children with secure attachment histories remembered positive events more accurately than negative events in the puppet show, whereas children with insecure attachment histories had better memories for negative events.<sup>70</sup>

As well as Sroufe and Bronfenbrenner, another precursor to Belsky's inquiry into positive and negative feelings and their specific correlates was Ainsworth. She had examined both infant signals of contentment and distress, and mothers' expressions of positive and negative feeling. This may be linked to Ainsworth's greater concern than Bowlby with the quality of non-distressed interaction, support, and caregiver delight in their child as building infants' expectations of the caregiver as a secure base from which to explore ([Chapter 1](#)). Ainsworth's group reported that the mothers in securely attached dyads were more likely to pace their face-to-face interactions to be contingent to their infant's responses, and to respond in a differential way to infant signals of contentment and distress.<sup>71</sup> Mothers in insecure dyads were more likely to initiate interactions with their infant without display of positive affect, without a quality of playfulness, and without gentle attempts to help keep the interaction going when it faltered.

Belsky and Isabella argued that the findings from Ainsworth's group needed to be treated with caution, since the Strange Situations were not coded blind to other knowledge about the families. Following up on these findings, for his doctoral thesis Isabella conducted further examination of the home observation data from 10 secure, 10 avoidant, and 10

<sup>68</sup> Isabella, R. A. & Belsky, J. (1985) Marital change during the transition to parenthood and security of infant-parent attachment. *Journal of Family Issues*, 6(4), 505–522, p. 518.

<sup>69</sup> Belsky, J., Fish, M., & Isabella, R. A. (1991) Continuity and discontinuity in infant negative and positive emotionality: Family antecedents and attachment consequences. *Developmental Psychology*, 27(3), 421–431.

<sup>70</sup> Belsky, J., Spritz, B., & Crnic, K. (1996) Infant attachment security and affective-cognitive information processing at age 3. *Psychological Science*, 7(2), 111–114.

<sup>71</sup> Blehar, M. C., Lieberman, A. F., & Ainsworth, M. D. S. (1977) Early face-to-face interaction and its relation to later infant-mother attachment. *Child Development*, 48(1), 182–194.

resistant dyads, drawn from the Study II sample.<sup>72</sup> He looked at the extent to which interactions seemed to be reciprocal and mutually rewarding, which was termed ‘interactional synchrony’ and based on close-in-time micro codes of mother–infant interaction. Isabella and Belsky anticipated that interactional synchrony would be important for security, as such interactions would foster the development of infant expectations of the mother as available and responsive.

Secure attachment was associated with greater frequency of reciprocal and mutually rewarding interactions. Avoidant attachment was associated with asynchronous interactions, with mothers talking at their infants almost without regard to what the baby was doing, and rarely in response to the baby’s own vocalizations. This aligned with and further clarified earlier findings from the full sample, that avoidant attachment was associated with high levels of dyadic interaction. The high levels of interaction seemed to reflect insensitive, intrusive overstimulation unresponsive to the child’s own cues.

Resistant attachment was similarly associated with asynchronous interactions. As in avoidant dyads, they also rarely responded to the baby’s own vocalizations. Distinctive to the mothers in resistant dyads, they were more frequently out of the room and did not return when their child was distressed. Again, these findings aligned with and further specified earlier results from the full sample, which showed that resistant attachment was associated with low levels of dyadic interaction and reflect infant experiences of lower levels of caregiver engagement and availability.

Isabella and Belsky then investigated interactional synchrony in the rest of Study II and Study III samples. The researchers replicated their earlier findings on this much larger cohort. Furthermore, they found that resistant attachment was predicted by maternal initiation of interaction when babies were otherwise involved or resting, and minimal maternal involvement (only visual attention) when infants vocalized or looked at their mothers. From this, Isabella and Belsky conclude that ‘there is thus reason to consider that insecure-resistant relationships grow out of interactions in which mothers are not only underinvolved but also tend to exhibit poorly timed interactive bids—that is, mothers are inconsistent.’<sup>73</sup>

The interpretation followed the orthodox position since Ainsworth that resistance was caused by ‘inconsistent’ care. Belsky reports that he had been advised to adopt this account by Sroufe in November 1982.<sup>74</sup> The idea is that inconsistent care means that infants know that they can have their attachment signals heeded, but it is not clear when. As such, the threshold for the activation of the attachment behavioural system is lowered, and the threshold for termination raised. When the infant’s intensified attachment behaviours and distress are accurately interpreted by the caregiver, this reinforces the strategy. The Isabella and Belsky paper would be treated by the attachment research community as definitive evidence that resistant attachment has its origins in inconsistent care.

However, as discussed in [Chapter 1](#), in fact the idea that it is ‘inconsistency’, specifically, that is the key ingredient remains unevidenced. Rather than inconsistency, the Belsky findings suggest a caregiver who finds it difficult to hold the child fully in mind—leading to a delay in responding and less full, satisfying, and well-judged responses when they do occur.

<sup>72</sup> Isabella, R. A., Belsky, J., & von Eye, A. (1989) Origins of infant–mother attachment: An examination of interactional synchrony during the infant’s first year. *Developmental Psychology*, 25(1), 12–21.

<sup>73</sup> Isabella, R. A. & Belsky, J. (1991) Interactional synchrony and the origins of infant–mother attachment: A replication study. *Child Development*, 62(2), 373–384, p. 381.

<sup>74</sup> Belsky, J., Rovine, M., & Taylor, D. G. (1984) The Pennsylvania Infant and Family Development Project, III: The origins of individual differences in infant–mother attachment: Maternal and infant contributions. *Child Development*, 55(3), 718–728, n. 4.

Indeed, Ainsworth herself later claimed that ‘the mother of a Pattern C baby is likely to enjoy contact with him even though she is often imperceptive of his need for it.’<sup>75</sup> The idea that the caregivers of ambivalent/resistant dyads are less effective at tracking their infant’s inner states is supported by findings from other laboratories that they make comments relevant to their child’s inner states during free play, but these appear to observers to have little relationship with the child’s actual states.<sup>76</sup> This aligns with the intriguing (unfortunately untested) theoretical proposal of Van IJzendoorn and Bakermans-Kranenburg that resistant attachment occurs when caregivers are sensitive only to children’s high-intensity signals.<sup>77</sup> Nonetheless, citing the Isabella and Belsky study as evidence, the dominant account remains still today that resistant attachment is caused by inconsistent caregiver behaviour.

In 1988, Belsky and Nezworski edited a book on *Clinical Implications of Attachment*. In a major chapter, Belsky and Isabella reported further findings regarding antecedents of the Strange Situation classifications in Study II.<sup>78</sup> Maternal self-report on their early experiences of care growing up was not associated with the Strange Situation; given emergent findings from the Berkeley group using the Adult Attachment Interview, Belsky and Isabella suspected that had they asked not only about experiences of care, but current feelings about these experiences, they might have had better prediction.

Maternal self-esteem also did not differentiate infant attachment classifications, whereas maternal self-report on empathy for others was decisively associated with infant–mother security in the Strange Situation ( $r = 0.41$ ). Belsky and Isabella reflected that this finding suggests that individuals are aware of whether or not they are able to provide sensitive care. Sensitivity may be a tacit behaviour, but it may not be outside of an individual caregiver’s awareness. Self-report of empathy was composited with other non-significant measures of personality. Path analysis revealed that the resulting construct was associated with the Strange Situation both directly, and indirectly via change in marital satisfaction. Conceivably maternal empathy is beneficial both for the infant–caregiver relationship and the marital relationship, within which the infant–caregiver relationship is nested.

Belsky and Isabella had available various sources of data on child temperament. This included newborn observational data; observer report at one, three, and nine months; and parent report of child temperament at three and nine months. None of these measures had any direct association with infant security in the Strange Situation. There was an interaction between temperament and time, however. When repeated maternal ratings of temperament revealed that children became less difficult to care for over time, they were more likely to be classified as secure in the Strange Situation. When the opposite was true—children reported as more difficult to care for over time—they were more likely to be classified as insecure in the Strange Situation. There was no association between these changes and prenatal measures of maternal personality. Belsky and Isabella interpreted

<sup>75</sup> Ainsworth, M. D. S. (1983) Patterns of infant–mother attachment as related to maternal care: Their early history and their contribution to continuity. In D. Magnusson & V. L. Allen (eds), *Human Development: An Interactional Perspective* (pp. 35–55). New York: Academic Press, p. 42.

<sup>76</sup> For example, Meins, E., Fernyhough, C., de Rosnay, M., Arnott, B., Leekam, S. R., & Turner, M. (2012) Mind-mindedness as a multidimensional construct: Appropriate and nonattuned mind-related comments independently predict infant–mother attachment in a socially diverse sample. *Infancy*, 17(4), 393–415, Table 1.

<sup>77</sup> For example, Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2019) Bridges across the intergenerational transmission of attachment gap. *Current Opinion in Psychology*, 25, 31–36, p. 32.

<sup>78</sup> Belsky, J. & Isabella, R. (1988) Maternal, infant and social-contextual determinants of infant–mother attachment. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 41–94). Hillsdale, NJ: Lawrence Erlbaum Associates.

these results as more likely reflecting mother–child interactive patterns than child temperament. They aligned with results from Study I, which found that infants classified as insecure did not cry more than others earlier in life, but by nine months were observed to cry more.<sup>79</sup>

Belsky and Isabella found no association between maternal report of social support at three months and nine months and secure infant–mother attachment in the Strange Situation. This failed to replicate earlier findings by Crockenberg, where maternal social support had been important for infant–mother security, especially for infants identified by mothers as having a difficult temperament.<sup>80</sup> Other research groups in the 1990s and early 2000s were, equally, reporting uneven findings regarding the role of social support. This ultimately led to growing consensus that the effects of social support are highly dependent on relevant moderators.<sup>81</sup>

Despite null findings for social support, Belsky and Isabella found that mothers who perceived their neighbourhood as friendlier were more likely to be in dyads later classified as secure in the Strange Situation. Belsky and Isabella reflected that their measure of social support might have been a limitation, as it focused more on contacts with friends, relatives, and neighbours, and failed to address whether mothers perceived these relationships as draining or ultimately unsupportive. In Study IV, Belsky would later use a different measure of social support, focused on whether mothers perceived they had people available they could turn to in times of need. Again, no association was found with attachment security in the Strange Situation.<sup>82</sup> Interested by the lack of association between measures of social support and infant security, Isabella would investigate this question further in another sample. He found that social support was influential for security, but indirectly: social support was a potent predictor of caregiver sensitivity, which in turn predicted security in the Strange Situation.<sup>83</sup>

Earlier work in developmental psychopathology had also examined the effects of cumulative risk, over and above individual risk factors. For instance, Rutter examined the implications of cumulative family risk for children's mental health.<sup>84</sup> Influenced by this literature, Belsky and Isabella created composites for social context variables, maternal variables, and child variables, and coded these as generally positive or generally negative in terms of sources of stress for the mother. Results revealed a dose–response relationship: when none of these composites were positive, 83% of relationships were classified as insecure. When one was positive, rates of insecurity fell to 62%. When two were positive, only 17% of relationships were classified as insecure.

<sup>79</sup> Belsky, J., Rovine, M., & Taylor, D. G. (1984) The Pennsylvania Infant and Family Development Project, III: The origins of individual differences in infant–mother attachment: Maternal and infant contributions. *Child Development*, 55(3), 718–728.

<sup>80</sup> Crockenberg, S. B. (1981) Infant irritability, mother responsiveness, and social support influences on the security of infant–mother attachment. *Child Development*, 857–865.

<sup>81</sup> For example, Green, B. L. & Rodgers, A. (2001) Determinants of social support among low-income mothers: A longitudinal analysis. *American Journal of Community Psychology*, 29(3), 419–441; Ceballo, R. & McLoyd, V. C. (2002) Social support and parenting in poor, dangerous neighborhoods. *Child Development*, 73(4), 1310–1321; Pitillas, C. (2021) *El Daño que se Hereda: Comprender y abordar la transmisión intergeneracional del trauma*. Bilbao: Desclee De Brouwer; Gu, Y., Waters, T. E., Zhu, V., Jamieson, B., Lim, D., Schmitt, G., & Atkinson, L. (2024) Attachment expectations moderate links between social support and maternal adjustment from 6 to 18 months postpartum. *Development and Psychopathology*, early view.

<sup>82</sup> Belsky, J. (1996) Parent, infant, and social-contextual antecedents of father–son attachment security. *Developmental Psychology*, 32(5), 905–913.

<sup>83</sup> Isabella, R. A. (1994) Origins of maternal role satisfaction and its influences upon maternal interactive behavior and infant–mother attachment. *Infant Behavior & Development*, 17, 381–387.

<sup>84</sup> Rutter, M. (1979) Protective factors in children's responses to stress and disadvantage. In M. W. Kent & J. E. Rolf (eds), *Primary Prevention of Psychopathology: Vol. 3. Social Competence in Children* (pp. 49–74). Hanover, NH: University Press of New England.

This nonlinear relationship was anticipated by Belsky's 'process model', and more generally ideas of cumulative risk within developmental psychopathology: a challenge in only one area was expected to have little impact on secure base and safe haven provision, as indexed by the Strange Situation, if in other regards the family were doing well. Belsky accepted that maternal personality variables were less powerful predictors than expected by the 'process model'. As in his other empirical work, no examination was reported by Belsky here of whether, as predicted by the 'process model', maternal variables would mediate associations between social context variables and either observed caregiving behaviour or Strange Situation classifications.

In a paper from 1992, Belsky and his graduate student Brenda Volling, examined antecedents of infant–father attachment in the Strange Situation.<sup>85</sup> The researchers found that infant–father insecurity was associated with a more strictly gendered household division of labour. Volling and Belsky did not make much of this finding. Instead, they focused on another result: a lack of association between the Strange Situation and observations of infant–father interaction. Since the Strange Situation was developed to serve as a proxy for such interaction, this was a concerning finding.

Infant–father interactions were all observed with mother present, in contrast to infant–mother interaction which was observed alone. Belsky's doctoral research on triadic interaction had demonstrated that both fathers and mothers engage in more active parenting when alone with their child than in the presence of their spouse, and infants direct more social behaviour towards a parent when alone with them.<sup>86</sup> Such findings may suggest that the observations of infant–father interaction were not well suited to establishing antecedents of infant–father attachment. However, Volling and Belsky did not refer to these findings, instead arguing against the validity of the Strange Situation as applied to infant–father attachment.

In fact, the Strange Situation did not perform as expected by Belsky for the infant–mother relationship either. As we saw above, Belsky had proposed that maternal developmental history, maternal personality, marital quality, social support, and infant temperament will all influence parenting. In a paper from 1995, with data from Study IV, Belsky, Rosenberger, and Crnic examined associations between maternal personality, marital quality, social support, and infant temperament and infant–mother attachment in the Strange Situation.<sup>87</sup> Observational measures were available on caregiver sensitivity, intrusiveness, withdrawal, and other aspects of parenting at 15 and 21 months.

Caregiving was not included as a dependent variable; as we have seen, Belsky interpreted attachment theory as about predictions of and from the Strange Situation. Belsky and colleagues also did not examine mothers' reports of their developmental history, despite developmental history being part of the 'process model'. It is possible that the Adult Attachment Interviews had not been coded yet (the first report from this data would be 1998).

No significant association with the Strange Situation classifications was found for any of the studied variables. Though social support had an indirect association with attachment

<sup>85</sup> Volling, B. L. & Belsky, J. (1992) Infant, father, and marital antecedents of infant father attachment security in dual-earner and single-earner families. *International Journal of Behavioral Development*, 15(1), 83–100.

<sup>86</sup> Belsky, J. (1979) Mother–father–infant interaction: A naturalistic observational study. *Developmental Psychology*, 15(6), 601–607.

<sup>87</sup> Belsky, J., Rosenberger, K., & Crnic, K. (1995) Maternal personality, marital quality, social support and infant temperament: Their significance for infant–mother attachment in human families. In C. Pryce, R. Martin, & D. Skuse (eds), *Motherhood in Human and Nonhuman Primates: A Synthetic Approach* (pp. 115–124). Basel, Switzerland: Karger.

security via mothers' satisfaction with their role as mothers.<sup>88</sup> There was likewise no significant association between the variables in the process model and the Attachment Q-sort.<sup>89</sup> Several other studies by attachment researchers had similarly found no direct association between maternal reported social support and infant-mother attachment in the Strange Situation, including Study II, and Crnic's own earlier doctoral research at the University of Washington.<sup>90</sup>

Faced with the choice between questioning the validity of the infant-mother Strange Situation data or deepen his process model of the causes of parenting behaviour, Belsky chose the latter. He went back to theory, and considered Bronfenbrenner's remark that, in the ecology of human development, 'the principal main effects are likely to be interactions.'<sup>91</sup> He therefore intensified the emphasis of the process model on interactions: he now proposed that maternal personality, marital quality, social support, and infant temperament will only minimally or unreliably predict parenting behaviour on their own as main effects. Their relevance for predicting parenting will be in interaction with one another. It would be the emergent properties of this interaction that would be causal, rather than any of the factors alone.

Belsky, Rosenberger, and Crnic therefore coded maternal personality, marital quality, social support, and infant temperament either 0 or 1, based on whether or not this domain appeared to be relatively more or less problematic, and likely to promote insecure infant-mother relationships. The idea that 'cumulative risk' rather than any univariate cause would be most important for child development was introduced to developmental science in the 1970s and would form an important premise of developmental psychopathology as a movement.<sup>92</sup>

The Minnesota group were important proponents of the concept of cumulative risk, and in their work frequently used composites of different variables to characterize various challenges faced by children, capitalizing on the statistical benefits of aggregation.<sup>93</sup> This was a pragmatic methodological decision, more than motivated by a specific theoretical account of causal or developmental processes. By contrast, Belsky, Rosenberger, and Crnic presented the theoretical proposition that multiple sources of stress, rather than any specific stressor, would be the most important cause of attachment insecurity.<sup>94</sup> Rather than a process model with arrows suggesting causal relationships between various factors that might influence parenting, the model was flattened and simplified: the compounding of risk factors was proposed as a predictor of adverse parenting and in turn of child development.<sup>95</sup>

<sup>88</sup> Isabella, R. A. (1994) Origins of maternal role satisfaction and its influences upon maternal interactive behavior and infant-mother attachment. *Infant Behavior & Development*, 17, 381-387.

<sup>89</sup> Belsky, J. & Rovine, M. (1990) Q-sort security and first-year nonmaternal care. *New Directions for Child and Adolescent Development*, 49, 7-22, p. 17.

<sup>90</sup> For example, Crnic, K. A., Greenberg, M. T., & Slough, N. M. (1986) Early stress and social support influences on mothers' and high-risk infants' functioning in late infancy. *Infant Mental Health Journal*, 7(1), 19-33; Spieker, S. J., & Booth, C. L. (1988) Maternal antecedents of attachment quality. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 95-135). Hillsdale, NJ: Lawrence Erlbaum.

<sup>91</sup> Bronfenbrenner, U. (1979) *The Ecology of Human Development: Experiments by nature and design*. Cambridge, MA: Harvard University Press, p. 38.

<sup>92</sup> Garmezy, N. & Rutter, M. (eds) (1983) *Stress, Coping, and Development in Children*. Baltimore: Johns Hopkins University Press.

<sup>93</sup> Rushton, J. P., Brainerd, C. J., & Pressley, M. (1983) Behavioral development and construct validity: The principle of aggregation. *Psychological Bulletin*, 94(1), 18-38.

<sup>94</sup> Belsky, J., Rosenberger, K., & Crnic, K. (1995) The origins of attachment security: 'Classical' and contextual determinants. In S. Goldberg, R. Muir, & J. Kerr (eds), *Attachment Theory: Social, Developmental, and Clinical Perspectives* (pp. 153-184). Hillsdale NJ: The Analytic Press.

<sup>95</sup> Belsky, J. (1997) Determinants and consequences of parenting: Illustrative findings and basic principles. In W. Hellinckx, M. Colton, & M. Williams (eds), *The Family Way: International Perspectives on Family Support* (pp. 1-21). Andershot, UK: Arena.

In other words, Belsky shifted from the causal model suggested by Figure 3.1 of his process model paper to the causal model suggested by Table 3.1.

Belsky reflected that one factor implicated in this compounding might be the adaptive responses of children and parents. The psychological or behavioural adaptations in response to one source of risk, their patterns of coping, may increase their vulnerability to another.<sup>96</sup> In the case of attachment, a parent may respond to lack of social support by using their child as a primary source of company and affiliation. When a new relationship is begun with a partner who becomes violent, this use of the child for support is then further potentiated as a risk factor for insecurity. Or again, a child may respond to a highly interfering caregiver by reducing their signals and communications. For a caregiver experiencing anxiety or with a tendency towards neuroticism this might contribute to an increase in interfering behaviour in attempts to elicit a response from their child, contributing further to insecurity.<sup>97</sup> There may also be bidirectional relationships, such as between depression in one parent and alcohol use by the other, that together increase the likelihood of attachment insecurity.<sup>98</sup>

A 1990 doctoral study by Lise Youngblade followed up 73 families from Studies II and III when the children were aged five.<sup>99</sup> Participants were brought back to the laboratory with a same-age friend identified by their mother. The friends were observed in free play, and positive and negative interactions coded, alongside synchrony and the sophistication of their play. Youngblade and Belsky found that infant–mother security at age one was associated with a decrease in distressed and asynchronous interactions in play with the peer at age five. These findings were generally aligned with earlier work by the Minnesota group that indicated that secure attachment was associated with more cooperative and less conflictual interactions at school.<sup>100</sup> However, the Minnesota group did not have Strange Situations with fathers. In the Penn State sample, to the researchers' surprise, infant–father security in the Strange Situation at age one had a negative association with children's positive interactions, synchrony and sophistication of play with a peer at age five.

There has not been any subsequent attempt to directly replicate these findings. With this in mind, it is still interesting that they run exactly counter to the primary explanatory frame in attachment theory and research. Especially propounded by Paquette and the Grossmanns, this framework suggests that in societies where women hold primary caregiving responsibilities, child–father interaction may especially contribute to development of play and social competence through the father's greater role as a playmate in the gendered division of labour.<sup>101</sup> To date, the research literature remains hazy on exactly what forms of play or social competence might be facilitated by child–father attachment. This

<sup>96</sup> Belsky, J. & Stratton, P. (2002) An ecological analysis of the etiology of child maltreatment. In K. Browne, H. Hanks, P. Stratton, & C. Hamilton (eds), *Early Prediction and Prevention of Child Abuse: A Handbook* (pp. 95–110). Chichester, UK: Wiley, p. 96.

<sup>97</sup> In later work on the concept of a general psychopathology factor, Belsky has emphasized that different mental health difficulties may tend to reinforce one another in the course of development. See, for example, McElroy, E., Fearon, P., Belsky, J., Fonagy, P., & Patalay, P. (2018) Networks of depression and anxiety symptoms across development. *Journal of the American Academy of Child & Adolescent Psychiatry*, 57(12), 964–973.

<sup>98</sup> See, for example, Eiden, R. D., & Leonard, K. E. (1996) Paternal alcohol use and the mother–infant relationship. *Development and Psychopathology*, 8(2), 307–323.

<sup>99</sup> Youngblade, L. M. (1990) Families and friends: Parent–child influences on patterns of interaction with a close friend. Unpublished doctoral dissertation, Pennsylvania State University; Youngblade, L. M. & Belsky, J. (1992) Parent–child antecedents of 5-year-olds' close friendships: A longitudinal analysis. *Developmental Psychology*, 28(4), 700–713.

<sup>100</sup> For example, Troy, M. & Sroufe, L. A. (1987) Victimization among preschoolers: Role of attachment relationship history. *Journal of the American Academy of Child & Adolescent Psychiatry*, 26(2), 166–172.

<sup>101</sup> Paquette, D. (2004) Theorizing the father–child relationship: Mechanisms and developmental outcomes. *Human Development*, 47(4), 193–219; Grossmann, K. & Grossmann, K. E. (2020) Essentials when studying

may reflect the fact that the father's role as a playmate is not an especially stable social role across societies and over time. For their part, Youngblade and Belsky speculated that the Strange Situation may not be as meaningful and relevant a measure with fathers than with mothers. The findings from Youngblade's dissertation appear to have contributed to Belsky's lack of interest in the network model of attachment relationships developed by Van IJzendoorn and Sagi-Schwartz (Chapter 4), which he never cites across his subsequent work, despite a friendship with Van IJzendoorn.

### Research with the Adult Attachment Interview

Belsky was excited when Main and Goldwyn published their 1984 paper introducing the Adult Attachment Interview.<sup>102</sup> He was inspired by their finding that women who remembered their own mothers as rejecting, but who could speak about their childhoods in a coherent way, were not likely to display rejecting behaviour towards their child. Whereas women who described rejection in their childhoods, but could not speak about this in a coherent way, were more likely to show rejection and have children classified as avoidantly attached in the Strange Situation. In Belsky's view, 'that attachment theory provides a theoretical basis for the conditions under which, and the mechanisms by which, child maltreatment is not transmitted across generations represents one of its major strengths.'<sup>103</sup>

At the start of Study IV, the Adult Attachment Interview was undertaken with mothers. Yet no report was made of associations between the AAI and the two Strange Situations conducted with the cohort. In fact, unpublished findings indicated that there was no association. But the data became available after Van IJzendoorn's 1995 meta-analysis of early studies examining associations between the two measures.<sup>104</sup> Belsky judged that reporting of a null finding was futile, given that the Penn State sample was too small to alter the results of that meta-analysis.<sup>105</sup> As we shall see in Chapter 4, though Van IJzendoorn's meta-analytic findings have been affirmed by later evidence, there has also been considerable publication bias in reports of the AAI–Strange Situation relationship, with many null or findings of minimal associations left unpublished. Belsky felt that attachment researchers had been complacent in identifying links between the AAI classifications and the Strange Situation classifications, and assuming that some idea of 'transmission' therefore accounted for such associations, without giving serious consideration to mechanisms and underlying constructs.<sup>106</sup>

child–father attachment: A fundamental view on safe haven and secure base phenomena. *Attachment & Human Development*, 22(1), 9–14.

<sup>102</sup> Main, M. & Goldwyn, R. (1984) Predicting rejection of her infant from mother's representation of her own experience: Implications for the abused-abusing intergenerational cycle. *Child Abuse & Neglect*, 8(2), 203–217.

<sup>103</sup> Belsky, J. (1993) Etiology of child maltreatment: A developmental-ecological analysis. *Psychological Bulletin*, 114(3), 413–434, p. 416.

<sup>104</sup> Van IJzendoorn, M. H. (1995) Adult attachment representations, parental responsiveness, and infant attachment—a meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin*, 117(3), 387–403.

<sup>105</sup> J. Belsky, personal communication, January 6, 2024.

<sup>106</sup> Belsky, J. (2005) The developmental and evolutionary psychology of intergenerational transmission of attachment. In C. S. Carter, L. Ahnert, K. Grossman, S. Hrdy, M. Lamb, S. Porges, & N. Sascher (eds), *Attachment and Bonding: A New Synthesis* (pp. 169–198). Cambridge, MA: MIT Press: 'Although we know that early attachment predicts later attachment, the intrapsychic mechanisms responsible for such continuity in development remain relatively unexplored, with the same being true of linkages between adult attachment and parenting' (192).



Belsky was persuaded by a 1998 paper by one of his academic heroes, Michael Rutter,<sup>107</sup> from which he took the idea that 'continuities in behavior across generations may be as much a function of the broader social environment and related individual characteristics as of family processes'.<sup>108</sup> Whereas US researchers seemed inhibited from making such claims by apparent orthodoxies, many Canadian attachment researchers raised parallel concerns regarding associations between the AAI and Strange Situation.<sup>109</sup> Belsky therefore went on to use the AAI data from his sample in studies that asked questions about mechanism, considering the social environment as a factor that could influence when the AAI would have associations with caregiving behaviour, and examining potential underlying constructs masked by the coding system.

One such study addressed the case of AAI speakers classified as 'secure' on the basis of a lack of distortion, but who narrated difficult childhood relationships with their caregivers. Belsky was intrigued by recent findings from the Cowans' group at Berkeley, where secure/autonomous speakers had been divided between 'continuous secure' speakers who reported generally happy childhoods, and 'earned secure' speakers, who spoke with coherence about relationships in childhood that sounded potentially insecure. The Cowans operationalized 'earned security' as occurring when speakers were classified as secure-autonomous, but where the transcript simultaneously indicated high score for neglecting and rejecting behaviour by either caregiver, and a comparatively low score for loving behaviour by at least one caregiver.

The Cowans found that the half of their sample who were judged to be continuous-secure speakers reported lower levels of depressive symptoms than the insecure or earned secure speakers. However, observations of child-caregiver interaction indicated that the earned-secure speakers and continuous-secure speakers offered the same degree of warmth and structure as their children played, in contrast to a lower degree of warmth and structure offered by speakers who had been classified as insecure on the AAI.<sup>110</sup> The image of individuals able to 'earn' the benefits of secure early relationships through their own efforts in later childhood, adolescence or adulthood has naturally been one with great appeal, especially in the American clinical community.<sup>111</sup> Furthermore, the classification offered attachment researchers an answer to accusations from critics that attachment theory is concerned only with continuity from infancy to adult relationships.

A paper by Phelps, Belsky, and Crnic in 1998 was the first study of associations between the earned secure subclassification and observed maternal caregiving. A composite measure of 'positive caregiving behaviour' was created by adding warmth, sensitivity, cognitive stimulation, and fewer withdrawal behaviours. The use of a composite measure of positive caregiving perhaps reflects the influence of the Minnesota group, who argued that such composites should be used for the first studies exploring relationships between variables,

<sup>107</sup> Rutter, M. (1998) Some research considerations on intergenerational continuities and discontinuities: Comment on the special section. *Developmental Psychology*, 34, 1269–1273. Belsky described Rutter as among his role models in Belsky, J. (2009) <https://thepsychologist.bps.org.uk/volume-22/edition-10/one-one-jay-belsky>.

<sup>108</sup> Conger, R. D., Belsky, J., & Capaldi, D. M. (2009) The intergenerational transmission of parenting: Closing comments for the special section. *Developmental Psychology*, 45(5), 1276–1283, p. 1277.

<sup>109</sup> For example, Pederson, D. R., Gleason, K., Moran, G., & Bento, S. (1998) Maternal attachment representations, maternal sensitivity, and the infant-mother attachment relationship. *Developmental Psychology*, 34, 925–933; Raval, V., Goldberg, S., Atkinson, L., Benoit, D., Myhal, N., Poulton, L., & Zwiers, M. (2001) Maternal attachment, maternal responsiveness and infant attachment. *Infant Behavior & Development*, 24, 281–304.

<sup>110</sup> Pearson, J. L., Cohn, D. A., Cowan, P. A., & Cowan, C. P. (1994) Earned-and continuous-security in adult attachment: Relation to depressive symptomatology and parenting style. *Development and Psychopathology*, 6(2), 359–373.

<sup>111</sup> For example, Guina, J. (2016) The talking cure of avoidant personality disorder: Remission through earned-secure attachment. *American Journal of Psychotherapy*, 70(3), 233–250.

to increase coverage and listen out for initial signal in the data. A disadvantage is that the construct is rather idiosyncratic, including elements without a strong theoretical or empirical link to the AAI such as warmth and cognitive stimulation. It is not a construct that other laboratories have used subsequently.

Before the observation, mothers were asked to report on their level of stress and the number of daily hassles they had experienced that week. The researchers found that when mothers reported low stress, those with an earned secure classification displayed broadly the same degree of positive caregiving behaviours as continuous secure and non-secure speakers. On the contrary, when experiencing high stress, mothers with a non-secure classification showed considerably less positive caregiving ( $r = 0.42$ ) than those with a secure/autonomous classification, whether continuous or earned.<sup>112</sup> Phelps and colleagues concluded that the AAI appears to only be of relevance in predicting caregiver behaviour when caregivers are stressed. This is an intriguing finding, though not one that subsequent researchers have further investigated. Additionally, the authors concluded that, when caregivers are stressed, coherence on the AAI is more important for predicting caregiver behaviour than whether speakers report positive or negative experiences growing up.

Another line of research using data from the AAIs from Study IV asked about the psychometric properties of the AAI coding system itself. A 2007 paper by Roisman, Fraley, and Belsky pooled data from three samples: the Pennsylvania Child and Family Development Project; a study of 138 married couples expecting their first child conducted at the University of North Carolina;<sup>113</sup> and a study of 100 young adults conducted at the University of Illinois.<sup>114</sup> In total, 504 AAIs were available.

Taxometric analysis was applied to the data, examining the extent to which there seemed to be categorical differences between the secure and non-secure classifications, and continuous secure and earned secure subclassifications. In both cases, the analysis suggested that differences were more likely to be dimensional, rather than hard boundaries existing between types. Roisman, Fraley, and Belsky argued that the mischaracterization of continuous distributions using artificial categories will forced reality into artificial boxes, substantially reducing the measurement precision and statistical power of the AAI. They proposed that Main's four-category system had compromised theoretical development in attachment research by organizing the design and interpretation of studies around the assumption that there are differences in kind between people, when in reality there are only differences in degree.

Roisman and colleagues also conducted a principal components analysis of the AAI data, which suggested that two underlying dimensions accounted for the data better than a four-category system. The first was the difference between autonomous and dismissing speakers. The second was the difference between autonomous and speakers who were preoccupied, unresolved, or both. Such a model would bring the conceptualization of the AAI into alignment with the social psychological tradition of attachment research, of which

<sup>112</sup> Though not remarked on by the authors, the findings suggest that mothers with an earned secure classification displayed *more* positive caregiving when reporting high, rather than low, daily stress.

<sup>113</sup> Paley, B., Cox, M. J., Burchinal, M. R., & Payne, C. C. (1999) Attachment and marital functioning: Comparison of spouses with continuous-secure, earned-secure, dismissing, and preoccupied attachment stances. *Journal of Family Psychology*, 13, 580–597.

<sup>114</sup> Roisman, G. I., Fortuna, K., & Holland, A. (2006) An experimental manipulation of retrospectively defined earned and continuous attachment security. *Child Development*, 77, 59–71.

Fraley was a leading proponent, which conceptualized individual differences in attachment in terms of degrees of avoidance and anxiety.<sup>115</sup> It aligned with Belsky's scepticism, reflected elsewhere in his work, regarding the disorganized and unresolved attachment classifications. The Roisman, Fraley, and Belsky proposals have led to considerable subsequent research, and persuaded many in the field. They have also generated controversy, including criticisms from Van IJzendoorn and Bakermans-Kranenburg, who have argued on theoretical and empirical grounds that unresolved states of mind represent a discrete dimension (Chapter 4).

### **Integrating Developmental and Social Psychological Approaches to Attachment Theory**

Belsky had conducted empirical research on the antecedents of the Strange Situation classifications in the 1980s and early 1990s, and advocated for the value of attachment research to understanding child development and to resolving applied questions of policy and practice.<sup>116</sup> Among Ainsworth's immediate students and allies, Belsky was considered the first developmental scientist from outside of their tight-knit circle to really make a substantive contribution to attachment research.<sup>117</sup> By the mid-1990s, he was regarded by other developmental scientists and by the public as a 'well-known proponent of attachment theory'.<sup>118</sup> Kroonenberg and Stoltenborgh's bibliometric study of co-authorship in the 1999 *Handbook of Attachment* illustrated the nodal position occupied by Belsky within the attachment research community.<sup>119</sup> The nodal position occupied by Belsky was unusual for a researcher outside of Ainsworth's circle. Less integrally tied to this group socially or academically, he was both dismayed by the normativity of the attachment research community and considerably more independent than others of its regulation.<sup>120</sup>

From the mid-1990s, Belsky began to present critical appraisals of the state of attachment theory and research. The Pennsylvania Child and Family Development Project had, by this time, generated equivocal findings regarding the correlates of the Strange Situation and the AAI, not necessarily well aligned with the findings from Main's group at Berkeley. Furthermore, Belsky had seen the attachment community circle the wagons in response to the criticisms of Lamb, Thompson, and colleagues, a response he regarded with great dismay (Chapter 1). He felt that in-group/out-group dynamics risked contributing to the petrification of attachment research. When invited by editors to offer reviews of attachment research, Belsky discussed weaknesses as well as strengths.

A pair of appraisals of the state of attachment research were written with Jude Cassidy, then a colleague at Penn State (1988–1996), and published in 1994. Belsky and Cassidy observed that 'Bowlby's and Ainsworth's theorizing has been the spring board for a broad

<sup>115</sup> Fraley, R. C. & Shaver, P. R. (2008) Attachment theory and its place in contemporary personality research. In O. John & R. W. Robins (eds), *Handbook of Personality: Theory and Research*, (3rd ed., pp. 518–541). New York: Guilford.

<sup>116</sup> Belsky, J. & Nezworski, T. (1988) Clinical implications of attachment: An introduction. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 3–17). Hillsdale, NJ: Lawrence Erlbaum Associates.

<sup>117</sup> E. Waters, personal communication, May 24, 2024.

<sup>118</sup> Blakeslee, S. (1998) Re-evaluating significance of baby's bond with mother. *New York Times*, 4 August 1998.

<sup>119</sup> Kroonenberg, P. M. & Stoltenborgh, M. (2023) Handbooks as a means of mapping a discipline: An exploration of the world of attachment. In A. Okada, K. Shigemasa, R. Yoshino, & S. Yokoyama (eds), *Facets of Behaviormetrics: The 50th Anniversary of the Behaviormetric Society* (pp. 123–143). New York: Springer, Figure 5.

<sup>120</sup> Hilbert, R. A. (1986) Anomie and the moral regulation of reality: The Durkheimian tradition in modern relief. *Sociological Theory*, 4(1), 1–19.

continuum of implicit, if not explicit, theories of attachment.<sup>121</sup> They proposed a continuum between a 'narrow' view of individual differences in attachment, relating primarily to information about secure base and safe haven availability, and a 'broader' view of individual differences in attachment, as about perceptions and trust in close relationships.

Towards the latter end of the continuum was a tradition of research springing up within social psychology, initiated by Shaver and colleagues, which used self-report measures of attachment to examine experiences in romantic relationships.<sup>122</sup> Belsky and Cassidy were much more welcoming and encouraging of this research than most researchers in developmental science.<sup>123</sup> This led Seymour Weingarten, editor-in-chief of The Guilford Press, to approach Cassidy and Shaver at the 1995 meeting of the Society for Research in Child Development in Indianapolis with the idea of a *Handbook of Attachment* drawing on both traditions.<sup>124</sup> Cassidy would go on to use self-report measures of attachment in her own research, one of the few scholars to straddle the two traditions of research.<sup>125</sup>

Belsky would generally prefer observational measures of attachment in his own work. Nonetheless, when the infants in Study IV of the Pennsylvania Child and Family Development Project were nine months, he had mothers complete a self-report assessment of attachment style (Collins and Read's multi-item version of the Hazan and Shaver measure).<sup>126</sup> There was also maternal AAI data from this sample at 11–12 months. These data were discussed in a paper by Shaver, Belsky, and Brennan in 2000. Strangely, the researchers did not report the associations between self-reported anxiety and avoidance and the Adult Attachment Interview categories. Given that the overall priority of the paper was to emphasize the compatibility of the two measures, the reader is left with the impression that this analysis was run, but the null results were not regarded as desirable. Such null results would have been in line with subsequent research on associations between the AAI and self-report measures generally.<sup>127</sup>

Instead, Shaver, Belsky, and Brennan reported a few moderate associations on various subscales. Self-reported avoidance was associated with lack of memory for childhood events, anger at the speaker's parents, and lower overall coherence.<sup>128</sup> Shaver and colleagues reported that the self-report item: 'I am comfortable having others depend on me' turned out to correlate more strongly than most of the others with important AAI coding scales. Why? We suggest it is because the AAI was originally designed to predict what might be called "state of mind with respect to serving as an attachment figure for one's child". It seems also to implicitly assess a more general comfort with serving as an attachment figure.<sup>129</sup>

<sup>121</sup> Belsky, J. & Cassidy, J. (1994) Attachment: Theory and evidence. In M. Rutter & D. Hay (eds), *Development through Life: A Handbook for Clinicians* (pp. 373–402). Oxford: Blackwell, p. 381.

<sup>122</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 5.

<sup>123</sup> Belsky, J. & Cassidy, J. (1994) Attachment and close relationships: An individual-difference perspective. *Psychological Inquiry*, 5(1), 27–30: 'There is little in science that carries as much value as ideas that stimulate others and generate testable propositions. As Hazan and Shaver, as well as many others, have demonstrated, this is what makes attachment theory so attractive and enduring—its generativity' (30).

<sup>124</sup> Cassidy, J. & Shaver, P. (1999) Preface. In *The Handbook of Attachment*, 1st ed. New York: Guilford, xiv.

<sup>125</sup> For example, Duggan, A., Berlin, L., Cassidy, J., Burrell, L., & Tandon, D. (2009) Examining maternal depression and attachment insecurity as moderators of the impacts of home visiting for at-risk mothers and infants. *Journal of Consulting and Clinical Psychology*, 77(4), 788–799.

<sup>126</sup> Collins, N. L. & Read, S. J. (1990) Adult attachment, working models, and relationship quality in dating couples. *Journal of Personality and Social Psychology*, 58, 644–663.

<sup>127</sup> Roisman, G. I., Holland, A., Fortuna, K., Fraley, R. C., Clausell, E., & Clarke, A. (2007) The Adult Attachment Interview and self-reports of attachment style: An empirical rapprochement. *Journal of Personality and Social Psychology*, 92(4), 678–697.

<sup>128</sup> Shaver, P. R., Belsky, J., & Brennan, K. A. (2000) The adult attachment interview and self-reports of romantic attachment: Associations across domains and methods. *Personal Relationships*, 7(1), 25–43.

<sup>129</sup> *Ibid.*, 39.

Study IV of the Pennsylvania Child and Family Development Project had data available from four Strange Situations conducted on each child. It is astonishing that no assessment was made of the association between a self-report measure staking a claim to be measuring attachment and the Strange Situation, as the canonical assessment of that construct. Given that there clearly was already selective reporting of results in the paper, it may be anticipated that analysis of associations with the Strange Situation were conducted but that the results did not help Shaver's case for the standing of the self-report measure. If so, this would align with the results of subsequent studies which have generally found no association between self-reported attachment and either caregiver sensitivity or the Strange Situation.<sup>130</sup>

Only one other publication by Belsky ever used the self-report measure of attachment from Study IV, and in this paper he did not treat it as measuring attachment, but described it as a measure of attitudes towards relatedness.<sup>131</sup> Unlike Cassidy he did not use self-report measures of attachment in other research. Nonetheless, his paper with Shaver and Brennan signals an unusual degree of support for the social psychological tradition of attachment research—against a background of antipathy, and even threats of symbolic dispossession, from developmental psychologists in the 1990s. In subsequent writings, Belsky was impatient with researchers, including his friends Van IJzendoorn and Bakermans-Kranenburg, who drew sharp distinctions between the social psychological and developmental approaches to the study of attachment.<sup>132</sup>

Belsky and Cassidy held a number of theoretical positions that may have contributed to their receptiveness to social psychological research on attachment in the 1990s. In their 1994 chapter and paper, they characterized attachment as primarily a matter of an individual's working model about themselves and others, with individual differences on attachment measures reflecting differences in expectations of self and other. Some of these expectations would be cognitive representations; others would be regulatory processes that reflect response to threat at the physiological level. For all that Bowlby focused much more on cognitive representations, both Belsky and Cassidy felt that a strength of attachment theory was its evolutionary-biological basis, with room to grow for the theory in attending to responses to threat at the physiological level and other biological mechanisms.<sup>133</sup>

Expectations fed by representational and physiological processes would lead to individual differences. For Belsky and Cassidy, individuals classified as avoidant in the Strange Situation, or dismissing on the Adult Attachment Interview, have particular patterns in their social interactions. They will 'devalue the importance of close relationships to their psychological well-being' and 'emphasize autonomy and separateness at the expense of connectedness and intimacy'. Those classified as resistant in the Strange Situation, or preoccupied on the AAI, 'tend to emphasize in an exaggerated manner issues of attachment (i.e., proximity, intimacy, involvement, connectedness)' and 'to have a fundamental fear of abandonment'. Finally, individuals classified as secure or autonomous 'value attachment in a more balanced manner—recognizing, appreciating, and desiring both intimacy and autonomy, separateness as well as connectedness'. This allows the secure infant to respond

<sup>130</sup> For example, Bernier, A. & Matte-Gagné, C. (2011) More bridges: Investigating the relevance of self-report and interview measures of adult attachment for marital and caregiving relationships. *International Journal of Behavioral Development*, 35(4), 307–316.

<sup>131</sup> Belsky, J., Crnic, K., & Gable, S. (1995) The determinants of coparenting in families with toddler boys: Spousal differences and daily hassles. *Child Development*, 66(3), 629–642.

<sup>132</sup> See, for example, Del Giudice, M. & Belsky, J. (2010) Evolving attachment theory: Beyond Bowlby and back to Darwin. *Child Development Perspectives*, 4(2), 112–113.

<sup>133</sup> Belsky, J. & Cassidy, J. (1994) Attachment: Theory and evidence. In M. Rutter & D. Hay (eds), *Development through Life: A Handbook for Clinicians* (pp. 373–402). Oxford: Blackwell, p. 374.

proportionately to their caregiver's absence with distress and reunion with comfort and resumption of play. It allows the autonomous adult to offer an account of their experiences growing up proportionate to the specific memories they have of this time.<sup>134</sup>

This interpretation diverged sharply from that of Main. For her, 'there exist species-wide abilities that are not part of the attachment system itself, but can, within limits, manipulate (either inhibit or increase) attachment behavior in response to differing environments' (Chapter 1).<sup>135</sup> The cognitive contents discussed by Belsky and Cassidy might sometimes or often be associated with these processes, but they do not represent the heart of individual differences in attachment. Really what is at stake is a different mechanism for how individual differences in attachment work. For Main, this mechanism was the modulation of attention towards or away from attachment-relevant information.

Main felt, quite strongly, that to treat attachment categories as if they were personality traits was to sell the family heirlooms of attachment theory for timber, missing what was profound about the model. She expected individual differences in security/insecurity to be specific to contexts where such information was salient, rather than stable across other situations. Whereas Belsky's characterization assumed trait-like stability across contexts in individual differences in attachment, Main expected that individual differences on the AAI would not have much bearing in routine work contexts, a hypothesis tested and supported by Crowell and Waters.<sup>136</sup>

Main also pointed to Ainsworth's finding from her small sample of infants classified as avoidant in the Strange Situation: it was these infants who were the most distressed and aggressive at home, when the attachment motivational system was not activated.<sup>137</sup> This was supported by Goossens, Van IJzendoorn, and Leiden colleagues, who found no significant association between the Strange Situation conducted in the laboratory and conducted at home.<sup>138</sup> As we have seen, in the Parent Development Interview, it was participants who were dismissing on the AAI who described the most anger with their child. In later work on the NICHD sample, it was children from dyads classified as avoidant at 15 months who were most likely to have a tantrum when asked to pack away the toys at the end of a period of observed play.<sup>139</sup>

<sup>134</sup> Belsky, J. & Cassidy, J. (1994) Attachment and close relationships: An individual-difference perspective. *Psychological Inquiry*, 5(1), 27–30.

<sup>135</sup> Main, M., Hesse, E., & Kaplan, N. (2005) Predictability of attachment behavior and representational processes at 1, 6, and 19 years of age: The Berkeley longitudinal study. In K. E. Grossmann, K. Grossmann, & E. Waters (eds), *Attachment from Infancy to Adulthood: The Major Longitudinal Studies* (pp. 245–304). New York: Guilford, p. 256.

<sup>136</sup> Crowell, J. A., Waters, E., Treboux, D., O'Connor, E., Colon-Downs, C., Feider, O., ... & Posada, G. (1996) Discriminant validity of the adult attachment interview. *Child Development*, 67(5), 2584–2599.

<sup>137</sup> Ainsworth, M. D. S. (1977) Social development in the first year of life: Maternal influences on infant–mother attachment. In J. M. Tanner (ed.), *Developments in Psychiatric Research* (pp. 1–20). London: Hodder & Stoughton, p. 17.

<sup>138</sup> Goossens, F. A., Van IJzendoorn, M. H., Tavecchio, L. W. C., & Kroonenberg, P. M. (1986) Stability of attachment across time and context in a Dutch sample. *Psychological Reports*, 58(1), 23–32.

<sup>139</sup> NICHD Early Child Care Research Network (2004) Affect dysregulation in the mother–child relationship in the toddler years: Antecedents and consequences. *Development and Psychopathology*, 16(1), 43–68. Though group authored, there are several features of this article that point to a considerable role for Belsky, for example self-citations, citations of the Minnesota group as a synecdoche for attachment research generally, use of favoured statistical techniques. If so, then this may account for the authors' expression of surprise that avoidance was associated with tantrums during cleanup at 24 months, since this result would have run contrary to Belsky's expectations, and was more in line with Main's account, of which he was relatively sceptical. In a subsequent group-authored paper, the NICHD co-investigators still maintained that 'avoidantly attached infants are not used to acknowledging and expressing anger to their caregivers', despite the earlier evidence to the contrary, presumably since the earlier finding was contrary to expectations. NICHD Early Child Care Research Network (2006) Infant–mother attachment classification: Risk and protection in relation to changing maternal caregiving quality. *Developmental Psychology*, 42(1), 38–58, p. 40.

By contrast, in the account offered by Belsky and Cassidy in their 1994 papers, the mechanism underpinning individual differences in attachment was individuals' attitudes towards themselves and their relationships, even if these attitudes might be more salient and influential under conditions of threat or arousal. Individual differences in the Strange Situation or AAI would therefore be expected to be relatively trait-like and reflected similarly in other contexts. In a sense, the same might be said of Bretherton and Waters, for whom individual differences in attachment reflected individual's scripts about the availability of others as a secure base and safe haven. However, Bretherton and Waters regarded these scripts as specific to expectations about secure base and safe haven provision.<sup>140</sup> Crowell and Waters characterized the work of the social psychologists as 'thoughtful and provocative' but as sharing 'little common ground' with the tradition initiated by Ainsworth.<sup>141</sup>

Belsky and Cassidy criticized Main's proposals about attentional processes as speculative, not well moored by empirical validation.<sup>142</sup> As seen in [Chapter 1](#), Belsky interpreted his own attempt to test these proposals as not offering support. That said, the measure of individual differences in attention he used—children's distractibility during a puppet show unrelated to attachment themes—was not aligned with Main's theory of how attention underpins individual differences in attachment. Cassidy's own study, which would align with Main's proposals, was still underway.<sup>143</sup>

Having questioned Main's proposals about common attentional processes between the Strange Situation and the Adult Attachment Interview, Belsky and Cassidy raised questions about the meaning of the latter measure. With the AAI modelled by Main on the Strange Situation categories, Belsky and Cassidy wondered whether it would fail to capture aspects of attachment functioning distinct to adulthood, such as capacities for self-knowledge, contributing to the appeal of other methodologies for studying adults. Some years later, in a 2002 paper, Belsky would take this argument further, arguing that social psychological measures had demonstrated both more interesting correlates, and correlates more aligned with Bowlby's theory, than the AAI.<sup>144</sup>

Belsky and Cassidy criticized those, such as Waters, who wanted to narrow the idea of attachment to expectations about secure base and safe haven provision ([Chapter 1](#)). They felt this was unnecessary, and contrary to Bowlby's articulation of attachment theory. They also found the position unpersuasive given associations between the Strange Situation and aspects of development that would not be expectable on this basis, such as language and cognitive development. They felt that a distinction should be drawn between *expectations about secure base and safe haven provision*, and a wider conceptualization of attachment based in the *trust developed from experiences of attunement and responsiveness in close relationships*. In later writings, Belsky and Cassidy have tended to assume that these would have broadly the same correlates, though Cassidy has held that the former is perhaps the

<sup>140</sup> Waters regarded understanding the relationship between the constructs of security and traits as important for comprehending the study of attachment. For instance, in 2000 he set the following as an exam question for students at Stony Brook: 'Bowlby's attachment theory is NOT a trait theory. Attachment research OFTEN seems to reflect underlying trait hypotheses. Comment.' PSY552: Social Development Seminar, Fall 2000: Attachment Theory & Research. Everett Waters personal archive.

<sup>141</sup> Crowell, J. A. & Waters, E. (1994) Bowlby's theory grown up: The role of attachment in adult love relationships. *Psychological Inquiry*, 5(1), 31–34, pp. 33–34.

<sup>142</sup> Belsky, J. & Cassidy, J. (1994) Attachment: Theory and evidence. In M. Rutter & D. Hay (eds), *Development through Life: A Handbook for Clinicians* (pp. 373–402). Oxford: Blackwell, p. 383.

<sup>143</sup> Kirsh, S. J. & Cassidy, J. (1997) Preschoolers' attention to and memory for attachment-relevant information. *Child Development*, 68(6), 1143–1153.

<sup>144</sup> Belsky, J. (2002) Developmental origins of attachment styles. *Attachment & Human Development*, 4(2), 166–170, p. 168.

more central construct.<sup>145</sup> Nonetheless, in 1994 and subsequently, they regarded both as encompassed by Bowlby's theory and legitimate targets of attachment research.

In their 1994 paper and chapter, Belsky and Cassidy characterized individual differences in attachment in a highly congruent way to the social psychologists, as attitudes towards self and others. Such attitudes would be generally relevant across contexts, as stable traits (e.g., in routine work interactions). As such, Belsky and Cassidy regarded research by social psychologists on the study of attitudes as a logical application of attachment theory, one that they had felt for some time was a missed opportunity.<sup>146</sup> Furthermore, they were sympathetic to the approach of social psychologists to treat individual differences in attachment as much like personality traits:

When a close relationship is going poorly at home, we expect maximum and negative spillover to occur in the workplace (inefficiency, absenteeism, mistakes) for preoccupied individuals who have problems with boundary maintenance (self-other, work-family). When work experiences are going badly, we expect dismissing individuals to be least likely to communicate their problems directly to their partner (i.e., low self-disclosure).<sup>147</sup>

This perspective aligns with the idea that preoccupied and dismissing classifications on the AAI represent stable traits, reflecting general individual attitudes towards themselves and others. For Belsky and Cassidy, 'attachment theory can be viewed, in large part, as a theory of personality development'.<sup>148</sup>

In a 1997 paper, Belsky argued that 'real differences in orientation remain between the modern evolutionary perspective advanced in this essay and traditional attachment theory. Whereas the latter places issues of mental health and psychological well-being at center stage in its effort to understand individual differences in attachment security, the former replaces such a concern with a focus upon reproducing one's genes'.<sup>149</sup> He considered why the three organized types of attachment behaviour might have evolved. His focus on these three types was pragmatic rather than principled: 'they have been the subject of most research and theory'. He was by no means of the view 'that they are the only patterns that exist in nature or that 100% of infant-parent relationships can be neatly classified in such terms'.<sup>150</sup>

Belsky argued that, reflecting positive attitudes towards relationships, 'security evolved to promote mutually beneficial interpersonal relations and high investment parenting'. This would have contributed to both individual and offspring survival under relatively more gentle conditions, where cooperation and high investment in parenting would not be penalized, in fact would be rewarded. Reflecting attitudes that devalue the importance of close relationships, 'avoidant/dismissing attachment evolved to promote opportunistic interpersonal relations and low-investment parenting'.<sup>151</sup> This would have contributed

<sup>145</sup> For example, Cassidy, J., Woodhouse, S. S., Cooper, G., Hoffman, K., Powell, B., & Rodenberg, M. (2005) Examination of the precursors of infant attachment security: Implications for early intervention and intervention research. In L. J. Berlin, Y. Ziv, L. Amaya-Jackson, & M. T. Greenberg (eds), *Enhancing Early Attachments: Theory, Research, Intervention, and Policy* (pp. 34–60). New York: Guilford; Woodhouse, S. S., Scott, J. R., Hepworth, A. D., & Cassidy, J. (2020) Secure base provision: A new approach to examining links between maternal caregiving and infant attachment. *Child Development*, 91(1), 249–265.

<sup>146</sup> Belsky, J. & Cassidy, J. (1994) Attachment and close relationships: An individual-difference perspective. *Psychological Inquiry*, 5(1), 27–30, p. 28.

<sup>147</sup> Ibid.

<sup>148</sup> Belsky, J. & Cassidy, J. (1994) Attachment: Theory and evidence. In M. Rutter & D. Hay (eds), *Development through Life: A Handbook for Clinicians* (pp. 373–402). Oxford: Blackwell, p. 373.

<sup>149</sup> Belsky, J. (1997) Attachment, mating, and parenting. *Human Nature*, 8(4), 361–381, p. 375.

<sup>150</sup> Ibid., 366.

<sup>151</sup> Ibid., 361.



to both individual and offspring survival under relatively more harsh conditions, where cooperation and high investment in parenting would be penalized. Psychoanalytic ideas of avoidant/dismissing attachment as a defence against dysregulation, critical to the conceptualization of Main, are completely absent from Belsky. Instead, avoidant/dismissing attachment is considered solely in terms of adaptation to environmental signals and attitudes towards relationships. In other words, Belsky no longer viewed attachment through a mental health lens, but rather from an evolutionary-biological perspective, picking up this other, neglected aspect of Bowlby's legacy.

Belsky also argued that evolutionary theory can help conceptualize caregiver behaviour. Natural selection may be anticipated to have primed caregivers to engage in more sensitive and less alarming care when they feel less overwhelmed by day-to-day life. Belsky drew attention to situations where parents feel that the child is seriously threatening their own capacity to cope. When caregivers feel 'sociologically stressed and psychologically depleted', this may be especially associated with insensitive and alarming care, and potentially with abuse and neglect.<sup>152</sup>

Attachment researchers in the developmental tradition tended to treat an individual's feelings of security as reflecting solely their experiences within attachment relationships, a situation Ainsworth deeply regretted towards the end of her life: 'By focusing so closely on intimacies some attachment researchers have come to conceive of them as the only source of security—which is a pity.'<sup>153</sup> The few developmental psychologists to have been interested in other contributors to feelings of security, such as Cummings (Chapter 1), were often Ainsworth's direct students and immediate collaborators. This presumably reflected conversations with Ainsworth.<sup>154</sup> This oral tradition may have contributed to the interest of Cassidy, Ainsworth's last graduate student, in other factors that could contribute to feelings of security, and her attraction to social psychological research that treated security as an attitude, one that would be fed by many currents.<sup>155</sup> Belsky and Cassidy urged attention to 'what extent non-attachment components contribute to security'.<sup>156</sup> One such component was temperament, which ultimately led Belsky to the concept of differential susceptibility, as discussed below.

## Daycare Debates

### The Socio-political Context of Interest in Daycare and Attachment

From the start, one of the central concerns of Belsky's work has been the question of the effects of daycare on child development. This was a major social question in the early years of Belsky's career and reflected a rapidly changing demographic and policy

<sup>152</sup> Belsky, J. & Stratton, P. (2002) An ecological analysis of the etiology of child maltreatment. In K. Browne, H. Hanks, P. Stratton, & C. Hamilton (eds), *Early Prediction and Prevention of Child Abuse: A Handbook* (pp. 95–110). Chichester, UK: Wiley, p. 106.

<sup>153</sup> Ainsworth, M. ([1990] 2010) Security and attachment. In R. Volpe (ed.), *The Secure Child: Timeless Lessons in Parenting and Childhood Education* (pp. 43–53). Charlotte, North Carolina: Information Age Publishing, p. 49. See also Ainsworth, M. D. & Ainsworth, L. H. (1958) *Measuring Security in Personal Adjustment*. Toronto: University of Toronto Press.

<sup>154</sup> For example, Davies, P. T., Harold, G. T., Goeke-Morey, M. C., & Cummings, E. M. (2002) Child emotional security and interparental conflict. *Monographs of the Society for Research in Child Development*, 67, 1–115.

<sup>155</sup> For a review, see Mikulincer, M. & Shaver, P. R. (2023) *Attachment Theory Expanded: Security Dynamics in Individuals, Dyads, Groups, and Societies*. New York: Guilford Press.

<sup>156</sup> Belsky, J. & Cassidy, J. (1994) Attachment: Theory and evidence. In M. Rutter & D. Hay (eds), *Development through Life: A Handbook for Clinicians* (pp. 373–402). Oxford: Blackwell, p. 377.

context. Between the 1940s and 1970s in the United States, the number of women in employment doubled, and the number of working mothers with young children increased eightfold. In the '70s alone, the number of working mothers with young children increased by a third.<sup>157</sup> Bronfenbrenner reported from census data that by 1974, one of every eight children under three was living in a single-parent household, with 80% of these parents employed full time.<sup>158</sup> The most rapid growth was in employment of women with an infant under one year of age.<sup>159</sup>

These changes were among the prompts for conservative social and political discourse about the role of women in family life. In 1971, the US congress passed the Mondale-Brademas Comprehensive Child Development Act, which would have made publicly supported day care widely available—but this was vetoed by President Nixon on the grounds that daycare represented a communist approach contrary to American family values.<sup>160</sup> Belsky was scathing about this decision. In his view, 'of the many changes American society has witnessed during the recent past, perhaps none are as pervasive in scope and consequence as those involving women's roles', and Nixon's veto represented a wilful failure to recognize this fact. It did nothing to reduce the use of daycare, and instead simply contributed to uneven quality of provision: 'Instead of the viable child-care system the legislation envisioned, what we have instead is a jerry-built patchwork of arrangements.'<sup>161</sup> Belsky was appalled that Nixon was unable to see that children represented the human capital, the future workers, required by capitalism and capitalist values:

All that his veto assured was that young families of the 1980s and 1990s would endeavor to rear their children, and supposedly the nation's future, in an environment that appears to be ever more hostile to children and youth. A nation supposedly committed to capitalism has not awakened to its wastage of human capital and the social and economic consequences of that wastage.<sup>162</sup>

Political disinclination to offer support for families, in the name of family responsibility, also proved an obstacle to the availability of paid parental leave. This had considerable consequences for early childcare in families like those researched by Belsky and colleagues.<sup>163</sup> In the Pennsylvania Child and Family Development Project Studies II and III, 59% of women returned to work within the first year following the infant's birth. Of these women, 69% returned to employment within their infant's first three months. Only 2% of mothers reported that they returned to work for the sake of career development, and only 5% because they wanted to. Many more mothers—39%—said that they returned to employment because it was an essential financial necessity.<sup>164</sup>

<sup>157</sup> Hill, D. R. (1978) Private demand for child care: Implications for public policy. *Evaluation Quarterly*, 2, 523–545.

<sup>158</sup> Bronfenbrenner, U. (1975) Is early intervention effective? DHEW Publication No (OHD) 76–30025. Washington, DC: US Department of Health, Education and Welfare.

<sup>159</sup> Klein, R. (1985) Caregiving arrangements by employed women with children under one year of age. *Developmental Psychology*, 21, 403–406.

<sup>160</sup> Cohen, S. S. (2001) *Championing Child Care*. New York: Columbia University Press; Zigler, E., Marsland, K. W., & Lord, H. (2009) *The Tragedy of Child Care in America*. New Haven: Yale University Press.

<sup>161</sup> Belsky, J. (1990) Infant day care, child development, and family policy. *Society*, 27(5), 10–12, p. 10.

<sup>162</sup> *Ibid.*, 11.

<sup>163</sup> Zigler, E. F. & Frank, M. E. (1988) *The Parental Leave Crisis: Toward a National Policy*. New Haven: Yale University Press.

<sup>164</sup> Volling, B. L. & Belsky, J. (1993) Parent, infant, and contextual characteristics related to maternal employment decisions in the first year of infancy. *Family Relations*, 42(1), 4–12, p. 10.

With Penn State colleague Donald Peters, Belsky presented sociological reflections on the debate about daycare in a 1982 chapter. Peters and Belsky considered that 'ambivalence toward day care in the United States stems, in part, from historical traditions that stress individualism and the sanctity of the family'.<sup>165</sup> In their view, criticisms of daycare are grounded in a number of normative assumptions:

- (a) 'most families include a father, nonworking mother and children;
- (b) this type of family is the one against which all other family forms should be judged;
- (c) a principal function of the family is child-rearing;
- (d) most families provide the ideal learning and development environment for children; and
- (e) the family of the past is the family of the future'.<sup>166</sup>

Debates over daycare were therefore, at the same time, debates about threats to the family as a social institution.

Additionally, the issue of daycare had theoretical importance for Belsky. Bronfenbrenner's ecological model contributed to his fascination with the institutions within which family life is nested, including parental employment and child daycare. During his graduate studies at Cornell, Belsky worked with Bronfenbrenner on a review of the effects of daycare commissioned by the government.

Conceptually, daycare also raised important questions for attachment theory. Bowlby had modelled the attachment motivational system in terms of the child-mother relationship. He theorized that infants will seek their most familiar caregiver, often their mother, when distressed, as a source of protection and comfort. Ainsworth had added the idea that the mother may serve as a secure base from which the child can explore, lowering the threshold for activation of the attachment motivational system. Both Bowlby and Ainsworth anticipated that fathers and grandparents could likewise serve as a safe haven and secure base for a child, depending on how much time they had spent together and the quality of their interaction. Yet it was unclear what aspects of these models could be imported to the conceptualization of non-familial care. And it was unclear how the experience of daycare would impact familial attachment relationships.

Following visits to Israeli kibbutzim, Bowlby observed that 'there are always great advantages for a young child when he is familiar and feels secure with at least one other female figure. When the kibbutz nurse is temperamentally well suited to her job, on good terms with the mother, and remains in her post, multiple care has comparable advantages'.<sup>167</sup> Nonetheless, Bowlby had two worries about daycare.

- Firstly, he was concerned that daycare would reduce opportunities for a caregiver to learn about their child and their needs, resulting in less sensitive and attuned care. In their commentary on attachment theory and daycare, Jaeger and Weinraub would term this the 'quality of mothering' model.<sup>168</sup>

<sup>165</sup> Peters, D. & Belsky, J. (1982) The Day Care Movement: Past, present and future. In M. Kostelnik, A. Rabin, L. Phenice, & A. Soderman (eds), *Child Nurture: Patterns of Supplementary Parenting* (Vol. 2, pp. 101-130). New York: Plenum, p. 101.

<sup>166</sup> Ibid., 104.

<sup>167</sup> Bowlby, J. (1963) Children in the Kibbutz. *Guardian*, 3 July, p. 3.

<sup>168</sup> Jaeger, E. & Weinraub, M. (1990) Early nonmaternal care and infant attachment: In search of process. *New Directions for Child Development*, 49, 71-90. See also Ainslie, R. C. & Anderson, C. W. (1984) Day care children's relationships to their mothers and caregivers: An inquiry into the conditions for the development of attachment. In R. C. Ainslie (ed.), *The Child and the Day Care Setting* (pp. 98-132), New Year: Praeger.

- Secondly, Bowlby's more prominent argument was that daycare would be experienced by the child as a major separation from their caregiver, a source of distress without the capacity of daycare providers to offer effective comfort.

Even if briefer periods than a long stay in hospital, daycare was a more frequent source of separation. In principle Bowlby felt that it could be as or potentially even more harmful to children. Jaeger and Weinraub would term this Bowlby's 'maternal separation' model of the effects of daycare.

Writing to Michael Rutter in 1971, Bowlby stated 'As regards long-term effects of brief experiences, we [Bowlby's research group] have endeavoured to keep an absolutely open mind. The view I have held for some years is rather like Doll's view of smoking. Whilst serious effects are found almost always only by prolonged and heavy smoking, even lighter and less prolonged smoking can have adverse effects *in some people*. Where one draws the line in practice then becomes a matter for private judgement.'<sup>169</sup> This more qualified position in private is unfortunately generally absent in Bowlby's published writings. In *Separation*, for instance, the qualifications are removed from the comparison previously offered to Rutter. More separations of any kind are simply worse: 'the effects of separation from mother can be likened to the effects of smoking or of radiation. Although the effects of small doses appear negligible, they are cumulative.'<sup>170</sup>

This idea would be criticized in the strongest of terms by Van IJzendoorn, who felt that it had no logical alignment with the result of Bowlby's attachment theory. For Van IJzendoorn, Bowlby's theory was focused on the benefits to children of safe haven provision: daycare need not disturb a caregiver's offer of a safe haven in times of need. Rather, a small number of familiar daycareers might provide additional sources of safe haven provision.<sup>171</sup> Yet other empirical attachment researchers were persuaded by Bowlby's worries about daycare separations, including notably Brian Vaughn, who completed his PhD at Minnesota and then spent the 1980s at the University of Illinois.<sup>172</sup> Bowlby's views also circulated in social policy discourses. For example, they provided a claim to scientific authority for those arguing against state funding for daycare in England, though historians have debated the extent to which Bowlby's position ultimately influenced daycare policy.<sup>173</sup>

Critics of attachment theory and research have alleged that proponents have assumed that children have two modes of being: exclusive dyadic interaction with their mother, or alone.<sup>174</sup> There is this tendency in Bowlby's work; though it only dominates in his earlier and more polemical work, it is not disavowed when he is seeking to be more careful (Chapter 1). Ainsworth's stance was quite different. She was explicitly critical of Bowlby,

<sup>169</sup> Bowlby, J. (1971) Letter to Michael Rutter, 6 October 1971. John Bowlby Archive, Wellcome Collections, PP/Bow/J/9/161.

<sup>170</sup> Bowlby, J. (1973) *Separation: Anxiety and Anger*. New York: Basic Books, p. 96.

<sup>171</sup> Van IJzendoorn, M. H. (1979) Operationaliseringsproblemen bij onderzoek naar de affectieve relatie tussen ouder en kind. *Pedagogische Studien*, 56, 358–368, p. 358.

<sup>172</sup> Barglow, P., Vaughn, B. E., & Molitor, N. (1987) Effects of maternal absence due to employment on the quality of infant–mother attachment in a low-risk sample. *Child Development*, 945–954. See also Schwartz, P. (1983) Length of day-care attendance and attachment behavior in eighteen-month-old infants. *Child Development*, 54(4), 1073–1078; Owen, M. T. & Cox, M. J. (1988) Maternal employment and the transition to parenthood. In A. E. Gottfried & A. W. Gottfried (eds), *Maternal Employment and Children's Development: Longitudinal Research* (pp. 85–119). Boston, MA: Springer.

<sup>173</sup> Davis, A. (2013) *Modern Motherhood*. Manchester: Manchester University Press; Lewis, J. (2013) The failure to expand childcare provision and to develop a comprehensive childcare policy in Britain during the 1960s and 1970s. *Twentieth Century British History*, 24(2), 249–274.

<sup>174</sup> For example, Keller, H. (2016) Attachment: A pancultural need but a cultural construct. *Current Opinion in Psychology*, 8, 59–63.

who she felt adopted too general a concept of 'separation'. Daycare was not similar to a child being subjected to weeks in hospital.<sup>175</sup>

Ainsworth's first two graduate students were Mary Main and Mary Blehar. Blehar's 1974 doctoral thesis conducted Strange Situations with 20 children who had recently started daycare and 20 children who were exclusively cared for by their mothers at home, matched for demographic characteristics. The children who had recently started daycare cried more during separations. The 30-month-old children who had experienced daycare were more likely to show avoidance on reunion; the 40-month-old children who had experienced daycare were more likely to show avoidance on reunion. Blehar concluded that daycare was resulting in 'substantial disturbance', with parallels to children who had experienced extensive hospitalization.<sup>176</sup> Blehar did not report the distribution of children in terms of Strange Situation categories.

The results proved very controversial and aligned empirical attachment research in developmental psychology with Bowlby and critics of daycare. Writing in 1980, Vaughn, Gove, and Egeland observed that 'of all the debates about the effects of out-of-home care, none has been so acrimonious as that concerning the impact of alternative care on the infant-mother attachment.'<sup>177</sup> It has generally been assumed that Blehar's paper represented the position of Ainsworth and her circle. In fact, they regarded Blehar as overclaiming from the results of a small study and held that the results needed to be treated with caution. Ainsworth did not agree to be a co-author on the paper. Indeed, Blehar could only thank Ainsworth in the paper for her 'critical comments'.<sup>178</sup> It would have gone against Ainsworth's sense of professionalism to frankly criticize a student in print (Chapter 1). Instead, except in co-authored work with Blehar, she did not cite the paper.

In *Patterns of Attachment*, co-authored by Ainsworth, Blehar, Waters, and Wall in 1978, the authors nonetheless signal that Blehar's study and its strong conclusions represent the latter's views, rather than a collective stance on this 'political issue'.<sup>179</sup> The book outright distances itself from the findings: 'in regard to Blehar's day-care group, one would like to know the characteristic interaction with each of the caregivers in the day-care center and with the parents at home as well as the patterns of individual differences in each of these settings'.<sup>180</sup> Furthermore, *Patterns of Attachment* drew attention to subsequent studies that had found no differences in the Strange Situation between children with and those without experience of daycare.<sup>181</sup>

<sup>175</sup> Ainsworth, M. (1962) The effects of maternal deprivation: A review of findings and controversy in the context of research strategy. In *Deprivation of Maternal Care: A Reassessment of Its Effects* (pp. 87–195). Geneva: WHO, p. 101.

<sup>176</sup> Blehar, M. C. (1974) Anxious attachment and defensive reactions associated with day care. *Child Development*, 45(3), 683–692, p. 691.

<sup>177</sup> Vaughn, B. E., Gove, F. L., & Egeland, B. (1980) The relationship between out-of-home care and the quality of infant-mother attachment in an economically disadvantaged population. *Child Development*, 51(4), 1203–1214, p. 1203.

<sup>178</sup> Blehar, M. C. (1974) Anxious attachment and defensive reactions associated with day care. *Child Development*, 45(3), 683–692, p. 683.

<sup>179</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press, p. 206.

<sup>180</sup> *Ibid.*, 209.

<sup>181</sup> Brookhart, J. & Hock, E. (1976) The effects of experimental context and experiential background on infants' behavior toward their mothers and a stranger. *Child Development*, 47(2), 333–340; Moskowitz, D. S., Schwarz, J. C., & Corsini, D. A. (1977) Initiating day care at three years of age: Effects on attachment. *Child Development*, 48(4), 1271–1276. Unlike Blehar's sample, these studies were of children who had not necessarily just started daycare, and who may have been responding to the transition rather than daycare itself. Yet a small sample was studied by Roopnarine and Lamb even closer to the start of daycare than Blehar, and did not find similar findings. Roopnarine, J. L. & Lamb, M. E. (1978) The effects of day care on attachment and exploratory behavior in a strange situation. *Merrill-Palmer Quarterly of Behavior and Development*, 24(2), 85–95.

Likewise, in correspondence Ainsworth distanced herself from Blehar's paper, seemingly concerned that it reinforced the impression, stemming from Bowlby's early writings, that attachment research was conservative on women's issues and over-confident of the available evidence. Ainsworth regarded the quality of studies on attachment and daycare was inadequate for drawing meaningful conclusions, and that too few studies addressed the age the child started daycare as a moderator. To a student thinking about a graduate study of daycare, she proposed that, rather than attempting another study of whether daycare is harmful using the Strange Situation, more meaningful work could be done examining how and when daycare staff serve as a secure base for children.<sup>182</sup> She would no doubt have been thrilled by recent work by Macagno and Molina addressing just this question.<sup>183</sup> Ainsworth's letters indicate that her personal view was that daycare may have positive implications for children who would otherwise receive non-enriching care, and some negative implications for children where circumstances lead the child to experience being sent to daycare as a form of rejection. But she regarded these as personal views, rather than a stance grounded in Blehar's work or other studies.

Mary Main had undertaken the statistical work for Blehar's study. However, she felt that the findings reflected turbulence in the transition to daycare, rather than having further-reaching implications for child development. In 1979, Main published data from a small study with 21 infants in high-quality daycare. She found that infants who had spent more time in daycare were less likely to show avoidance on reunion with their mother either at daycare or in the Strange Situation. Months in daycare was also associated with more positive socio-emotional adjustment.<sup>184</sup>

One of the last doctoral students supervised by Ainsworth was Virginia Colin, in 1985.<sup>185</sup> Ainsworth supported Colin to conduct a study of 39 children seen in the Strange Situation with both their mother and their familiar nonfamilial daycarer ('an obvious group of potential attachment figures'),<sup>186</sup> in infancy and again in early toddlerhood. Stability was high in both cases: 83% for mothers, and 77% for daycarers. Colin found a number of factors that affected which caregiver was approached on reunion: the duration of each relationship and the proportion of time the infant spent with each caregiver each week were the most important. To a lesser extent, which caregiver was approached at reunion was also predicted by the intensity of each caregiver's emotional investment in the infant assessed with self-report, and the caregiver's observed sensitivity. Colin's conclusion, well in line with Ainsworth's own earlier private views, was that relationships with daycarers can be attachments, can be secure, and can be beneficial for children's emotional development. However, most children will retain their mother as their most important secure base and safe haven, as this relationship is the most familiar, intense and emotionally

<sup>182</sup> Ainsworth, M. (1982) Letter to Ricky Spencer, 18 February 1982. Ainsworth Archive, Box 3173, File 3. See also Ainsworth, M. (1982) Letter to Robert Weiss, 19 August 1982. Ainsworth Archive, Box 3173, File 3: 'In my opinion there is much more research into day care that needs to be done before we can pontificate about its effects. And at least some of this obviously ought to deal with the child's relationship to his day caregiver(s).' Ainsworth and Marvin's former student Mark Cummings had elsewhere conducted a study addressing these topics. His reference to Blehar is to note the 'inconsistency' of findings. Cummings, E. M. (1980) Caregiver stability and day care. *Developmental Psychology*, 16(1), 31–37, p. 36.

<sup>183</sup> Macagno, A. & Molina, P. (2024) Finding a secure base: Exploring children's attachment behaviors with professional caregivers during the first months of daycare. *Infant Behavior and Development*, 74, 101919.

<sup>184</sup> Blanchard, M. & Main, M. (1979) Avoidance of the attachment figure and social-emotional adjustment in day-care infants. *Developmental Psychology*, 15(4), 445–446.

<sup>185</sup> Colin, V. L. (1985) Hierarchies and patterns of infants' attachments to parents and day caregivers: An exploration. Unpublished doctoral dissertation, University of Virginia.

<sup>186</sup> *Ibid.*, 6.

invested. In her otherwise comprehensive review of the literature to date, Colin followed Ainsworth's practice of avoiding citing Blehar's study.

### Reviewing the Effects of Daycare

Belsky and Steinberg published a review of the effects of daycare in *Child Development* in 1978 based on the government report which they worked on under Bronfenbrenner's guidance.<sup>187</sup> Though acknowledging the severe limits of the available evidence on the effects of daycare, the review concluded that there was little evidence of dangers for child development. When the staff:child ratio is not high, and where the caregivers are well trained and attentive to the children, Belsky and Steinberg found little evidence of harm, and promising evidence of benefits. Belsky and Steinberg compared outcomes of daycare in different countries and suggested that child outcomes may reflect the particular values of the society. In the case of US daycare, 'the social development of children in day-care programs most often reflects the characteristically stressed American values of aggressiveness, impulsivity, and egocentrism'.<sup>188</sup>

As such, though their review was mostly positive, they did accept that 'some evidence does suggest that children enrolled in day care for extended periods of time show increased aggression toward peers and adults and decreased cooperation with adults and involvement in educational activities once the child enters school, but these consequences are more likely to be functions of particular socialization values than of day care in general'.<sup>189</sup> They emphasized how limited the evidence was, having little to say about age of entry, amount of care and even quality of care.

In 1985, in the influential 'Growing Points' special issue of *Monographs of the Society for Research in Child Development*, Vaughn, Deane, and Waters published a follow-up of 90 families from the Minnesota Longitudinal Study of Risk and Adaptation.<sup>190</sup> Strange Situations had been conducted at 12 and 18 months. At 24 months the children returned with their mothers to the laboratory and were assessed for perseverance and effective use of their caregiver for support with a difficult tool-use task, and then compliance when asked to pack away. In general, secure attachment was associated with greater perseverance with the task, more effective use of the caregiver support, and more cooperation with cleanup. This was the case both for home-reared children and for children who had started nursery after their first birthday. However, the scores for children from secure dyads who had started nursery before their first birthday were considerably lower, and similar to children who had been classified as insecure in the Strange Situation.

In 1985, Belsky was asked to give a talk on the effects of daycare at the University of Minnesota.<sup>191</sup> In reviewing the literature since 1978, he found several studies linking infant

<sup>187</sup> Belsky, J. & Steinberg, L. D. (1978) The effects of day care: A critical review. *Child Development*, 929-949, referencing Bronfenbrenner, U., Belsky, J., & Steinberg, L. (1976) Day care in context: An ecological perspective on research and public policy. Paper prepared for the Office of the Assistant Secretary for Planning and Evaluation, Department of Health, Education, and Welfare.

<sup>188</sup> Belsky, J. & Steinberg, L. D. (1978) The effects of day care: A critical review. *Child Development*, 929-949, p. 941.

<sup>189</sup> *Ibid.*, 944.

<sup>190</sup> Vaughn, B. E., Deane, K. E., & Waters, E. (1985) The impact of out-of-home care on child-mother attachment quality: Another look at some enduring questions. *Monographs of the Society for Research in Child Development*, 50(1/2), 110-135.

<sup>191</sup> Hunt, M. (1998) *The New Know-nothings: The Political Foes of the Scientific Study of Human Nature*. London: Routledge, p. 317 reporting from an interview with Belsky.

daycare with insecurity, and several studies linking infant daycare with behavioural problems. Together these sources suggested negative effects of daycare. Belsky found the Vaughn and colleagues paper especially salient, since not only did it report empirical findings, but these aligned with a theoretical framework. It seemed coherent that child development might be disrupted by daycare before the age of one, when the attachment bond was first developing:

A relatively persuasive circumstantial case can be made that early infant care may be associated with increased avoidance of mother, possibly to the point of greater insecurity in the attachment relationship, and that such care may also be associated with diminished compliance and cooperation with adults, increased aggressiveness, and possibly even greater social maladjustment in the preschool and early school-age years. What is most noteworthy about these very possibilities is that they are strikingly consistent with basic theoretical contentions of attachment theory.<sup>192</sup>

Further examination of the available evidence suggested that daycare was associated with less perseverance, less compliance, and more aggression across a number of studies in which children experienced over 20 hours of daycare a week before the age of one. This included studies even of very high-quality provision.<sup>193</sup> In the audience for the Minnesota talk was one of the editors of *Zero to Three*, a bulletin published by the National Center for Clinical Infant Programs, who encouraged Belsky to publish his paper in the bulletin.

In this 1986 *Zero to Three* paper, Belsky argued that 'variation in the samples studied, yet similarity in the developmental outcomes associated with non-maternal care in the first year, lead me to conclude that entry into care in the first year of life is a "risk factor" for the development of insecure-avoidant attachments in infancy and heightened aggressiveness, noncompliance, and withdrawal in the preschool and early school years.'<sup>194</sup> Though Belsky underlined that he was making an argument by inference, and that others could, would, and should read the data differently.

A major 1988 paper by Belsky and Rovine also reported findings from Studies II and III, exploring associations between childcare arrangements in the first year of life and infant-parent attachment in the Strange Situation.<sup>195</sup> Examining concurrent associations, Belsky and Rovine found that infants in full-time care were most likely to be classified as insecure with their mothers in the Strange Situation (47%), those with care above 20 hours but not full time less likely to be insecure (35%), and those with under 20 hours of non-maternal care showing the least insecurity (21–25%).

Also in 1988, Belsky published further reviews in the *Journal of Child Psychology and Psychiatry* and *Early Childhood Research Quarterly*.<sup>196</sup> In these papers, he argued that 20 hours of care a week was perhaps a threshold at which non-familial care would impact the child-caregiver attachment relationship and, through this, child development. Belsky also presented more strident claims about the strength of the available evidence: 'Incontestable patterns are evident in the literature regarding the future functioning of children

<sup>192</sup> Belsky, J. (1986) Infant day care: A cause for concern? *Zero to Three*, 7, 1–7, p. 6.

<sup>193</sup> For example, Haskins, R. (1985) Public school aggression among children with varying day-care experience. *Child Development*, 56(3), 689–703.

<sup>194</sup> Belsky, J. (1986) Infant day care: A cause for concern? *Zero to Three*, 7, 1–7, p. 6.

<sup>195</sup> Belsky, J. & Rovine, M. J. (1988) Nonmaternal care in the first year of life and the security of infant-parent attachment. *Child Development*, 59(1), 157–167.

<sup>196</sup> Belsky, J. (1988) Infant day care and socioemotional development: The United States. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, 29(4), 397–406; Belsky, J. (1988) The 'effects' of infant day care reconsidered. *Early Childhood Research Quarterly*, 3(3), 235–272.



with secure versus insecure infant attachment relationships.<sup>197</sup> The more strident tone seems to have reflected Belsky's perception that the field of developmental science was glibly dismissing evidence about daycare that it did not like, or holding it to a higher methodological standard, and blithely accepting evidence it did like, or holding it to a lower standard.

Belsky concluded that the available research by no means suggests policy change to reduce availability of daycare. In fact, in his 1986 and 1988 papers he argued for greater public investment in daycare provision, since high-quality care after age one appears to contribute positively to child development. He regarded parental leave policies as especially urgent. (Parental leave bills would be vetoed by Bush in 1990 and 1992, and eventually passed by the Clinton administration in 1993.) He argued that policies should be implemented to support a parent to work part-time in the infant's first year with guarantees that their jobs will revert back to full-time after that. He acknowledged, though, that for many parents any sustained period out of employment was not financially viable. Ideally the state should help make this viable. But if not, then affordable or free quality daycare should be available, with state involvement and subsidy to ensure its quality. Belsky suspected that this would reduce the frequency of child maltreatment by reducing pressure on parents.

Belsky regarded his policy proposals as politically progressive. Yet the very fact of claiming that some daycare is harmful to children had an incendiary effect. Indeed, it was often understood more broadly as an implacable criticism of all and any daycare.<sup>198</sup> Having been considered a bastion of the consensus that daycare is not harmful, Zigler and colleagues recall that 'Belsky's dramatic public reversal reverberated through the field.'<sup>199</sup> Looking back, Belsky recalls that his paper 'inadvertently and totally unintentionally lit the fuse of what became known, quite rightly, as 'the day care wars':<sup>200</sup>

Not only did stories about me and my thinking appear in the New York Times, Washington Post, Wall Street Journal and Time magazine, but I was accused of being against day care, against women working, and—more or less—a misogynist. It was rather amazing how quickly supporters and admirers turned me into the devil incarnate almost overnight.<sup>201</sup>

The Zero to Three paper was accompanied by critical commentary from feminist developmental scientists Kathleen McCartney, Deborah Phillips, and Carollee Howes.<sup>202</sup> They characterized Belsky's criticisms of daycare as ideologically motivated, and as reflecting

<sup>197</sup> Ibid., 243.

<sup>198</sup> Faludi, S. (2010) *Backlash: The Undeclared War against Women*. London: Random House: Belsky: 'I was not saying we shouldn't have day care', he says. 'I was saying that we need good day care. Quality matters.' But his words 'fell on deaf ears'. And once the misrepresentations of his work passed into the media it seemed impossible to root them out. 'What amazed me was the journalists just plagiarised each other's newspaper stories. Very few of them actually read my article' (65).

<sup>199</sup> Zigler, E. F., Marsland, K., & Lord, H. (2009) *The Tragedy of Child Care in America*. New Haven: Yale University Press, p. 87.

<sup>200</sup> Belsky, J. (2006) Early child care and early child development: Major findings of the NICHD study of early child care, *European Journal of Developmental Psychology*, 3(1), 95–110, p. 98.

<sup>201</sup> Belsky, J. (2003) The politicized science of day care: A personal and professional odyssey. *Family Policy Review*, 1, 23–40, p. 26.

<sup>202</sup> For example, Phillips, D., McCartney, K., Scarr, S., & Howes, C. (1987) Selective review of infant day care research: A cause for concern. *Zero to Three*, 7, 18–21. For recollections by Howes of this period in an oral history, see Singer, E., & Wong, S. (2021) Emotional security and daycare for babies and toddlers in social-political contexts: Reflections of early years pioneers since the 1970s. *Early Child Development and Care*, 191(3), 461–474. Referring to the production of the commentaries, Belsky recalled: 'the commentary prepared by four child-care researchers was scathing. It questioned my motives, my understanding, and my intelligence. But it was also so ill-informed, despite the outstanding credentials of its authors, that it was easy to rebut. But then something even

poorly on his credibility as a scientist. The commentaries stressed the findings of contrary studies, which had found no statistically significant associations between daycare and problems with child behaviour, even for children who started daycare before the age of one. They attributed variability in the literature not to the age of the child, or number of hours, but to the quality of daycare provision. Belsky was dismayed by the commentaries, and by the broader reception of his work within developmental science and the popular press. He argued that the data was being selectively cited, with methodological critiques only applied to so-called 'bad news', not 'good news', about the effects of daycare.

Belsky's work was reported favourably in conservative venues, such as *Christian Science Monitor*, where his concerns about some forms of daycare could be aligned with conservative criticism of all forms of daycare.<sup>203</sup> In other media, his claims received pointed criticism. In an article in the *Wall Street Journal*, Belsky was accused of 'male chauvinism and right-wing politicking'.<sup>204</sup> Irving Lazar, from Vanderbilt University, described the evidence offered by Belsky as 'ludicrous', and dismissed his claims: 'All it does is make mothers feel guilty'.<sup>205</sup> Describing this period, Belsky felt he was treated as a 'pariah', shunned by colleagues.<sup>206</sup> He recalled:

I was crushed by the fact that instead of disagreeing with me intellectually, people accused me of against women, against day care, of implying that the quality of day care had no bearing. I had violated the Eleventh Commandment of Developmental Psychology—Thou Shalt Not Speak Ill of Day Care.<sup>207</sup>

Belsky's position informed a high-profile consensus-generating panel held by the National Research Council in the late 1980s, which concluded that infant care, but not later care, increased risk of avoidant attachment relationships, though perhaps might increase social competence with peers.<sup>208</sup> However, many colleagues within developmental science were critical of Belsky's arguments.<sup>209</sup> Attachment researchers regarded Belsky's position as premature given the available evidence, and seemingly politically unpalatable. The attachment research community seem to have regretted the legacy of Bowlby's strong claims about maternal care, and wished to retreat from positions that would expose attachment theory to criticism as politically conservative, and as mother-blaming.

more remarkable happened. After my rebuttal was submitted so that all three pieces—my original essay, my critics' fierce commentary, and my reply—could be published in the same issue, my critics replaced their injudicious commentary with a sanitized version. I was livid. So I phoned the editor and we negotiated a settlement: either the original commentary and my rebuttal would appear along with my essay, or the sanitized commentary and a new rejoinder by me would appear in a later issue. My critics chose the latter option, no doubt recognizing that they stood to look unprofessional and obviously ideological should the first commentary appear in print.' Belsky, J. (2003) The politicized science of day care: A personal and professional odyssey. *Family Policy Review*, 1, 23–40, p. 26.

<sup>203</sup> Christian Science Monitor (1992) Babies and day care: Finding new options, 8 December 1992.

<sup>204</sup> Ricks, T. E. (1987) Day care for infants is challenged by research on psychological risks. *Wall Street Journal*, 3 March 1987, p. 35.

<sup>205</sup> Cited in Blakeslee, S. (1998) Re-evaluating significance of baby's bond with mother. *New York Times*, 4 August 1998.

<sup>206</sup> Stolberg, S. G. (2001) Another academic salvo in the Nation's 'Mommy Wars'. *New York Times*, 21 April 2001.

<sup>207</sup> Hunt, M. (1998) *The New Know-nothings: The Political Foes of the Scientific Study of Human Nature*. London: Routledge, p. 319.

<sup>208</sup> Hayes, C. D., Palmer, J. L., & Zaslow, M. J. (1990) *Who Cares for America's Children?* Washington, DC: National Academy Press.

<sup>209</sup> See, for example, Clarke-Stewart, K. A. (1989) Infant day care. Maligned or malignant? *The American Psychologist*, 44(2), 266–273; McGurk, H., Caplan, M., Hennessy, E., & Moss, P. (1993) Controversy, theory and social context in contemporary day care research. *Child Psychology & Psychiatry & Allied Disciplines*, 34(1), 3–23.

Belsky had used data from the Minnesota study as an important plank in his argument. It might be thought that the Minnesota group, if anyone within the attachment research community, would be natural allies. In fact, even Sroufe's response to Belsky had an ambivalent tone, and emphasized the need for a more process-oriented perspective. On the one hand, Sroufe accepted that experience of regular daycare before the age of one may be associated with negative outcomes for a proportion of children, and that this may be mediated by the 'effect of daily separations on the infant's confidence in the availability and responsiveness of care and, especially, his or her sense of effectiveness in eliciting care'.<sup>210</sup>

However, Sroufe felt that Belsky had paid too little attention to the potential impacts of early daycare on 'lost opportunities for ongoing tuning of the emerging infant-caregiver interactive system'.<sup>211</sup> The importance of this factor compared to the effects of separations had similarly been proposed by other attachment researchers, including Lamb, Goossens, and Van IJzendoorn, and Goldberg and Easterbooks.<sup>212</sup> Sroufe anticipated that early negative effects of daycare would not be enduring for children with sensitive caregivers. As such, Sroufe regarded Belsky as overstating the importance of early daycare as a concern. Certainly, it might have some negative effects in the short-term. So could many other social issues. For Sroufe, what was of considerably greater importance was helping parents and daycare staff provide sensitive care, which was anticipated to have positive effects in itself, as well as help children cope with adversities of various kinds. Sroufe personally anticipated that children would be worse off if neither parents nor daycare staff provided sensitive care.

Belsky took up Sroufe question about whether daycare would have the same consequences for children with experiences of sensitive and insensitive care. Using data from Study IV of the Pennsylvania Child and Family Development Project, he examined associations between time in nonparental care between ages three and five and parents' reports of child externalizing problems. There was a statistically significant association for mothers' reports, though it was weak ( $\beta = 0.21$ ). Fathers' reports were in the same direction, but even weaker and not statistically significant. There was also an association between time in nonparental care and observed negative maternal behaviours (negative affect + intrusiveness;  $\beta = 0.34$ ) and paternal behaviours ( $\beta = 0.17$ ). The Baron and Kenny procedure was used to test mediation. It was found that there was no association between use of nonparental care and parents' report of child externalizing problems once caregiver negative behaviour was included in the model. Belsky interpreted these findings as suggesting that *the effect of nonparental care on children occurred primarily due to changes to the behaviour of the parents*. It was these changes in caregiver behaviour which, in turn, contributed to children's externalizing behaviour: 'the previously discerned effect of child care on this outcome was mediated by family processes occurring in the home (i.e., parenting)'.<sup>213</sup>

Besides Sroufe, other attachment researchers were also cautious of Belsky's position and offered critical conceptual reflections.<sup>214</sup> Van IJzendoorn and Sagi-Schwartz felt that it was

<sup>210</sup> Sroufe, L. A. (1988) A developmental perspective on day care. *Early Childhood Research Quarterly*, 3(3), 283–291, p. 286.

<sup>211</sup> *Ibid.*, 286.

<sup>212</sup> Lamb, M. E. (1982) Maternal employment and child development: A review. In M. E. Lamb (ed.), *Non-traditional Families: Parenting and Child Development* (pp. 45–69). Hillsdale, NJ: Lawrence Erlbaum Associates; Goossens, F. A. (1987) Maternal employment and day care: Effects on attachment. In L. W. Tavecchio & M. H. Van IJzendoorn (eds), *Attachment in Social Networks* (pp. 137–150); Goldberg, W. A. & Easterbrooks, M. A. (1988) Maternal employment when children are toddlers and kindergartners. In A. E. Gottfried & A. W. Gottfried (eds), *Maternal Employment and Children's Development: Longitudinal Research* (pp. 121–154). Boston, MA: Springer.

<sup>213</sup> Belsky, J. (1999) Quantity of nonmaternal care and boys' problem behavior/adjustment at ages 3 and 5: Exploring the mediating role of parenting. *Psychiatry*, 62(1), 1–20, p. 14.

<sup>214</sup> For example, Thompson, R. A. (1988) The effects of infant day care through the prism of attachment theory: A critical appraisal. *Early Childhood Research Quarterly*, 3(3), 273–282.

theoretically unwarranted to oppose daycare to attachment, as if children only formed attachments with their parents. Van IJzendoorn and Sagi-Schwartz argued that a familiar daycarer can serve as a secure base from which to explore for a child, and a safe haven in times of need, even if the child may prefer to use a parent for this role where possible given deeper familiarity. Children may utilize secure base and/or safe haven provision from more than one caregiver. True, there will be limits on how many people children can meaningfully use as a secure base and/or safe haven, as this use depends upon familiarity.<sup>215</sup> Nonetheless, a child's attachment relationships form a network, with various potential sources and degrees of secure base and safe haven availability.<sup>216</sup> They reported data from 68 Dutch children and 59 Israeli children were assessed in the Strange Situation with their mother, their father, and their most familiar daycarer, if not exclusively home-reared.<sup>217</sup> Child-adult interactions were also observed in the Dutch sample to assess mother/father/daycarer sensitivity. In line with attachment theory, daycarer sensitivity was associated with secure attachment behaviour in the Strange Situation.

In a follow-up two years later, child behaviour in preschool in the Israeli sample, who spent longer hours in daycare, was predicted best actually by the security of attachment to their daycarer—not their mother or father.<sup>218</sup> However, this effect did not hold for the Dutch sample. In both samples, prediction of child behaviour in preschool was best when information from child-mother, child-father, and child-daycarer classifications were brought together. Van IJzendoorn and colleagues concluded that 'infants may be considered attached to their professional caregiver. It remains unclear, however, in what ways the children digest the "loss" of their professional caregivers, who change on a regular basis. This early loss may make the mental representation of the nonparental attachment different from that of the parental attachment. This loss notwithstanding, the first infant-caregiver attachment appeared to be a strong predictor of later socioemotional development.'<sup>219</sup> From this perspective, daycare might have different meanings for a child depending on the state of their attachment network.

In an interview, Bowlby had observed that where a grandparent offers regular occasional care for a child, this will offer another source of security and reduce strain on the child's mother, helping her to provide more sensitive care.<sup>220</sup> In his 1986 book *Attachment, Life-Span and Old Age* he reflected on this dynamic from his own role as a grandfather.<sup>221</sup>

<sup>215</sup> Bakermans-Kranenburg, M. J. (2021) The limits of the attachment network. *New Directions for Child and Adolescent Development*, 2021(180), 117–124.

<sup>216</sup> Waters and Eagle have concurred: 'Attachment theory is not inherently at odds with observations and interpretations of multiple parenting. What has been missing is detailed information about how infants and young children relate to individual alloparenting figures. The multiplicity of caregiving roles and functions suggests thinking of non-maternal caregivers in terms of diverse profiles of roles and functions—and where there are multiple caregivers, whether they specialize in particular roles or adopt them according to circumstances.' Waters, E. & Eagle, M. (2023) Cross-cultural criticisms of attachment: A taxonomy and the method and advantages of charitable interpretation. Presentation to the Rapaport-Klein Study Group, <https://www.psychomedia.it/rapaport-klein/Waters-Slides-2023.pdf>. See also Gaskins, S., Beeghly, M., Bard, K., Gernhardt, A., Liu, C., Teti, D., ... & Yovsi, R. (2017) Meaning and methods in the study and assessment of attachment. In H. Keller & K. Bard (eds), *The Cultural Nature of Attachment: Contextualizing Relationships and Development Nature of Relationships and Development* (pp. 195–229). Cambridge, MA: MIT Press.

<sup>217</sup> Van IJzendoorn, M. H., Sagi, A., & Lambermon, M. W. (1992) The multiple caretaker paradox: Data from Holland and Israel. *New Directions for Child and Adolescent Development*, 57, 5–24.

<sup>218</sup> Oppenheim, D., Sagi, A., & Lamb, M. E. (1988) Infant-adult attachments on the kibbutz and their relation to socioemotional development 4 years later. *Developmental Psychology*, 24(3), 427–433.

<sup>219</sup> Van IJzendoorn, M. H., Sagi, A., & Lambermon, M. W. (1992) The multiple caretaker paradox: Data from Holland and Israel. *New Directions for Child and Adolescent Development*, 57, 5–24, p. 22.

<sup>220</sup> Bowlby, J. (1986) Interview with the BBC. John Bowlby Archive, Wellcome Collections, PP/Bow/F.5/8.

<sup>221</sup> Bowlby, J. (1986) *Attachment, Life-Span and Old Age*, Joep Munnichs & Bére Miesen (eds), Utrecht: Van Loghum.

Empirical support would later be offered by Spieker and Bensley, who found that care support from grandmothers is associated with secure infant–mother attachment relationships for teenage mothers.<sup>222</sup> Van IJzendoorn and Sagi-Schwartz presented a similar argument: for children otherwise experiencing insensitive care at home, hours in high-quality daycare may be a positive if relationships can be formed with familiar caregivers. If staff turnover is low, and children can come to trust their daycarers, this experience may provide access to other familiar sources of secure base and safe haven availability. Furthermore, daycare may reduce strain on the primary caregiver and help facilitate sensitive behaviours when the child is at home.<sup>223</sup>

In line with this position, Howes and colleagues reported findings from two studies (115 children and 60 children) in which children were observed with their mother and primary daycarer and scored for security using the Attachment Q-Sort.<sup>224</sup> Children who were classified as insecurely attached to both mother and daycarer were cared for in lower-quality child care settings with large numbers of children per caregiver, while children who were classified as securely attached to both mother and caregiver were cared for in higher-quality care settings with fewer children per adult caregiver. Like Van IJzendoorn and Sagi-Schwartz, Howes felt that the opposition between child–mother attachment and daycare, apparent in Belsky’s framing of the issue of daycare, could not be assumed.<sup>225</sup>

## The National Institute of Child Health and Human Development (NICHD) Study of Early Child Care and Youth Development

### Background

The controversy of the ‘day care wars’, sparked by Belsky’s 1986 *Zero to Three* article, was fuelled partly by the availability of contradictory results from numerous small-scale studies.<sup>226</sup> Individual studies could be selected from this literature to support any desired position, or dismissed on one basis or another. For instance, Van IJzendoorn and colleagues attempted several replications of the Minnesota findings (amounting to data from 282 Dutch mother–infant dyads), and failed to find supportive results.<sup>227</sup> Yet the findings

<sup>222</sup> Spieker, S. J., & Bensley, L. (1994) Roles of living arrangements and grandmother social support in adolescent mothering and infant attachment. *Developmental Psychology*, 30(1), 102–111. See also Riem, M. M., Bakermans-Kranenburg, M. J., Cima, M., & Van IJzendoorn, M. H. (2023) Grandparental support and maternal postpartum mental health: A review and meta-analysis. *Human Nature*, 34(1), 25–45.

<sup>223</sup> See also Bakermans-Kranenburg, M. J. (2021) The limits of the attachment network. *New Directions for Child and Adolescent Development*, 2021(180), 117–124; Bernier, A., Côté, S. M., Leclerc, G., Matte-Gagné, C., & Marquis-Brideau, C. (2024) Revisiting the childcare–attachment question: Under what conditions is childcare participation associated with mother–child attachment security? *Attachment & Human Development*, 26(2), 95–115.

<sup>224</sup> Howes, C., Rodning, C., Galluzzo, D. C., & Myers, L. (1988) Attachment and child care: Relationships with mother and caregiver. *Early Childhood Research Quarterly*, 3(4), 403–416.

<sup>225</sup> Howes, C. (1999) Attachment relationships in the context of multiple caregivers. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment Theory and Research* (pp. 671–687). New York: Guilford. A study by the Leiden group later found that day carer report that children had a safe haven available among the nursery staff was associated with concurrent report of child wellbeing. De Schipper, J. C., Tavecchio, L. W., Van IJzendoorn, M. H., & Van Zeijl, J. (2004) Goodness-of-fit in center day care: Relations of temperament, stability, and quality of care with the child’s adjustment. *Early Childhood Research Quarterly*, 19(2), 257–272.

<sup>226</sup> Roggman, L. A., Langlois, J. H., Hubbs-Tait, L., & Rieser-Danner, L. A. (1994) Infant day-care, attachment, and the ‘file drawer problem’. *Child Development*, 65(5), 1429–1443.

<sup>227</sup> Findings were brought together in Van Dam, M., & Van IJzendoorn, M. H. (1990) *Are Infants of Working Mothers Insecurely Attached?* Leiden: Center for Child and Family Studies. See also Goossens, F. A. (1986) The quality of the attachment relationship of two-year-old children of working and nonworking mothers and some associated factors. Unpublished doctoral thesis, Leiden University.

could be dismissed by Belsky and allies as not relevant to the United States, since daycare in the Netherlands was of considerably better average quality and different welfare provision made part-time working by mothers more common.

In support for Belsky's position, in a 1992 paper, Lamb and colleagues pooled the raw data from 13 US studies where researchers had information on infant daycare and the Strange Situation. They reported that 71% of children in exclusive maternal care were classified as secure, compared to 65% of children experiencing regular non-maternal care.<sup>228</sup> Of those experiencing centre-based care specifically, only 49% were classified as secure.<sup>229</sup> Centre-based care was associated with an odds ratio for insecurity of 2.56 (CI 1.36–4.82) compared to maternal home rearing.

One of the arms of the National Institutes of Health, the National Institute of Child Health and Human Development (NICHD), issued a call for proposals for larger-scale studies of the effects of early daycare, with the plan to fund six proposals. On Belsky's account, his proposal was lambasted by reviewers, who regarded him as a right-wing partisan and lacking credibility for further research on the topic. However, it was ultimately decided that none of the individual proposals would be funded, and instead a single study on 10 sites would be undertaken by the highest-ranked applicants. Belsky's proposal was not among those with strong scores. Nonetheless, 'later, NICHD administrators apparently decided, or so Belsky believes, that the project would have greater credibility if he were part of it rather than made up entirely of women researchers known to be in favor of day care, so they enlarged the consortium to make place for him.'<sup>230</sup>

At its commencement in 1989, the founding participating investigators in the NICHD study of early child care and youth development were Mark Appelbaum (Vanderbilt), Jay Belsky (Penn State), Cathryn Booth and Sue Spieker (Washington), Celia Brownell and Susan Campbell (Pittsburgh), Bettye Caldwell (Arkansas), Martha Cox (North Carolina), Kathryn Hirsh-Pasek and Marsha Weinraub (Temple), Aletha Huston and Marion O'Brien (Kansas), Nancy Marshall (Wellesley), Kathleen McCartney (New Hampshire), Deborah Phillips (Virginia), and Deborah Lowe Vandell (Wisconsin).<sup>231</sup> These researchers 'had been, more or less, at each other's intellectual throats over fundamental disagreements about research on the effects of childcare.'<sup>232</sup> They were nonetheless tasked to sit down and, collaboratively, draw up plans for a single study that would be conducted at 10 sites in the exact same way. The primary account of this process of study design is from Belsky:<sup>233</sup>

I would end up working closely with some of the very individuals who regarded me almost as a pariah.... Needless to say, the enterprise proved challenging. Differences of view in planning the research often became heated; within the NICHD, we became known as 'the

<sup>228</sup> Lamb, M. E., Sternberg, K. J., & Prodromidis, M. (1992) Nonmaternal care and the security of infant-mother attachment: A reanalysis of the data. *Infant Behavior and Development*, 15(1), 71–83.

<sup>229</sup> Ibid., Table 3.

<sup>230</sup> Hunt, M. (1998) *The New Know-nothings: The Political Foes of the Scientific Study of Human Nature*. London: Routledge, p. 319.

<sup>231</sup> NICHD Early Child Care Research Network (1997) The effects of infant child care on infant-mother attachment security: Results of the NICHD study of early child care. *Child Development*, 68(5), 860–879.

<sup>232</sup> Belsky, J. (2009) Quality, quantity and type of child care: Effects on child development in the USA. In G. Bentley & R. Mace (eds), *Substitute Parents: Biological and Social Perspectives on Alloparenting across Human Societies* (pp. 304–321). Oxford, UK: Berghahn Books, p. 306.

<sup>233</sup> A passing account of the design process is also offered in Crosnoe, R. & Leventhal, T. (2016) *Debating Early Child Care: The Relationship between Developmental Science and the Media*. Cambridge: Cambridge University Press, p. 18.

study from hell.' But we succeeded in something that I doubt few others have: our capacity to work together has, for the most part, increased.<sup>234</sup>

The resulting study has received widespread praise. For example, Vermeer and Bakermans-Kranenburg observed that 'it distinguishes itself from other studies because of the numerous qualities that are uniformly considered significant within child care research: the excellent collaboration of child care experts from across the USA, the large and diverse sample, the longitudinal design, the blind and central coding of data, and the inclusion of child, maternal, family, and child care factors.'<sup>235</sup>

Friedman and Boyle recall the design period for the study that the selection of variables was influenced by Bronfenbrenner and Belsky's work towards an ecological model of development.<sup>236</sup> Childcare decisions were made independently by participant families, and this variable was uncontrolled in the study design.<sup>237</sup> Though no attempt was made to collect data on the availability of child care to families, it was assumed that the care received by a child was what the family wanted.<sup>238</sup> Ultimately, the consortium decided that the study would focus on 'repeated measurement of (a) the quality of the child's family-rearing environment, (b) the quality of whatever non-maternal care was provided to the child, and (c) the child's cognitive- linguistic and socio-emotional development.'<sup>239</sup>

The framing of the NICHD study, until the 2010s, remained largely on the effects of 'non-maternal' care.<sup>240</sup> Data collection with fathers was extremely minimal, only in the later phases of the study, and little was done with this data in any case.<sup>241</sup> There is no indication that childcare providers themselves were consulted in the design of the study.

Mother-child interactions were videotaped in semi-structured 15-minute observations at 6, 15, 24, 36, and 54 months. Maternal sensitivity was not coded using Ainsworth's scale. No justification is given for this decision. The NICHD investigators may have felt, like

<sup>234</sup> Belsky, J. (2003) The politicized science of day care: A personal and professional odyssey. *Family Policy Review*, 1, 23–40, p. 29.

<sup>235</sup> Vermeer, H. J., & Bakermans-Kranenburg, M. J. (2008) Attachment to mother and nonmaternal care: Bridging the gap. *Attachment & Human Development*, 10(3), 263–273, p. 263.

<sup>236</sup> Friedman, S. L. & Boyle, E. D. (2008) Attachment in US children experiencing nonmaternal care in the early 1990s. *Attachment & Human Development*, 10(3), 225–261, p. 226.

<sup>237</sup> Decisions about daycare may have been shaped by factors relevant to attachment relationships. See, for example, Koren-Karie, N. (2001) Mothers' attachment representations and choice of infant care: Center care vs. home. *Infant and Child Development: An International Journal of Research and Practice*, 10(3), 117–127.

<sup>238</sup> NICHD Early Child Care Research Network (1997) Familial factors associated with the characteristics of nonmaternal care for infants. *Journal of Marriage and the Family*, 59(2), 389–408, p. 405.

<sup>239</sup> Belsky, J. (2009) Quality, quantity and type of child care: Effects on child development in the USA. In G. Bentley & R. Mace (eds), *Substitute Parents: Biological and Social Perspectives on Alloparenting across Human Societies* (pp. 304–321). Oxford, UK: Berghahn Books, p. 309.

<sup>240</sup> Wolf, J. B. (2016) Framing mothers: Childcare research and the normalization of maternal care. *Signs: Journal of Women in Culture and Society*, 41(3), 627–651. For a shift to analyses of non-familial care, see Vandell, D. L., Belsky, J., Burchinal, M., Steinberg, L., Vandergrift, N., & NICHD Early Child Care Research Network (2010) Do effects of early child care extend to age 15 years? Results from the NICHD study of early child care and youth development. *Child Development*, 81(3), 737–756.

<sup>241</sup> Crosnoe, R. & Leventhal, T. (2016) *Debating Early Child Care: The Relationship between Developmental Science and the Media*. Cambridge: Cambridge University Press: 'we want to stress that fathers were not a major focus of the NICHD SECCYD by design of the Network investigators, and data were not collected from fathers until investigators reconsidered their initial strategy once the study was well underway' (105). The primary data collection with fathers was during the 36 and 54-month home visits. The coding of sensitivity from these observations was used in two papers: NICHD Early Child Care Research Network (2000) Factors associated with fathers' caregiving activities and sensitivity with young children. *Journal of Family Psychology*, 14(2), 200–219; NICHD Early Child Care Research Network (2009) Family-peer linkages: The mediational role of attentional processes. *Social Development*, 18(4), 875–895. This paternal sensitivity data would also be used very occasionally in secondary dataset by other researchers, for example Meece, D. & Robinson, C. M. (2014) Father-child interaction: Associations with self-control and aggression among 4.5-year-olds. *Early Child Development and Care*, 184(5), 783–794.

Belsky, that the measure was too subjective. Perhaps a more broad-brush measure of perceived parenting quality was desired. Instead, mothers were scored on three dimensions: intrusiveness (the score was reversed), displays of positive regard towards the child, and maternal responsiveness when the child was not distressed. A composite of these dimensions was termed 'sensitivity', by which the NICHD investigators appear to have meant quality of care, rather than Ainsworth's construct *per se*.

Mothers' sensitivity to distress, and negative affect towards their child, and disengagement from their child were also measured by the NICHD researchers. These measurements were not normally distributed. As a result, this data was thrown aside: it was not used by the NICHD investigators, nor included as a variable for use in secondary analyses of the dataset. This is a massive shame as the decision is reported to have been made on the assumption that non-normally distributed data cannot be included within a composite with normally distributed data in a linear regression.<sup>242</sup> This is simply an error, based on a misapprehension of the requirements of linear regression.<sup>243</sup> The exclusion of mothers' sensitivity to distress, negative affect towards their child, and disengagement was unwarranted. Furthermore, it is an exclusion that has then been (likely unknowingly) repeated by the many researchers who have used the scale,<sup>244</sup> including the landmark Bucharest Early Intervention Project (Chapter 4).<sup>245</sup>

The operationalization of 'sensitivity' by the NICHD researchers and those using their measure was, to an extent, aligned with Ainsworth's conceptualization of sensitivity. Nonetheless, there were some potentially important and under-recognized differences. To be clear: this is not to suggest that the operationalization of 'sensitivity' by the NICHD researchers was any less valuable as a measure of caregiver behaviour, only that it had differences. Specifically, the focus on caregiver response when the child was not distressed aligned with Ainsworth's interest in secure base provision, but not safe haven availability.

Ainsworth deliberately did not include positive regard towards the child within her conceptualization of sensitivity, and in fact found it to have different correlates in her small, classic study.<sup>246</sup> Additionally, she distinguished intrusiveness from sensitivity. In Ainsworth's data, the two were considerably intercorrelated. Nonetheless, she emphasized that intrusiveness seemed particularly important for distinguishing the caregivers of avoidant vs resistant dyads, whereas sensitivity seemed particularly important for distinguishing the caregivers of secure vs insecure dyads. In debates about the cross-national validity of measures of sensitivity (Chapter 4), the distinction between safe haven/secure base provision, warmth and intrusiveness have been important, as attachment researchers

<sup>242</sup> NICHD Early Child Care Research Network (1997) The effects of infant child care on infant-mother attachment security: Results of the NICHD study of early child care. *Child Development*, 68(5), 860-879: 'Sensitivity to distress, negative regard, and detachment / disengagement were not considered for this composite due to kurtosis problems' (865).

<sup>243</sup> Ernst, A. F. & Albers, C. J. (2017) Regression assumptions in clinical psychology research practice—a systematic review of common misconceptions. *PeerJ*, 5, e3323.

<sup>244</sup> For example, Hopkins, J., Gouze, K. R., & Lavigne, J. V. (2013) Direct and indirect effects of contextual factors, caregiver depression, and parenting on attachment security in preschoolers. *Attachment & Human Development*, 15(2), 155-173; Olsavsky, A. L., Berrigan, M. N., Schoppe-Sullivan, S. J., Brown, G. L., & Kamp Dush, C. M. (2020) Paternal stimulation and father-infant attachment. *Attachment & Human Development*, 22(1), 15-26.

<sup>245</sup> Zeanah, C. H., Smyke, A. T., Koga, S. F., Carlson, E., & The Bucharest Early Intervention Project Core Group (2005) Attachment in institutionalized and community children in Romania. *Child Development*, 76(5), 1015-1028. A few studies have used the NICHD sensitivity measure, but supplemented it with aspects it had lost such as caregiver intrusiveness and negative expressed affect towards the child, for example Mills-Koonce, W. R., Garipey, J. L., Propper, C., Sutton, K., Calkins, S., Moore, G., & Cox, M. (2007) Infant and parent factors associated with early maternal sensitivity: A caregiver-attachment systems approach. *Infant Behavior and Development*, 30(1), 114-126.

<sup>246</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 2.



have accepted that there is likely considerable cultural variability in the extent to which the latter two dimensions are regarded by mothers as aspects of high-quality care.<sup>247</sup>

One indicator that the NICHD researchers had captured a different construct to Ainsworth was that they found no statistically significant association between the measure of sensitivity at 6 or 15 months and classifications of infant attachment in the Strange Situation. Influenced by arguments by Goldberg and Thompson on the importance of safe haven availability within attachment theory,<sup>248</sup> McElwain and Booth-LaForce reflected on this finding. Ainsworth's operationalization of sensitivity included response to both infant distress and non-distress signals. By contrast, the NICHD measure was concerned only with the latter. In this methodological choice, McElwain and Booth-LaForce felt that the NICHD measure of sensitivity had departed from the fundamental concern in attachment theory with safe haven availability. In 75% of observations at 6 months and 83% of observations at 15 months infants showed no distress and did not seek comfort from their caregivers. However, when they did, McElwain and Booth-LaForce recoded the data for caregiver sensitivity, assessed using Ainsworth's approach.<sup>249</sup> When they did, only caregiver sensitivity to distress at six months was an effective predictor of the infants' Strange Situation classification, not sensitivity to non-distress.<sup>250</sup>

Leerkes and colleagues would later show that maternal sensitivity to distress, but not to non-distress, was associated with maternal report of fewer behavioural problems at 24 and 36 months, and greater social competence at 24 months.<sup>251</sup> Sensitivity to distress and non-distress were highly correlated ( $r = 0.68$ ), though part of this was that they were assessed in the same task.<sup>252</sup> Leerkes and colleagues found that the association between caregiver responsiveness during free play and sensitivity to infant distress in a separate situation was  $r = 0.38$ .<sup>253</sup> Maternal response to non-distress was also decidedly associated with an index of demographic risk ( $r = 0.41$ ), whereas there was no association for sensitivity to distress controlling for sensitivity to non-distress.<sup>254</sup> Such findings suggest a need for caution regarding expectations that the NICHD measure of sensitivity, though measuring related and important aspects of parenting, will have the correlates expectable from attachment theory regarding safe haven availability.

Commenting on the work of McElwain and Booth-LaForce, and Leerkes and colleagues, Bakermans-Kranenburg and Van IJzendoorn have argued that stressful assessment tasks

<sup>247</sup> For example, Mesman, J. (2018) Sense and sensitivity: A response to the commentary by Keller et al. (2018) *Child Development*, 89(5), 1929–1931; Cheung, H. S. (2021) Maternal sensitivity and warmth in Singapore: Cultural insights from comparing the Ainsworth and Emotional Availability Scales. *Infant and Child Development*, 30(4), e2233.

<sup>248</sup> Thompson, R. A. (1998) Early sociopersonality development. In W. Damon (Series Ed.) and N. Eisenberg (Vol. Ed.), *Handbook of Child Psychology: Vol. 3, Social, Emotional, and Personality Development* (5th ed., pp. 25–104). New York: Wiley; Goldberg, S., Grusec, J. E., & Jenkins, J. M. (1999) Confidence in protection: Arguments for a narrow definition of attachment. *Journal of Family Psychology*, 13, 475–483.

<sup>249</sup> McElwain, N. L. & Booth-LaForce, C. (2006) Maternal sensitivity to infant distress and nondistress as predictors of infant–mother attachment security. *Journal of Family Psychology*, 20(2), 247–255.

<sup>250</sup> See also Wright, N., Hill, J., Sharp, H., & Pickles, A. (2018) Maternal sensitivity to distress, attachment and the development of callous-unemotional traits in young children. *Journal of Child Psychology and Psychiatry*, 59(7), 790–800.

<sup>251</sup> Leerkes, E. M., Blankson, A. N., & O'Brien, M. (2009) Differential effects of maternal sensitivity to infant distress and nondistress on social-emotional functioning. *Child Development*, 80(3), 762–775.

<sup>252</sup> *Ibid.*, Table 2.

<sup>253</sup> Leerkes, E. M. (2011) Maternal sensitivity during distressing tasks: A unique predictor of attachment security. *Infant Behavior and Development*, 34(3), 443–446.

<sup>254</sup> Leerkes, E. M., Weaver, J. M., & O'Brien, M. (2012) Differentiating maternal sensitivity to infant distress and non-distress. *Parenting*, 12(2–3), 175–184. See also Taraban, L., Shaw, D. S., Morris, p. A., & Mendelsohn, A. L. (2024) An exploration of the domain specificity of maternal sensitivity among a diverse sample in the infancy period: Unique paths to child outcomes. *Child Development*, 95(1), 60–73.

and measures that include responsiveness to distress may have greater validity, including greater ecological validity given the challenges that parents face.<sup>255</sup> They have avoided using the NICHD measure in their empirical work.

For my part, no claim is implied about the NICHD measure of sensitivity being inferior to Ainsworth's. Meta-analytic research has shown that the NICHD measure has considerable predictive validity for child development and mental health, even if it seems less related to children's expectations of safe haven availability (Chapter 5). Nonetheless, to signal that it is plausibly a different construct to Ainsworth's, the NICHD measure will be described below as assessing sensitivity\* rather than sensitivity. A similar interpretation can be seen in the work of Lee and colleagues at Stony Brook, who have used the NICHD measure as an index of caregiver secure base provision specifically and contrasted it to caregiver safe haven provision, documenting an association of  $r = 0.44$ , but different correlates.<sup>256</sup>

The NICHD researchers also assessed caregiving in another way. Bradley and Caldwell had developed an inventory for assessing the child's experience of a stimulating home life: The Home Observation for Measurement of the Environment (HOME).<sup>257</sup> This was administered during home visits at 6, 15, 36, and 54 months. The HOME measured the quality of learning materials in the home, and whether the home seemed physically well organized around the child, as well as interactional features such as whether the caregiver showed acceptance towards their child and seemed involved with them.<sup>258</sup> As might be expected, the HOME had a considerable association with sociodemographic variables, though was not identical with them (e.g., income-to-needs ratio,  $r = 0.31$ ).<sup>259</sup>

The measure of sensitivity\* and the HOME inventory were considerably related ( $r = 0.41$ ). The NICHD investigators often summed results from their measure of sensitivity and the HOME scale, though sometimes they reported one and sometimes the other. Furthermore, sometimes they called the sum 'caregiver sensitivity' and sometimes 'caregiving quality'. Overall, the use of a different construct called 'sensitivity' and its amalgamation with other measures, while nonetheless using the term sensitivity from attachment research, have contributed to uncertainty about whether and when findings from the NICHD study might be expected to relate to the correlates expected by attachment theorists.

In choice of variables, and analysis and interpretation of results, the NICHD investigators addressed mothers largely as sources of care or vectors of contextual risk to their children.<sup>260</sup> Despite the researchers' comprehension in principle that maternal wellbeing will contribute to child development in the long run, there was little interest in their wellbeing independent of their responsibility to children, though depression was sometimes

<sup>255</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2018) Oxytocin and human sensitive and protective parenting. *Current Topics in Behavioral Neurosciences*, 35, 421–448.

<sup>256</sup> Lee, A. H., Kuzava, S., & Bernard, K. (2022) Sociodemographic risk and infants' emerging language ability: Examining the indirect effects of maternal sensitivity and nurturance to distress. *Parenting*, 22(1), 40–60.

<sup>257</sup> Bradley, R. H., & Caldwell, B. M. (1984) The HOME Inventory and family demographics. *Developmental Psychology*, 20(2), 315–320.

<sup>258</sup> For infancy–36 months, the HOME has six subscales: (a) Parental Responsivity, (b) Acceptance of Child, (c) Organization of the Environment, (d) Learning Materials, (e) Parental Involvement, and (f) Variety in Experience. At 54 months, there are eight subscales: (a) Learning Materials, (b) Language Stimulation, (c) Physical Environment, (d) Responsivity, (e) Academic Stimulation, (f) Modelling, (g) Variety, and (h) Acceptance.

<sup>259</sup> NICHD Early Child Care Research Network (1997) The effects of infant child care on infant–mother attachment security: Results of the NICHD study of early child care. *Child Development*, 68(5), 860–879, Table 2.

<sup>260</sup> Wolf, J. B. (2016) Framing mothers: Childcare research and the normalization of maternal care. *Signs: Journal of Women in Culture and Society*, 41(3), 627–651.

treated as a covariate. The potential costs of maternal care for mothers were not measured, or when measured not explored.

To offer an illustration: the researchers did not probe the conspicuous finding that mothers who provide full-time care are more likely to be depressed, at *every* measured timepoint, than mothers who make use of daycare.<sup>261</sup> They likewise showed little interest in their finding that maternal depression was associated with—by far—the greatest increase in child externalizing behaviour between 24 months and preschool ( $r = 0.36$ ), compared with income-to-needs ratio ( $r = 0.22$ ), maternal sensitivity\* ( $r = 0.18$ ), quality of childcare ( $r = 0.13$ ), mother ethnic minority status ( $r = 0.11$ ), and hours in childcare ( $r = 0.06$ ).<sup>262</sup> Maternal depression when the child was two was also associated with the least decline in aggressive behaviour by age 9 ( $r = 0.29$ ), compared with other factors such as income-to-needs ratio ( $r = 0.19$ ), maternal sensitivity\* ( $r = 0.17$ ) and hours in daycare ( $r = 0.002$ ). These findings are tucked away in a table, and not discussed by the researchers, seeming to reflect a lack of interest in maternal wellbeing.<sup>263</sup>

To take another example: Maternal report of stress was used by feminist members of the NICHD collective in other studies of daycare in the period,<sup>264</sup> and maternal report of stress was measured at five time points in the NICHD study. Mothers' experience of feeling isolated or well-supported by friends and family was measured at five time points. All this data about mothers' experiences was never used in the NICHD group publications. It was of course not possible or advisable to use all the data collected: choices were made to prioritize other factors regarded as of greater importance or relevance by the research team.<sup>265</sup> The neglect of the collected maternal stress and felt isolation/support data did not represent a principled distrust of self-report measures, as was the case for Van IJzendoorn and Bakermans-Kranenburg (Chapter 4). Maternal self-report was relied on extensively by the

<sup>261</sup> NICHD Early Child Care Research Network (1999) Child care and mother–child interaction in the first three years of life. *Developmental Psychology*, 35(6), 1399–1413, Table 2. Though no test of statistical significance was conducted.

<sup>262</sup> NICHD Early Child Care Research Network, & Arsenio, W. F. (2004) Trajectories of physical aggression from toddlerhood to middle childhood: Predictors, correlates, and outcomes. *Monographs of the Society for Research in Child Development*, 69(4), 1–143, Table 17. In multivariate analyses reported in this table, maternal depression also accounted for a great deal more variance in child outcomes than the other variables examined. It may be suspected that part of the strength of the association between maternal depression and rates of child aggressive behaviour rests on that both analyses used maternal report. There may also be bidirectional relationships between these two variables. However, this point was not made by the NICHD researchers to qualify or interpret the findings regarding maternal depression: instead, they were ignored. Stanley, for instance, has raised questions about this neglect of maternal depression in the NICHD study. She examined the relationship between hours of daycare and cognitive/language abilities, child interpersonal engagement and sustained attention at 9 months and 24 months in the large Early Childhood Longitudinal Study—Birth Cohort. She found that the effect of hours of daycare was moderated by maternal depression. Stanley, L. M. (2008) The relationship between the amount of time children spend in child care and their healthy development during the toddler years, unpublished doctoral thesis, University of California.

<sup>263</sup> Decades later, other researchers would take forward analysis of the implications of maternal depression for sensitivity, attachment and child development using the NICHD data, see for example Wang, Y., & Dix, T. (2013) Patterns of depressive parenting: Why they occur and their role in early developmental risk. *Journal of Family Psychology*, 27(6), 884–895; Cao, H., Zhou, N., Buehler, C., Li, X., Liang, Y., & Chen, Y. (2024) Mothers' work-to-family conflict, depressive symptoms, and parental role functioning: A five-wave, cross-lagged panel model from infancy through middle childhood. *Family Relations*. Early view.

<sup>264</sup> For example, McCartney, K., Scarr, S., Rocheleau, A., Phillips, D., Abbott-Shim, M., Eisenberg, M., ... & Ruh, J. (1997) Teacher–child interaction and child-care auspices as predictors of social outcomes in infants, toddlers, and preschoolers. *Merrill-Palmer Quarterly*, 43(3), 426–450.

<sup>265</sup> A single and partial exception to the neglect of the maternal stress and isolation data was in 1997. The NICHD group authors used maternal stress and isolation at one month as part of an exceptionally diverse basket of 'psychosocial variables' (maternal well-being and personality, social support and stress, maternal attitudes, child health and temperament, and the quality of the home environment) in predicting use of daycare. Maternal reported stress and isolation were, in any case, left out of the psychosocial bucket for the test of predictors of the quality of daycare. NICHD Early Child Care Research Network (1997) Familial factors associated with the characteristics of nonmaternal care for infants. *Journal of Marriage and the Family*, 59(2), 389–408.

NICHD researchers in assessing child psychosocial development before first grade, despite mounting evidence of limitations to this data.<sup>266</sup> Rather, the disinterest in maternal report of stress and isolation can be regarded as aligned with a broader disinterest in maternal experience and strain in the NICHD group publications, including potential interactions with use of daycare in predicting child outcomes.<sup>267</sup>

For example, it might readily be supposed that where stressed and isolated caregivers are able to make use of daycare, this might reduce pressure on them and improve child outcomes. However, in the analyses agreed by the whole NICHD team, the relevance of daycare for helping families was outside of their predominant concern with the direct effects on the child, in isolation from the needs of their family.

The NICHD study was not designed to be nationally representative. The investigators sought participants from 31 hospitals in 10 areas close to the universities of the collaborating investigators.<sup>268</sup> They excluded teenage mothers, mothers with anything less than fluent English, mothers with drug or alcohol addiction, families living in dangerous neighbourhoods, infants with disabilities or medical complications, and twins and triplets.<sup>269</sup> Of those contacted, 58% agreed to take part.<sup>270</sup> To ensure at least some diversity, a conditional random sampling plan was used to ensure that at least 10% of the mothers would not have graduated from high school, at least 10% would be single, and that at least 10% would be minorities.<sup>271</sup> The research team will have been aware that rates of diversity in the national population were considerably higher (e.g., over 25% of mothers would have been expected not to have graduated from high school).<sup>272</sup> The extremely minimal concern with diversity in the NICHD study seems surprising in retrospect. It would appear that the policy focus directing the study was primarily to examine the effects of daycare on the children of 'normal' mothers, presumed to be high school graduates, married, and white American.

A desire to respond to policy concerns and their framing of social problems seems also to have motivated the choice of measure of income. Rather than examining the family assets or income, the NICHD investigators chose to examine 'income-to-needs ratio'. This is obtained by dividing the family's income by the poverty threshold for that family's household composition. The NICHD investigators used thresholds for eligibility for federal and state welfare programmes to distinguish families in poverty (235 families), near poverty (180 families), and above-poverty (874 families).<sup>273</sup>

<sup>266</sup> Solheim, E., Wichstrøm, L., Belsky, J., & Berg-Nielsen, T. S. (2013) Do time in child care and peer group exposure predict poor socioemotional adjustment in Norway? *Child Development*, 84(5), 1701–1715: 'The NICHD SECCYD found that maternal reports of the social functioning of children was less sensitive to child-care effects than caregiver and teacher reports (NICHD Early Child Care Research Network, 2003a, 2006), which led the research team to abandon maternal reports when evaluating the effects of child care following entry into school' (1702).

<sup>267</sup> Though there would be no attempt to redress this issue, the problems with the lack of examination of social support as a potential moderator would be acknowledged in NICHD Early Child Care Research Network (1998) Early child care and self-control, compliance, and problem behavior at twenty-four and thirty-six months. *Child Development*, 69(4), 1145–1170, p. 1167.

<sup>268</sup> Little Rock, AR; Orange County, CA; Lawrence and Topeka, KS; Boston, MA; Philadelphia, PA; Pittsburgh, PA; Charlottesville, VA; Morganton and Hickory, NC; Seattle, WA; and Madison, WI.

<sup>269</sup> NICHD Early Child Care Research Network (2002) The interaction of child care and family risk in relation to child development at 24 and 36 months, *Applied Developmental Science*, 6(3), 144–156, note 1.

<sup>270</sup> NICHD Early Child Care Research Network (1997) The effects of infant child care on infant-mother attachment security: Results of the NICHD study of early child care. *Child Development*, 68(5), 860–879, p. 874.

<sup>271</sup> NICHD Early Child Care Research Network (2001) Before Head Start: Income and ethnicity, family characteristics, child care experiences, and child development. *Early Education and Development*, 12(4), 545–576, p. 549.

<sup>272</sup> [https://nces.ed.gov/programs/digest/d17/tables/dt17\\_219.10.asp](https://nces.ed.gov/programs/digest/d17/tables/dt17_219.10.asp).

<sup>273</sup> NICHD Early Child Care Research Network (2001) Before Head Start: Income and ethnicity, family characteristics, child care experiences, and child development. *Early Education and Development*, 12(4), 545–576, p. 550.

At the time, the way the income-to-needs ratio was calculated did not take into account geographic location (rural vs city; differences in cost in housing), and defined 'family' as persons living in the same household related by birth or marriage, not capturing well the diversity of family forms (such as unmarried partners with children from previous relationships).<sup>274</sup> As such, Bakermans-Kranenburg, Van IJzendoorn, and Kroonenberg suspected that the measure had political advantages for downplaying systemic inequalities and racialized poverty in the United States. In a later paper, they would demonstrate that the use of the income-to-needs ratio radically underestimated differences between black and white families in the NICHD sample compared to pure income. Black and white families barely differed on the income-to-needs ratio formula,<sup>275</sup> so the NICHD investigators generally felt able to ignore this difference. In fact, black families had around half the income of white families in the sample,<sup>276</sup> which was even more unequal than the very unequal national picture in the United States at the time.<sup>277</sup> In general, the NICHD investigators showed little interest in income and ethnicity. The tables of papers reveal their potential potency as predictors,<sup>278</sup> but the authors tend to leave these findings undiscussed, presumably as intersectional structural inequalities were outside policy priorities and remit of the study.<sup>279</sup>

It should be noted that the number of families in poverty and ethnic minority families in the sample fell further with time due to considerably higher attrition among these participants. As Belsky later acknowledged, 'the fact of the matter is that the NICHD Study sample does not have a very good representation of the most economically disadvantaged children and families, even though efforts were made to over sample such research participants. This raises the question of whether the same findings would have emerged in a sample that was significantly poorer or otherwise more distressed.'<sup>280</sup>

<sup>274</sup> Cf. Meyer, B. D., & Sullivan, J. X. (2012) Identifying the disadvantaged: Official poverty, consumption poverty, and the new supplemental poverty measure. *Journal of Economic Perspectives*, 26(3), 111–136.

<sup>275</sup> The NICHD Early Child Care Research Network (2001) Before Head Start: Income and ethnicity, family characteristics, child care experiences, and child development, *Early Education and Development*, 12(4), 545–576.

<sup>276</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Kroonenberg, P. M. (2004) Differences in attachment security between African-American and white children: Ethnicity or socio-economic status? *Infant Behavior and Development*, 27(3), 417–433.

<sup>277</sup> Pew Research Centre (2016) On views of race and inequality, blacks and whites are worlds apart. 27 June 2016, Pew Research Centre, [https://www.pewresearch.org/social-trends/wp-content/uploads/sites/3/2016/06/ST\\_2016.06.27\\_Race-Inequality-Final.pdf](https://www.pewresearch.org/social-trends/wp-content/uploads/sites/3/2016/06/ST_2016.06.27_Race-Inequality-Final.pdf).

<sup>278</sup> For instance, in a 2001 paper the NICHD investigators have a table presenting means for child outcomes at 36 months, indicating huge differences for African American and European American participants, which dwarf any of the effects found for daycare. Given the available data in the table the following effect sizes can be calculated: differences on receptive vocabulary ( $d = 1.30$ ), school readiness ( $d = 1.15$ ) and cooperation ( $d = -0.78$ ). There is also an interesting effect for problem behaviour: in poverty, African American children are reported to show more problem behaviour than European American children; when not in poverty, African American are reported to show less problem behaviour. As more African American children are in poverty, the overall association between ethnicity and problem behaviour is therefore  $d = 0.30$ . However the authors did not comment on any of these findings, or even report the effect sizes. NICHD Early Child Care Research Network (2001) Before Head Start: Income and ethnicity, family characteristics, child care experiences, and child development. *Early Education and Development*, 12(4), 545–576, Table 7.

<sup>279</sup> In the one study dedicated to considering family-level risk and adversity factors from Phase 1, ethnicity is dealt with as an afterthought, only in a limited number of post hoc tests, and without disaggregating Black American and Hispanic participants. NICHD Early Child Care Research Network (2002) The interaction of child care and family risk in relation to child development at 24 and 36 months. *Applied Developmental Science*, 6(3), 144–156.

<sup>280</sup> Belsky, J., Schlomer, G. L., & Ellis, B. J. (2012) Beyond cumulative risk: Distinguishing harshness and unpredictability as determinants of parenting and early life history strategy. *Developmental Psychology*, 48(3), 662–673, p. 671.

Appraising the methodology used by the NICHD study, Thompson praised the focus on repeated measures and research at scale, as essential for ensuring dependable data.<sup>281</sup> He also identified limitations. Inevitably choices had to be made about what to measure and what not to measure. Thompson was sorry, though, to see no measures of personality development, self-concept, or emotion understanding, as these would have helped interpret other findings from the study. Additionally, he expressed regret that the NICHD study had only analysed responsiveness to non-distress and used observations only 15 minutes long.<sup>282</sup> Like McElwain and Booth-LaForce, he felt that this cut the assessment of sensitivity away from one of its primary functions for attachment theory, which is to offer signal to the infant of caregiver availability in times of need.

To this, Lyons-Ruth and colleagues expressed regret that the NICHD observational measures of caregiving gave little attention to forms of parenting disturbance.<sup>283</sup> No measure of trauma or abuse was used, and no inquiry was made about involvement of clinical or child protective services. Clearly daycare was not anticipated to result in such outcomes for children. However, by choosing not to assess whether children were experiencing such additional threats and difficulties, the researchers made it impossible to examine whether daycare use is different, or has different implications, for populations of children at risk.

### Daycare and Attachment

In line with national patterns, the families in the NICHD study made extensive use of daycare. On average, children in the sample experienced 21 hours of childcare between three and six months, with increasing hours across time. Between 37 and 54 months, children in the sample were in daycare for an average of 33 hours per week.<sup>284</sup> Some children spent as much as 62 hours per week in daycare. Others were entirely home-reared. The average quality of daycare was not good. The NICHD researchers' observations found that positive caregiving was 'very uncharacteristic' or 'somewhat uncharacteristic' in 57% of the care settings for children ages one to three they assessed, with sharply declining rates of positive care across 15-month, 24-month, and 36 months observations, such that only around a third of observations of care for three-year olds were positive.<sup>285</sup> Furthermore, the care settings that refused to be observed were generally those where other metrics suggested that the quality of care would be especially low.

In 1997 a first report was published from Phase I of data collection, when children in the sample were aged 0–3, examining associations between non-maternal care experience and classifications in the Strange Situation. Belsky recalled that he and allies had to argue for the inclusion of the Strange Situation in the study: NICHD investigators critical of his use

<sup>281</sup> Thompson, R. A. (2008) Measure twice, cut once: Attachment theory and the NICHD study of early child care and youth development. *Attachment & Human Development*, 10(3), 287–297.

<sup>282</sup> McElwain, N. L. & Booth-LaForce, C. (2006) Maternal sensitivity to infant distress and nondistress as predictors of infant-mother attachment security. *Journal of Family Psychology*, 20(2), 247–255.

<sup>283</sup> Lyons-Ruth, K., Bureau, J. F., Easterbrooks, M. A., Obsuth, I., Hennighausen, K., & Vulliez-Coady, L. (2013) Parsing the construct of maternal insensitivity: Distinct longitudinal pathways associated with early maternal withdrawal. *Attachment & Human Development*, 15(5–6), 562–582, p. 565. The closest measure is a self-report scale for children in sixth grade, where eight items ask about parental hostile behaviour. Items include 'How often does your parent push, grab, hit, or shove you?' and 'How often does your parent insult or swear at you?' This measure has rarely been used by researchers.

<sup>284</sup> NICHD Early Child Care Research Network (2003) Does amount of time spent in child care predict socioemotional adjustment during the transition to kindergarten? *Child Development*, 74(4), 976–1005.

<sup>285</sup> National Institute of Child Health and Human Development (NICHD) Early Child Care Research Network. (2000) Characteristics and quality of child care for toddlers and preschoolers. *Applied Developmental Science*, 4(3), 116–135.

of the Minnesota Strange Situation findings to raise concerns about daycare were strongly against using the measure. They would have preferred solely to assess child–caregiver interaction during play.<sup>286</sup> However the use of the Minnesota Strange Situation findings in Belsky's review was regarded by other NICHD investigators as critical for triggering the 'daycare wars',<sup>287</sup> which suggested the need to include this measure in the study.

In the event, there was sufficient support and Strange Situations were conducted at around 15 months for 1,201 infant–mother dyads. These were double coded, on an industrial scale, by a team of three coders at the University of Washington, led by Sue Spieker. Given the size of the dataset inter-rater reliability between coders for security and insecurity was good (86%, kappa = 0.70), and is a testament to the efforts of Spieker and her team.<sup>288</sup> Even so, they were not able to achieve reliability with Mary Main in coding disorganization.<sup>289</sup> Nor were data for inter-rater reliability within the team for disorganization ever reported, suggesting that they were low.

In identifying concealed problems in the coding of disorganization on the NICHD sample, it should be fully acknowledged that at the time the tapes were being coded there was no formal training programme or established reliability set for the disorganized classification. Moreover, even after the commencement of a yearly training institute at Minnesota, taught by a widely acclaimed teacher (Elizabeth Carlson), rates of certification for reliability in coding disorganization have been very low.<sup>290</sup> This likely reflects in part the underdeveloped and baroque state of the Main and Solomon 1990 coding system (Chapter 1).<sup>291</sup> Such considerations offer relevant context to the possible problems with the NICHD coding.

The headline claim from the 1997 paper was no findings of a significant association between any feature of childcare experience (quality, hours, age of entry, stability, or type of care) and the Strange Situation classifications. That is to say, even extensive, early, unstable, or poor-quality care was not found to increase the likelihood of infant insecure attachment to their mother. This absence of evidence (no statistically significant association) was taken to mean evidence of absence (no relationship between non-maternal care and the Strange Situation). The 1997 paper reported the findings as disproving Belsky's concerns.

The NICHD investigators did report some relevant, if small, interactions: 'infants were less likely to be secure when low maternal sensitivity/responsiveness was combined with poor quality child care, more than minimal amounts of child care [10h/week], or more than one care arrangement'.<sup>292</sup> For his part, Belsky's sense was that these findings suggest that 'when mother provides sensitive care, the baby can tolerate lots of time away from her and still develop the confidence and trust that she will be there for him; yet when the quality

<sup>286</sup> Belsky, J. (2009) Quality, quantity and type of child care: Effects on child development in the USA. In G. Bentley & R. Mace (eds), *Substitute Parents: Biological and Social Perspectives on Alloparenting across Human Societies* (pp. 304–321). Oxford: Berghahn Books, p. 316.

<sup>287</sup> For example, Vandell, D. L. & Corasaniti, M. A. (1990) Variations in early child care: Do they predict subsequent social, emotional, and cognitive differences? *Early Childhood Research Quarterly*, 5(4), 555–572.

<sup>288</sup> NICHD Early Child Care Research Network (1997) The effects of infant child care on infant–mother attachment security: Results of the NICHD study of early child care. *Child Development*, 68(5), 860–879, p. 867.

<sup>289</sup> M. Main, personal communication, March 4, 2016.

<sup>290</sup> Reijman, S., Foster, S., & Duschinsky, R. (2018) The infant disorganised attachment classification: 'Patterning within the disturbance of coherence'. *Social Science & Medicine*, 200, 52–58.

<sup>291</sup> However, Van IJzendoorn and Bakermans-Kranenburg have reported better reliability among the students from their training, suggesting that one problem may be the quality of the reliability set of videos used at Minnesota. Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2021) Replication crisis lost in translation? On translational caution and premature applications of attachment theory. *Attachment & Human Development*, 23(4), 422–437.

<sup>292</sup> NICHD Early Child Care Research Network (1997) The effects of infant child care on infant–mother attachment security: Results of the NICHD study of early child care. *Child Development*, 68(5), 860–879, p. 860.



of care that mother provides is more insensitive, for an equivalent degree of felt security to develop, the child needs to know that his mother is simply around, physically.<sup>293</sup>

The NICHD researchers framed their findings as showing that centre-based child-care and insensitive maternal care represented a 'dual risk'. Vermeer and Bakermans-Kranenburg criticized this conclusion.<sup>294</sup> True, the lowest proportion of secure attachment was found when both maternal sensitivity\* and childcare quality were low. However, the results showed that the proportion of attachment security among children with the least sensitive mothers was higher when the children also experienced high-quality daycare. Vermeer and Bakermans-Kranenburg argued that the findings suggest that daycare can be a risk or protective factor, depending on the circumstances and the state of the child's attachment networks. This conclusion was later supported by their own empirical work. With Chilean researcher Rodrigo Cárcamo, they documented that ethnic minority children, but not ethnic majority children, were likely to shift from an insecure to a secure classification if they began full-time high-quality daycare. The same was true of children from low-income, but not higher-income, families.<sup>295</sup> Belsky would later acknowledge the importance of these findings, though emphasized that they do not speak to the questions of quantity and age of entry to daycare, which were his central concerns.<sup>296</sup> He also countered Vermeer and Bakermans-Kranenburg's criticisms, arguing that the interaction they identified between caregiver sensitivity and day-care quality in predicting attachment security did not hold at 24 months, and may have been just chance.

The NICHD researchers reported that rates of insecurity were especially high when low scores on the HOME Inventory were coupled with more than 10 hr/week of care or more than one care arrangement, not 20 as Belsky had earlier argued. The researchers interpreted these findings as suggesting that insecurity is increased to a degree when children face sources of anxiety at home and at daycare, but not when they experience only one emotionally challenging context. The NICHD investigators considered that these findings agree with Sroufe's commentary on Belsky, and the proposal that it would be primarily in the context of low-quality maternal caregiving that use of daycare may have implications for a child's expectations about the caregiver's availability.

In general, when the HOME Inventory score was low, infants were generally more likely to be classified as insecure. Yet children in families with a low score on the HOME Inventory were more likely to be secure if they spent more time with their mother and less in non-maternal care. The NICHD researchers interpreted this apparently counterintuitive

<sup>293</sup> Belsky, J. (2002) Why the 'transmission gap' in attachment research: Differential susceptibility to rearing influence. *Journal of Infant, Child, and Adolescent Psychotherapy*, 2(4), 163–183, p. 166. That said, an aspect of the 1997 report is perhaps worth noting. When Belsky and the NICHD researchers refer to an interaction with 'low maternal sensitivity/responsiveness', there is an ambiguity. The interaction for poor quality childcare was with observed caregiver sensitivity\* and the HOME Inventory. However, the interaction with amount of childcare was only with the HOME Inventory, not with observed maternal sensitivity\*. It might therefore be argued that this finding in fact reflects an interaction between quantity of daycare and the specific aspects of the HOME Inventory *distinct* from maternal sensitivity\*, such as quality of learning materials and the organisation of the physical environment of the child. It could be these, rather than sensitivity, that has an interaction with hours of childcare.

<sup>294</sup> Vermeer, H. J., & Bakermans-Kranenburg, M. J. (2008) Attachment to mother and nonmaternal care: Bridging the gap. *Attachment & Human Development*, 10(3), 263–273.

<sup>295</sup> Cárcamo, R. A., Vermeer, H. J., van der Veer, R., & Van IJzendoorn, M. H. (2016) Early full-time day care, mother–child attachment, and quality of the home environment in Chile: Preliminary findings. *Early Education and Development*, 27(4), 457–477.

<sup>296</sup> Belsky, J. (2020) Early day care and infant-mother attachment security. *Encyclopedia on Early Childhood Development*. Montreal, Quebec: Centre of Excellence for Early Childhood Development and Strategic Knowledge Cluster on Early Child Development. Retrieved from: <http://www.child-encyclopedia.com/attachment/accordingexperts/early-day-care-and-infant-mother-attachment-security>.



finding with reference to Sroufe's proposal that children with less sensitive/responsive caregivers may need more time with them to develop confidence in their availability. Indeed, it would later be reported, supporting Belsky's findings, that more hours in childcare at one time-point predicted lower quality maternal caregiving at the next (using an index of the HOME Inventory and caregiver sensitivity\*).<sup>297</sup>

Overall, the primary conclusion drawn by the paper was that daycare poses no material threat to the quality of children's attachments. This was equally how the paper was received in both popular and academic contexts and considered within the attachment research community: as decisive evidence that daycare does not have negative implications for children's development.<sup>298</sup> This was also the interpretation advocated by Michael Rutter.<sup>299</sup>

The findings of interactions between maternal caregiving and forms of daycare were not given the same level of priority in discussions of the paper. Ultimately the study was a response to a policy question about whether daycare is bad for children. The finding that it may have negative effects for children with less stimulating care at home was *not perceived as relevant to this question*, as this was then a matter for individual families rather than public policy. In the 'daycare wars', the NICHD findings suggested that daycare had won, and helped support a growing public consensus.<sup>300</sup>

Despite being considered decisive evidence, there are in fact a number of debatable, even dubious, statistical choices made in the 1997 paper. They repeatedly point towards tests that would underestimate effects. To give an example: The 1997 NICHD paper reported 75 regressions. Though a large sample for a study in developmental science in the period, the NICHD study was extraordinarily underpowered to report from 75 regression analyses. All analyses of associations between daycare and the Strange Situation control for one of: maternal depression and personality; maternal sensitivity\*; the HOME Inventory; child temperament; and child sex.<sup>301</sup> Two-fifths of analyses of the effects of childcare on

<sup>297</sup> NICHD Early Child Care Research Network (1999) Child care and mother-child interaction in the first three years of life. *Developmental Psychology*, 35(6), 1399-1413. Huston and Rosenkrantz Aronson would later report from reanalysis of the NICHD data that hours spent together was associated with greater observed maternal sensitivity\* towards their child, though not security as measured in the Strange Situation. Huston, A. C., & Rosenkrantz Aronson, S. (2005) Mothers' time with infant and time in employment as predictors of mother-child relationships and children's early development. *Child Development*, 76(2), 467-482. However, a further analysis of the NICHD data by Kim and Wickrama found that mothers who never worked had lower levels of maternal sensitivity at 24 months compared to those who worked consistently through their child's early years. The authors suggest that this may reflect a concerted effort by mothers who worked through their child's infancy to make good use of their time with their child. Kim, J. & Wickrama, K. A. S. (2021) Early maternal employment status and attachment quality: An investigation of a conditional process model. *Journal of Family Issues*, 42(2), 395-421.

<sup>298</sup> For example, Howes, C., & Spieker, S. J. (2008) Attachment relationships in the context of multiple caregivers. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment* (pp. 317-332). New York: Guilford. See also Guedeney, A., Grasso, F., & Starakis, N. (2004) Le séjour en crèche des jeunes enfants: Sécurité de l'attachement, tempérament et fréquence des maladies. *La psychiatrie de l'enfant*, 47(1), 259-312.

<sup>299</sup> Rutter, M. (2008) Implications of attachment theory and research for child care policies. In J. Cassidy, & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research and Clinical Applications* (2nd ed., pp. 958-974). New York: Guilford Press, p. 967.

<sup>300</sup> Shpancer, N., Degenhard, S., Snell, M., Baron, A., Eversole, G., & Troutman, H. (2024). Changing with the times? Current attitudes about non-parental care and maternal employment in relation to young children. *Child Care in Practice*, early view.

<sup>301</sup> NICHD Early Child Care Research Network (1997) The effects of infant child care on infant-mother attachment security: Results of the NICHD study of early child care. *Child Development*, 68(5), 860-879: 'In a series of analyses, the dependent variable (secure/insecure or secure/avoidant) was predicted from (1) one of five characteristics of the mother (psychological adjustment, sensitivity in play, sensitivity in the HOME) or the child (difficult temperament, sex), (2) one of five characteristics of child care (positive caregiving frequency, positive caregiving ratings, amount of care, age of entry, and frequency of care starts), and (3) the interaction between the two selected (mother / child and child care) variables' (868).

attachment control for an index of caregiving, which is potentially troublesome, since theoretically part of the anticipated effect of daycare was anticipated to be, precisely, via effects on caregiving. In principle the NICHD researchers could have pointed to the other three-fifths of analyses, and shown that controlling for caregiving made no difference. In the event, the reporting of the interactions is poor, no doubt due to their sheer number, and no such evidence is provided. In particular, it is not clear whether positive results were left unreported due to correction for multiple tests.

A further example: many of the analyses were conducted using the Wald  $\chi^2$  test. This was a popular method in the 1970s as it required less computational power, and so could be done by hand. But by the 1990s Wald  $\chi^2$  was already an anachronism, as it came with a risk of false negative results. Furthermore, the risk of false negative results is increased when Wald  $\chi^2$  is used with logistic regression.<sup>302</sup> And in the 1997 paper all 75 regression analyses were logistic regressions, none of which were transparently reported.<sup>303</sup> Indeed, the NICHD authors reported the statistical significance of tests for associations between daycare and the Strange Situation, but did not provide effect sizes. Significance tests are not evidence for a lack of relationship; this would have required additional tests.

Quite different findings were reported by Sagi-Schwartz and colleagues from the Haifa Study of Early Child Care in 2002.<sup>304</sup> This study was intended as a replication of the NICHD study, with similar measures, though only ranging up to the end of infancy. It had a large sample of 758 families, though unlike NICHD, there was considerable socioeconomic diversity. Unlike the NICHD study, the coders achieved inter-laboratory reliability with Main and Van IJzendoorn. Inter-rater reliability within the research group was high (82% to 94%; kappa = 0.74 to 0.90). The Haifa study used a measure of sensitivity that followed Ainsworth's conceptualization of the construct.

Sagi-Schwartz and colleagues found that centre-based care greatly increased the odds of attachment insecurity (OR ~2.4) compared to other forms of childcare or home-rearing, which was remarkably similar to the results of Lamb and colleagues' 1992 meta-analysis (OR 2.56). In the Haifa study, this effect was comparable to the effect of a 2.5 standard deviation change in maternal sensitivity. That is to say, assuming a normal distribution for maternal sensitivity, children in centre-based care with maternal sensitivity in the 89th percentile were as likely to be securely attached as children not receiving centre-based care with mothers in the 11th percentile for sensitivity. Children who received care from non-maternal family members had especially low rates of insecurity, even when away from their

<sup>302</sup> Harrell, F. E. (2015) *Regression Modeling Strategies: With Applications to Linear Models, Logistic Regression, and Survival Analysis*, 2nd ed. New York: Springer, p. 193. See also Hauck Jr, W. W. & Donner, A. (1977) Wald's test as applied to hypotheses in logit analysis. *Journal of the American Statistical Association*, 72(360), 851–853. My thanks to Mohan Ganesalingam for discussions of these papers.

<sup>303</sup> Or another example: elsewhere in the paper, two-tailed tests are used to examine whether daycare increases or decreases the probability that an insecure attachment will develop. However, in fact researchers' question was whether daycare increases the probability that an insecure attachment will develop, for which a one-tailed test would have been appropriate. The use of a two-tailed test again would have unnecessarily increased the likelihood of false negative results, given the researchers' question. There was research in the period suggesting better outcomes for children in daycare in other regards, but no proposal had been made by the 1990s that daycare would improve child–mother attachment. Ramey, C. T., Bryant, D. M., & Suarez, T. M. (1985) Preschool compensatory education and the modifiability of intelligence: A critical review. In D. K. Detterman (ed.), *Current Topics in Human Intelligence. Vol. 1. Research Methodology* (pp. 247–296). Norwood, NJ: Ablex. In fact, later research would raise the possibility of positive effects of daycare on attachment: Anheer and colleagues found that children's attachments could change from an insecure to a secure classification if the acclimatization process was handled sensitively. Anheer, L., Gunnar, M., Lamb, M., & Barthel, M. (2004) Transition to child care. *Child Development*, 75(3), 639–650.

<sup>304</sup> Sagi, A., Koren-Karie, N., Gini, M., Ziv, Y., & Joels, T. (2002) Shedding further light on the effects of various types and quality of early child care on infant–mother attachment relationship: The Haifa study of early child care. *Child Development*, 73(4), 1166–1186.

mother for over 40 hours a week. Sagi-Schwartz and colleagues reflected that the extreme nature of their findings for centre-based care may, in part, reflect the especially poor quality of Israeli centre-based daycare.

No significant association between amount of care and security of attachment was discerned. There was a small significant and positive association ( $r = 0.08$ ) between hours in daycare and caregiver sensitivity. This provides a degree of evidence that hours in centre-based care were not, as Sroufe had worried, undermining caregiver attunement to the child's signals (though more decisive evidence would be change in the slope of sensitivity over time, which was not tested).<sup>305</sup> It should be acknowledged, though, that the Haifa Study of Early Child Care considered fewer potential confounders than the NICHD study.

Capitalizing on the similarity between the NICHD and Haifa studies in terms of the measures used, Love, Harrison, Sagi-Schwartz, Van IJzendoorn, and colleagues combined data from the 143 children from the United States and 151 children from Israel who experienced centre-based care. Within each of these samples, and with the samples combined, they found again that the quality of provision predicted children's attachment classification, and no association between security and number of hours of daycare.<sup>306</sup> Sagi-Schwartz and colleagues criticized 'the popular "take home" message from the NICHD study that underplays the impact of non-maternal child care on the quality of attachment'.<sup>307</sup> However, the Haifa study generated a fraction of the interest and engagement of the NICHD study. Even when noticed, it has generally been treated as an addendum, including by the attachment research community, with the narrative from Phase 1 of the NICHD study left uncontested.<sup>308</sup>

In 2001 the NICHD investigators reported associations of a second set of Strange Situations, conducted with the sample at 36 months. These Strange Situations were coded using the Cassidy and Marvin system, which brought together elements of the Ainsworth infant system and the Main and Cassidy six-year system.<sup>309</sup> In general, results were in line with the findings at 15 months. There was modest stability of attachment classifications from 15 to 36 months. Hours in daycare, age of entry, stability, and quality of daycare made no unique contribution in multinomial logistic regressions to Strange Situation classifications at 36 months.<sup>310</sup> The NICHD investigators concluded that none of these factors are therefore relevant. However, the bar of 'unique contribution' was predisposed to produce negative results: age at entry and hours per week had a correlation of  $-0.60$ , so it would have been almost impossible for either to make a 'unique' contribution.

The NICHD investigators again made the bizarre choice to control for sensitivity\* in examining the association between daycare and the Strange Situation.<sup>311</sup> That is to say, the study examined variance in child attachment in the Strange Situation *unrelated* to observed caregiver behaviour. As we saw above, it had been theorized that daycare may result in

<sup>305</sup> Ibid., Table 4.

<sup>306</sup> Love, J. M., Harrison, L., Sagi-Schwartz, A., Van IJzendoorn, M. H., Ross, C., Ungerer, J. A., ... & Chazan-Cohen, R. (2003) Child care quality matters: How conclusions may vary with context. *Child Development*, 74(4), 1021–1033.

<sup>307</sup> Aviezer, O. & Sagi-Schwartz, A. (2008) Attachment and non-maternal care: Towards contextualizing the quantity versus quality debate. *Attachment & Human Development*, 10(3), 275–285, p. 280.

<sup>308</sup> See, for example, Howes, C. & Spieker, S. J. (2008) Attachment relationships in the context of multiple caregivers. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment* (pp. 317–332). New York: Guilford.

<sup>309</sup> Cassidy, J., Marvin, R. with the Attachment Working Group of the John D. and Catherine T. MacArthur Network on the Transition from Infancy to Early Childhood (1992) Attachment organisation in preschool children: Procedures and coding manual, unpublished manual.

<sup>310</sup> NICHD Early Child Care Research Network (2001) Child-care and family predictors of preschool attachment and stability from infancy. *Developmental Psychology*, 37(6), 847–62.

<sup>311</sup> Ibid., Table 4.

insecurity perhaps through the child's expectations and/or through altering caregiver's behaviour. As we saw earlier, Sroufe had argued that daycare would impact attachment by reducing caregiver familiarity with child signals. From his perspective, the choice to control for sensitivity\* would therefore predispose negative findings regarding potential associations between daycare and the Strange Situation. The NICHD investigators offered no explanation for why they controlled for sensitivity\*. It is not even explicitly outlined in the methodology, only revealed in Table 4 of the results. Subsequent discussions of the paper appear wholly unaware of the decision.

Unlike in the 1997 report on the infancy data, at 36 months caregiver sensitivity\* predicted security in the Strange Situation, though this association was modest ( $r = 0.16$ ). In part, the modest association was because avoidance in the Strange Situation at 36 months was not predicted by insensitivity\*. The NICHD investigators were surprised, but the result is perhaps to be anticipated given that the NICHD measure of sensitivity\* excludes responsiveness to distress, understood by attachment theory as critical to the development of avoidance (Chapter 1). In the 36 month data, less sensitive caregiving in combination with more hours of daycare was associated with a slight increase in resistance and a decrease in secure attachment, but the researchers found no significant effect for avoidance. For children who started at least 10 hours a week of daycare between 16 and 36 months, this was quite clearly associated with change from a secure to an insecure classification ( $OR = 0.55$ ).<sup>312</sup> However, this finding was downplayed by the researchers.

Overall, then, the 36 month data was interpreted by the NICHD team as offering minimal evidence that non-maternal care would have any impact on child-caregiver attachment. Exactly as Ainsworth had feared, attachment theory had been painted as focused on the dangers of daycare. With the NICHD showing minimal consequences of daycare for the Strange Situation specifically, or most aspects of development generally, this was treated as a challenge to attachment theory and its fundamental premises.<sup>313</sup>

Another concern was raised by Van IJzendoorn. The NICHD study had conducted their investigation, following the nature of the policy concerns, as a study of the effects of *non-maternal* care. Van IJzendoorn felt that there was no theoretical justification to assuming that fathers, siblings, grandparents, and others in a family could not serve as attachment figures for children, and that such a treatment of the data by Belsky risked bringing attachment theory into disrepute and reaffirming stereotypes about the paradigm.<sup>314</sup> Van IJzendoorn and colleagues requested and re-analysed the data reported by the NICHD researchers, distinguishing care by family members from other forms of

<sup>312</sup> Belsky reported that Owen and associates (Owen, Booth, Clarke-Stewart, Vandell & McCartney, 2001) re-examined the NICHD data and found that increases in maternal employment (and consequent child-care usage) between two and three years of age predicted declines in maternal sensitivity across this same developmental period, even with selection factors taken into account. However, the paper by Owen and colleagues was not published. Belsky, J. (2001) Emanuel Miller Lecture: Developmental risks (still) associated with early child care. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 42(7), 845–859, p. 850.

<sup>313</sup> For example, Scarr, S. (1998) American child care today. *American Psychologist*, 53, 95–108; Newcombe, N. S. (2007) Developmental psychology meets the Mommy Wars. *Journal of Applied Developmental Psychology*, 28, 553–555; McCartney, K., Burchinal, M., Clarke-Stewart, A., Bub, K. L., Owen, M. T., Belsky, J., & NICHD Early Child Care Research Network (2010) Testing a series of causal propositions relating time in child care to children's externalizing behavior. *Developmental Psychology*, 46(1), 1–17.

<sup>314</sup> For later discussion of attachment theory and non-maternal familial care by the Leiden group, see for example Mooya, H., Sichimba, F., & Bakermans-Kranenburg, M. (2016) Infant-mother and infant-sibling attachment in Zambia. *Attachment & Human Development*, 18(6), 618–635.

non-maternal care.<sup>315</sup> As they expected, there was no significant association between hours of familial care (e.g., fathers, grandparents) and maternal report of externalizing difficulties. Van IJzendoorn and colleagues strongly criticized the NICHD team for use of the construct of 'non-maternal care': 'It seems uncritically mirroring dominant cultural stereotypes to assign active fathers a status similar to the babysitter or the professional caregiver.... Presenting the SECCYD findings in terms of "any type of non-maternal child-care" should therefore be considered scientifically incorrect and obsolete.'<sup>316</sup> Belsky and NIHR collaborators would later publicly accept this criticism.<sup>317</sup>

### The Effects of Daycare and the Role of Sensitivity

Further data collection was undertaken in Phase 2 of the NICHD study, when the children were 4½. The NICHD team was bolstered by the excellent addition of Peg Burchinal taking the role of lead statistician. From this point, statistical analyses became considerably more defensible. Nonetheless, this would be too late for the Strange Situation data, which was assumed to have been dealt with adequately in the 1997 and 2001 papers.

Findings from Phase 2 were reported in a 2002 paper in the *American Educational Research Journal*.<sup>318</sup> The paper reported findings controlling for child gender, ethnicity, maternal education, income-to-needs ratio, maternal depression, and—once again—maternal sensitivity\*. No justification is given for these choices, and the decision to control for maternal depression and maternal sensitivity\* seem highly debatable, given the expectation that part of the effects of daycare on child development might be specifically through positive or negative effects on these aspects of their care.

The researchers reported that children in high-quality daycare had slightly higher scores on tests of academic ability ( $r = 0.16$ ) and language skills ( $r = 0.10$ ) at 4½ years old than children in low-quality daycare.<sup>319</sup> The 2002 paper also reported that children who averaged 30 or more hours a week were reported by their daycarers to have somewhat more problem behaviours than children who averaged less than 10 hours a week ( $r = 0.19$ ). At less than 10 hours a week 5% of children were reported to show externalizing behaviour a standard deviation above the norm; at 30 hours a week this was 16%.

<sup>315</sup> Van IJzendoorn, M. H., Kroonenberg, P. M., Out, D., Randsdorp, Y., Lehmann, A., & Van der Maas, H. (2003) Does more non-maternal care lead to aggression? Paper presented at the biennial meeting of the Society for Research of Child Development, Tampa, FL. 2003.

<sup>316</sup> Linting, M. & Van IJzendoorn, M. H. (2009) Dissipating or diffusing aggression after non-maternal childcare? Commentary on a novel hypothesis. *Social Development*, 18(1), 239–246.

<sup>317</sup> Belsky, J., Vandell, D. L., Burchinal, M., Clarke-Stewart, K. A., McCartney, K., Owen, M. T., & NICHD Early Child Care Research Network (2007) Are there long-term effects of early child care? *Child Development*, 78(2), 681–701, p. 695.

<sup>318</sup> NICHD Early Child Care Research Network (2002) Early child care and children's development prior to school entry: Results from the NICHD Study of Early Child Care. *American Educational Research Journal*, 39(1), 133–164.

<sup>319</sup> Ibid. A later follow-up, at first grade, reported similar findings, with quality of daycare associated with first grade academic results. These associations were not mediated by children's language skills at 54 months, unlike the (much larger) associations between parenting quality and first grade academic results. NICHD Early Child Care Research Network (2004) Multiple pathways to early academic achievement. *Harvard Educational Review*, 74(1), 1–29. Similar findings would also be reported by a UK study in which Belsky participated: Melhuish, E., Belsky, J., MacPherson, K., & Cullis, A. (2010) *The Quality of Group Childcare Settings Used by 3–4 Year Old Children in Sure Start Local Programme Areas and the Relationship with Child Outcomes*. London: Department for Education.

The NICHD investigators published another report from the Phase 2 data in 2003, focused on further examining the question of hours spent in daycare.<sup>320</sup> Hierarchical linear modelling was used to examine the cumulative relationship between hours of daycare and child conduct problems as reported by the child's mother and daycarer/teacher at 6, 15, 24, 36, and 54 months and at the start of kindergarten around age five. This analysis agreed with the 2002 paper that cumulative hours in daycare was linked to daycarer/teacher reported conduct problems and extended this finding to kindergarten age. Whereas the 2002 paper had reported that there was no increase in maternal report for hours in daycare, the test for cumulative effect of hours in the 2003 paper showed that mothers did report slightly more conduct problems from when the child was two.

The appearance of independent effects of quality and quantity in the early 2000s supported a narrative of the benefits of high-quality daycare for academic ability and language skills as a 'plus' to balance the 'minus' of effects of childcare on behaviour. The NICHD investigators advised that 'parents might decide to use high-quality center care in hopes of enhancing cognitive skills but restrict the numbers of hours of child care in hopes of decreasing behavior problems.'<sup>321</sup> Further investigations in a 2010 paper by the NICHD investigators did ultimately reveal an interaction between quality and quantity, with more low-quality care having more of an effect.<sup>322</sup> However, this U-turn came too late to influence either the framing of the main NICHD findings, or their reception by developmental scientists or other audiences.

It should also be noted that the 'plus' to balance a 'minus' narrative was dependent on an important absence: no test was conducted of whether children in high- or low-quality daycare differed in academic ability and language skills to those not in daycare. No justification was provided for the absence of this test, and the results would have been available to the NICHD investigators. It is unclear whether this is an oversight, or whether the results were held back. The 'plus' to balance a 'minus' may have functioned to hold together the NICHD investigator team, offering enough of what was wanted by members variously more favourable and more critical towards daycare.

In a 2006 capstone paper to their collective work the NICHD investigators ultimately concluded that, in line with Belsky's interpretation from his interpretation of attachment theory and available research in the 1980s, hours in daycare did represent a potential risk to children. 'So far it is looking like he's right', acknowledged McCartney, who had been among Belsky's strongest critics: 'Long hours in child care are associated with behavior problems.'<sup>323</sup> The NICHD investigators could agree that 'our results provide support for policies that reduce the amount of time children spend in child care. These include programs that support extended welfare benefits and workplace policies that offer flexible hours and paid parental leave.'<sup>324</sup>

<sup>320</sup> NICHD Early Child Care Research Network (2003) Does amount of time spent in child care predict socioemotional adjustment during the transition to kindergarten? *Child Development*, 74(4), 976–1005.

<sup>321</sup> National Institute of Child Health and Human Development Early Child Care Research Network (2006) Child-care effect sizes for the NICHD study of early child care and youth development. *American Psychologist*, 61(2), 99–116, p. 114.

<sup>322</sup> McCartney, K., Burchinal, M., Clarke-Stewart, A., Bub, K. L., Owen, M. T., Belsky, J., & NICHD Early Child Care Research Network (2010) Testing a series of causal propositions relating time in child care to children's externalizing behavior. *Developmental Psychology*, 46(1), 1–17.

<sup>323</sup> Cited in Lang, H. (2005) The trouble with day care: Are researchers telling parents the whole truth about day care? The verdict isn't good and parents won't like it. *Psychology Today*, 1 May 2005, <https://www.psychologytoday.com/gb/articles/200505/the-trouble-day-care>.

<sup>324</sup> National Institute of Child Health and Human Development Early Child Care Research Network (2006) Child-care effect sizes for the NICHD study of early child care and youth development. *American Psychologist*, 61(2), 99–116, p. 114.

They acknowledged that their findings applied in the first instance to the United States, and secondarily to other countries with similar public policies, average levels of quality, and patterns of care. Indeed, research outside of the United States has often, but not always, found no association between hours of daycare and child externalizing difficulties, though this research has tended to rely on mother-report, which may have contributed to the different findings.<sup>325</sup> In a later UK study co-led by Belsky, the researchers found that the availability of free high-quality daycare for five-year-olds in areas of high adversity was associated with less chaotic home environment for the children and mothers' reports of engaging in less harsh discipline.<sup>326</sup>

In papers from 2010 and 2014, Vandell, Belsky, and colleagues presented findings from a follow-up when the sample were aged 15. The researchers reported remarkable congruence in associations even so many years later.<sup>327</sup> Hours in early daycare was associated over a decade later with 15 year olds' self-report of externalizing difficulties/impulsivity.

Unlike in the 2002 paper, the researchers did not control for maternal sensitivity\*. As a result, they were able to identify that the association between hours of daycare and externalizing difficulties/impulsivity had an important moderator. This was: maternal sensitivity\*. When maternal sensitivity\* was high, there was no link between hours in daycare and adolescent externalizing difficulties. When maternal sensitivity\* was low, childcare hours were related to both adolescent report of externalizing behaviours ( $r = 0.17$ ) and impulsivity ( $r = 0.21$ ).<sup>328</sup>

Quality of early daycare was likewise associated with measures of cognitive and academic skill. Again, there was moderation by observed caregiver sensitivity\*. When subsequent maternal sensitivity\* was low, there was no link between quality of early daycare and measures of cognitive and academic skill. When subsequent maternal sensitivity\* was high, there was a material association between quality of early daycare and measures of cognitive and academic skill over a decade later ( $r = 0.14$ ).

Vandell, Belsky, and colleagues concluded that their findings show that the meaning of daycare is altered by subsequent caregiver sensitivity. When a child experiences longer hours of daycare, as Sroufe had anticipated, the meaning of this experience and its implications for development depends on how the child's relationship with their mother subsequently develops. Longer hours at daycare does not predict externalizing difficulties if the child-mother relationship is positive, with time away at daycare not hindering the capacity of the caregiver to respond positively to their child, and the relationship perhaps serving as a resource for the child in learning how to manage difficult feelings. Likewise, Vandell, Belsky, and colleagues suspected that the benefits of high-quality compared to

<sup>325</sup> For reviews of the international literature, see Huston, A. C., Bobbitt, K. C., & Bentley, A. (2015) Time spent in child care: How and why does it affect social development? *Developmental Psychology*, 51(5), 621–634; Rey-Guerra, C., Zachrisson, H. D., Dearing, E., Berry, D., Kuger, S., Burchinal, M. R., ... & Côté, S. M. (2023) Do more hours in center-based care cause more externalizing problems? A cross-national replication study. *Child Development*, 94(2), 458–477. A strong study, capitalizing on the natural experiment of the introduction of universal childcare in Quebec, reported findings aligned with those of NICHD in terms of some link between centre-based daycare and externalizing difficulties. Baker, M., Gruber, J., & Milligan, K. (2019) The long-run impacts of a universal child care program. *American Economic Journal: Economic Policy*, 11(3), 1–26.

<sup>326</sup> National Evaluation of Sure Start (NESS) Team (2012) *The Impact of Sure Start Local Programmes on Five Year Olds and Their Families*. London: Department for Education.

<sup>327</sup> Vandell, D. L., Belsky, J., Burchinal, M., Steinberg, L., Vandergrift, N., & NICHD Early Child Care Research Network (2010) Do effects of early child care extend to age 15 years? Results from the NICHD study of early child care and youth development. *Child Development*, 81(3), 737–756.

<sup>328</sup> Burchinal, M. R., Lowe Vandell, D., & Belsky, J. (2014) Is the prediction of adolescent outcomes from early child care moderated by later maternal sensitivity? Results from the NICHD study of early child care and youth development. *Developmental Psychology*, 50(2), 542–553.

low-quality daycare might not be consolidated into stronger cognitive and academic skills if the child does not feel supported by their mother.

### Prediction from the NICHD Strange Situations

Though the NICHD study was primarily set up to investigate the effects of daycare, rich longitudinal information was available on other aspects of child development relevant to attachment research, including sensitivity\*. A 1998 paper examined associations between early care and child outcomes at 24 and 36 months.<sup>329</sup> Observed sensitivity\* was highly related to income-to-needs ratio,<sup>330</sup> and the two generally had very similar correlates. Even so, sensitivity\* was generally a better and more enduring predictor of child outcomes. Sensitivity\* in infancy was a robust predictor at 24 months of IQ ( $r = 0.38-0.40$ ), social competence ( $r = 0.23-0.26$ ), and lack of conduct problems ( $r = 0.16-0.23$ ). At 36 months sensitivity\* predicted school readiness ( $r = 0.34-0.37$ ), language skills ( $r = 0.29-0.52$ ), social competence ( $r = 0.18-0.27$ ) and lack of problem behaviour ( $r = 0.10-0.27$ ). However, as we saw above, Leerkes and colleagues would later re-analyse this data, documenting that sensitivity to infant distress seemed to be driving at least some of these associations, rather than the sensitivity\* construct routinely used by the NICHD study.

Unlike the considerable and cross-cutting prediction from observed sensitivity\*, there was almost no association between the infant Strange Situation classifications and any of the measured child outcomes.<sup>331</sup> For the 36 month Strange Situations, there were weak associations for security with concurrent maternal report for child social compliance ( $r = 0.17$ ) and conduct problems ( $r = -0.12$ ).<sup>332</sup> There was no significant association at 36 months between disorganized attachment at 15 or 36 months and child outcomes (this would be the only test of disorganized attachment in the 36 month data published by the NICHD group authors).

The NICHD investigators argued that these findings contradicted Belsky's earlier proposal that the infant-parent attachment relationship played an important role in shaping associations between early daycare and problematic behaviour in the late preschool and early elementary school years.<sup>333</sup> Infant attachment relationships as measured by the Strange Situation were not, in themselves, predictive of all that much: this represented a general and basically catastrophic failure for attachment theory in the account of the NICHD investigators.<sup>334</sup>

<sup>329</sup> NICHD Early Child Care Research Network (1998) Relations between family predictors and child outcomes: Are they weaker for children in child care? *Developmental Psychology*, 34(5), 1119-1128.

<sup>330</sup> See also NICHD Early Child Care Research Network (2001) Before Head Start: Income and ethnicity, family characteristics, child care experiences, and child development. *Early Education and Development*, 12(4), 545-576.

<sup>331</sup> For infants without daycare experience, there was some association at 24 months between security and social competence ( $r = 0.16$ ). However given the number of tests, this could just as easily represent chance, and the association disappeared in a dedicated post hoc analysis-of-variance test. NICHD Early Child Care Research Network (1998) Relations between family predictors and child outcomes: Are they weaker for children in child care? *Developmental Psychology*, 34(5), 1119-1128.

<sup>332</sup> NICHD Early Child Care Research Network (2001) Child-care and family predictors of preschool attachment and stability from infancy. *Developmental Psychology*, 37(6), 847-862.

<sup>333</sup> NICHD Early Child Care Research Network (1998) Early child care and self-control, compliance, and problem behavior at twenty-four and thirty-six months. *Child Development*, 69(4), 1145-1170, p. 1146.

<sup>334</sup> This narrative was maintained in NICHD Early Child Care Research Network (2006) Infant-mother attachment classification: Risk and protection in relation to changing maternal caregiving quality. *Developmental Psychology*, 42(1), 38-58.



This is a questionable framing. Caregiver sensitivity\* appeared to have an important predictive role. When it was later reported, the 24 month AQS in the NICHD study also performed as expected in predicting children's later internalizing ( $r = -0.15$ ) and externalizing difficulties ( $r = -0.23$ ), though this was relegated to a table by the NICHD researchers, and little was made of the results.<sup>335</sup> Ultimately, prediction from the Strange Situation alone was treated as indexing the adequacy of attachment research, which is, to be fair, *exactly* what Lamb and colleagues had warned would happen if attachment researchers continued to overemphasize the Strange Situation (Chapter 1).

As we shall see, the lack of prediction from the NICHD Strange Situations would prove discrepant with meta-analytic evidence which has reported material concurrent and prospective associations between the Strange Situation and child IQ, language development, social competence, and conduct problems (Chapter 4). This meta-analytic research has documented the importance of both the secure/insecure distinction and disorganized attachment. Within the attachment research community, some such as Roisman have tended to advocate for the stronger validity of the NICHD Strange Situation findings, drawing from repeated assessments with a large sample, compared to the results of meta-analyses forced to report publication biases and with high heterogeneity.<sup>336</sup> Sue Spieker, disappointed by the poor performance of the disorganized attachment classification in the NICHD study, subsequently abandoned research using the disorganized classification, and instead has pursued collaboration with Crittenden and her alternative approach to classification.<sup>337</sup> Belsky argued that the NICHD findings show that 'quality of attachment by itself is not a great predictor of much', especially by comparison with the great predictive success of observed caregiver sensitivity\*, which continued to predict well into the teenage years.<sup>338</sup>

Other attachment researchers, such as Van IJzendoorn and Bakermans-Kranenburg, have tended to advocate for the validity of meta-analytic results, which can account for publication bias, and which can aggregate from multiple well-conducted studies rather than being forced to rely on the industrial-scale coding of the NICHD study, with problems in the coding of the Strange Situation. Sroufe has outright dismissed the validity of the coding of disorganization in the NICHD study.<sup>339</sup>

Beyond the community of attachment researchers, the lack of prediction from the NICHD Strange Situations was seen as important, perhaps even definitive, evidence. They published over a decade earlier than meta-analytic work on the sequelae of the Strange Situation, and so had precedence in shaping the narrative. Beyond this, the NICHD study was designed to be the decisive study in size and scope, and was characterized by attachment researchers as such.<sup>340</sup> The lack of association between the Strange Situation and developmental outcomes contributed to a transformation of the standing of attachment

<sup>335</sup> McCartney, K., Owen, M. T., Booth, C. L., Clarke-Stewart, A., & Vandell, D. L. (2004) Testing a maternal attachment model of behavior problems in early childhood. *Journal of Child Psychology and Psychiatry*, 45(4), 765–778, Tables 4–6.

<sup>336</sup> For example, Roisman, G. & Groh, A. (2021) The legacy of early attachments: Past, present, future. In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 187–194). New York: Guilford.

<sup>337</sup> Spieker, S. & Crittenden, P. (2010) Comparing two attachment classification methods applied to preschool strange situations. *Clinical Child Psychology and Psychiatry*, 15(1), 97–120; Spieker, S. J. & Crittenden, P. M. (2018) Can attachment inform decision-making in child protection and forensic settings? *Infant Mental Health Journal*, 39(6), 625–641.

<sup>338</sup> Karen, R. (2024) *Becoming Attached*, 2nd ed. Oxford: Oxford University Press, p. 364.

<sup>339</sup> Sroufe, L. A. (2021) Then and now: The legacy and future of attachment research. *Attachment & Human Development*, 23(4), 396–403.

<sup>340</sup> For example, Sroufe, L. A., Coffino, B., & Carlson, E. A. (2010) Conceptualizing the role of early experience: Lessons from the Minnesota longitudinal study. *Developmental Review*, 30(1), 36–51.

research within developmental science. From the late 1980s to late 1990s, attachment was often discussed with respect as a core aspect of child development. From the late 1990s onwards, attachment theory was a target of criticism, and characterized as ‘overrated’, in part with reference to the NICHD Strange Situation results.<sup>341</sup> Just as for the NICHD investigators, the impressive findings for the predictive power of observed caregiver behaviour (sensitivity\*), and the reasonable prediction from the AQS, appear not to have been regarded as relevant to the evaluation of attachment theory, treated as synonymous with the Strange Situation.

Yet one of the NICHD researchers, Martha Weinraub, held a different perspective on the NICHD Strange Situations. She anticipated that the Strange Situation classifications were more important than the impression given by her NICHD collaborators, and in particular that attachment theory would suggest that infant security would function as a protective factor in children. In a 2007 paper, Dallaire and Weinraub documented associations between negative events in the lives of families in the NICHD sample and higher rates of mother-, father- and teacher-reported child externalizing and internalizing symptoms by first grade.<sup>342</sup> Insecurity in the Strange Situation at 36 months made a much larger contribution to teacher-reported externalizing symptoms than negative life events. Furthermore, Dallaire and Weinraub were able to also document that this association was moderated by attachment security at 15 months, with secure infant attachment serving as a protective factor. Secure attachment all but eliminated the likelihood of later internalizing difficulties for the child stemming from the negative events.

Weinraub subsequently supervised a doctoral study by Bowler, which questioned the reliability of the coding of disorganization in the NICHD study. The coding system for disorganized attachment is baroque, difficult to use and time consuming. Like Sroufe, Bowler suspected that coding at scale, many hundreds of recordings, may have reduced the acuity of the measurement of disorganization, resulting in null findings when using the category in the NICHD group papers. If so, increasing the resolution would probably result in associations between disorganization and expectable outcomes. The most well-replicated association in the meta-analytic literature is between disorganized attachment and later externalizing behaviours (Chapter 4). To increase resolution, Bowler therefore adopted an approach to the NICHD that would likely capture more variance in disorganization.

The NICHD study only analysed disorganization categorically, and only ever in one assessment. If there may have been difficulties with the coding of disorganization at industrial scale in the NICHD study, scale scores from across two assessments might be expected to capture the construct more accurately. Bowler’s reexamination of the NICHD data in this way found that, indeed, when disorganization was present in both assessments this was associated with externalizing behaviours in the early years and at Grade 6.<sup>343</sup> Bowler also generally found better prediction from the preschool assessment of disorganization than the infant assessment, concluding that there may have been problems with the coding of disorganization, especially in infancy. In her view, researchers would probably do better to trust the results of meta-analytic research than results from the NICHD study regarding the correlates of disorganized attachment.

<sup>341</sup> For example, Birns, B. (1999) Attachment theory revisited: challenging conceptual and methodological sacred cows. *Feminism & Psychology*, 9(1), 10–21; Meins E. (2017) Overrated: The predictive power of attachment. *The Psychologist*, 30, <https://www.bps.org.uk/psychologist/overrated-predictive-power-attachment>.

<sup>342</sup> Dallaire, D. H. & Weinraub, M. (2007) Infant–mother attachment security and children’s anxiety and aggression at first grade. *Journal of Applied Developmental Psychology*, 28(5–6), 477–492.

<sup>343</sup> Bowler, G. M. (2020) Lawful patterns of early attachment disorganization are related to externalizing behaviors across childhood. Unpublished doctoral thesis, Temple University.

Bowler considered that an alternative would be to use NICHD data for replication of findings using the Strange Situation from smaller studies, with the working assumption that the NICHD findings will likely point in the right direction but sometimes give false negative results and generally underestimate the strength of effects. This was the strategy adopted by Hazen and colleagues from the Austin Texas group.<sup>344</sup> They found that the vast majority of children with over 60 hours of daycare a week in their sample received a disorganized infant-mother attachment classification ( $r = 0.79$ ), with the Strange Situation coding checked with Mary Main. This was a potentially controversial finding, with an improbably large effect size, and needed replication.

Hazen and colleagues therefore ran the same analysis with the NICHD data. Here they found that over 60 hours of childcare a week was likewise associated with disorganized infant-mother attachment ( $r = 0.11$ ). The size of the NICHD sample allowed Hazen and colleagues to specifically examine effects of 60–100 hours of daycare a week: they found that the risk of disorganized attachment increased exponentially after the 60-hour threshold. For Hazen and colleagues, the potentially weak signal in the NICHD Strange Situation data, a concern for Bowler, did not matter as much: their use of the NICHD was to provide replication and further exploration of a finding from a smaller sample, rather than to establish the strength of an association.<sup>345</sup>

Bowler's pessimism regarding the NICHD Strange Situation data might be somewhat qualified, however. A doctoral study by Faiad, supervised by Fearon, applied machine learning techniques to the NICHD dataset, examining factors from Phase 1 of the NICHD study (when children were 0–3) that predicted mothers' reports of externalizing and internalizing symptoms when the child was aged 15.<sup>346</sup> Rather than identifying variables based on theory and examining their associations with child outcomes, machine learning is an inductive approach where the focus is on the predictive power of variables. Faiad examined prediction from 17 measures of contextual risk (e.g., income-to-needs ratio; minority ethnic status), child characteristics (sex and temperament), maternal psychosocial characteristics (e.g., personality, depression, stress), number of hours of childcare; the NICHD measure of sensitivity\*, the Strange Situation at 15 and 36 months, and the Attachment-Q-sort at 24 months. A variety of machine learning techniques were adopted: linear regression, regression trees, support vector machines, gaussian process regression, and ensemble trees.

Across the best performing models, Faiad found that the preschool Strange Situation classifications were the most, or among the most, important predictors of mothers' reports of externalizing and internalizing symptoms. Like Bowler, Faiad found that the preschool Strange Situations generally had better prediction of child externalizing and internalizing symptoms than the infant Strange Situations, though the infant secure classification performed well. She also specifically reported good long-term prediction from disorganized attachment assessed at preschool for reported externalizing symptoms in adolescence.

<sup>344</sup> Hazen, N. L., Allen, S. D., Christopher, C. H., Umemura, T., & Jacobvitz, D. B. (2015) Very extensive nonmaternal care predicts mother-infant attachment disorganization: Convergent evidence from two samples. *Development and Psychopathology*, 27(3), 649–661.

<sup>345</sup> A similar use of the NICHD data for the purposes of replication was reported by Luijk, M. P., Roisman, G. I., Haltigan, J. D., Tiemeier, H., Booth-LaForce, C., Van IJzendoorn, M. H., ... & Bakermans-Kranenburg, M. J. (2011) Dopaminergic, serotonergic, and oxytonergic candidate genes associated with infant attachment security and disorganization? In search of main and interaction effects. *Journal of Child Psychology and Psychiatry*, 52(12), 1295–1307.

<sup>346</sup> Faiad, Y. (2020) The role of early environmental factors in predicting adolescent psychopathology: A secondary data analysis of NICHD SECCYD data using machine learning. Unpublished doctoral thesis, University College London.

The NICHD group publications barely examined the correlates of disorganized attachment in the preschool Strange Situation data, presumably because the infant disorganized attachment data had been regarded as so disappointing. Against Bowlby's argument that researchers would probably do better to trust the results of meta-analytic research than results from the NICHD study regarding the correlates of disorganized attachment, Faia's findings suggest that this applies more to the infant Strange Situation data than the preschool classification.

Another notable finding from Faia's study was that hours in non-familial childcare, though less predictive than the Strange Situation, were associated with mothers' reports of adolescent internalizing difficulties at age 15. The NICHD group collected data on child internalizing difficulties at multiple timepoints, but rarely analysed associations with experiences in childcare. Associations for internalizing difficulties at 54 months appear in a table in a 2004 NICHD group report, but are not discussed: hours in care appear to have similar consequences for externalizing and internalizing symptoms according to teacher report, and a stronger association with internalizing symptoms by maternal report.<sup>347</sup> Van IJzendoorn and Tavecchio observed at the time that the NICHD researchers seemed quite uninterested in children's suffering or wellbeing, and instead oriented by policy concerns with effects of daycare on children's conduct problems.<sup>348</sup> Faia's results suggested that attention to internalizing difficulties might be a valuable avenue for future secondary analyses.

Picking up on questions about prediction from the NICHD Strange Situations, a recent paper by Nivison and colleagues examined the respective predictive validity of the Strange Situations and the assessment of sensitivity conducted in the Minnesota and NICHD longitudinal studies.<sup>349</sup> On the one hand, the Minnesota study is of particular symbolic importance as the study that established the Strange Situation as a prospective predictor of child outcomes in the 1980s and 1990s, which helped carve a key place for attachment theory within developmental science. On the other hand, as we have seen, the weak prospective associations of the Strange Situation in the NICHD study dampened enthusiasm for attachment theory in the 2000s and fed accusations that the paradigm had been overrated. This was part of the interest for Nivison and colleagues in considering the two cohort studies together.

Nivison and colleagues were also motivated by distrust in the results of meta-analytic research on the prospective correlates of the Strange Situation. Few of the studies in the meta-analyses were pre-registered, giving researchers freedom to run statistical tests in different ways, or adjust the way that variables are handled, until a desired outcome is reached. They point to evidence of publication bias documented by the meta-analytic reports. Nivison and colleagues were also concerned that meta-analytic research on the prospective correlates of the Strange Situation had failed to take into account potential

<sup>347</sup> NICHD Early Child Care Research Network (2004) Type of child care and children's development at 54 months. *Early Childhood Research Quarterly*, 19(2), 203–230, Table 9.

<sup>348</sup> Van IJzendoorn, M. H., & Tavecchio, L. W. C. (2003) Infant day-care: Short-term and longterm implications for mother-child interaction and child development. *Infant Behavior and Development*, 26, 283–284: 'In the NICHD study little attention has been paid to the daily experiences of children involved in various care arrangements. More specifically, their feelings of well-being seem to have been neglected in favor of developmental outcome assessments. This emphasis is, of course, legitimate as users of daycare facilities wonder which positive and negative consequences these facilities may have for child development. But children are not only raised for the future: they also live in the present, and have the right to feel comfortable' (283).

<sup>349</sup> Nivison, M., Caldo, P. D., Magro, S. W., Raby, K. L., Groh, A. M., Vandell, D. L., ... & Roisman, G. I. (2024) The predictive validity of the strange situation procedure: Evidence from registered analyses of two landmark longitudinal studies. *Development and Psychopathology*, early view.

demographic confounders, which could influence associations between early care and later child outcomes.

Nivison and colleagues examined associations between the Strange Situation and child externalizing difficulties, internalizing difficulties, and social competence. They also examined academic outcomes. These questions were rather theoretically controversial. Sroufe had argued that attachment security or insecurity would be expected to be associated with socioemotional not academic outcomes or language competence.<sup>350</sup> Main and colleagues had agreed that while security or insecurity might be associated with language use in discussions of attachment-related topics, it would not be associated with general language competence.<sup>351</sup> This was generally regarded as the orthodox position among the attachment research community, supported by the interpretation of an early narrative review by Bretherton and colleagues.<sup>352</sup> This has remained a widespread position into the present. For instance, in Waters and Waters' major recent survey of secure base/safe haven dynamics across the lifespan, there is no mention of the role of these dynamics in shaping learning or language except in relation to socioemotional development.<sup>353</sup>

Yet in fact Bowlby's first attempt to study the effects of hospitalization on child attachment focused on effects on academic development,<sup>354</sup> and Ainsworth predicted in conversations with allies that secure attachment would be associated with language and academic development.<sup>355</sup> Van IJzendoorn and Bus also developed major theoretical proposals along these lines. They argued that the attentional and emotion regulation capacities supported by secure attachment would be especially important for facilitating more positive academic outcomes (Chapter 4).

In the Minnesota study, associations between infant security and externalizing difficulties were modest: teacher-reported,  $r = -0.05$ ; mother-reported  $r = -0.14$ ; self-reported  $r = -0.14$ . The same was true for internalizing difficulties: teacher-reported,  $r = -0.16$ ; mother-reported  $r = -0.15$ ; self-reported  $r = -0.13$ . These results are in keeping with meta-analytic results (Chapter 4). The strongest associations were with teacher-reported social competence  $r = 0.20$  and standardized academic test results ( $r = 0.34$ ). Demographic factors were not identified as confounds of these associations. There was likewise no difference whether security was measured at 12 months, 18 months, or using a composite of the two.

<sup>350</sup> Sroufe, L. A. (1988) The role of infant-caregiver attachment in development. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 18–38). Hillsdale, NJ: Erlbaum.

<sup>351</sup> Main, M., Kaplan, N., & Cassidy, J. (1985) Security in infancy, childhood, and adulthood: A move to the level of representation. *Monographs of the Society for Research in Child Development*, 50(1/2), 66–104, p. 92.

<sup>352</sup> Bretherton, I., Bates, E., Benigni, L., Camaioni, L., & Volterra, V. (1979) Relationships between cognition, communication, and quality of attachment. In E. Bates, L. Benigni, I. Bretherton, L. Camaioni, & V. Volterra (eds), *The Emergence of Symbols: Cognition and Communication in Infancy* (pp. 223–269). New York: Academic Press.

<sup>353</sup> Waters, E. & Waters, T. E. A. (2024) Developmental change, bricolage, and how a lot of things develop: Mechanisms and changes in attachment across the lifespan. *Development & Psychopathology*, forthcoming.

<sup>354</sup> Recalled in Ainsworth, M. (1969) CPA Oral History of Psychology in Canada Interview, unpublished, <http://www.feministvoices.com/assets/Women-Past/Ainsworth/Mary-Ainsworth-CPA-Oral-History.pdf>.

<sup>355</sup> Ainsworth, M. (1961) Letter to John Bowlby, 19 March 1961, Mary Ainsworth papers, box M3168, folder 1: 'I spoke to you of my hypothesis that the chief irreversible effect of separation-deprivation on intellectual development is attributable to interference with language development. I have done a lot of background reading on early vocalization and the more I get into it the more convinced I am that you should add vocalisation to your list of species-specific responses that link child to mother.... Even more exciting is the notion I have that deprivation or interference with mother-child relationships during the critical period of 6–12 months (with a flexible extension to about 18 months) not only makes for retardation in language and hence intellectual development, but that some kind of 'early learning' in this critical period is an essential condition for the acquisition of that 'inner structure' that underlies symbolic processes of the kind necessary for conceptualization, abstraction and inner controls.'

At first sight, the associations between the Strange Situation in the NICHD study and later outcomes were not in keeping with either the Minnesota study or meta-analytic findings:  $r_s = 0.06$  to  $0.09$  across informants for social competence;  $r_s = -0.01$  to  $-0.08$  for externalizing behaviour;  $r_s = -0.01$  to  $-0.10$  for internalizing behaviour; and  $r = 0.07$  for academic scores. However, when a composite was made of security at 15 months in the Strange Situation, at 24 months on the Attachment Q-Sort, and at 24 months in the Strange Situation, results were back in line with those of Minnesota and meta-analytic findings for teacher- and mother-reports. The association with academic scores increased to  $r = 0.25$ . These findings agree with Bowler's concerns about the coding of the NICHD Strange Situations, since compositing multiple assessments improved the signal for the NICHD study but not the Minnesota study. As such, the NICHD investigators may have reported null findings or underestimated associations, relying as they did on the results of Strange Situations from one time-period.

As we saw in [Chapter 1](#), to Ainsworth's dismay, most developmental scientists from the 1980s onwards tended to treat the Strange Situation as the definitive measure of infant attachment, and to downplay or neglect direct observational measures of caregiving such as maternal sensitivity. Lamb and colleagues criticized this practice. In their view, the Strange Situation was at best an indirect measure of the child's expectations about their caregiver's availability, which could be better assessed by directly observing caregiver behaviour. Picking up this critique, Nivison and colleagues compared prediction from the Strange Situation to prediction from observed caregiver behaviour.

As Lamb and colleagues had anticipated, observed caregiver behaviour seemed a more important predictor than the Strange Situation. In the Minnesota study, early maternal sensitivity (assessed four times from 3 months to 42 months using Ainsworth's approach) was associated with:

- teacher-reported social competence ( $r = 0.29$ ),
- externalizing difficulties (teacher report,  $r = -0.22$ ; mother report,  $r = -0.29$ ; self-report,  $r = -0.29$ ),
- internalizing symptoms (teacher report,  $r = -0.21$ ; mother report,  $r = -0.13$ ; self-report,  $r = -0.12$ ),
- and academic achievement ( $r = 0.47$ ).

In the NICHD study, early maternal sensitivity\* (assessed four times from 6 months to 36 months with a focus on responsiveness when the child was not distressed) was associated with:

- social competence (teacher report,  $r = 0.29$ ; mother report,  $r = 0.33$ ; self-report,  $r = 0.17$ ),
- externalizing difficulties (teacher report,  $r = -0.34$ ; mother report,  $r = -0.24$ ; self-report,  $r = -0.10$ ),
- internalizing symptoms (teacher report,  $r = -0.21$ ; mother report,  $r = -0.18$ ; self-report,  $r = -0.01$ ),
- and academic achievement ( $r = 0.47$ ).

These findings suggest that the differences between the Ainsworth and NICHD approaches to measuring caregiving behaviour, whilst potentially relevant when understanding attachment-specific dynamics, do not have bearing in predicting general aspects of child development. To the surprise of Nivison and colleagues, they also suggest that,

across two samples, the Strange Situation and measures of sensitivity are at least as good and perhaps *better predictors of academic outcomes than socioemotional outcomes*.

Nivison and colleagues' findings have subsequently been affirmed by an umbrella review of meta-analyses on parental sensitivity by Nivison, Watt, Madigan, and Fearon. Here again, early sensitive care was least as good and perhaps a better predictor of academic outcomes as of socioemotional outcomes.<sup>356</sup> Suggestive experimental evidence has also been provided by Dozier, Bernard, Raby, and colleagues. They have documented that the Attachment and Biobehavioral Catchup intervention improves child language skills, executive functioning, cognitive skills, and quality of questions in child–caregiver conversations compared to controls.<sup>357</sup> And a meta-analysis by the Toronto group, examining randomized control trials of parenting interventions to improve child–caregiver relationships, affirmed effects on children's later cognitive and language abilities.<sup>358</sup>

This growing body of findings not only suggest that the implications of early attachment and sensitivity have been underestimated in terms of their impact on school and education. They also raise questions about established accounts of how early attachment and sensitivity influence later development, which—with exceptions such as Granqvist, Talia, and Fonagy—have been premised to date on *the assumption that socioemotional consequences would be primary, not learning*.<sup>359</sup> Despite apparent limitations in the coding of attachment in the NICHD study, the study by Nivison and colleagues illustrates well how the availability of this large dataset is important to contemporary attachment research, and able to support empirical discoveries and the advancement of theory.

## The Idea of Differential Susceptibility

### Attachment and Temperament

One of the most important lines of criticism of attachment research in the 1980s was the argument, made most vociferously by Jerome Kagan at Harvard, that differences in children's Strange Situation behaviour represent differences in child temperament rather than children's expectations about the availability of their caregiver. This criticism was

<sup>356</sup> Nivison, M. D., Watt, J., Madigan, S., & Fearon, P. (2024) An umbrella review of meta-analyses on parental sensitivity in child development. Paper presented at the International Attachment Conference, Rouen, France, July 2024.

<sup>357</sup> Lewis-Morrarty, E., Dozier, M., Bernard, K., Terracciano, S. M., & Moore, S. V. (2012) Cognitive flexibility and theory of mind outcomes among foster children: Preschool follow-up results of a randomized clinical trial. *Journal of Adolescent Health*, 51(2), S17–S22; Bernard, K., Lee, A. H., & Dozier, M. (2017) Effects of the ABC intervention on foster children's receptive vocabulary: Follow-up results from a randomized clinical trial. *Child Maltreatment*, 22(2), 174–179; Lind, T., Raby, K. L., Caron, E. B., Roben, C. K., & Dozier, M. (2017) Enhancing executive functioning among toddlers in foster care with an attachment-based intervention. *Development and Psychopathology*, 29(2), 575–586; Raby, K. L., Freedman, E., Yarger, H. A., Lind, T., & Dozier, M. (2019) Enhancing the language development of toddlers in foster care by promoting foster parents' sensitivity: Results from a randomized controlled trial. *Developmental Science*, 22(2), e12753; Gaudreau, C., Delgado, A., Confair-Jones, R., Flambaum, S., Hirsh-Pasek, K., Raby, K. L., Dozier, M., & Golinkoff, R. M. (2024) The unanticipated side effects of an attachment intervention: Parents ask higher quality questions. *Developmental Psychology*, 60(3), 456–466.

<sup>358</sup> Prime, H., Andrews, K., Markwell, A., Gonzalez, A., Janus, M., Tricco, A. C., ... & Atkinson, L. (2023) Positive parenting and early childhood cognition: A systematic review and meta-analysis of randomized controlled trials. *Clinical Child and Family Psychology Review*, 26(2), 362–400. See also Jeong, J., Franchett, E. E., Ramos de Oliveira, C. V., Rehmani, K., & Yousafzai, A. K. (2021) Parenting interventions to promote early child development in the first three years of life: A global systematic review and meta-analysis. *PLoS Medicine*, 18(5), e1003602.

<sup>359</sup> Granqvist, P. (2021) Attachment, culture, and gene-culture co-evolution: Expanding the evolutionary toolbox of attachment theory. *Attachment & Human Development*, 23(1), 90–113; Talia, A., Mazzarella, D., Duschinsky, R., Miller-Bottomo, M., Taubner, S., Holmes, J., & Fonagy, P. (2024) Reconceptualizing attachment-related differences: From Proximity-seeking to Epistemic trust. <https://osf.io/3grxf>.



experienced as an existential threat, since it characterized both attachment theory and research as misguided and unnecessary. Furthermore, Karen has reported that Kagan helped to block access to potential funders for attachment research.<sup>360</sup> During Lyons-Ruth's graduate studies at Harvard, interest in attachment was met with condemnation by Kagan, his allies and students; this contributed to Lyons-Ruth's transition to the Medical School where Kagan had less influence.

From the attachment community, Sroufe led the counter-offensive. He argued that findings, such as those of the Berkeley group, had documented barely any overlap between attachment classifications with different caregivers. As such, differences in attachment lie in the history of infant-caregiver interaction and have no basis in differences in temperament.<sup>361</sup> Throughout the 1980s and 1990s Sroufe was hostile to all and any temperament research and especially interpretations of attachment research informed by the study of temperament. In subsequent years, he has acknowledged a place for temperament research within developmental science but has continued to emphasize that 'temperament measures cannot tell you whether someone believes they are worthy of care and that others can be counted on to respond to them. And they certainly do not account for assessed variations in the Strange Situation assessment of Ainsworth. Measures of temperament do not predict such differences and they are conceptually distinctive.'<sup>362</sup>

Later research would document a small negative association between infant negative emotionality and security, and a small positive association with resistance (Chapter 4).<sup>363</sup> However, in the 1980s and 1990s, research in developmental science reported no or few direct associations between maternal report measures of temperament and the Strange Situation.

In 1984 Egeland and Farber reported no association between the Strange Situation and maternal observations of infant temperament in the Minnesota cohort, though nurses' report of infant difficult temperament did predict later insecurity.<sup>364</sup> In the same year, Belsky, Rovine, and Taylor found no association in their Penn State data between the Strange Situation at 12 months and earlier maternal report of infant activity, attention-span vigour or adaptability.<sup>365</sup> In fact, how much the infant fusses or cries at 12 months was much more affected by previous maternal sensitivity than one month measurements of fussing/crying.

Bates and colleagues reported the same in a paper published in the influential *Growing Points* special issue in 1985 (Chapter 1).<sup>366</sup> A doctoral study by Colin, under Ainsworth's

<sup>360</sup> Karen, R. (1998) *Becoming Attached: First Relationships and How They Shape Our Capacity to Love*. Oxford: Oxford University Press, p. 256.

<sup>361</sup> Sroufe, L. A. (1985) Attachment classification from the perspective of infant-caregiver relationships and infant temperament. *Child Development*, 56(1), 1–14.

<sup>362</sup> MindinMind Legacy Interview with Alan Sroufe, 28/3/2024, [www.mindinmind.org.uk](http://www.mindinmind.org.uk). Sroufe also reflected that 'no attachment theorist disowns or disregards the concept of temperament. It is useful for description. Children certainly vary in their preferred tempo and so forth. In fact, a crucial aspect of Ainsworth's parental sensitivity scales is that parent behavior be responsive and fitted to the infant's state, mood, and preferences. Thus, temperament is already part of the system. But temperament concepts are not adequate for capturing the complex organization of attitudes, expectations, beliefs and behavior that we call the self of person.'

<sup>363</sup> Dagan, O., Schuengel, C., Verhage, M. L., Madigan, S., Roisman, G. I., Van IJzendoorn, M., ... & Oosterman, M. (2024) Attachment relationship quality with mothers and fathers and child temperament: An individual participant data meta-analysis. *Developmental Psychology*, early view.

<sup>364</sup> Egeland, B., & Farber, E. A. (1984) Infant-mother attachment: Factors related to its development and changes over time. *Child Development*, 55(3), 753–771.

<sup>365</sup> Belsky, J., Rovine, M., & Taylor, D. G. (1984) The Pennsylvania Infant and Family Development Project, III: The origins of individual differences in infant-mother attachment: Maternal and infant contributions. *Child Development*, 55(3), 718–728.

<sup>366</sup> Bates, J. E., Maslin, C. A., & Frankel, K. A. (1985) Attachment security, mother-child interaction, and temperament as predictors of behavior-problem ratings at age three years. *Monographs of the Society for Research in Child Development*, 50(1/2), 167–193.



supervision, published the same year, likewise found no association.<sup>367</sup> Frodi found that infants from dyads classified as resistant at 12 months were reported by their mothers to be more difficult.<sup>368</sup> This finding could be downplayed, though, since both assessments were conducted at the same time.<sup>369</sup>

Attachment researchers, especially in the United States, tended to turn away from work integrating attention to temperament and early care in the 1980s and 1990s, even when conducted by researchers they otherwise rated highly. For instance, in the 1980s Stephen Suomi, a former student of Harry Harlow, documented that rhesus monkey infants identified as having a reactive temperament, when reared in isolated and stressful conditions, were more likely to show various behaviours suggestive of depression such as stereotypes, self-harm, and lack of response to challenge. However, reactive monkey infants who received care and affection in their upbringing showed accelerated development and rose to the top of the dominance hierarchies when they reached adulthood.<sup>370</sup> These findings suggested that infant reactivity may moderate the effects of early experiences of care on developmental outcomes.

The attachment research community had great respect for Suomi, inviting him to contribute a chapter to the first edition of the *Handbook of Attachment*, but assiduously avoided citing these findings on temperamental reactivity.<sup>371</sup> As usual, the Grossmanns were an exception. Indeed, Klaus Grossmann spent his sabbatical from October 1985 to April 1986 visiting Suomi's laboratory in Maryland. Van IJzendoorn and Bakermans-Kranenburg also cited Suomi warmly.<sup>372</sup> Other exceptions were Sagi-Schwartz and Lamb who considered that resistance may in part reflect temperamental reactivity or fearfulness.<sup>373</sup>

As we saw in [Chapter 1](#), from the mid-1980s Thompson and Lamb had argued that attachment researchers had risked complacency in the use of the concept of 'attachment', which they tended to reify. In a re-analysis of his dissertation data in collaboration with Connell, Thompson had shown that infants' emotional reactions were more consistent across episodes in the Strange Situation, and less contextually sensitive, than their pattern of social interactive behaviours with their mother and the stranger.<sup>374</sup> The infants' emotion reactions were also more stable through to a second Strange Situation seven months later than their social interactive behaviours. Connell and Thompson suggested that some of what attachment researchers were treating as the stability of individual differences in

<sup>367</sup> Colin, V. L. (1985) Hierarchies and patterns of infants' attachments to parents and day caregivers: an exploration. Unpublished doctoral dissertation, University of Virginia.

<sup>368</sup> Frodi, A. (1983) Attachment behavior and sociability with strangers in premature and full-term infants. *Infant Mental Health Journal*, 4(1), 13–22.

<sup>369</sup> For example, Bates, J. E. (1987) Temperament in infancy. In J. D. Osofsky (ed.), *Handbook of Infant Development* (pp. 1101–1149). New York: Wiley.

<sup>370</sup> Higley, J. D., & Suomi, J. D. (1989) Temperamental reactivity in nonhuman primates. In G. A. Kohnstamm, J. E. Bates, & M. K. Rothbart (eds), *Temperament in Childhood* (pp. 152–167). Chichester: Wiley; Suomi, S. J. (1991) Early stress and adult emotional reactivity in rhesus monkeys. In G. R. Bock & J. Whelan (eds), *The Childhood Environment and Adult Disease* (pp. 171–188). Chichester: Wiley.

<sup>371</sup> Suomi, S. J. (1999) Attachment in rhesus monkeys. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment* (1st ed., pp. 181–197). New York: Guilford Press.

<sup>372</sup> For example, Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2007) Research review: Genetic vulnerability or differential susceptibility in child development: The case of attachment. *Journal of Child Psychology and Psychiatry*, 48(12), 1160–1173.

<sup>373</sup> Sagi, A., Lamb, M. E., & Gardner, W. (1986) Relationship between Strange Situation behavior and stranger sociability among infants on Israeli kibbutzim. *Infant Behavior and Development*, 2, 271–282.

<sup>374</sup> Connell, J. P. & Thompson, R. (1986) Emotion and social interaction in the strange situation: Consistencies and asymmetric influences in the second year. *Child Development*, 57(3), 733–745.

'attachment' might alternatively be regarded as stability in forms of emotion reactivity or regulation.<sup>375</sup>

Building on these findings, Bridges, Connell, and Belsky examined similarities and differences in infant–mother and infant–father interaction in the Strange Situation. They found little association between ratings of interactive behaviour in the two Strange Situations. However, they found considerable consistency in whether the child got upset. This suggested that some children might be more prone than others to emotional reactivity.<sup>376</sup>

Belsky had respect for, and professional relationships with, both Sroufe and Kagan. For example, he asked for feedback from both Sroufe and Kagan on his 1988 chapter with Isabella, examining prediction from maternal social context, maternal personality, and child temperament to Strange Situation classifications in Study II.<sup>377</sup> Belsky and Rovine nonetheless criticized both parties: 'temperament and attachment theorists seem to escalate the debate focusing on their points of disagreements, often not seeming to notice—or at least respond to—apparently legitimate claims made by the competing point of view'.<sup>378</sup> Belsky's perspective was shaped by Bronfenbrenner, who had argued that developmental processes may operate very differently across different ecological contexts, and that different individuals may be affected in various ways by the same childhood context. This perspective, already present in Bronfenbrenner's writings from during Belsky's doctoral studies, was later formalized as the 'person-process-context model of development'.<sup>379</sup> In line with Bronfenbrenner's thinking, Belsky and Rovine argued that emotional reactivity might interact with individual differences in attachment:

We hypothesize that the quality of mothering that results in a temperamentally vulnerable infant developing a secure attachment relationship may well differ from that which promotes a secure attachment in a less vulnerable infant. What this suggests, of course, is that future attempts to identify the proximal, interactional antecedents of secure and insecure attachments may need to distinguish between 'easy' and 'difficult' infants.<sup>380</sup>

As we saw above, in the Pennsylvania Child and Family Development Project, examination of the newborn observational data and parent report of child temperament revealed no direct association between any measure of temperament and infant security in the Strange Situation.<sup>381</sup> However, there were associations between the newborn observational data and, for those infant–caregiver dyads classified as insecure, the form of the insecure behaviour. Specifically, children who displayed some avoidance of the caregiver in the

<sup>375</sup> Thompson, R. A., Connell, J. P., & Bridges, L. J. (1988) Temperament, emotion, and social interactive behavior in the Strange Situation: A component process analysis of attachment system functioning. *Child Development*, 59(4), 1102–1110.

<sup>376</sup> Bridges, L. J., Connell, J. P., & Belsky, J. (1988) Similarities and differences in infant–mother and infant–father interaction in the strange situation: A component process analysis. *Developmental Psychology*, 24(1), 92–100.

<sup>377</sup> Belsky, J. & Isabella, R. (1988) Maternal, infant and social-contextual determinants of infant–mother attachment. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 41–94). Hillsdale, NJ: Lawrence Erlbaum Associates.

<sup>378</sup> Belsky, J. & Rovine, M. (1987) Temperament and attachment security in the strange situation: An empirical rapprochement. *Child Development*, 787–795, p. 788.

<sup>379</sup> See, for example, Bronfenbrenner, U., & Crouter, A. C. (1983) The evolution of environmental models in developmental research. In P. H. Mussen (Series ed.) & W. Kessen (Vol. ed.), *Handbook of Child Psychology*, Vol. 1: *History, Theory, Methods* (4th ed., pp. 357–414). New York: Wiley.

<sup>380</sup> Belsky, J. & Rovine, M. (1987) Temperament and attachment security in the strange situation: An empirical rapprochement. *Child Development*, 787–795, p. 793.

<sup>381</sup> Belsky, J. & Isabella, R. (1988) Maternal, infant and social-contextual determinants of infant–mother attachment. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 41–94). Hillsdale, NJ: Lawrence Erlbaum Associates.

Strange Situation (subclassifications A1, A2, B1, and B2)—regardless of ultimate secure or insecure classification—displayed more autonomic stability as newborns than children who displayed some distress or frustration with the caregiver (subclassifications B3, B4, C1, and C2). As Belsky himself later acknowledged, these specific findings were not well replicated by subsequent research.<sup>382</sup> Still, they provided initial support for the basic idea that temperament may interact with caregiving in shaping child development.

Building on this thinking about emotional reactivity, in a 1991 paper with Steinberg and Draper, Belsky first proposed that individuals may be more or less open to being affected by their environment, and termed this ‘differential susceptibility’: ‘while nurture may determine the direction development takes, nature may determine the likelihood that, and the extent to which, an individual will be influenced by a particular set of environmental conditions.’<sup>383</sup> The idea of differential susceptibility had been used throughout the twentieth century in biology to refer to differences in the extent to which the development of a plant or animal would be responsive to changes in the environment, especially exposure to toxins.<sup>384</sup> The concept had entered psychology in a very limited way in the 1970s to describe differences in individuals’ capacity to be hypnotized, elaborating on the preexisting concept of hypnotic susceptibility.<sup>385</sup> Prior to Belsky, though, the concept had not seen widespread adoption in psychology.

In Belsky’s usage from the 1990s, the concept was deployed to consider that susceptibility might be an asset or a disadvantage depending on the circumstances. This contrasted with the ‘diathesis-stress’ model dominant within developmental science, which presumed that negative outcomes arise when an underlying vulnerability is activated by high stress conditions; under low stress, the vulnerability remains dormant and so the negative outcome does not arise.<sup>386</sup> For example, Sroufe and colleagues at Minnesota had argued that insecure infant attachment may function as a vulnerability factor: though to an extent predictive of outcomes in its own right, insecure attachment was regarded as more important in potentiating the effects of subsequent adversity.<sup>387</sup> The diathesis-stress model, Belsky felt, reflected the concerns of clinical practitioners and public services focused on reducing individual and social problems, with minimal concern for how individuals might be supported to thrive.

Belsky argued that from the perspective of evolutionary theory, it is not clear how or why such vulnerabilities would have emerged, survived, and spread, if they did not help individuals survive or reproduce in at least some circumstances. He proposed instead that, in the

<sup>382</sup> Fearon, P. R. & Belsky, J. (2016) Precursors of attachment security. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment* (3rd ed., pp. 291–313). New York, NY: Guilford Press.

<sup>383</sup> Belsky, J., Steinberg, L., & Draper, P. (1991) Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development*, 62(4), 647–670, p. 650.

<sup>384</sup> See, for example, Bellamy, A. W. (1919) Differential susceptibility as a basis for modification and control of early development in the frog. *The Biological Bulletin*, 37(5), 312–361; Chaudhry, F. M., Alam, S. M., Rashid, A., & Latif, A. (1977) Mechanism of differential susceptibility of two rice varieties to zinc deficiency. *Plant and Soil*, 46, 637–642. Ideas of susceptibility go back to Aristotle, who considered the extent to which humans are open to or exposed to their environments, especially in his thinking about the senses and human passions. The term ‘susceptibility’ itself entered into circulation in the reception of Aristotle, especially in Aquinas and Henry of Ghent. For these scholastic thinkers, the concept of susceptibility was important for understanding how the qualities of an individual interacted with their experiences to shape their perceptions and morality: ‘All forms of knowledge and morality come from within in terms of the *potentiam susceptibilis* [potential susceptibility] of the recipient and also come from outside.’ Teske, R. J. (ed.) (2008) *Henry of Ghent’s Summa of Ordinary Questions: Article One: On the Possibility of Knowing*. South Bend, IN: St Augustine Press Inc, p. 58.

<sup>385</sup> Gibson, H. B., & Corcoran, M. E. (1975) Personality and differential susceptibility to hypnosis: Further replication and sex differences. *British Journal of Psychology*, 66(4), 513–520.

<sup>386</sup> Beck, A. T. (1987) Cognitive models of depression. *Journal of Cognitive Psychotherapy*, 1, 5–37.

<sup>387</sup> Sroufe, L. A. (1990) An organizational perspective on the self. In D. Cicchetti & M. Beeghly (eds), *The Self in Transition: Infancy to Childhood* (pp. 281–307). Chicago: University of Chicago Press.

face of an ever-uncertain future, natural selection will have shaped humans to vary in terms of their openness to their environment. In harsher environments, less susceptible individuals may be better set to endure. In kinder environments, more susceptible individuals may be better set to capitalize on the available opportunities.<sup>388</sup>

The idea of differential susceptibility, Belsky argued, had considerable implications for temperament and attachment researchers, opening paths to collaboration and reciprocal influence. Research on temperament might help identify which children are more or less reactive to their environment. As such, infants high in expressed negative affect to challenging situations or separations might be reframed from infants with emotional reactivity or a 'difficult' temperament to those highly reactive to their environment—though with this reframe might come better ways to tap the construct of openness to the environment than asking parents about whether their child is difficult or fearful.

Research on attachment might help identify the kinds of supportive or unsupportive environments that would be especially important for the outcomes of children with a more reactive temperament, however this was measured. Admittedly, attachment research, like much work in developmental science, tended to focus on predictors of negative outcomes, such as mental health difficulties or their absence. Without data collected across the full continuum from dysfunction to thriving, there might be ceiling effects in researchers' analyses, masking the operation of differential susceptibility. However, the prominence of security and sensitivity in attachment theory meant that salutogenesis and positive child outcomes, such as social competence, had been considered from the start of empirical research using the Strange Situation.<sup>389</sup> This represented an important contribution to developmental science, where researchers have generally been preoccupied with environmental adversities to the neglect of positive environmental factors.<sup>390</sup>

In 1995, discussions of the potential role of temperament were advanced by an influential study by the paediatrician Boyce and his colleagues at the University of California, San Francisco. Examining predictors of respiratory illness in three- to five-year-old children, they found that children showing low cardiovascular or immune reactivity to stressors had approximately equal rates of respiratory illnesses in both low and high adversity settings. However, children with high cardiovascular or immune reactivity to stressors had the highest levels of respiratory illnesses in high adversity settings, and the lowest levels of respiratory illnesses in low adversity settings.<sup>391</sup> Boyce and colleagues reflected that:

One plausible explanation for such a pattern of findings is the possibility that reactive children are more sensitive or more susceptible to the characteristics of the social environment or, alternatively, that they may be somehow less capable of 'screening' or 'filtering' signals and information originating in the social milieu. Children with a heightened sensitivity to psychosocial processes emanating in the environment might then be expected to experience unusually poor outcomes in high-stress, unsupportive social conditions. The same

<sup>388</sup> Belsky, J. (1997) Variation in susceptibility to environmental influence: An evolutionary argument. *Psychological Inquiry*, 8(3), 182–186.

<sup>389</sup> For example, Lieberman, A. F. (1977) Preschoolers' competence with a peer: Relations with attachment and peer experience. *Child Development*, 48, 1277–1287; Waters, E., Wippman, J., & Sroufe, L. A. (1979) Attachment, positive affect, and competence in the peer group: Two studies in construct validation. *Child Development*, 50, 821–829.

<sup>390</sup> Leighton, C., Botto, A., Silva, J. R., Jiménez, J. P., & Luyten, p. (2017) Vulnerability or sensitivity to the environment? Methodological issues, trends, and recommendations in gene–environment interactions research in human behavior. *Frontiers in Psychiatry*, 8, 106.

<sup>391</sup> Boyce, W. T., Chesney, M., Alkon, A., Tschann, J. M., Adams, S., Chesterman, B., ... & Wara, D. (1995) Psychobiologic reactivity to stress and childhood respiratory illnesses: Results of two prospective studies. *Psychosomatic Medicine*, 57(5), 411–422.

children might flourish, on the other hand, under low-stress, nurturing, and predictable conditions, in which social cues denote encouragement and acceptance.... Exaggerated psychobiologic reactivity may reflect a relative deficit in self-regulatory capacity, which results in a heightened sensitivity to the character of the social world.<sup>392</sup>

Belsky was fascinated by these findings, regarding them as a great advance. Not only did they resonate with his interest in contextual moderators. They aligned with his concern, as far back as his doctoral studies, to attend to the specific correlates of positives and negatives, without assuming that they will merely be the opposite of one another. The Boyce and colleagues findings suggested that biology and attachment, rather than being natural opponents, might work together, with the stakes no less than insight into 'the nature of human development' and the role of environmental influences.<sup>393</sup>

Furthermore, thinking about temperament and attachment together might help provide empirical support for the claims of attachment theory. Belsky proposed that empirical research may have underestimated the effect of causal relationships between caregiving and child development if these processes were less relevant to children with lower susceptibility to rearing influence. As initial proof of concept for this proposal, Belsky conducted a re-analysis of the NICHD data.<sup>394</sup> As we saw above, in line with expectations, the NICHD researchers had documented that high levels of maternal sensitivity\* predicted fewer behaviour problems in children. Belsky used structural path analysis to examine whether this association differed for children identified at six months by their mothers as negative or highly negative in their mood.

He reported that for children without this indicator of negative temperament maternal sensitivity\* predicted fewer behaviour problems in children, but less strongly. By contrast, for children identified at six months by their mothers as negative or highly negative in their mood, maternal sensitivity\* was a clear predictor of fewer behaviour problems. Belsky speculated that differential susceptibility might account for why insecure attachment in early childhood is not associated with negative outcomes for some children.<sup>395</sup> Additionally, differential susceptibility to rearing inference might account for some of the 'transmission gap' between the Adult Attachment Interview and the Strange Situation (Chapter 4).

To test this latter claim, in a 1998 paper Belsky, Hsieh, and Crnic drew data from Study IV of the Pennsylvania Child and Family Development project. They had available maternal and paternal report of child negative emotionality at 10 months, and observation of mothers and fathers interacting with their child for an hour around dinner time at 15, 21, 27, and 33 months. Belsky and colleagues found that the extent of positive and negative parenting behaviours was a good predictor of the extent of child externalizing and internalizing problems only for children identified as high in negative emotionality at 10 months. The

<sup>392</sup> Ibid., 419–420.

<sup>393</sup> Belsky, J. (2015) Beyond vulnerability: attachment, adversity, gene-environment interaction, and implications for intervention. *Journal of Developmental & Behavioral Pediatrics*, 36(6), 464–466, p. 464.

<sup>394</sup> Belsky, J. (2002) Why the 'transmission gap' in attachment research: Differential susceptibility to rearing influence. *Journal of Infant, Child, and Adolescent Psychotherapy*, 2(4), 163–183.

<sup>395</sup> For later supportive evidence, see for example Humphreys, K. L., Zeanah, C. H., Nelson III, C. A., Fox, N. A., & Drury, S. S. (2015) Serotonin transporter genotype (5HTTLPR) moderates the longitudinal impact of atypical attachment on externalizing behavior. *Journal of Developmental and Behavioral Pediatrics*, 36(6), 409–416; Lee, J. K., Schoppe-Sullivan, S. J., & Beauchaine, T. P. (2021) Serotonergic sensitivity alleles moderate relations between attachment security at age three and socioemotional competence at age five. *Developmental Psychobiology*, 63(4), 698–712; Zimmermann, P., & Spangler, G. (2022) Longitudinal influences of DRD4 polymorphism and early maternal caregiving on personality development and problem behavior in middle childhood and adolescence. *Frontiers in Human Neuroscience*, 16, 839340.

association for children identified as low in negative emotionality did not reach conventional significance. These findings provided early empirical evidence suggesting that there may be differential susceptibility to rearing influence.<sup>396</sup>

### Differential Susceptibility Research at Leiden

In general, take up of the idea of differential susceptibility was slow in the 1990s and early 2000s, though there was interest in some quarters, such as Kochanska at Iowa and Feldman in Herzliya.<sup>397</sup> The stress diathesis model was dominant across developmental science, responsive to policy and clinical concerns with preventing negative outcomes for children. Belsky moved from Penn State to Birkbeck University, London in 1999, and in his new role there appears to have been reduced scope for research pursuing questions of differential susceptibility. Though as ever working on several fronts, he was nonetheless quite preoccupied with research on daycare, both with the NICHD study, and with the national evaluation of the Sure Start early years initiative in England.<sup>398</sup>

Yet one research group that was receptive to Belsky's proposals was Van IJzendoorn and Bakermans-Kranenburg's team at Leiden University (Chapter 4). Their empirical research, as Belsky later recalled, played a critical role in the late 2000s and early 2010s in providing evidence for the differential susceptibility theory, identifying potential biological mechanisms, and further elaborating the theory.<sup>399</sup>

Like Belsky, Van IJzendoorn and Bakermans-Kranenburg were critical of Kagan and Sroufe for the 'deadly war over dominance and territory' between attachment and temperament researchers, sustaining a polemic that obscured the way that parenting, attachment and temperament might interrelate.<sup>400</sup> In 1995 Van IJzendoorn published a meta-analysis of the association between the Adult Attachment Interview and the Strange Situation (Chapter 4), which advocated for the importance of Main's work and praised its boldness in discovering relationships between the constructs measured by two such very different forms of assessment. A colleague of Kagan's, Nathan Fox, wrote a critical, if respectful, reply to Van IJzendoorn.<sup>401</sup> Fox argued that an adult autobiographical discourse may simply reflect the interpretive lens of their adult personality; and behaviour in the Strange Situation may simply reflect the child's personality. As such, associations between the two

<sup>396</sup> Belsky, J. A. Y., Hsieh, K. H., & Crnic, K. (1998) Mothering, fathering, and infant negativity as antecedents of boys' externalizing problems and inhibition at age 3 years: Differential susceptibility to rearing experience? *Development and Psychopathology*, 10(2), 301–319.

<sup>397</sup> Kochanska, G. (1995) Children's temperament, mothers' discipline, and security of attachment: Multiple pathways to emerging internalization. *Child Development*, 66(3), 597–615; Feldman, R., Greenbaum, C. W., & Yirmiya, N. (1999) Mother–infant affect synchrony as an antecedent of the emergence of self-control. *Developmental Psychology*, 35(1), 223–231.

<sup>398</sup> Belsky, J., Melhuish, E., & Barnes, J. (2008) Research and policy in developing an early years initiative: The case of Sure Start. *International Journal of Child Care and Education Policy*, 2, 1–13.

<sup>399</sup> Belsky, J., & Pluess, M. (2013) Beyond risk, resilience, and dysregulation: Phenotypic plasticity and human development. *Development and Psychopathology*, 25(4.2), 1243–1261, p. 1255.

<sup>400</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2012) Integrating temperament and attachment. The differential susceptibility paradigm. In M. Zentner & R. L. Shiner (eds), *Handbook of Temperament* (pp. 403–424). New York: Guilford, p. 409.

<sup>401</sup> This written debate began as a heated exchange at the 1995 biennial meeting of the Society for Research in Child Development in Indiana: 'In one of the most memorable public clashes between attachment theory and temperamental models of child development in a full Ballroom hall of the SRCD biennial meeting of 1995, one of us (vIJ) exchanged quite contrarian views with Nathan Fox about the meaning of adult attachment representations and intergenerational transmission of attachment. The debate was heated.' Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 218.

measures were no great discovery or novelty and might be explained by the heritability of temperament.<sup>402</sup>

Van IJzendoorn consulted Belsky in formulating his reply. Van IJzendoorn mentioned empirical studies by his research group, which found no association between the Adult Attachment Interview and a self-report measure of temperament. He also mentioned research by other groups, including Belsky's, which had found equivocal evidence of associations between the Strange Situation and measures of infant temperament. With coherence in the Adult Attachment Interview associated with caregiver sensitivity, and caregiver sensitivity associated with security in the Strange Situation, Van IJzendoorn suggested that available evidence would suggest that caregiver behaviour mediated associations between the two measures rather than temperament. However, he urged that there was no need for polemics. He accepted that temperament might play a role in associations between the Adult Attachment Interview and the Strange Situation, given that there was considerable unexplained variance. Nonetheless, proposals to date regarding the role of temperament remained no more than 'intriguing speculations'.<sup>403</sup> Though not a convert, Fox responded well to Van IJzendoorn's reply, and would later even contribute to the study of attachment in the Bucharest Early Intervention Project.<sup>404</sup>

Van IJzendoorn and Bakermans-Kranenburg were interested when the journal *Molecular Psychiatry* published a report in 2000 by Lakatos and colleagues from their Hungarian study, showing an association between the dopamine D4 receptor (DRD4) gene polymorphism and attachment disorganization.<sup>405</sup> Of 17 infants with a disorganized attachment classification in their sample, 12 had the 7-repeat allele. Of 73 infants without a disorganized attachment classification, 21 had the 7-repeat allele. The finding was coherent, in that the dopaminergic system is related to attentional, motivational, and reward mechanisms. DRD4 had previously been associated with impulsive behaviour in adults, and attentional difficulties in children, in a series of papers in *Molecular Psychiatry*.<sup>406</sup> Auerbach and colleagues had found that one-year-old infants with the 7-repeat allele showed less sustained attention.<sup>407</sup> The 7-repeat allele might represent an inefficiency in the dopaminergic system, contributing to disinhibition and dysregulation. Though it was notable that Lakatos and colleagues reported no significant association between DRD4 polymorphism and parent-reported temperament at 9 and 12 months, and no significant association between parent-reported temperament and the Strange Situation. The relationship with disorganized attachment seemed to be specific to the DRD4 7-repeat allele.

<sup>402</sup> Fox, N. A. (1995) Of the way we were: Adult memories about attachment experiences and their role in determining infant-parent relationships: A commentary on Van IJzendoorn (1995) *Psychological Bulletin*, 117, 404–410.

<sup>403</sup> Van IJzendoorn, M. H. (1995) Of the way we are. *Psychological Bulletin*, 117(3), 411–415, p. 414.

<sup>404</sup> Nelson, C. A., Fox, N. A., & Zeanah, C. H. (2014) *Romania's Abandoned Children: Deprivation, Brain Development, and the Struggle for Recovery*. Cambridge, MA: Harvard University Press. Fox would also later provide first evidence of gene–gene interaction in differential susceptibility: Schmidt, L. A., Fox, N. A., & Hamer, D. H. (2007) Evidence for a gene–gene interaction in predicting children's behavior problems: Association of serotonin transporter short and dopamine receptor D4 long genotypes with internalizing and externalizing behaviors in typically developing 7-year-olds. *Development and Psychopathology*, 19(4), 1105–1116.

<sup>405</sup> Lakatos, K., Toth, I., Nemoda, Z., Ney, K., Sasvari-Szekely, M., & Gervai, J. (2000) Dopamine D4 receptor (DRD4) gene polymorphism is associated with attachment disorganization in infants. *Molecular Psychiatry*, 5(6), 633–637.

<sup>406</sup> For example, Kotler, M., Cohen, H., Segman, R., Gritsenko, I., Nemanov, L., Lerer, B., ... & Ebstein, R. P. (1997) Excess dopamine D4 receptor (D4DR) exon III seven repeat allele in opioid-dependent subjects. *Molecular Psychiatry*, 2(3), 251–254.

<sup>407</sup> Auerbach, J. G., Benjamin, J., Faroy, M., Geller, V., & Ebstein, R. (2001) DRD4 related to infant attention and information processing: A developmental link to ADHD? *Psychiatric Genetics*, 11(1), 31–35.

The Leiden group collected genetic data on as part of the SCRIPT study, a cohort of 237 Dutch two-year olds selected from a larger sample at age one on the basis of relatively high levels of externalizing behaviours. The study sought to evaluate the effects of a new intervention to improve sensitive caregiving: Video-Feedback Intervention to Promote Positive Parenting and Sensitive Discipline (VIPP) (Chapter 4).

Analysing the genetic data, Bakermans-Kranenburg and Van IJzendoorn failed to replicate the findings of Lakatos and colleagues. Subsequent studies have generally found the same.<sup>408</sup> More broadly, the rate of successful replication of the molecular genetics studies in the 1990s and early 2000, often conducted with small samples, has not been high. However, in a 2006 paper Bakermans-Kranenburg and Van IJzendoorn reported that the 7-repeat polymorphism on the D4 receptor (DRD4) gene proved an important moderator of the association between maternal insensitivity and child oppositional and aggressive behaviour.<sup>409</sup> In fact, only for children with the 7-repeat polymorphism did maternal insensitivity result in more oppositional and aggressive behavior. Children with the 7-repeat allele who also experienced insensitive care showed a very considerable increase (OR 5.81) in externalizing behaviours compared to children without this polymorphism who received sensitive care.

Next, Bakermans-Kranenburg and Van IJzendoorn examined whether the 7-repeat polymorphism on the D4 receptor moderated associations between unresolved states of mind on the Adult Attachment Interview and disorganized attachment in the Strange Situation.<sup>410</sup> They found that children with the 7-repeat allele who had mothers without unresolved states of mind showed significantly less attachment disorganization than children without the 7-repeat allele who had mothers without unresolved states of mind; and children with the 7-repeat whose mothers had unresolved loss showed significantly more attachment disorganization than children without the 7-repeat allele whose mothers had unresolved loss.

In a similar vein, children with the 7-repeat allele with sensitive mothers showed the lowest levels of externalizing behaviour, and children with the 7-repeat allele with insensitive mothers showed the highest levels of externalizing behaviour, whereas such difference in externalizing behaviour was not observed in children without the 7-repeat allele.<sup>411</sup> These findings suggested that the 7-repeat allele may be an indicator of the genetic basis for differential susceptibility.

The Leiden group also examined whether DRD4 polymorphism moderated the effectiveness of their intervention. In fact, they found that the intervention was only effective for children with the DRD4 7-repeat allele, but not in children without the DRD4 7-repeat allele. Bakermans-Kranenburg and colleagues were struck that: 'The reported moderate effect size ( $d = 0.47$ ) indicates a substantial change in the development of externalizing

<sup>408</sup> For example, Spangler, G., Johann, M., Ronai, Z., & Zimmermann, P. (2009) Genetic and environmental influence on attachment disorganization. *Journal of Child Psychology & Psychiatry*, 50(8), 952–961; Luijk, M., Roisman, G., Haltigan, J., Tiemeier, H., Booth-Laforce, C., Van IJzendoorn, M., et al. (2011) Dopaminergic, serotonergic, and oxytonergic candidate genes associated with infant attachment security and disorganization? In search of main and interaction effects. *Journal of Child Psychology and Psychiatry*, 52(12), 1295–1307.

<sup>409</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2006) Gene–environment interaction of the dopamine D4 receptor (DRD4) and observed maternal insensitivity predicting externalizing behavior in preschoolers. *Developmental Psychobiology*, 48(5), 406–409.

<sup>410</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2007) Research review: Genetic vulnerability or differential susceptibility in child development: The case of attachment. *Journal of Child Psychology and Psychiatry*, 48(12), 1160–1173.

<sup>411</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2006) DRD4 7-repeat polymorphism moderates the association between maternal unresolved loss or trauma and infant disorganization. *Attachment & Human Development*, 8(4), 291–307, Figure 1.



behavior for children with DRD4 7-repeat alleles as a result of the intervention.<sup>412</sup> Parallel findings were reported for the effect of the intervention on reducing daily cortisol production, as an endocrinal indicator of stress: the intervention only had effects for children with the DRD4 7-repeat allele. On both measures of externalizing behaviour and cortisol, without consideration of DRD4 as a moderator, the study would have considerably underestimated the value of the intervention for those children who did benefit from it. It would have appeared as a less effective intervention for all children, when in fact consideration of the DRD4 7-repeat allele as a moderator revealed that it was of considerable effectiveness, but only for some of the sample.

Rather than reflecting inefficiency in the dopaminergic system, contributing to disinhibition and dysregulation, Bakermans-Kranenburg and colleagues reflected that the DRD4 7-repeat allele may shape attentional, motivational, and reward mechanisms towards differential susceptibility to experiences, good and bad. This proposal was supported by later research with another Leiden sample of 124 adopted adults.<sup>413</sup> Bakermans-Kranenburg and colleagues found that participants' self-report of adverse childhood experiences growing up was more strongly associated with unresolved states of mind on the Adult Attachment Interview for participants with the DRD4 7-repeat allele than for participants without DRD4 7-repeat. However, among participants who did not report adverse childhood experiences, the DRD4 7-repeat allele was associated with less unresolved loss and trauma than for participants without the DRD4 7-repeat. The 7-repeat allele was not simply a vulnerability factor as expected by the diathesis stress model. It was associated with more favourable outcomes under better circumstances.<sup>414</sup>

Kegel, Bus, and Van IJzendoorn assessed whether the association between the DRD4 7-repeat allele and positive response to intervention was limited to parenting interventions. They examined the effectiveness of a computerized instructional program to promote preschoolers' phonemic awareness and early literacy. In fact, the intervention was again only effective for participants with the DRD4 7-repeat polymorphism.<sup>415</sup> These findings again ran completely counter to the idea of the DRD4 7-repeat as a 'risk allele', and fit better with the idea that they represented part of the genetic basis for differential susceptibility to the environment, in both its difficulties and opportunities, stemming from a dopamine-related genetic pathway.

In his initial proposals regarding differential susceptibility, Belsky had suggested negative emotionality as a potential index. A doctoral study by Klein Velderman, supervised by Bakermans-Kranenburg, Juffer, and Van IJzendoorn, followed up on this suggestion and investigated mothers' reports of infant negative emotionality in a different sample,

<sup>412</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Pijlman, F. T., Mesman, J., & Juffer, F. (2008) Experimental evidence for differential susceptibility: Dopamine D4 receptor polymorphism (DRD4 VNTR) moderates intervention effects on toddlers' externalizing behavior in a randomized controlled trial. *Developmental Psychology*, 44(1), 293–300, p. 298.

<sup>413</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Caspers, K., & Philibert, R. (2011) DRD4 genotype moderates the impact of parental problems on unresolved loss or trauma. *Attachment & Human Development*, 13(3), 253–269.

<sup>414</sup> These findings aligned with other work by Philibert, which found that the Strong African American Families intervention was only effective for African American youths with the DRD4 7-repeat allele, again findings difficult to explain with the idea of the polymorphism as a vulnerability factor: Beach, S., Brody, G., Lei, M., & Philibert, R. (2010) Differential susceptibility to parenting among African American youths: testing the DRD4 hypothesis. *Journal of Family Psychology*, 24, 513–521.

<sup>415</sup> Kegel, C. A., Bus, A. G., & Van IJzendoorn, M. H. (2011) Differential susceptibility in early literacy instruction through computer games: The role of the dopamine D4 receptor gene (DRD4). *Mind, Brain, and Education*, 5(2), 71–78.

comprised of 81 first-time mothers.<sup>416</sup> Emotional reactivity was measured using the Infant Behavior Questionnaire, subtracting scores on items for how readily the child smiles and laughs from scores for items asking about distress in response to frustration.<sup>417</sup>

The researchers found that mothers of highly reactive infants were more likely to show sensitive caregiving following the intervention, and their relationships were more likely to be classified as secure in the Strange Situation. Mothers with infants scored low on reactivity showed a smaller difference to the control group in sensitivity ( $d = 0.29$ , but below conventional significance) and there was also no significant difference to the control group in terms of Strange Situation classifications. These results constituted the first experimental support for Belsky's hypothesis of differential susceptibility to rearing influences in the domain of sensitivity and attachment. Not long after, the Leiden group reported aligned findings from a second sample, documenting that increases in maternal sensitivity were related to decreases in externalizing problems, but only for children identified by their mothers as having a 'difficult' temperament (e.g., easily upset, unadaptable).<sup>418</sup>

In the larger SCRIPT study, van Zeijl and colleagues also examined whether maternal report of difficult temperament, measured with an adaptation of the Infant Characteristics Questionnaire,<sup>419</sup> moderated the effectiveness of the intervention.<sup>420</sup> Unlike DRD4 as an indicator of differential susceptibility, there was no moderation effect for maternal report of child difficult temperament. These two measures might be tapping different things. That said, the discrepancy could be methodological. Maternal report of child temperament was sought 18 months before the post-test assessment for the intervention: the attributes that had led to the initial characterization of difficult temperament may have changed in this time.

Furthermore, to avoid contamination between the measure of temperament and measurement of externalizing behaviour, the items from the measure of temperament that related to frustration and aggression had been removed, which again may have impacted the results. In the event, maternal report of difficult temperament did in fact align with DRD4 7-repeat as an indicator of differential susceptibility in prediction of externalizing behaviours. Van Zeijl and colleagues examined whether mothers' report of child difficult temperament, like DRD4 7-repeat, moderated the association between parental insensitivity and child externalizing behaviours.<sup>421</sup>

The researchers found that children characterized as having a difficult temperament were more susceptible to insensitive discipline, showing more externalizing problems especially in response to parental harshness or prohibition than children with relatively easy

<sup>416</sup> Klein Velderman, M., Bakermans-Kranenburg, M. J., Juffer, F., & Van IJzendoorn, M. H. (2006) Effects of attachment-based interventions on maternal sensitivity and infant attachment: Differential susceptibility of highly reactive infants. *Journal of Family Psychology*, 20(2), 266.

<sup>417</sup> Rothbart, M. K. (1981). Measurement of temperament in infancy. *Child Development*, 52, 569–578.

<sup>418</sup> Mesman, J., Stoel, R., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Juffer, F., Koot, H. M., & Alink, L. R. (2009) Predicting growth curves of early childhood externalizing problems: Differential susceptibility of children with difficult temperament. *Journal of Abnormal Child Psychology*, 37(5), 625–636.

<sup>419</sup> Bates, J. E., Freeland, C. A. B., & Lounsbury, M. L. (1979) Measurement of infant difficultness. *Child Development*, 50, 794–803.

<sup>420</sup> Van Zeijl, J., Mesman, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., ... & Alink, L. R. (2006) Attachment-based intervention for enhancing sensitive discipline in mothers of 1-to 3-year-old children at risk for externalizing behavior problems: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74(6), 994–1005.

<sup>421</sup> Van Zeijl, J., Mesman, J., Stolk, M. N., Alink, L. R., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., ... & Koot, H. M. (2007) Differential susceptibility to discipline: The moderating effect of child temperament on the association between maternal discipline and early childhood externalizing problems. *Journal of Family Psychology*, 21(4), 626–636.

temperaments. However, the same children were also more susceptible to positive discipline, showing fewer externalizing problems and less physical aggression in response to sensitive parental disciplinary practices, especially distraction, than children with relatively easy temperaments. Contrary to the diathesis stress model, mothers' report of their child's difficult temperament was not simply a vulnerability factor leading to negative outcomes in the context of insensitive parenting. It was associated with more positive outcomes in the context of sensitive parenting.

Influenced by Bakermans-Kranenburg and Van IJzendoorn's identification of the importance of the DRD4 7-repeat allele, Belsky collaborated with Israeli researchers to study a classic concern of attachment theory, the effects of children's hospitalization, drawing data from the Longitudinal Israeli Study of Twins. Bowlby's first empirical paper was a study of 44 juvenile thieves from his case files, observing links with earlier separations and adversities, including hospitalizations.<sup>422</sup> His work on attachment had been elaborated in part to account for the observations from his group's study of hospitalized children; his 1969 book *Attachment* started life as the theory chapter for a book he was writing on the study of hospitalized children.<sup>423</sup>

Based on their findings, Bowlby and colleagues campaigned to allow parents to stay in hospital, especially with young children. This campaign was especially influential in Israel, where hospitals adapted their practices to ensure that children were accompanied and supported throughout their stay by a parent or familiar caregiver.<sup>424</sup> In the Israeli sample, there was no association between number or length of hospital stays and later child externalizing or internalizing behaviours. However, for children with the DRD4 7-repeat allele, the length of hospitalization was related to diminished levels of internalizing and externalizing problems. Benish-Weisman, Belsky, and colleagues reflected that 'during hospitalization, young children often enjoy close parental care all day long and at night as well. Conceivably, then, longer periods of hospitalization may provide children with extra parental support and care, thereby promoting their emotional security and well-being.'<sup>425</sup> This extra support during a time of need may have been particularly reassuring and helpful for children with the DRD4 7-repeat allele.

Though inspired by Bakermans-Kranenburg, Van IJzendoorn, and Leiden colleagues, Belsky also pointed to limitations to their work. In the SCRIPT study, they had measures of DRD4 7-repeat for mothers and children, as well as maternal report of difficult temperament for children. Yet this data was presented piecemeal, in part due to the demands of forming papers for doctoral projects. Despite stating that 'it would be critical to know whether dopamine system-related genes are involved in specific temperamental features',<sup>426</sup> the Leiden group did not even report the bivariate correlation between DRD4 7-repeat in children and maternal report of difficult temperament.

<sup>422</sup> Bowlby, J. (1944) Forty-four juvenile thieves: Their characters and home-life (II) *International Journal of Psycho-Analysis*, 25, 107–128; Cf. Follan, M. & Minnis, H. (2010) Forty-four juvenile thieves revisited: From Bowlby to reactive attachment disorder. *Child: Care, Health and Development*, 36(5), 639–645.

<sup>423</sup> Various drafts of the book on hospitalised children are available in the Bowlby Archive in the Wellcome Collections. PP/BOW/D.3/38.

<sup>424</sup> Ayalon, E. & Kirsh, N. (2023) Doctors and parents in children's wards: Tel-Hashomer hospital's unrestricted visitations in 1950s' Israel. *Social History of Medicine*, 36(2), 263–283.

<sup>425</sup> Benish-Weisman, M., Kerem, E., Knafo-Noam, A., & Belsky, J. (2015) The moderating role of genetics: The effect of length of hospitalization on children's internalizing and externalizing behaviors. *Frontiers in Psychiatry*, 6, 109.

<sup>426</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2012) Integrating temperament and attachment. The differential susceptibility paradigm. In M. Zentner & R. L. Shiner, *Handbook of Temperament* (pp. 403–424). New York: Guilford, p. 419.

As we saw above, Lakatos and colleagues had found no association between DRD4 and maternal report of child difficult temperament. Bakermans-Kranenburg and Van IJzendoorn, though they did not test this in their data, regarded the finding as implausible. They suspected that ‘carriers of the DRD4 7-repeat alleles might be more temperamentally reactive.’<sup>427</sup> In fact, evidence remains equivocal. Some subsequent studies have indeed found an association between DRD4 polymorphism and maternal report of child difficult temperament,<sup>428</sup> whereas others have agreed with the results of Lakatos and colleagues in not finding an association.<sup>429</sup> Auerbach and colleagues in Israel found a negative association between DRD4 7-repeat and maternal report of child negative emotionality.<sup>430</sup>

More important, however, to Bakermans-Kranenburg and Van IJzendoorn was that the question of ‘whether these two markers of differential susceptibility have similar roles in similar domains of functioning and in similar contexts remains to be seen.’<sup>431</sup> DRD4 polymorphism and maternal report of difficult temperament might have an additive or cumulative effect, or one might be redundant. For his part, Van IJzendoorn personally suspected that genetic differential susceptibility underpinned the relevant parts of what mothers were identifying as difficult temperament.<sup>432</sup>

A further question lay in what type of effect maternal and child DRD4 7-repeat polymorphisms might have: additive, cumulative, or was one redundant?<sup>433</sup> If these data had been in the hands of Belsky or in the hand of Lyons-Ruth (Chapter 2), they would have examined how much variance in outcomes could be explained by each marker. Bakermans-Kranenburg and Van IJzendoorn were certainly curious about this, but ultimately felt their sample was too small and, as such, underpowered to run this analysis.<sup>434</sup> Belsky regarded this as a missed opportunity, even if results would have been preliminary.

This empirical caution seems to have come apiece with limitations on the willingness of the Leiden group to consider causal mechanisms. When Klein Velderman and colleagues reported that mothers of highly reactive infants were more likely to show sensitive caregiving following the intervention, a question arises about mechanism. It is explicable that child susceptibility to their environment might moderate the effect of an intervention on child behaviour; it is less obvious how child temperament would moderate the effect of an intervention on maternal behaviour. Barred from empirical examination of the respective

<sup>427</sup> Ibid.

<sup>428</sup> For example, Ivorra, J. L., Sanjuan, J., Jover, M., Carot, J. M., de Frutos, R., & Molto, M. D. (2010) Gene–environment interaction of child temperament. *Journal of Developmental & Behavioral Pediatrics*, 31(7), 545–554; Holmboe, K., Nemoda, Z., Fearon, R. M. P., Sasvari-Szekely, M., & Johnson, M. H. (2011) Dopamine D4 receptor and serotonin transporter gene effects on the longitudinal development of infant temperament. *Genes, Brain and Behavior*, 10(5), 513–522.

<sup>429</sup> For example, Bersted, K. A., & DiLalla, L. F. (2016) The influence of DRD4 genotype and perinatal complications on preschoolers’ negative emotionality. *Journal of Applied Developmental Psychology*, 42, 71–79; Jamnik, M. R., & DiLalla, L. F. (2023) The impact of dopamine receptor D4, temperamental negativity, and household chaos on young twins’ externalizing behaviors. *Developmental Psychobiology*, 65(4), e22387.

<sup>430</sup> Auerbach, J., Geller, V., Lezer, S., Shinwell, E., Belmaker, R. H., Levine, J., & Ebstein, R. P. (1999) Dopamine D4 receptor (D4DR) and serotonin transporter promoter (5-HTTLPR) polymorphisms in the determination of temperament in 2-month-old infants. *Molecular Psychiatry*, 4(4), 369–373.

<sup>431</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2012) Integrating temperament and attachment. The differential susceptibility paradigm. In M. Zentner & R. L. Shiner, *Handbook of Temperament* (pp. 403–424). New York: Guilford, p. 419.

<sup>432</sup> Van IJzendoorn, M. H. (2013) Opvoeding bestuderen van molecuul tot maatschappelijke context. *NVO Bulletin*, 5, 4–8: ‘Some children look like orchids, vulnerable in them a bad environment but fantastic in a fertile one context. Other kids are more like dandelions that always and everywhere grow and bloom. We were the first in Leiden to put our finger on it that dopamine-related genes explained the difference’ (5).

<sup>433</sup> Pluess, M. & Belsky, J. (2013) Vantage sensitivity: Individual differences in response to positive experiences. *Psychological Bulletin*, 139(4), 901–916, p. 907.

<sup>434</sup> M. Van IJzendoorn, personal communication, February 10, 2024.

contributions of maternal and child differential susceptibility, the Leiden group also held back from theoretical reflection.

### Elaborating Differential Susceptibility

Encouraged by these findings and other emergent evidence,<sup>435</sup> Belsky, Bakermans-Kranenburg, and Van IJzendoorn collaborated on a 2007 paper in *Current Directions in Psychological Science* advocating for differential susceptibility theory as representing a 'paradigm shift' in developmental science.<sup>436</sup> This was followed by a 2011 paper in *Development & Psychopathology*, together with Thomas Boyce and the evolutionary psychologist Bruce Ellis.<sup>437</sup> Ellis had completed his doctorate in evolutionary psychology at the University of Michigan, followed by postdoctoral training in developmental psychopathology at Vanderbilt University, during which time he had become a great advocate for Belsky's work.<sup>438</sup>

These papers argued that differential susceptibility stems from differences in receptivity to the environment. They proposed that 'more susceptible individuals are more likely to experience sustained developmental change, not just transient fluctuations in functioning, in response to environmental exposures.'<sup>439</sup> Making reference to Boyce's study of respiratory illness, and Bakermans-Kranenburg and Van IJzendoorn's report of the importance of DRD4 polymorphism, the authors argued that 'susceptibility to the environment is instantiated in the biology of the nervous system; it is neurobiological susceptibility.'<sup>440</sup> The Leiden results suggested a particular role for factors that shape modulation of specific neurotransmitter systems such as the dopamine systems, and evidence was starting to accumulate for a role for the serotonin system, with the 5-HTTLPR polymorphism serving as an important marker of differential susceptibility.<sup>441</sup>

One of the studies that sparked interest in gene x environment interactions was a 2002 paper by Caspi and colleagues, which reported that the low-activity MAOA allele moderated associations between child maltreatment and violent behaviour later in life.<sup>442</sup> Caspi and colleagues interpreted their data as aligned with stress diathesis, with MAOA treated as a 'risk allele'. In fact, inspection of their results revealed that the low-activity MAOA allele was associated with the lowest scores for violent behaviour for participants not exposed to maltreatment. Belsky and collaborators argued that other polymorphisms

<sup>435</sup> For example, Quas, J. A., Bauer, A., & Boyce, W. T. (2004) Physiological reactivity, social support, and memory in early childhood. *Child Development*, 75(3), 797–814; Kochanska, G., Aksan, N., & Joy, M. E. (2007) Children's fearfulness as a moderator of parenting in early socialization: Two longitudinal studies. *Developmental Psychology*, 43(1), 222–237.

<sup>436</sup> Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2007) For better and for worse: Differential susceptibility to environmental influences. *Current Directions in Psychological Science*, 16(6), 300–304.

<sup>437</sup> Ellis, B. J., Boyce, W. T., Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2011) Differential susceptibility to the environment: An evolutionary-neurodevelopmental theory. *Development and Psychopathology*, 23(1), 7–28, p. 7.

<sup>438</sup> Ellis, B. J., & Bjorklund, D. F. (eds) (2005) *Origins of the Social Mind: Evolutionary Psychology and Child Development*. New York: Guilford Press, p. xi.

<sup>439</sup> Ellis, B. J., Boyce, W. T., Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2011) Differential susceptibility to the environment: An evolutionary-neurodevelopmental theory. *Development and Psychopathology*, 23(1), 7–28, p. 7.

<sup>440</sup> Ibid.

<sup>441</sup> Van IJzendoorn, M. H., Belsky, J., & Bakermans-Kranenburg, M. J. (2012) Serotonin transporter genotype 5HTTLPR as a marker of differential susceptibility? A meta-analysis of child and adolescent gene-by-environment studies. *Translational Psychiatry*, 2(8), e147.

<sup>442</sup> Caspi, A., McClay, J., Moffitt, T. E., Mill, J., Martin, J., Craig, I. W., ... & Poulton, R. (2002) Role of genotype in the cycle of violence in maltreated children. *Science*, 297(5582), 851–854.

treated as 'risk alleles' in a stress diathesis approach, such as Catechol-Omethyltransferase Val158Met (COMT), could be investigated for their contribution both to vulnerability and to benefits, depending on children's circumstances. Rather than risk alleles, these might be 'susceptibility alleles': genotypic indicators of differential susceptibility.<sup>443</sup>

In addition to genotype, susceptibility could be anticipated to extend to other neurobiological processes, including differences in attention (e.g., bias towards positive and negative emotional cues), cognitive processes (e.g., feedback processing and reward sensitivity), physiological processes (e.g., stress reactivity). In their 2011 co-authored paper, Ellis, Boyce, Belsky, Bakermans-Kranenburg, and Van IJzendoorn acknowledged that some forms of differential susceptibility may be present from birth; others may be learnt, or unlearnt, in the course of development. However, their paper gives the overriding impression that the 'true' form of differential susceptibility is present from birth. Learnt or unlearnt susceptibility is acknowledged in theory but kept largely offstage and treated as uninteresting.

Ellis and Boyce had previously used the metaphor of dandelions and orchids to characterize stress reactivity: some children are like dandelions, hardy to diverse conditions; other children are like orchids, liable to struggle under difficult circumstances but develop beautifully given nurturance.<sup>444</sup> Van IJzendoorn and Bakermans-Kranenburg accepted the value of the metaphor but were uncomfortable with it. They viewed the analogy as disparaging towards the achievements of dandelion children, and with a risk of alignment with widely circulating discourses which presented resilient children as invulnerable, even to the most severe adversity. (They also felt the comparison unflattering to dandelions, which they have characterized as a remarkable flower: asexual procreation makes dandelions—each a clone of the next—almost completely dependent on epigenetics for adaptation to harsh or mild environments.) In their 2011 co-authored paper with Ellis, Boyce, and Belsky, they pressed the argument that 'it may make more sense to conceptualize differential susceptibility as a continuous dimension rather than in categorical terms'.<sup>445</sup> Ideas of dandelions and orchids might help convey the idea of differential susceptibility, but they could be misleading if they gave the impression of different types of children.

In their work, Ellis and Boyce tended to regard susceptibility as general across all the aspects of a person's life. By contrast, Belsky anticipated that some forms of susceptibility might be general and others specific to particular domains, such as emotional development or education. For their part, Van IJzendoorn and Bakermans-Kranenburg found the results of the computerized instructional program to promote preschoolers' phonemic awareness thought-provoking, as they suggested that the DRD4 7-repeat allele might increase susceptibility across various developmental domains. Even so, they were sympathetic to the principle of Belsky's position and the idea that some forms of susceptibility might be general and others specific to particular domains. This seemed plausible if susceptibility could stem from various grounds as diverse as reward sensitivity and stress reactivity. In the co-authored paper by the five researchers, the authors acknowledged this as an open question for future research: 'there could be individual differences in the degree to which susceptibility is broad versus narrow, such that some are highly susceptible to many environmental

<sup>443</sup> For example, Hygen, B. W., Belsky, J., Stenseng, F., Lydersen, S., Guzey, I. C., & Wichstrøm, L. (2015) Child exposure to serious life events, COMT, and aggression: Testing differential susceptibility theory. *Developmental Psychology*, 51(8), 1098–1104.

<sup>444</sup> Boyce, W. T., & Ellis, B. J. (2005) Biological sensitivity to context: I. An evolutionary–developmental theory of the origins and functions of stress reactivity. *Development and Psychopathology*, 17(2), 271–301.

<sup>445</sup> Ellis, B. J., Boyce, W. T., Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2011) Differential susceptibility to the environment: An evolutionary–neurodevelopmental theory. *Development and Psychopathology*, 23(1), 7–28, p. 24.

effects on multiple outcomes, others only to some effects on some outcomes, and still others not susceptible to many or even any.<sup>446</sup>

In 2011, Bakermans-Kranenburg and Van IJzendoorn re-examined 15 studies that had looked at DRD4 7-repeat and other dopamine-receptor polymorphisms in predicting child negative behavioural outcomes, on the expectation that these represented 'risk alleles' making children more vulnerable when faced with more adverse forms of caregiving behaviour. In line with this expectation Bakermans-Kranenburg and Van IJzendoorn found that the combined effect size for behavioural disturbance in the presence of the 'risk alleles' was  $r = 0.37$ . For children without the 'risk alleles' the association was  $r = 0.10$ .<sup>447</sup> However, Bakermans-Kranenburg and Van IJzendoorn reported that the association between parental support and *better* child adaptation was also  $r = 0.31$  for carriers of the putatively risk alleles, whereas there was no significant effect ( $r = 0.03$ ) for children without these alleles. Polymorphisms such as DRD4 7-repeat that had previously been thought to represent vulnerability factors in fact signified essentially equivalent susceptibility to negative and supportive caregiving.

These conclusions were later supported by another meta-analysis by Bakermans-Kranenburg and Van IJzendoorn of 11 randomized trials examining dopamine-receptor polymorphisms as moderators of the effectiveness of parenting interventions. Bakermans-Kranenburg and Van IJzendoorn emphasized that randomized trials, studies that had manipulated the environment, were especially important to the establishment of claims about the determinate, moderating role of differential susceptibility. The purported 'risk alleles', considered now by Bakermans-Kranenburg and Van IJzendoorn as indicators of a susceptible genotype, were associated with positive effects for children of the parenting intervention ( $r = 0.35$ ). The interventions were discerned to have no significant effect for children without these markers of susceptible genotype.<sup>448</sup>

Among these studies, one that bucked the general trend was an evaluation by Cicchetti and colleagues of two different forms of intervention compared to social work as usual with 137 families known to child protection services for infant abuse and/or neglect.<sup>449</sup> The researchers found a considerable increase in attachment security and a decrease in disorganization for families who received child-parent psychotherapy. This effect was not moderated by DRD4 polymorphism, as with the other parenting interventions considered in the meta-analysis. Bakermans-Kranenburg and Van IJzendoorn reflected that 'this unique experiment may not be considered so much a disconfirmation of the differential susceptibility hypothesis but an indicator of its boundaries. With drastic changes in previously extremely depriving environments, the influence of genetics might be almost negligible.'<sup>450</sup>

Whereas Belsky's account of differential susceptibility had focused on childhood, Van IJzendoorn, Bakermans-Kranenburg, and Mesman extrapolated the concept to consider

<sup>446</sup> Ibid., 24.

<sup>447</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2011) Differential susceptibility to rearing environment depending on dopamine-related genes: New evidence and a meta-analysis. *Development and Psychopathology*, 23(1), 39–52.

<sup>448</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2015) The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology*, 66, 381–409.

<sup>449</sup> Cicchetti, D., Rogosch, F. A., & Toth, S. L. (2006) Fostering secure attachment in infants in maltreating families through preventive interventions. *Development and Psychopathology*, 18(3), 623–649.

<sup>450</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2012) Differential susceptibility experiments: Going beyond correlational evidence. *Developmental Psychology*, 48(3), 769–774, pp. 772–773.

parents' susceptibility to their environment.<sup>451</sup> Using data from their first study of the effects of the VIPP intervention, they examined associations between daily hassles and caregiver insensitivity. There was generally a small association ( $r = 0.16$ ). This was not materially altered when mothers had either the DRD4 7-repeat allele, or another polymorphism associated with the functioning of the dopaminergic system, COMT val/met. However, when mothers had both variations, there was a much stronger association with greater sensitivity when mothers experienced few hassles, and greater insensitivity in the context of more hassles ( $r = 0.49$ ).

These findings stimulated many other studies in developmental science generally, and attachment research specifically, exploring when and how parents, too, can show differential susceptibility to their environment.<sup>452</sup> As one illustration, in another study with an Israeli sample of 104 twin pairs, Fortuna, Van IJzendoorn, and colleagues examined associations between challenges at birth (e.g., low gestational age, low birth weight, and prolonged stay at the neonatal intensive care unit) and mothers' sensitivity observed in the laboratory when their children were three years old.

Challenges at birth were associated with higher scores for insensitivity for mothers with the DRD4 7-repeat allele than those without. However, when the twins had few challenges at birth, mothers with the DRD4 7-repeat allele showed more sensitivity than those without. The researchers speculated that 'the presence of the 7R allele makes individuals more distractible by less relevant stimuli (e.g., stress-related and not related to the child's signals) while they are simultaneously less able to regulate stress and therefore more susceptible to its influences. On the positive side, carriers of the 7R allele might be more attentive and open to the child's signals if other, interfering stimuli originating from a stressful environment are lacking.'<sup>453</sup>

Experimental evidence was also provided by Knop, Van IJzendoorn, Bakermans-Kranenburg, Joëls, and van der Veen.<sup>454</sup> They studied mice with the same genetic make-up, except that some had the 7-repeat allele and others did not. For their first 14 days, these mice were exposed to one of three conditions. Some mice were exposed to limited bedding for dam and litter, anticipated to be a source of stress for the dam. Some mice were exposed to standard nesting. A third group were cared for in a setting with two or more dams and their litters, as sources of mutual support for the dams and interaction for the pups.

The researchers found that, as adults, female mice reared with limited bedding were slower and less active in retrieving their offspring. Those reared in the communal environment displayed more reliable, less unpredictable behaviour towards their offspring. There was also evidence of differential susceptibility, mice reared with limited bedding and the 7-repeat allele showed the least licking and grooming of their young, whereas those reared

<sup>451</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Mesman, J. (2008) Dopamine system genes associated with parenting in the context of daily hassles. *Genes, Brain and Behavior*, 7(4), 403–410.

<sup>452</sup> See, for example, Lee, D., Brooks-Gunn, J., McLanahan, S. S., Notterman, D., & Garfinkel, I. (2013) The Great Recession, genetic sensitivity, and maternal harsh parenting. *Proceedings of the National Academy of Science, USA*, 110, 13780–13784; Bouvette-Turcot, A. A., Fleming, A. S., Wazana, A., Sokolowski, M. B., Gaudreau, H., Gonzalez, A., ... & MAVAN Research Team. (2015) Maternal childhood adversity and child temperament: An association moderated by child 5-HTTLPR genotype. *Genes, Brain and Behavior*, 14(3), 229–237; Ludmer, J. A., Gonzalez, A., Kennedy, J., Masellis, M., Meinz, P., & Atkinson, L. (2018) Association between maternal childhood maltreatment and mother–infant attachment disorganization: Moderation by maternal oxytocin receptor gene and cortisol secretion. *Hormones and Behavior*, 102, 23–33.

<sup>453</sup> Fortuna, K., Van IJzendoorn, M. H., Mankuta, D., Kaitz, M., Avinun, R., Ebstein, R. P., & Knafo, A. (2011) Differential genetic susceptibility to child risk at birth in predicting observed maternal behavior. *PLoS One*, 6(5), e19765.

<sup>454</sup> Knop, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Joëls, M., & van der Veen, R. (2020) Maternal care of heterozygous Dopamine Receptor D4 knockout mice: differential susceptibility to early-life rearing conditions. *Genes, Brain and Behavior*, 19(7), e12655.



in the communal nest with the 7-repeat allele showed the most licking and grooming of their young. These findings offered support for observations in humans that the 7-repeat allele may have a role in shaping parenting behaviours.

A further elaboration of differential susceptibility theory was the proposal of 'vantage sensitivity'. In a paper at the 2011 Society for Research in Child Development biennial conference in Montreal, Manuck and colleagues from the University of Pittsburgh proposed the idea of 'vantage susceptibility'.<sup>455</sup> The term vantage was short for advantage, but was also intended to imply benefit, gain, or opportunity.<sup>456</sup> Just as some individuals could be especially susceptible to adversity (diathesis stress), and some susceptible to adversity or support and opportunities (differential susceptibility), other individuals may be susceptible only to support and opportunities. These ideas aligned with, and likely were fed by, work in positive psychology, which had argued that positive environmental factors are not merely the inverse of adversities but have their own logic and contribution to development.<sup>457</sup>

Belsky and Pluess were reflecting on this question at the same time, especially in a 2011 chapter celebrating the work of Sroufe, Egeland, and colleagues at Minnesota.<sup>458</sup> Sroufe had conceptualized secure attachment as a sociodevelopmental contributor to individuals' susceptibility only to support and opportunities, whilst conferring no additional vulnerability to risk. In the terms of Manuck and colleagues, secure attachment represented a form of learnt vantage susceptibility. Though for Sroufe, secure attachment would additionally reduce susceptibility to risks and adversities or help individuals overcome such experiences in the long run. Secure attachment relationships were *both* a form of learnt vantage susceptibility and a learnt protective factor.<sup>459</sup>

Whereas diathesis stress focused on identifying risk and protective factors, and differential susceptibility on identifying susceptibility factors, Belsky and Pluess proposed that there may exist vantage-susceptibility factors, which make individuals more responsive when they experience a positive environment, but which offer no vulnerability in a negative environment.

Bakermans-Kranenburg and Van IJzendoorn have expressed very considerable scepticism regarding the idea of vantage susceptibility.<sup>460</sup> From their perspective, if there were no costs associated with vantage sensitivity, then human evolution would have spread the advantage to all individuals in the population. Belsky and Pluess have accepted the point but argued that perhaps such a process of spreading could still be underway, and

<sup>455</sup> Manuck, S. B. (2011) Delay discounting covaries with childhood socioeconomic status as a function of genetic variation in the dopamine D4 receptor (DRD4). Paper presented at the Society for Research in Child Development, Montreal. Later published as Sweitzer, M. M., Halder, I., Flory, J. D., Craig, A. E., Gianaros, P. J., Ferrell, R. E., & Manuck, S. B. (2013) Polymorphic variation in the dopamine D4 receptor predicts delay discounting as a function of childhood socioeconomic status: Evidence for differential susceptibility. *Social, Cognitive and Affective Neuroscience*, 8(5), 499–508.

<sup>456</sup> Pluess, M., & Belsky, J. (2013) Vantage sensitivity: Individual differences in response to positive experiences. *Psychological Bulletin*, 139(4), 901–916, citing personal communication from Manuck, January 18, 2011.

<sup>457</sup> Seligman, M. E. P. & Csikszentmihalyi, M. (2000) Positive psychology: An introduction. *American Psychologist*, 55(1), 5–14.

<sup>458</sup> Belsky, J. & Pluess, M. (2011) Beyond adversity, vulnerability, and resilience: Individual differences in developmental plasticity. In D. Cicchetti & G. I. Roisman (eds), *The Origins and Organization of Adaptation and Maladaptation: Minnesota Symposia on Child Psychology* (Vol. 36, pp. 379–422). Hoboken, NJ: Wiley.

<sup>459</sup> Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2005) *The Development of the Person*. New York: Guilford. See also Darling Rasmussen, P., Storebø, O. J., Løkkeholt, T., Voss, L. G., Shmueli-Goetz, Y., Bojesen, A. B., ... & Bilenberg, N. (2019) Attachment as a core feature of resilience: A systematic review and meta-analysis. *Psychological Reports*, 122(4), 1259–1296.

<sup>460</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2015) The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology*, 66, 381–409.

so incomplete.<sup>461</sup> This debate seems to have assumed that vantage susceptibility would be genetic or otherwise innate. Neither set of researchers considered learnt vantage sensitivity, such as secure attachment relationships.

### Debating Screening for Differential Susceptibility

Though allies in investigating differential susceptibility, Belsky and Van IJzendoorn and Bakermans-Kranenburg have disagreed on the implications for policy and practice. In particular, they have come to very different conclusions about whether children should be screened for markers, such as routine testing for the DRD4 7-repeat allele.

In a 2008 paper, Bakermans-Kranenburg and Van IJzendoorn were initially intrigued by the idea that DRD4 7-repeat might be used for ‘screening families with children who are anticipated to profit most from the intervention efforts.’<sup>462</sup> However, reflecting further on what this would entail, in a 2011 paper they argued that it could not involve targeting resources. In their view, ‘for reasons of equity there cannot be a difference in eligibility for intervention between children with the same needs.’<sup>463</sup> Rather, screening for differential susceptibility might best be used to tailor public services to the individual.

Bakermans-Kranenburg and Van IJzendoorn offered no account of what an intervention tailored to unsusceptible individuals might look like. This may be because they did not believe anyone is unsusceptible in the round. In their view, it is most likely that differential susceptibility is generally dimensional rather than categorical, and domain specific rather than generic.<sup>464</sup> If so, there should almost always be forms of support that would be relevant to an individual, if we can attend to the dimension or dimensions in which they are more open to the environment.<sup>465</sup> Alternatively, Bakermans-Kranenburg and Van IJzendoorn’s position may imply that interventions tailored to less susceptible individuals should be more intensive, and more frequently repeated, to make headway against their reduced openness.<sup>466</sup>

In the 2011 paper co-authored with Ellis, Boyce, and Belsky, Bakermans-Kranenburg and Van IJzendoorn argued that ‘a good analogy is schooling: because all individuals are entitled to learn to read and write, a largely state-subsidized basic school system for all children has been installed, even though some children profit much more (are more susceptible) from this intervention than others.’<sup>467</sup> This is an analogy Bakermans-Kranenburg

<sup>461</sup> Jolicoeur-Martineau, A., Belsky, J., Szekely, E., Widaman, K. F., Pluess, M., Greenwood, C., & Wazana, A. (2020) Distinguishing differential susceptibility, diathesis-stress, and vantage sensitivity: Beyond the single gene and environment model. *Development and Psychopathology*, 32(1), 73–83, p. 82.

<sup>462</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Pijlman, F. T., Mesman, J., & Juffer, F. (2008) Experimental evidence for differential susceptibility: Dopamine D4 receptor polymorphism (DRD4 VNTR) moderates intervention effects on toddlers’ externalizing behavior in a randomized controlled trial. *Developmental Psychology*, 44(1), 293–300, p. 299.

<sup>463</sup> Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2011) Differential susceptibility to rearing environment depending on dopamine-related genes: New evidence and a meta-analysis. *Development and Psychopathology*, 23(1), 39–52, p. 50.

<sup>464</sup> See also Markovitch, N., Hart, Y., & Knafo-Noam, A. (2024) Environmental susceptibility for all: A data-driven approach suggests individual differences in domain-general and domain-specific patterns of environmental susceptibility. *Development and Psychopathology*, early view.

<sup>465</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2015) The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology*, 66, 381–409, p. 403.

<sup>466</sup> M. Van IJzendoorn, personal communication, September 9, 2024.

<sup>467</sup> Ellis, B. J., Boyce, W. T., Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2011) Differential susceptibility to the environment: An evolutionary-neurodevelopmental theory. *Development and Psychopathology*, 23(1), 7–28, p. 23.

and Van IJzendoorn would often repeat. In their view, no differentiation should be made by public services based on markers of differential susceptibility in terms of individuals' access to services; to do otherwise would be unethical, and potentially dystopian.<sup>468</sup> Instead, service should be adapted to the individual and their dimensions of susceptibility. The same strategy might be used outside of public services. For example, marriage counsellors might use understanding of individuals' degrees and domains of susceptibility in their work with private clients.

Yet Belsky came to be unsatisfied with the position articulated in 2011 with Ellis, Boyce, Bakermans-Kranenburg, and Van IJzendoorn. From 2014, he argued that the quantity of public and charitable resources should be targeted to those who might most benefit from them. Writing for a public and policy audience in the *New York Times*, Belsky stated:

If we get to the point where we can identify those more and less likely to benefit from a costly intervention with reasonable confidence, why shouldn't we do this? What is ethical, after all, about providing services to individuals for whom they will not prove effective, especially when spending taxpayers' money? One might even imagine a day when we could genotype all the children in an elementary school to ensure that those who could most benefit from help got the best teachers.<sup>469</sup>

In the *Journal of Developmental and Behavioral Pediatrics*, in 2015, he elaborated 'there is nothing ethical about (1) providing services to those who do not benefit, (2) especially if limited-resource conditions mean that those who could and would benefit are denied the service when equity is the primary guiding principle, and (3) when taxpayers are asked to pay for the services being provided.'<sup>470</sup> To evidence the point, Belsky elsewhere pointed to work such as Kegel, Bus, and Van IJzendoorn, showing that only children with the DRD4 7-repeat allele benefited from additional language support.<sup>471</sup> In his view, the additional language support provided to the children without 7-repeat was functionally wasted.

Yet Belsky acknowledged that there was reason to suspect that susceptibility might be better conceptualized as a dimension than as differences between types of people. If multiple genes and other facets of temperament variously contributed to differential susceptibility, then susceptibility would always be by degrees based on these various factors. With more research into the various contributors, screening and resource targeting might also follow this gradient, to ensure maximum effectiveness from public or charitable investment. Individuals with multiple indicators of differential susceptibility would receive extreme investment from public bodies across health, education, and social care. Individuals with some indicators might receive investment if indicators of adversity were present.

<sup>468</sup> In a 2017 seminar at the Cambridge Centre for Family Research, Van IJzendoorn argued this point with reference to the political theory of John Rawls: 'All social primary goods—liberty and opportunity, income and wealth, and the bases of self-respect—are to be distributed equally unless an unequal distribution of any or all of these goods is to the advantage of the least favoured.' Given that differential susceptibility is likely dimensional, and domain specific in at least some regards, Van IJzendoorn was not convinced that screening access to resources or targeting who gets them based on differential susceptibility could benefit those 'least favoured'. Van IJzendoorn, M. (2017) Attachment across the lifespan. Seminar at the Centre for Family Research, Cambridge University, 11th November 2017, citing Rawls, J. (1971) *A Theory of Justice*. Cambridge, MA: Harvard University Press, p. 303.

<sup>469</sup> Belsky, J. (2014) The downside of resilience. Sunday Review, *New York Times*, 30 November 2014. <https://www.nytimes.com/2014/11/30/opinion/sunday/the-downside-of-resilience.html>.

<sup>470</sup> Belsky, J. (2015) Beyond vulnerability: attachment, adversity, gene-environment interaction, and implications for intervention. *Journal of Developmental & Behavioral Pediatrics*, 36(6), 464–466, p. 465.

<sup>471</sup> Hartman, S. & Belsky, J. (2018) Prenatal programming of postnatal plasticity revisited—And extended. *Development and Psychopathology*, 30(3), 825–842.

A study by Cicchetti and Rogosch had found that having more genetic markers of differential susceptibility was associated with a stronger link between child maltreatment and child outcomes across mental health and education, whereas there was no association with child outcomes for children with no genetic markers of differential susceptibility.<sup>472</sup> To Belsky, this raised the question of the justification and required scope of social services interventions for children with no genetic markers of differential susceptibility. In his view, individuals with no indicators of differential susceptibility should ultimately receive care from public services that ‘qualifies as humane’, but no more.<sup>473</sup>

Belsky argued that in pursuing screening and the targeting of resources to the more susceptible, it should nonetheless be held in mind that ‘we don’t know if the children who seem unsusceptible to interventions truly are, or whether they’re simply not affected by what is currently being provided.’<sup>474</sup> Belsky cautioned against overconfidence in judgments about the meaning of effectiveness: ‘Even if my theoretical leanings incline me to believe that some will prove relatively impervious to most interventions, I suspect that this will not be the case for many nonresponders.’<sup>475</sup> He urged that extensive efforts should be undertaken to see whether individuals who seem unsusceptible might benefit from quite different intervention approaches, tailored to their predisposition to be less reactive to their environment.

Reflecting on this debate, Canadian researchers Shah and colleagues regarded Belsky’s position as generally too extreme. They argued that universal and preventative services should not entail screening or targeting of resources on the basis of differential susceptibility. Shah and colleagues would not sign up to Belsky’s utopia in which the most susceptible students in primary school are screened, put into a specific class, and given the best teachers. However, beyond the position of Van IJzendoorn and Bakermans-Kranenburg, Shah and colleagues argued that professionals working with children should be educated about phenotypic indicators of differential susceptibility, as this information may be helpful in informing decisions to make referrals for specialist support when children or families are struggling.

As such, whereas Shah and colleagues do not countenance targeting of resources within universal and preventative services, they do think targeting of resources within specialist services would be justifiable. Furthermore, for these specialist services, Shah and colleagues consider that testing for genetic differential susceptibility could well be worthwhile, in order to understand more about what works for whom.<sup>476</sup> For instance, a study by Keers and colleagues examined whether an index of genes previously associated with differential susceptibility moderated the effectiveness of psychological treatments for child anxiety disorders. It did not. Treatments were equally effective for children with more or fewer markers of genetic differential susceptibility. Nonetheless, children with more such markers responded better to individual therapist-delivered cognitive-behavioural therapy than

<sup>472</sup> Cicchetti, D. & Rogosch, F. A. (2012) Genex Environment interaction and resilience: Effects of child maltreatment and serotonin, corticotropin releasing hormone, dopamine, and oxytocin genes. *Development and Psychopathology*, 24(2), 411–427.

<sup>473</sup> Belsky, J. (2015) Beyond vulnerability: attachment, adversity, gene–environment interaction, and implications for intervention. *Journal of Developmental & Behavioral Pediatrics*, 36(6), 464–466, p. 465.

<sup>474</sup> Belsky, J. (2014) The downside of resilience. *Sunday Review, New York Times*, 30 November 2014. <https://www.nytimes.com/2014/11/30/opinion/sunday/the-downside-of-resilience.html>.

<sup>475</sup> Ibid.

<sup>476</sup> Shah, S., Laplante, D., Atkinson, L., & Wazana, A. (2022) From temperament and parenting to attachment: A review of the interplay of gene and environment factors in the developmental pathway to attachment. *Current Opinion in Psychiatry*, 35(6), 401–408.

group therapy or brief parent-delivered cognitive-behavioural therapy. Though no formal equivalence test was conducted, the researchers' impression of their data was that children with fewer markers responded as well to the latter two, lower-cost forms of provision.<sup>477</sup>

### Testing for Differential Susceptibility

In the 2010s, differential susceptibility theory, and especially the discovery of genetic differential susceptibility, contributed to a surge in research across developmental science examining physiological reactivity, emotional reactivity, difficult temperament, and susceptibility genotype as moderators of the effects of care on child development and the effects of early child development on later outcomes. Work in this area became a 'hot topic', not only in journals such as *Development & Psychopathology* close to Belsky's home disciplines, but in *Molecular Psychiatry*, *Proceedings of the National Academy of Sciences*, and other biomedical journals.<sup>478</sup>

Such analyses of interactions were attractive to both developmental and biomedical scientists as they could frequently be added as a planned secondary analysis to studies primarily interested in main effects. Already-collected data could also be re-analysed where relevant measures were already available, as was often the case with maternal report of child temperament especially. For studies with genetic data, new hypotheses could be elaborated about the correlates of susceptibility.

For instance, Kitayama and colleagues were interested in cross-cultural psychology and had data showing that European Americans tended to value independence and Asian-born Asians living in America tended to value interdependence. Intrigued by research on DRD4 as a susceptibility gene, Kitayama and colleagues examined the possibility of genetic differential susceptibility to cultural context. They found that differences in cultural values were much more pronounced for carriers of the DRD4 7-repeat, or the 2-repeat, alleles. For non-carriers, there were no cultural differences found in values identified between European Americans and Asian-born Asians living in America.<sup>479</sup>

A further attraction of differential susceptibility theory was that it could help account for uneven findings, pointing to the neglected role of supportive environments, when purported 'risk alleles' such as 5-HTTLPR were considered as moderators of associations between adversity and poor mental health in line with a diathesis stress approach.<sup>480</sup> For example, two 2013 studies documented that adolescents with poor family support and at least one 5-HTTLPR s-allele had more symptoms of depression relative to boys

<sup>477</sup> Keers, R., Coleman, J. R., Lester, K. J., Roberts, S., Breen, G., Thastum, M., ... & Eley, T. C. (2016) A genome-wide test of the differential susceptibility hypothesis reveals a genetic predictor of differential response to psychological treatments for child anxiety disorders. *Psychotherapy and Psychosomatics*, 85(3), 146–158. See also Assary, E., Krebs, G., & Eley, T. C. (2024) Practitioner review: Differential susceptibility theory: might it help in understanding and treating mental health problems in youth? *Journal of Child Psychology and Psychiatry*, early view.

<sup>478</sup> Slagt, M., Dubas, J. S., Deković, M., & van Aken, M. A. (2016) Differences in sensitivity to parenting depending on child temperament: A meta-analysis. *Psychological Bulletin*, 142(10), 1068–1100, p. 1096.

<sup>479</sup> Kitayama, S., King, A., Yoon, C., Tompson, S., Huff, S., & Liberzon, I. (2014) The dopamine D4 receptor gene (DRD4) moderates cultural difference in independent versus interdependent social orientation. *Psychological Science*, 25(6), 1169–1177.

<sup>480</sup> Risch, N., Herrell, R., Lehner, T., Liang, K. Y., Eaves, L., Hoh, J., ... & Merikangas, K. R. (2009) Interaction between the serotonin transporter gene (5-HTTLPR), stressful life events, and risk of depression: a meta-analysis. *Jama*, 301(23), 2462–2471; Fox, E., Zoukou, K., Ridgewell, A., & Garner, K. (2011) The serotonin transporter gene alters sensitivity to attention bias modification: evidence for a plasticity gene. *Biological Psychiatry*, 70(11), 1049–1054.

homozygous for the l-allele. But adolescents with high levels of family support and at least one s-allele had the lowest levels of depression symptoms.<sup>481</sup>

Developmental scientists increasingly examined their data for differential susceptibility as well as diathesis stress when exploring moderation by temperament. Leighton and colleagues alleged that researchers frequently conducted exploratory tests but only reported those interactions that proved positive.<sup>482</sup> However, in their review of gene x environment studies in the interventions literature, at least, Bakermans-Kranenburg and Van IJzendoorn did not find evidence of publication bias.<sup>483</sup>

Empirical evidence began to converge on a number of susceptibility genes. The strongest evidence was for 5-HTTLPR (serotonin system) and DRD4 (dopamine system). Whilst the serotonin system has been especially linked to internalizing behaviours, and the dopamine to externalizing behaviours, Schmidt, Fox, and Hamerhad found that when the 5-HTTLPR s-allele and DRD4 7-repeat allele co-occur, both internalizing and externalizing behaviours are increased or decreased depending on whether the individual experiences a positive or negative environment. These findings provided initial evidence of gene–gene interplay in differential susceptibility.<sup>484</sup>

There was some evidence for other genes such as MAOA (implicated in the dopamine, norepinephrine, and serotonin systems).<sup>485</sup> COMT had also been highlighted by the Leiden group as another potential susceptibility gene implicated in the dopamine system.<sup>486</sup> In the early 2010s a number of studies offered persuasive evidence of a further genetic marker of differential susceptibility: the brain-derived neurotrophic factor Val66Met polymorphism (BDNF). BDNF is involved in promoting neuronal differentiation, synaptic connectivity, neuronal repair and survival. Hayden and colleagues, for example, documented that three-year-olds with at least one BDNF methionine (met) allele were more likely to show sadness, anger, or fear during a challenging laboratory-based task when they had a parent with a history of depressive disorder or when their parents reported often arguing.<sup>487</sup> However, this allele was associated with especially low expressed negative emotionality in the laboratory when parents had no history of depression and reported less conflict.

Belsky was highly active in conducting secondary analyses of large cohort studies to provide evidence for differential susceptibility and understand more about the phenomenon.

<sup>481</sup> Li, J. J., Berk, M. S., & Lee, S. S. (2013) Differential susceptibility in longitudinal models of gene–environment interaction for adolescent depression. *Development and Psychopathology*, 25(4.1), 991–1003; Starr, L. R., Hammen, C., Brennan, P. A., & Najman, J. M. (2013) Relational security moderates the effect of serotonin transporter gene polymorphism (5-HTTLPR) on stress generation and depression among adolescents. *Journal of Abnormal Child Psychology*, 41, 379–388.

<sup>482</sup> Leighton, C., Botto, A., Silva, J. R., Jiménez, J. P., & Luyten, P. (2017) Vulnerability or sensitivity to the environment? Methodological issues, trends, and recommendations in gene–environment interactions research in human behavior. *Frontiers in Psychiatry*, 8, 106.

<sup>483</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2015) The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology*, 66, 381–409.

<sup>484</sup> Schmidt, L. A., Fox, N. A., & Hamer, D. H. (2007) Evidence for a gene–gene interaction in predicting children's behavior problems: Association of serotonin transporter short and dopamine receptor D4 long genotypes with internalizing and externalizing behaviors in typically developing 7-year-olds. *Development and Psychopathology*, 19(4), 1105–1116.

<sup>485</sup> Widom, C. S. & Bruzstowicz, L. M. (2006) MAOA and the 'cycle of violence': Childhood abuse and neglect, MAOA genotype, and risk for violent and antisocial behavior. *Biological Psychiatry*, 60, 684–689.

<sup>486</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Mesman, J. (2008) Dopamine system genes associated with parenting in the context of daily hassles. *Genes, Brain and Behavior*, 7(4), 403–410.

<sup>487</sup> Hayden, E. P., Klein, D. N., Dougherty, L. R., Olino, T. M., Dyson, M. W., Durbin, C. E., ... & Singh, S. M. (2010) The role of brain-derived neurotrophic factor genotype, parental depression, and relationship discord in predicting early-emerging negative emotionality. *Psychological Science*, 21(11), 1678–1685.

Data from the Pennsylvania Child and Family Development Project was not used; it may be that Belsky no longer had access to this data after leaving Penn, or that he regarded the sample as too small for these analyses. The large cohorts analysed by Belsky in his studies of differential susceptibility were not designed with questions about interactions between person and environment in mind, and often he needed to adapt measures to these purposes. The price of such opportunistic secondary analysis was frequently a reduction in quality of measurement, especially measures of environmental factors, though also sometimes measures of outcomes. This likely contributed to increased measurement error, and to deflated effect sizes.

In 2011, a study by Belsky and Beaver re-analysed data from the American Add Health project. The advantage of the cohort study was the rich availability of genomic data for a sample of 1,586 participants. Belsky and Beaver created a cumulative index of genetic susceptibility using alleles relating to the functioning of the dopamine and serotonin systems and associated in research with differential susceptibility. A disadvantage of the study was that the measure of the environment was adolescent self-report about their upbringing: unquestionably a weaker assessment than the detailed observational assessments available in the Leiden studies. The outcome measure was adolescent self-report regarding difficulties with self-regulation.

Belsky and Beaver found that their index of genetic susceptibility was associated for males with greater adolescent self-regulation when adolescents had experienced supportive parenting, and reduced regulation when adolescents had experienced unsupportive parenting. There was a dose–response relationship between number of susceptibility alleles and the strength of differential susceptibility. Whilst Belsky and Beaver examined five susceptibility alleles as initial proof of concept, they anticipated that future research would incorporate a much wider range of relevant genes and ideally a genome-wide analysis. This could be informed by attention to genes relevant to specific neurological systems.<sup>488</sup>

Yet Belsky and Beaver found no indication of differential susceptibility for female participants. The researchers did not report their results without gender as an interaction term. Nor did they mention gender in the introduction and literature review, as a basis for expecting different effects by gender. It may be suspected that the weak data diminished a true association for females, and the initial results did not support differential susceptibility. Belsky and Beaver may then have examined interaction with gender—and perhaps other characteristics—in post-hoc analyses in the hope of finding evidence of differential susceptibility.<sup>489</sup>

In a follow-up paper Beaver and Belsky examined data from the same sample 14 years later, looking at participant report of parenting stress.<sup>490</sup> No reported tests examined gender as a factor. Beaver and Belsky found that associations between adolescents' experience of supportive or unsupportive parenting and their own report of parenting stress 14 years

<sup>488</sup> Polygenic risk scores entered into developmental science in 2009 in schizophrenia research. Purcell, S. M., Wray, N. R., Stone, J. L., Visscher, P. M., O'Donovan, M. C., Sullivan, P. F., & Sklar, P. (2009) Common polygenic variation contributes to risk of schizophrenia and bipolar disorder. *Nature*, 460(7256), 748–752. For advocacy of composite score from candidate genes, see Belsky, J. & Van IJzendoorn, M. H. (2017) Genetic differential susceptibility to the effects of parenting. *Current Opinion in Psychology*, 15, 125–130.

<sup>489</sup> From evidence to date, Van IJzendoorn and Bakermans-Kranenburg have agreed with Belsky and Beaver that it does appear that male gender strengthens differential susceptibility, though the respective role of biological or cultural factors remains unclear. Netsi, E., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Wulff, K., Jansen, P. W., Jaddoe, V. W., ... & Ramchandani, P. G. (2015) Does infant reactivity moderate the association between antenatal maternal depression and infant sleep? *Journal of Developmental & Behavioral Pediatrics*, 36(6), 440–449, p. 447.

<sup>490</sup> Beaver, K. M., & Belsky, J. (2012) Gene–environment interaction and the intergenerational transmission of parenting: Testing the differential-susceptibility hypothesis. *Psychiatric Quarterly*, 83, 29–40.

later were moderated by their index of genetic susceptibility. Participants with the most susceptibility alleles not only experienced the highest levels of parental stress when exposed to unsupportive parenting in adolescence, but the lowest levels of parental stress when exposed to supportive parenting in adolescence. Again, there was a dose–response relationship between number of susceptibility alleles and differential susceptibility. Beaver and Belsky argued that an implication of their study is that the intergenerational transmission of parenting difficulties may be impacted by differential susceptibility. Transmission may be diminished for individuals low in susceptibility and heightened for individuals high in susceptibility. As such, average estimates of intergenerational transmission, such as those examined by Van IJzendoorn and collaborators (Chapter 4), could be both under- and over-estimate effects of parenting experienced on the experience of parenting.

By 2016, Slagt and colleagues at Utrecht could report a meta-analysis of 84 studies, with data from 6,153 children, addressing reported child temperament as a moderator of the effects on child development of caregiving behaviour.<sup>491</sup> This meta-analysis revealed that, compared to children reported to have an easy temperament, children with a difficult temperament had worse outcomes when they experienced harsh and low-quality parenting, but more positive outcomes when they experienced supportive and positive parenting. These results held across externalizing and internalizing problems and social and cognitive outcomes. Contrary to Belsky's expectations, negative emotionality was not a consistent marker for differential susceptibility except in infancy. Belsky's optimism about negative emotionality as an indicator of differential susceptibility may, in this light, have stemmed from the fact that he had started by thinking from the infancy literature.<sup>492</sup>

Slagt and colleagues acknowledged a number of limitations with the empirical studies available for synthesis. In principle, differential susceptibility entails that, in the presence of a marker or markers for susceptibility, children will have positive outcomes under positive environmental circumstances and negative outcomes under negative circumstances. However, many of the studies of parenting–temperament interactions focused on a restricted range of environments, and on a restricted range of developmental outcomes. In the meta-analysis, the children that were susceptible to negative parenting and children that were susceptible to positive parenting were not generally drawn from the same study sample. Even among studies that did include a range of environments and outcomes, none employed a within-person design to test the claim of differential susceptibility theory that the same children that are most adversely affected by harsh and low-quality parenting can benefit disproportionately from supportive and high-quality parenting.

Besides the Leiden group, there was comparatively little interest in physiological reactivity as a potential indicator of differential susceptibility among attachment researchers.<sup>493</sup> As

<sup>491</sup> Slagt, M., Dubas, J. S., Deković, M., & van Aken, M. A. (2016) Differences in sensitivity to parenting depending on child temperament: A meta-analysis. *Psychological Bulletin*, 142(10), 1068.

<sup>492</sup> Recently Zhang, Sayler, Hartman, and Belsky have contested the findings of the meta-analysis by Slagt and colleagues. Drawing data from the Avon Longitudinal Study of Parents and Children (N = 14,541), they documented that while more and less supportive parenting predicted fewer or more behaviour problems for all children, this relationship was stronger for children who were more difficult as infants. They highlight that the size of this sample is larger than the total of all the studies synthesized in the meta-analysis by Slagt and colleagues. Zhang, X., Sayler, K., Hartman, S., & Belsky, J. (2022) Infant temperament, early-childhood parenting, and early-adolescent development: Testing alternative models of Parenting × Temperament interaction. *Development and Psychopathology*, 34(3), 784–795.

<sup>493</sup> For example, Kok, R., Luijk, M. P., Lucassen, N., Prinzie, P., Jongerling, J., Van IJzendoorn, M. H., ... & Bakermans-Kranenburg, M. J. (2022) The role of supportive parenting and stress reactivity in the development of self-regulation in early childhood. *Journal of Child and Family Studies*, 31(9), 2424–2435. The primary exception was the University of Oregon group, who were particularly interested in associations between attachment and physiological and emotion regulation. See Conradt, E., Measelle, J., & Ablow, J. C. (2013) Poverty, problem behavior, and promise: Differential susceptibility among infants reared in poverty. *Psychological Science*, 24(3),



we saw in [Chapter 2](#), Bowlby had been interested in physiological reactivity, and sketched ideas towards how it might integrate with attachment theory, but ultimately did not find a satisfactory conclusion and did not discuss the issue in print. This difficulty was not resolved by subsequent attachment researchers, and Main's 'move to the level of representation' may have even, as Cassidy and colleagues have alleged, drawn attachment theory and research in the opposite direction.<sup>494</sup> Until recently, the primary, relatively circumscribed, engagement of attachment researchers with issues of physiological reactivity has been in understanding the effects of the Strange Situation on children's arousal.<sup>495</sup> A lack of clarity on the place of physiological reactivity within attachment theory may have contributed to reduced take-up in studies of attachment and differential susceptibility.

Nevertheless, encouraged by the striking findings of the Leiden group, attachment researchers have shown more interest in maternal reported temperament and genotype as indicators of differential susceptibility. They have examined these indicators as moderators of the effects of sensitivity on child attachment in the Strange Situation, the effectiveness of attachment-based interventions, and associations between the Strange Situation and later outcomes.<sup>496</sup>

Cassidy's group at Maryland undertook several such analyses.<sup>497</sup> Among these a 2009 study by Stupica, supervised by Cassidy, examined whether newborn irritability, assessed in the first 30 days postpartum, moderated associations between changes in maternal depression, life satisfaction and self-efficacy on changes in Strange Situation classification between 12 and 18 months. No effects were found. However, in a 2011 study, Stupica, Sherman, and Cassidy examined whether newborn irritability and attachment in the Strange Situation at 12 months predicted child behaviour in the laboratory at 24 months. Visual inspection of the results indicated that toddlers who had been both highly irritable and insecurely attached were less exploratory than other toddlers. Highly irritable infants were also less sociable as toddlers when they had been insecurely attached. Conversely, they were more sociable when they had been securely attached.<sup>498</sup>

Another research group especially interested in differential susceptibility and attachment was Kochanska's group in Iowa. They observed that most conclusions about the moderating role of indicators of differential susceptibility had been based on researchers'

235–242. Cicchetti and colleagues were interested in physiological reactivity, but did not integrate this with their work on attachment. There was also an adjacent literature on mild perinatal adversities, for example Windhorst, D. A., Rippe, R. C., Mileva-Seitz, V. R., Verhulst, F. C., Jaddoe, V. W., Noppe, G., ... & Bakermans-Kranenburg, M. J. (2017) Mild perinatal adversities moderate the association between maternal harsh parenting and hair cortisol: Evidence for differential susceptibility. *Developmental Psychobiology*, 59(3), 324–337.

<sup>494</sup> Cassidy, J., Ehrlich, K. B., & Sherman, L. J. (2013) Child–parent attachment and response to threat: A move from the level of representation. In M. Mikulincer & P. R. Shaver (eds), *Nature and Development of Social Connections: From Brain to Group* (pp. 125–144). Washington, DC: American Psychological Association.

<sup>495</sup> Groh, A. M. & Narayan, A. J. (2019) Infant attachment insecurity and baseline physiological activity and physiological reactivity to interpersonal stress: A meta-analytic review. *Child Development*, 90(3), 679–693.

<sup>496</sup> For example, Conradt, E., Measelle, J., & Ablow, J. C. (2013) Poverty, problem behavior, and promise: Differential susceptibility among infants reared in poverty. *Psychological Science*, 24(3), 235–242; Graffi, J., Moss, E., Jolicoeur-Martineau, A., Moss, G., Lecompte, V., Pascuzzo, K., ... & Wazana, A. (2018) The dopamine D4 receptor gene, birth weight, maternal depression, maternal attention, and the prediction of disorganized attachment at 36 months of age: A prospective gene × environment analysis. *Infant Behavior and Development*, 50, 64–77; İşcanoglu, Z., & Ucanok, Z. (2022) Associations between Turkish incarcerated mothers' sensitivity and their co-residing children's attachment: The moderating role of children's temperament. *Attachment & Human Development*, 24(4), 439–460.

<sup>497</sup> For example, Cassidy, J., Woodhouse, S. S., Sherman, L. J., Stupica, B., & Lejuez, C. W. (2011) Enhancing infant attachment security: An examination of treatment efficacy and differential susceptibility. *Development and Psychopathology*, 23(1), 131–148.

<sup>498</sup> Stupica, B., Sherman, L. J., & Cassidy, J. (2011) Newborn irritability moderates the association between infant attachment security and toddler exploration and sociability. *Child Development*, 82(5), 1381–1389.

subjective impression of the shape of the effect, rather than a formal test.<sup>499</sup> They proposed that researchers should use analysis of regions of significance, a statistical method that entails graphing potential interaction effects to the range of two standard deviations below and above the mean, extrapolating predicted values from the empirical observed values obtained in the actual sample. Extending the graph up to two standard deviations below and above the mean increases the chances of identifying a role for indicators of differential susceptibility that only occur in either very poor or very beneficial environmental conditions.<sup>500</sup> Kochanska and colleagues claimed that this approach would allow researchers to pinpoint the crossover moment, where a negative association becomes a positive association between an environmental factor and an outcome variable. Though without driving confidence intervals, the approach perhaps offers undue confidence about pinpointing the crossover moment.

Roisman and colleagues agreed with Kochanska and colleagues that there was too much subjectivity in interpretation of whether findings were more aligned with stress diathesis or differential susceptibility.<sup>501</sup> They agreed that regions of significance analysis would help provide a more objective basis. However, Roisman and colleagues argued that, in addition to regions of significance, additional tests should be used. They argued that if differential susceptibility is present, the association between the predictor and outcome will be statistically significant for adequately powered studies—not just visibly detectable—at both ends of the environmental variable. However, it should be highlighted that lack of statistical significance would not prove that differential susceptibility was absent.

To examine the proportion of for better and for worse attributable to differential susceptibility, Roisman and colleagues proposed that researchers should examine what they termed the ‘proportion of interaction.’ Diathesis stress assumes that individuals with a vulnerability factor who experience adversity will have worse outcomes than individuals with just the vulnerability factor or who just experience adversity. To this, differential susceptibility theory argues that individuals with the putative vulnerability factor—now conceived of as a susceptibility factor—who experience positive developmental inputs will have better outcomes than individuals with just the susceptibility factor or who just experience the positive environment. Prototypical differential susceptibility would have a proportion of interaction score of 50%, signalling that the susceptibility factor contributes to better and worse outcomes to an equal degree, with the inferred point of interaction around the population mean. Roisman and colleagues assume an adequately sized sample for the percentages to be meaningful rather than reflecting chance, and do not propose tests for significance for the percentages. Proportion of interaction is therefore essentially heuristic.

Using data from the NICHD sample, Roisman and colleagues applied analysis of regions of significance to a study of the effects of maternal sensitivity\* (6–36 months) on children’s academic skills, social competence, and mental health difficulties with data from across all available timepoints, examining maternal report of child temperament at six months as a moderator. Through a regions of significance analysis incorporating scrutiny of proportion

<sup>499</sup> Kochanska, G., Kim, S., Barry, R. A., & Philibert, R. A. (2011) Children’s genotypes interact with maternal responsive care in predicting children’s competence: Diathesis–stress or differential susceptibility? *Development and Psychopathology*, 23(2), 605–616.

<sup>500</sup> It may be considered that this utilisation of standard deviations from the mean comes with potential drawbacks, such as comparability of clinical and community samples, where not only the means but the standard deviations will likely differ.

<sup>501</sup> Roisman, G. I., Newman, D. A., Fraley, R. C., Haltigan, J. D., Groh, A. M., & Haydon, K. C. (2012) Distinguishing differential susceptibility from diathesis–stress: Recommendations for evaluating interaction effects. *Development and Psychopathology*, 24(2), 389–409.

of interaction, Roisman and colleagues found a diathesis stress model was a better fit for children's academic results: infants identified as having a difficult temperament had especially poor academic results when they experienced relatively insensitive\* care. However, child temperament was an indicator of differential susceptibility for the effects of maternal sensitivity for teacher reports of academic skills, social competence, and symptomatology. Maternal sensitivity\* had a stronger association with child positive outcomes for children identified as difficult at six months, and maternal insensitivity\* had a stronger association with child negative outcomes. Roisman and colleagues were especially struck by these findings as different teachers rated participants over time, serving as an indicator of the reliability of their scores.

Belsky appreciated these recommendations regarding how to test for differential susceptibility. For all that, he was critical of the idea that an exploratory test of interaction needed to show significance before different forms of interaction are tested. In his view, this approach was too conservative and had diminished statistical power: it risked false negatives in identification of differential susceptibility. Instead, in 2013 Belsky, Pluess, and Widaman proposed an alternative statistical test, a reparametrized equation approach, in which diathesis stress and differential susceptibility hypotheses can be tested against the data.<sup>502</sup> Their proposed method entailed systematically varying the parameters included in the regression equation to discern where on the continuum of environmental measurement the regression lines will cross for the association between environmental predictor and outcome for different subgroups of participants.

A diathesis stress hypothesis would be confirmed if the regression lines do not cross before the most positive observed value for the measured environment. A differential-susceptibility hypothesis would be confirmed if the lines cross within the range of values of the measured environment. Thinking about Roisman and colleagues' idea of proportion of interaction, Belsky, Pluess, and Widaman distinguished between 'strong' and 'weak' models of differential susceptibility. In the strong model, individuals without the marker of differential susceptibility may be expected to be unaffected by the aspect of the environment assessed. In the weak model, individuals without the marker of differential susceptibility may be expected to be affected by the aspect of the environment assessed, but to a lesser degree than those with the marker of differential susceptibility.

To illustrate their argument, Belsky and his collaborators examined whether the DRD4 7-repeat allele moderated associations between childcare quality and children's social competence and problem behaviour in first grade. Belsky and colleagues found that their proposed statistical procedure indicated that the differential susceptibility model was a better fit than diathesis stress, and the data fit the strong version of differential susceptibility. There was no association between childcare quality and children's outcomes for children without the DRD4 7-repeat allele. Belsky and colleagues emphasized that the approach advocated by Roisman would have failed to detect the interaction. The finding is striking since the NICHD researchers had found no main effect of childcare quality on children's social competence: consideration of differential susceptibility revealed that the main effect had been masked by some children showing better outcomes and other children showing worse outcomes than would be expected depending on the quality of care, with temperament serving as moderator.<sup>503</sup>

<sup>502</sup> Belsky, J., Pluess, M., & Widaman, K. F. (2013) Confirmatory and competitive evaluation of alternative gene-environment interaction hypotheses. *Journal of Child Psychology and Psychiatry*, 54(10), 1135–1143.

<sup>503</sup> Pluess, M. & Belsky, J. (2009) Differential susceptibility to rearing experience: The case of childcare. *Journal of Child Psychology and Psychiatry*, 50(4), 396–404.

Belsky and Pluess then re-ran this analysis but this time with maternal report of child difficult temperament as the moderator rather than DRD4 polymorphism. The strong version of differential susceptibility was found for maternal report of child temperament for associations of childcare quality on children's social competence. Belsky and Pluess found that both DRD4 7-repeat and maternal report of child temperament made largely, though not entirely, independent contributions to children's social competence in kindergarten and first grade. These are important findings since they suggest that genetic and phenotypic susceptibility factors may make distinct contributions and align with the equivocal evidence mentioned above regarding their intercorrelation.

Since the paper by Belsky, Pluess, and Widaman, over the subsequent decade there have been a diversity of ways to assess for differential susceptibility. Perhaps a majority of developmental scientists, including attachment researchers, have continued to make a subjective assessment of simple slopes. Some researchers have used the reparametrized equation approach advocated by Belsky, Pluess, and Widaman. More have used regions of significance analysis and the recommendations of Roisman and colleagues, which have been widely praised and become the de facto standard.<sup>504</sup> However, Van IJzendoorn and Bakermans-Kranenburg have warned that the Roisman and colleagues guidelines do risk false negatives, and interpretation of the literature should bear this in mind.<sup>505</sup> Del Giudice has raised the same point.<sup>506</sup> He has proposed revisions to the tests recommended by the guidelines of Roisman and colleagues to reduce the likelihood of false negative results, and this revised procedure has also been taken up by some studies.

### The Meaning of Susceptibility

A question remains about the logic of the indicators of differential susceptibility. They moderate relations between the environment and developmental outcomes, but this does not in itself elucidate the mechanisms in play. Bondarenko has criticized research on differential susceptibility for a tendency towards opportunism in the kinds of analyses conducted, based on variables to hand, combined with comparatively weak development of theory regarding the meaning of susceptibility.<sup>507</sup> Bondarenko alleged that researchers have tended to reify susceptibility as if, in itself, 'susceptibility' were the mechanism producing the moderation, and too few researchers have presented specific claims about the relevant causal mechanisms.<sup>508</sup>

Among those who have discussed causal processes, some have argued that the different indicators of differential susceptibility represent relatively distinct processes with the

<sup>504</sup> Dick, D. M., Agrawal, A., Keller, M. C., Adkins, A., Aliev, F., Monroe, S., ... & Sher, K. J. (2015) Candidate gene-environment interaction research: Reflections and recommendations. *Perspectives on Psychological Science*, 10(1), 37-59; McCabe, C. J., Kim, D. S., & King, K. M. (2018) Improving present practices in the visual display of interactions. *Advances in Methods and Practices in Psychological Science*, 1(2), 147-165.

<sup>505</sup> Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2015) Genetic differential susceptibility on trial: Meta-analytic support from randomized controlled experiments. *Development and Psychopathology*, 27(1), 151-162.

<sup>506</sup> Del Giudice, M. (2017) Statistical tests of differential susceptibility: Performance, limitations, and improvements. *Development and Psychopathology*, 29(4), 1267-1278.

<sup>507</sup> Bondarenko, O. (2021) Explaining the good as well as the bad? Mechanistic understanding in the gene-environment research on differential plasticity. Paper presented at the Philosophy of Science Association Conference, 13 November 2021.

<sup>508</sup> Bondarenko also argued that what investigations into mechanism have rarely included potential covariates in their models, reducing the precision of the empirical claims. See also Keller, M. C. (2014) Genex environment interaction studies have not properly controlled for potential confounders: The problem and the (simple) solution. *Biological Psychiatry*, 75(1), 18-24, 473-481.

similar effect of moderating the impact of environment on development. Kochanska and colleagues have proposed that the ease with which anxiety is induced in fearful children makes them highly responsive to parental demands, whereas difficult temperament elicits more extreme responses from caregivers and others.<sup>509</sup> Whereas Belsky has offered his suspicion that negativity, difficult temperament, and physiological reactivity all reflect a latent factor: a highly sensitive experience of the world in which what happens, and its positive or negative possibilities, registers and impacts especially powerfully.<sup>510</sup> This includes the positive or negative qualities of attachment relationships.

In favour of this position, Belsky and Pluess pointed to emerging evidence for impulsivity and anger-proneness as indicators of differential susceptibility. A study by Smeekens and colleagues asked Dutch mothers to report on their child's anger-proneness at 15 and 27 months, and child-caregiver interaction was observed.<sup>511</sup> For parents who offered effective structure, limit setting and supportive presence to their children, there was a negative association between anger-proneness in early childhood and parent-report of externalizing difficulties at age five. For parents who offered ineffective structure, limit-setting, and supportive presence to their children, there was a positive association between anger-proneness and externalizing behaviours. These associations were partly mediated by disorganized attachment assessed in the Strange Situation. The association between observed parental behaviour and externalizing behaviour for children reported as having low anger-proneness was not significant.

Belsky and Pluess argued that maternal report of anger-proneness may be a marker for differential susceptibility because it is an indirect indicator of 'a highly sensitive nervous system, one on which experience register especially strongly', especially due to differences in functioning of the serotonergic and dopaminergic systems.<sup>512</sup> They considered that 'perhaps the reason why some are more responsive than others to environmental conditions is because they have lower thresholds for experiencing pleasure and/or displeasure and thus are more sensitive and responsive than others to, respectively, rewards and/or punishments'.<sup>513</sup>

The idea of a latent susceptibility factor has empirical implications. Most research to date on genetic differential susceptibility has studied genetic polymorphisms originally associated with negative outcomes. Indeed, the Leiden group first collected data on DRD4 following research by Lakatos and colleagues suggesting associations with disorganized attachment in the Strange Situation. However, if differential susceptibility represents a distinct quality of registering experience especially strongly, there may be genetic variation with effects related specifically to this registering. And how the latent susceptibility factor is conceptualized has ramifications for where researchers might look for such genetic variation.

For instance, Grazioplene, DeYoung, Rogosch, and Cicchetti reasoned that the essence of differential susceptibility lies in neural plasticity and openness to learning from

<sup>509</sup> Kochanska, G., Aksan, N., & Joy, M. E. (2007) Children's fearfulness as a moderator of parenting in early socialization: Two longitudinal studies. *Developmental Psychology*, 43(1), 222–237.

<sup>510</sup> Belsky, J. (2005) Differential susceptibility to rearing influence: An evolutionary hypothesis and some evidence. In B. Ellis & D. Bjorklund (eds), *Origins of the Social Mind: Evolutionary Psychology and Child Development* (pp. 139–163). New York: Guilford.

<sup>511</sup> Smeekens, S., Riksen-Walraven, J. M., & van Bakel, H. J. (2007) Multiple determinants of externalizing behavior in 5-year-olds: A longitudinal model. *Journal of Abnormal Child Psychology*, 35, 347–361.

<sup>512</sup> Belsky, J. & Pluess, M. (2009) Beyond diathesis stress: Differential susceptibility to environmental influences. *Psychological Bulletin*, 135(6), 885–908, p. 894.

<sup>513</sup> *Ibid.*, 903.

experience.<sup>514</sup> They therefore investigated the neuronal acetylcholine receptor subunit  $\alpha 4$  genotype, which is involved in the production of the neurotransmitter acetylcholine, a component of the cholinergic system, which supports attention and memory. This was an analysis driven specifically by the hypothesis that learning processes are central to susceptibility and are underpinned by attention and memory. Grazioplene and colleagues found links with scores for personality characteristics. Maltreated children with the rs1044396 T/T genotype scored highest on neuroticism, whereas non-maltreated children with this genotype scored lowest on neuroticism and highest on openness. This study offers an impressive example of how differential susceptibility theory can contribute to selection of candidate genes for investigation, based on specific ideas about how susceptibility works, rather than opportunistically testing genes identified by previous research as linked to risk. It stands in contrast to much of the literature on differential susceptibility, which is limited by opportunism in examining the correlates of genes already identified by diathesis-stress research, rather than using a theoretical, predictive structure for identifying potential candidate genes and designing studies.

Van IJzendoorn and Bakermans-Kranenburg have likewise considered the possibility of a latent factor underpinning the various indicators of differential susceptibility. In their view, the latent factor may be 'openness to environmental stimuli',<sup>515</sup> which has been associated with the dopamine system.<sup>516</sup> This would imply that related constructs associated with dopamine system-related genes, such as the personality trait of 'openness to experience' might also serve as indirect markers of differential susceptibility.<sup>517</sup>

These reflections on the latent factor underpinning the various forms of differential susceptibility would imply that neurobiological susceptibility is one mechanism among many, albeit potentially an underpinning one through which other mechanisms will pass in order to be translated into cognition and behaviour.<sup>518</sup> Social and cultural factors may also play a determinate role in shaping individuals' openness to their environment, including in moderating what aspects of experience are considered relevant as an 'environment' in the first place.<sup>519</sup>

Fonagy and colleagues, however, have argued for qualification of the claim that the latent factor underpinning differential susceptibility is openness to environmental stimuli. In their view, this is a necessary but not sufficient condition. Individuals still need to experience the stimuli as relevant and having bearing for them. Belsky and Pluess have

<sup>514</sup> Grazioplene, R. G., DeYoung, C. G., Rogosch, F. A., & Cicchetti, D. (2013) A novel differential susceptibility gene: CHRNA4 and moderation of the effect of maltreatment on child personality. *Journal of Child Psychology and Psychiatry*, 54(8), 872–880.

<sup>515</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2011) Differential susceptibility to rearing environment depending on dopamine-related genes: New evidence and a meta-analysis. *Development and Psychopathology*, 23(1), 39–52. This claim may have been influenced by Plessner, the doctoral supervisor of Van IJzendoorn's doctoral supervisor Lempert, who conceptualised the relationship between humans and their environment in terms of mediators of openness and closedness. See Plessner, H. ([1928] 2019) *Levels of Organic Life and the Human*, trans. M. Hyatt. New York: Fordham University Press.

<sup>516</sup> Dragan, W., Oniszczenko, W., Czerski, P. M., & Dmitrzak-Węglarz, M. (2012) Dopamine genes and sensory sensitivity as a temperamental trait: A family-based association study. *Journal of Individual Differences*, 33(4), 205–211.

<sup>517</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2012) Integrating temperament and attachment: The differential susceptibility paradigm. In M. Zentner & R. L. Shiner (eds), *Handbook of Temperament* (pp. 403–424). New York: Guilford, p. 419. A degree of supportive evidence for openness to experience as an indicator of differential susceptibility is offered by Slagt, M., Dubas, J. S., Denissen, J. J., Deković, M., & van Aken, M. A. (2015) Personality traits as potential susceptibility markers: Differential susceptibility to support among parents. *Journal of Personality*, 83(2), 155–166.

<sup>518</sup> M. Van IJzendoorn, personal communication, September 9, 2024.

<sup>519</sup> Sasaki, J. Y. & Kim, H. S. (2017) Nature, nurture, and their interplay: A review of cultural neuroscience. *Journal of Cross-Cultural Psychology*, 48(1), 4–22.

proposed that this would be a consequence of lower thresholds for experiencing pleasure and/or displeasure. Fonagy and colleagues have argued for an additional factor.<sup>520</sup> Where individuals have learnt in close relationships, including attachment relationships or in therapy, that communications from others are likely to have high personal relevance and be helpful, Fonagy and colleagues propose they will be more open to change for good or bad.

On the contrary, where individuals have learnt to distrust others, this will reduce their openness to adjusting current perspectives and plans.<sup>521</sup> Such circumstances may include avoidant or resistant attachment relationships, or historical or organizational circumstances that foster scepticism of others' good intentions or competence. Fonagy and colleagues have wavered on whether disorganized attachment would be associated with decreased susceptibility to the environment on the basis of low trust in others, increased susceptibility to the environment on the basis of no fixed strategy, or either depending on the circumstances.<sup>522</sup>

Van IJzendoorn and Bakermans-Kranenburg have characterized the proposals of Fonagy and colleagues as interesting,<sup>523</sup> and accepted the underlying point: even if Belsky and other researchers have allowed a conceptual place for learnt susceptibility or unsusceptibility, they have nonetheless tended to write and research *as if* indicators of differential susceptibility were unlearnt. Prototypically, the DRD4 7-repeat polymorphism is assumed to predate the environments in which it interacts. Yet Van IJzendoorn and Bakermans-Kranenburg emphasized that the functioning of genes is shaped by environmental factors, both pre- and postnatally, which alter methylation level and gene expression.<sup>524</sup>

Maternal report of temperament is also already environmental. Van IJzendoorn and Bakermans-Kranenburg accepted Sroufe's point that maternal report of temperament will reflect emergent properties of the child-caregiver attachment relationship. Maternal report of temperament is by no means reducible to qualities innate to the child. In a behavioural genetics study with Van Wijk and colleagues, Van IJzendoorn and Bakermans-Kranenburg calculated that individual differences in maternal report of fearful temperament were 35% genetic and 65% environmental.<sup>525</sup>

Susceptibility may be predisposed by genes that alter the expression of neurotransmitters that shape sensitivity to interactions, but also by anything and everything that allows the world we encounter to inscribe itself deeper and harder into us. This is a classic argument, already present in Aristotle: nurture as well as nature can shape the extent to which

<sup>520</sup> Fonagy, P., Allison, E., & Campbell, C. (2019) Mentalising, resilience and epistemic trust. In A. Bateman & P. Fonagy (eds), *Handbook of Mentalising in Mental Health Practice* (2nd ed., pp. 63–77). Washington, DC: American Psychiatric Association.

<sup>521</sup> Fonagy, P., Luyten, P., Allison, E., & Campbell, C. (2017) What we have changed our minds about: Part 2. Borderline personality disorder, epistemic trust and the developmental significance of social communication. *Borderline Personality Disorder and Emotion Dysregulation*, 4, 9.

<sup>522</sup> Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press, chapter 4.

<sup>523</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2018) Disorganized attachment, entropic care, epistemic trust, and 'unusual' beliefs. Paper presented at the Epistemic Petrification Conference, 2–3 July 2018, Bristol University.

<sup>524</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2015) The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology*, 66, 381–409; Dall'Aglio, L., Rijlaarsdam, J., Mulder, R. H., Neumann, A., Felix, J. F., Kok, R., ... & Cecil, C. A. (2022) Epigenome-wide associations between observed maternal sensitivity and offspring DNA methylation: A population-based prospective study in children. *Psychological Medicine*, 52(13), 2481–2491.

<sup>525</sup> Van Wijk, I. C., Huffmeijer, R., Bosdriesz, J. R., Bakermans-Kranenburg, M. J., Koliijn, L., Van IJzendoorn, M. H., ... & van den Bulk, B. G. (2019) Behavioral genetics of temperament and frontal asymmetry in early childhood. *Journal of Experimental Child Psychology*, 179, 348–361, p. 356.

what we encounter can redirect who we become.<sup>526</sup> In line with this position, a further step encouraged by Fonagy and colleagues would be for research to attend to how and when individuals can learn to be susceptible or be made more susceptible by their social or historical environment, for better and for worse.<sup>527</sup> Such a programme of work would benefit from dialogue with existing studies of clinical interventions and relapse prevention,<sup>528</sup> as well as studies of psychopharmacological causes of hyper-plastic states.<sup>529</sup> In turn, research on phenomena such as hardiness may help shed light on learned unsusceptibility. After all, in numerous adverse situations unsusceptibility is a major asset.<sup>530</sup>

Van IJzendoorn and Bakermans-Kranenburg have characterized the idea of environmentally induced susceptibility or unsusceptibility as very important and pervasive, as even the expression of genetic differential susceptibility is likely effected by experience.<sup>531</sup> Belsky and Pluess have likewise agreed that it would be worthwhile to examine environmentally induced susceptibility to improve the clinical efficacy of interventions.<sup>532</sup> Where learnt differential susceptibility has similar or different correlates to genetic differential susceptibility, this may help shed light on the mechanism of each, perhaps identifying some processes in common such as factors contributing to individuals' responsiveness to reward, attentional processing, and attribution biases, or the integration of affective information into action planning.<sup>533</sup> For instance, both genetic and socio-developmental factors may contribute to a tendency towards rumination, which in turn can contribute to positive or negative outcomes depending on circumstances.<sup>534</sup>

<sup>526</sup> Aristotle (1987) *De Anima*, trans. Hugh Lawson-Tancred. London: Penguin; Aristotle (2018) *Rhetoric*, trans. C. D. C. Reeve, London: Hackett. For discussion of Aristotle and human development by Van IJzendoorn and Bakermans-Kranenburg, see Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2011) On embodied and situational morality: Neurobiological, parental and situational determinants of altruism and donating to charity. In D. de Ruyter & S. Miedema (eds), *Moral Education and Development* (pp. 11–30). Rotterdam: Sense Publishers.

<sup>527</sup> Asen, E., Campbell, C., & Fonagy, P. (2019) Social systems: Beyond the microcosm of the individual and family. In A. Bateman & P. Fonagy (eds), *Handbook of Mentalising in Mental Health Practice* (pp. 229–243). Washington, DC: American Psychiatric Association.

<sup>528</sup> Knapen, S., Hutsebaut, J., van Diemen, R., & Beekman, A. (2020) Epistemic trust as a psycho-marker for outcome in psychosocial interventions. *Journal of Infant, Child, and Adolescent Psychotherapy*, 19(4), 417–426.

<sup>529</sup> Brouwer, A. & Carhart-Harris, R. L. (2021) Pivotal mental states. *Journal of Psychopharmacology*, 35(4), 319–352.

<sup>530</sup> Eschleman, K. J., Bowling, N. A., & Alarcon, G. M. (2010) A meta-analytic examination of hardiness. *International Journal of Stress Management*, 17(4), 277–307; Thomassen, Å. G., Hystad, S. W., Johnsen, B. H., Johnsen, G. E., & Bartone, P. T. (2018) The effect of hardiness on PTSD symptoms: A prospective mediational approach. *Military Psychology*, 30(2), 142–151. Cf. Hartman, S. & Belsky, J. (2016) An evolutionary perspective on family studies: Differential susceptibility to environmental influences. *Family Process*, 55(4), 700–712: 'Additional costs of increased plasticity derive from dependence on a more complex developmental system designed to receive and translate information from the environmental conditions to regulate development (Belsky & Pluess, 2013) As delineated by DeWitt, Sih, and Wilson (1998), reliance on a more complex system incurs costs across several areas, some of which include energetic costs of the sensory and regulatory mechanisms of plasticity, the production cost of environmentally inducible structures and processes, and the cost of acquiring information about the environment. On the other hand, less plastic individuals may rely on more simple systems and thus can expend energy to enhance other areas of development. Therefore, plasticity is not an unmitigated good but rather a trade-off that confers both costs and benefits to the organism' (701).

<sup>531</sup> For example, Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Coughlan, B., & Reijman, S. (2020) Annual research review: Umbrella synthesis of meta-analyses on child maltreatment antecedents and interventions: Differential susceptibility perspective on risk and resilience. *Journal of Child Psychology and Psychiatry*, 61(3), 272–290, p. 286.

<sup>532</sup> Pluess, M., & Belsky, J. (2013) Vantage sensitivity: Individual differences in response to positive experiences. *Psychological Bulletin*, 139(4), 901–916, p. 912.

<sup>533</sup> See also Homberg, J. R. & Jagiellowicz, J. (2022) A neural model of vulnerability and resilience to stress-related disorders linked to differential susceptibility. *Molecular Psychiatry*, 27(1), 514–524.

<sup>534</sup> Harding, K. A. & Mezulis, A. (2017) Is rumination a risk and a protective factor? *Europe's Journal of Psychology*, 13(1), 28. There is also preliminary neuroscientific evidence that children with lower connectivity within the central executive network are more susceptible to hostile or supportive parenting. Ding, Q., Xu, J., Peng, S.,



## Differential Susceptibility 2.0

Since 2022, Belsky and his students have presented a version of differential susceptibility they refer to as version 2.0. They have come to agree with Van IJzendoorn and Bakermans-Kranenburg that differential susceptibility is both a dimension and variegated by domain. Growing alignment with IJzendoorn and Bakermans-Kranenburg on the nature of differential susceptibility may perhaps account for why Belsky did not follow up his recommendations for screening and targeting of resources after 2015. Screening and targeting of resources could still be justifiable if differential susceptibility is both a dimension and variegated by domain, but it complicates the picture considerably, along with the implications for translation in policy and practice.

A doctoral study by Zhang, supervised by Belsky, drew data from the NICHD study, restricted to white participants.<sup>535</sup> Differential susceptibility to various forms of environmental factors were examined. The initial analyses composited maternal report of child temperament and a polygenic plasticity score. Across these domains, Zhang and colleagues found that susceptibility is, in fact, normally distributed, with a nice bell curve. ‘Orchids’ and ‘dandelions’ were rare and not representative.<sup>536</sup>

Susceptibility to caregiver behaviour (HOME Inventory + sensitivity\*) for cognitive development was associated with susceptibility to childcare quality for the same outcome ( $r = 0.25$ ). Susceptibility to caregiver behaviour (HOME Inventory + sensitivity\*) for externalizing difficulties was somewhat associated with susceptibility to quantity of centre-based care for the same outcome ( $r = 0.07$ ). However, the more susceptible children were to the effects of caregiver behaviour for behavioural development, the less susceptible they were to the effect of daycare for cognitive development ( $r = -0.09$ ). These findings suggest that differential susceptibility is not domain general. Zhang, Belsky, and colleagues considered that there may even be small trade-offs between susceptibility in different areas of our lives.<sup>537</sup> Differential susceptibility may itself be differential between domains, though the researchers did not formally test this (e.g., with a likelihood ratio test).

A further analysis by Zhang, Belsky, and colleagues distinguished between maternal report of child temperament and the composite score of candidate genes.<sup>538</sup> In general, difficult infant temperament was associated with greater susceptibility to both family and daycare factors, whereas the composite score from candidate genes was only related to greater susceptibility to daycare but not caregiving. It may be that, as Van IJzendoorn and Bakermans-Kranenburg predicted, maternal report of child temperament is picking

Chen, J., Luo, Y., Li, X., ... & Qin, S. (2024) Brain network integration underpins differential susceptibility of adolescent anxiety. *Psychological Medicine*, 54(1), 193–202. Reduced mental integration and self-monitoring might have a basis in genetic differential susceptibility. Yet Bowlby specifically predicted that dynamics in attachment relationships promoting segregated systems would also be expected to have just this effect, suggesting that weak mental integration and self-monitoring may also develop over time in the context of attachment relationships.

<sup>535</sup> Zhang, X., Widaman, K., & Belsky, J. (2023) Beyond orchids and dandelions: Susceptibility to environmental influences is not bimodal. *Development and Psychopathology*, 35(1), 191–203.

<sup>536</sup> Elsewhere Belsky’s collaborator Pluess and colleagues have drawn attention to moderately susceptible individuals, who they characterize as ‘tulips’—though without any clear conceptual payoff for continuing to flog the botanical metaphor. Lionetti, F., Aron, A., Aron, E. N., Burns, G. L., Jagiellowicz, J., & Pluess, M. (2018) Dandelions, tulips and orchids: Evidence for the existence of low-sensitive, medium-sensitive and high-sensitive individuals. *Translational Psychiatry*, 8(1), 24.

<sup>537</sup> Zhang and colleagues acknowledge that ‘the latent potential to be more or less susceptible to environmental influence may be domain-general, but realized susceptibility could be domain-specific, depending on the degree to which a particular environment encourages or discourages particular ways of behaving.’ Zhang, X., Widaman, K., & Belsky, J. (2023) Beyond orchids and dandelions: Susceptibility to environmental influences is not bimodal. *Development and Psychopathology*, 35(1), 191–203, p. 201.

<sup>538</sup> Belsky, J., Zhang, X., & Saylor, K. (2022) Differential susceptibility 2.0: Are the same children affected by different experiences and exposures? *Development and Psychopathology*, 34(3), 1025–1033.

up a broader facet of susceptibility, including but not limited to those predisposed by genetic differential susceptibility. Nonetheless, given the different correlates of maternal report of child temperament and the composite score from candidate genes, such findings raise questions for presumptions about a latent factor underpinning different indicators of differential susceptibility.

As we saw earlier, critical to accounts of the NICHD findings from the mid-2000s was a 'plus' to balance a 'minus' narrative, in which the effects of quality of care on cognitive and language development were treated as a 'plus' to balance the 'minus' effects of quantity of care on behaviour problems. This narrative appears to have helped sustain the ability of the NICHD co-investigators to function as a group, given their diverging views. In a 2022 paper, Belsky, Zhang, and Sayler observed that if differential susceptibility may be somewhat domain-specific rather than domain-general, this raises the question of whether the children susceptible to the effects of the quality of care on their cognitive and language development were the same children susceptible to the effects of quantity of care on their behaviour.<sup>539</sup> As such, this analysis questioned the 'plus' to balance a 'minus' narrative, asking whether the plus and minus were experienced by different children.

In fact, around half of children categorized as highly susceptible to the quality of care proved highly unsusceptible to the quantity of care they received, and vice versa. This suggests for many children susceptibility to one kind of experience does not translate into susceptibility to another. Yet Belsky and colleagues found that those children who were more susceptible to either or both kinds of effects scored significantly higher on an index of the 'top tier' genetic indicators of differential susceptibility (5-HTTLPR, DRD4, and BDNF), though the detected effect size was small.<sup>540</sup> These findings provide initial indication that these forms of genetic differential susceptibility may be relatively domain-general, at least in terms of aspects of childcare experience.

A doctoral study by Sayler, supervised by Belsky, likewise analysed data from the NICHD study to examine whether susceptibility to caregiving and child report of parent-child closeness was related to susceptibility to child-reported peer influence on their behaviour, in terms of prediction of adolescent social competence and externalizing behaviours.<sup>541</sup> In fact, only 7% of the sample proved highly susceptible to the putative effects of both parents and peers; 10% appeared highly unsusceptible to either aspect of their environment. So, the 'orchids' and 'dandelions' metaphor seemed accurate for a small minority of the sample. A further 15% appeared highly susceptible to peer influence on their behaviour but unsusceptible to influence from their caregiving context, and 19% appeared highly susceptible to parental influence but not peers. The researchers did not test how a model assuming a single general susceptibility would perform against a model assuming differences in domain susceptibility. To Sayler, Belsky, and colleagues, the findings appeared to suggest that more than a third of the sample proved highly susceptible only in one environment and not the other. They argued that such findings might indicate that targets of effective intervention would vary considerably for these groups of children: some might benefit considerably more from a school-and-peer-based intervention and not from a family-based intervention, for other children the reverse might be true. Again, these results

<sup>539</sup> Ibid.

<sup>540</sup> Belsky, J., Newman, D. A., Widaman, K. F., Rodkin, P., Pluess, M., Fraley, R. C., ... & Roisman, G. I. (2015) Differential susceptibility to effects of maternal sensitivity? A study of candidate plasticity genes. *Development and Psychopathology*, 27(3), 725–746, p. 729, and Table 2 for the 'tiers'.

<sup>541</sup> Sayler, K., Zhang, X., Steinberg, L., & Belsky, J. (2022) Parenting, peers and psychosocial adjustment: Are the same—or different—children affected by each? *Journal of Youth and Adolescence*, 51(3), 443–457.

offered most support for the idea of susceptibility as domain-specific, while suggesting that domain-general differential susceptibility is relevant for some children.

A later study by Markovitch and colleagues investigated similar questions using data from the Longitudinal Israeli Study of Twins, when the sample were 11 years old.<sup>542</sup> Markovitch and colleagues praised 'differential susceptibility 2.0' as a clear advance, and expressed admiration and approval for the turn to conceptualization and investigation of differential susceptibility as continuous and multidimensional. As in the NICHD study, the researchers had available a wide variety of measures of the environment, including observed caregiving, and child report of relationships with parents, peers, and their twin. They also had a variety of outcome measures including empathy, prosocial behaviour, aggression, and self-esteem, with information from multiple respondents. These measures were different to those in NICHD, and Markovitch and colleagues analysed them with different, more data-driven, and inductive statistical techniques: their ambition was to pursue a conceptual replication.<sup>543</sup>

Markovitch and colleagues found that differential susceptibility appeared to be strongly continuous rather than categorically distributed. A principal components analysis identified one component that accounted for 28% of variance in susceptibility across domains, again suggesting some degree of domain-general susceptibility but with domain-specific susceptibility as more common. Some children in the sample showed susceptibility to contexts involving almost all environmental domains and many developmental outcomes, suggesting a more domain-general pattern. On the other hand, other groups of children showed susceptibilities to only specific contexts, such as parental effects. Another group of children showed limited susceptibility, with the partial exception of effects on aggressive behaviour. Identical twins had more similar patterns of susceptibility than non-identical twins, indicating that environmental susceptibility is partially heritable. These findings align well with those of Belsky's students.

Overall, differential susceptibility 2.0 appears to represent an exciting programme of research, within and beyond developmental science. Originally inspired by an attempt to mediate an acrimonious debate between attachment and temperament researchers, differential susceptibility theory has been one of the major exports from developmental psychopathology to the wider scientific community. Indeed, whilst there had been considerable influence of biomedical science on the theory and methods of attachment research from the 2000s, proposals regarding differential susceptibility by Belsky, Van IJzendoorn, and Bakermans-Kranenburg were among the few ideas to travel in the other direction.

One limitation on differential susceptibility 2.0 is that evidence to date has been correlational rather than experimental. As Bakermans-Kranenburg and Van IJzendoorn have emphasized, given the variety of potential confounds, any proposals regarding differential susceptibility must be regarded as tentative until supported by replicated experimental evidence.<sup>544</sup>

Another limitation on differential susceptibility 2.0 is that further work remains to be done in establishing the theoretical and practical ramifications of the shift from 1.0. For example, the original evolutionary model for 1.0 was that evolution is 'hedging

<sup>542</sup> Markovitch, N., Hart, Y., & Knafo-Noam, A. (2024) Environmental susceptibility for all: A data-driven approach suggests individual differences in domain-general and domain-specific patterns of environmental susceptibility. *Development and Psychopathology*, early view.

<sup>543</sup> Crandall, C. S., & Sherman, J. W. (2016) On the scientific superiority of conceptual replications for scientific progress. *Journal of Experimental Social Psychology*, 66, 93–99.

<sup>544</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2015) The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology*, 66(1), 381–409.

its bets' concerning the characteristics necessary for reproductive success. This explanation remains possible, but gets messy, when required to account for the kinds of domain-specificity hypothesized by current research.

Attachment researchers at the clinical interface, such as Lyons-Ruth, have ignored ideas of differential susceptibility. The original version of the theory characterized inherently more and less susceptible children which, while resonating with what many clinicians see, has been perceived as not of much clinical use.<sup>545</sup> Exceptions include Fonagy and collaborators, and Slade and collaborators, who have acknowledged differential susceptibility theory as a constraint on prevailing clinical theories, and offered reflections on the latent dimension of human susceptibility, though not included measures of susceptibility in their empirical studies.<sup>546</sup> Yet differential susceptibility theory 2.0 has considerable clinical implications, including the proposal that some children can be helped best through peer support rather than adult support, and others the opposite. If so, it may be hoped that such claims will be able to be established descriptively and experimentally.

Attachment researchers with lines of genealogical descent from Ainsworth have generally not pursued studies of gene x environment interaction. The primary exception is Cassidy, perhaps due to links with Belsky from their time together at Penn State.<sup>547</sup> The assumption has remained that attachment and temperament are competing forms of explanation. This has been slow to shift but may be facilitated by the theoretic work entailed by the transition to differential susceptibility theory 2.0.

Nonetheless, developmental psychologists engaged in attachment research outside of those with filiation from Ainsworth or a clinical focus have been interested by potential interactions between attachment and temperament, especially groups with an interest in integrating psychological and biological theory and methods. This has included the VU Amsterdam group, Wazana's group at McGill, and Spangler's group at the Friedrich-Alexander-University of Erlangen-Nuremberg.<sup>548</sup>

Certainly there is considerable scope for inquiry over the coming years. Differential susceptibility may help us understand:

<sup>545</sup> Eagle, M. N. (2014) Psychoanalysis needs a better developmental theory—Can new perspectives in biology help? *Neuropsychanalysis*, 16(1), 29–33.

<sup>546</sup> Fonagy, P. & Campbell, C. (2015) Bad blood revisited: Attachment and psychoanalysis, 2015. *British Journal of Psychotherapy*, 31(2), 229–250; Luyten, P. (2015) Unholy questions about five central tenets of psychoanalysis that need to be empirically verified. *Psychoanalytic Inquiry*, 35(sup1), 5–23; Slade, A., with Sadler, L. S., Eaves, T., & Webb, D. L. (2023) *Enhancing Attachment and Reflective Parenting in Clinical Practice: A Minding the Baby Approach*. New York: Guilford Press.

<sup>547</sup> For example, Cassidy, J., Woodhouse, S. S., Sherman, L. J., Stupica, B., & Lejuez, C. W. (2011) Enhancing infant attachment security: An examination of treatment efficacy and differential susceptibility. *Development and psychopathology*, 23(1), 131–148. Though recently see Cuyvers, B., Ein-Dor, T., Houbrechts, M., Freson, K., Goossens, L., Van Den Noortgate, W., ... & Bosmans, G. (2024) Exploring the role of OXTR gene methylation in attachment development: A longitudinal study. *Developmental Psychobiology*, 66(5), e22496.

<sup>548</sup> For example, De Schipper, J. C., Oosterman, M., & Schuengel, C. (2012) Temperament, disordered attachment, and parental sensitivity in foster care: differential findings on attachment security for shy children. *Attachment & Human Development*, 14(4), 349–365; Lang, K., Bovenschen, I., Gabler, S., Zimmermann, J., Nowacki, K., Kliwer, J., & Spangler, G. (2016) Foster children's attachment security in the first year after placement: A longitudinal study of predictors. *Early Childhood Research Quarterly*, 36, 269–280; Fong, M. C., Measelle, J., Conrads, E., & Ablow, J. C. (2017) Links between early baseline cortisol, attachment classification, and problem behaviors: A test of differential susceptibility versus diathesis-stress. *Infant Behavior and Development*, 46, 158–168; Corval, R., Mesquita, A., & Soares, I. (2020) Links between reactive attachment disorder, caregiving and temperament: A differential susceptibility perspective. *The Journal of Genetic Psychology*, 181(5), 405–412; Potter-Dickey, A., Letourneau, N., Silveira, P. P., Ntanda, H., Giesbrecht, G. F., Hart, M., ... & de Koning, A. J. (2021) Associations among parental caregiving quality, cannabinoid receptor 1 expression-based polygenic scores, and infant–parent attachment: Evidence for differential genetic susceptibility? *Frontiers in Neuroscience*, 15, 704392.

- how and when children develop an organized rather than a disorganized attachment relationship in contexts of adversity;
- how and when individuals will develop an unresolved state of mind following loss or trauma;
- or which parents will display alarming caregiving behaviour when feeling overwhelmed by frightening memories or circumstances.

For instance, a recent doctoral study by Shah, supervised by Wazana, found that a composite score of candidate genes interacted with both prenatal stress and postnatal maternal sensitivity in predicting avoidant attachment in the Strange Situation. She also found that a composite score of candidate genes for ADHD interacted with maternal sensitivity in predicting disorganized attachment.<sup>549</sup>

It may be that attachment theory and research will also have more to teach differential susceptibility theory about the role of learnt susceptibility. That may include through the potential contribution of secure attachment to vagance sensitivity, or the contribution of attachment-based interventions to susceptibility to the environment. One of the most significant limitations of research to date on differential susceptibility has been that studies have been opportunistic in selection of candidate genes and other measures, rather than informed by a theoretical, predictive structure. If attachment theory can offer insights into learnt susceptibility, this may have further implications for comprehending the latent dimension or dimensions of susceptibility itself, and help develop such a theoretical, predictive structure.

## Life-History Theory

### An Evolutionary Perspective on Attachment

At the same time that he was starting to develop differential susceptibility theory, in the mid-1990s, Belsky was also articulating a sustained line of criticism of Ainsworth, Main, Sroufe, and other attachment researchers, arguing that they had left behind the ‘secure base’ of Bowlby’s attachment theory in evolutionary science.<sup>550</sup> Ainsworth barely mentioned evolutionary theory or biology except when citing Bowlby or Hinde. Main let the topic go after her initial enthusiasm and integration of the idea of conditional strategies into attachment theory. Sroufe was oriented by a quest to understand how individuals come to see the world and their place in it and tended to treat biological or evolutionary forms of explanation as a distraction or potentially in conflict. Belsky felt that such neglect of evolutionary science by attachment researchers was highly ill-judged, and that it had contributed to failures of theoretical exploration. There was growing interest in attachment and mating in evolutionary perspective in the late 1990s.<sup>551</sup> In line with this, but going further,

<sup>549</sup> Shah, S. (2023) Prenatal and postnatal genetic and environmental predictors of attachment. Unpublished doctoral thesis, McGill University.

<sup>550</sup> Simpson, J. A. & Belsky, J. (2008) Attachment theory within a modern evolutionary framework: Theory, research, and clinical applications. In *Handbook of Attachment* (2nd ed., pp. 131–157). New York: Guilford: ‘At its (secure) base, attachment theory is an evolutionary theory of human social behavior “from the cradle to the grave” (Bowlby, 1979, p. 129)’ (150). Simpson and Belsky may have drawn this metaphor from Chisholm, J. S. (1996) The evolutionary ecology of attachment organization. *Human Nature*, 7, 1–37.

<sup>551</sup> For example, Crittenden, P. M. (1997) Patterns of attachment and sexual behaviour. In L. Atkinson & K. J. Zuckerman (eds), *Attachment and Psychopathology* (pp. 34–84). New York: Guilford Press; Hazan, C. & Diamond, L. M. (2000) The place of attachment in human mating. *Review of General Psychology*, 4(2), 186–204.

Belsky's call was for a wider renewal of attachment researchers through reengagement with evolutionary biology.

Bowlby had considered that aggressive behaviour would have been prevalent in the environment in which humans evolved, as it could contribute to survival and reproduction.<sup>552</sup> In his later work, he agreed with Emmy Gut that depression might represent an evolutionary adaptation 'to facilitate and protect concentration on intensified conscious and unconscious scanning, exploration, and integration of relevant experience in ways that can lead to a resolution of the internal deadlock, or to the recognition that the situation cannot be changed, so that a fruitless effort to do so is abandoned.'<sup>553</sup> Bowlby's final work was a large biography of Charles Darwin.<sup>554</sup> However in this book Bowlby did not consider attachment theory on the basis of Darwin's evolutionary theory, or developments in evolutionary theory attentive to the limitations of Darwin. Belsky felt this had been a missed opportunity for attachment theory to renew its basis in biological and evolutionary science.

Whatever priority Bowlby had given to adaptation to the environment, Belsky felt had been lost by his successors. Perhaps in part out of fidelity to Bowlby, and partly a lack of relevant expertise, developmental scientists working on attachment had duct-taped shut the opening between evolutionary science and attachment research.<sup>555</sup>

In notes shared with Ainsworth and close collaborators following a workshop in 1987, Waters acknowledged that attachment research was founded on the 'application of ethological method to attachment behavior (may have to rediscover this one someday)'.<sup>556</sup> In these notes, he distinguished 'three perspectives in contemporary attachment':

- A. Biological—interest in evolution of secure base behavior, definition of biological biases in learning ability, analysis of attachment behavior control system. (Note: Is control system to be taken literally or as a metaphor?) This is traditional 'attachment' research and theory. This area is probably not a primary interest for many people today. The psychological concept of 'security' is not really central here.
- B. Developmental—interest in process of acquisition, definition of phases in development, transformations, stability, change, and relations to other aspects of normal development. This is sure to be the point of intersection for most of our interests.
- C. Personality/Mental Health—interest in conceptualizing individual differences across the lifespan, attachment working models as assets and liabilities, role of early and adult attachment in adjustment problems, intervention in attachment relationships, and attachment in clinical populations. This is probably where the action will be next.<sup>557</sup>

<sup>552</sup> Bowlby, J. (1973) *Separation: Anxiety and Anger*. New York: Basic Books, p. 285.

<sup>553</sup> Gut, E. (1989) *Productive and Unproductive Depression*, London: Routledge, p. 1. See also Bowlby, J. ([1974] 2019) Psychological processes evoked by a major psychosocial transition. In Duschinsky, R. & White, K. (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 97–103), London: Routledge.

<sup>554</sup> Bowlby, J. (1990) *Charles Darwin: A Life*, New York: W. W. Norton.

<sup>555</sup> Cf. Waters, E. & Eagle, M. (2023) Cross-cultural criticisms of attachment: A taxonomy and the method and advantages of charitable interpretation. Presentation to the Rapaport-Klein Study Group, <https://www.psychomedia.it/rapaport-klein/Waters-Slides-2023.pdf>. 'Neither attachment theorists nor their critics are necessarily expert in evolutionary analysis.... There is room for corrections and clarifications on both sides.'

<sup>556</sup> Waters, E. (1987) Outline for Winter Attachment Project: Compiled from written briefs (12/87). Unpublished manuscript, Everett Waters personal archive.

<sup>557</sup> Ibid. Also of note here are the notes Waters, E. (1988) Whither attachment theory? Normal science questions. Unpublished manuscript, Everett Waters archive: 'What do we gain by using the biological underpinnings of attachment theory? Would it make more sense just to go with a mental health theory of attachment?'

In the 1990s, Belsky was dismayed at the apparent lack of curiosity of developmental scientists about the evolutionary basis for individual differences. There were exceptions among developmental scientists such as Daly and Wilson at McMaster,<sup>558</sup> and Bjorklund at Florida Atlantic.<sup>559</sup> And among attachment researchers, again the Grossmanns were an exception.<sup>560</sup> Generally, though, ‘what might be considered striking in light of the dramatic changes that have taken place in thinking about evolution and natural selection since Bowlby first advanced his theory is how little modern evolutionary thinking has shaped developmental psychology, in general, and thinking about attachment, in particular.’<sup>561</sup>

In Ainsworth’s view, ‘the ordinary expectable social environment for a young child is both responsive and protective. These assumptions imply a fundamental compatibility between man and society.’<sup>562</sup> In contrast, forms of insecurity were believed to represent ‘developmental anomalies.’<sup>563</sup> Bowlby’s collaborator Robert Hinde criticized these claims in the 1980s as a poor fit with evolutionary theory or ethological research, but failed to win over the research community, with exceptions such as Lamb and Thompson (Chapter 1).<sup>564</sup>

Belsky held that attachment researchers had absorbed from Ainsworth the assumption that security is the natural and optimal state, with insecurity considered as a deviation and deficiency. In Belsky’s view, this was naïve: ‘an idealized and romantic view of human nature.’<sup>565</sup> He agreed with anthropologist critics of attachment research that there seemed to be implicit value judgements contained in the account of security offered by Ainsworth and accepted by her successors.<sup>566</sup>

Additionally, Belsky held that attachment researchers had been complacent in taking up Main’s concept of conditional strategies, failing to ask questions about how and why these strategies evolved. The relationship between the ideas of ‘adaptive strategies’ and ‘attentional strategies’ as aspects of ‘conditional strategies’ remained underdeveloped (Chapter 1). In particular, if behavioural repertoires were selected for by human evolution (conditional strategies), as Main proposed, some benefits to insecurity should be expected (adaptive strategies). However, following Main’s interpretation of her concepts, researchers had come to treat security/insecurity as equivalent to good/bad, a perspective that failed

<sup>558</sup> For example, Daly, M. & Wilson, M. (1980) Discriminative parental solicitude: A biological perspective. *Journal of Marriage and the Family*, 277–288.

<sup>559</sup> For example, Geary, D. C. & Bjorklund, D. F. (2000) Evolutionary developmental psychology. *Child Development*, 71(1), 57–65; Bjorklund, D. F. & Pellegrini, A. D. (2002) Evolutionary developmental psychology. In D. F. Bjorklund & A. D. Pellegrini (eds), *The Origins of Human Nature: Evolutionary Developmental Psychology* (pp. 3–10). American Psychological Association.

<sup>560</sup> For example, Grossmann, K. E. (2001) Die Geschichte der Bindungsforschung: Von der Praxis zur Grundlagenforschung und zurück. In G. J. Suess, H. Scheuerer-Engelsch, & W.-K. P. Pfeifer (eds), *Bindungstheorie und Familiendynamik* (pp. 29–52). Gießen: Psychosozial-Verlag.

<sup>561</sup> Belsky, J. (2005) The developmental and evolutionary psychology of intergenerational transmission of attachment. In C. S. Carter, L. Ahnert, K. Grossman, S. Hrdy, M. Lamb, S. Porges, & N. Sascher (eds), *Attachment and Bonding: A New Synthesis* (pp. 169–198). Cambridge, MA: MIT Press, p. 172.

<sup>562</sup> Stayton, D. J., Hogan, R., & Ainsworth, M. (1971) Infant obedience and maternal behavior: The origins of socialization reconsidered. *Child Development* 42(4), 1057–1069, p. 1059.

<sup>563</sup> Ainsworth, M. D. S. (1979) Attachment as related to mother-infant interaction. In J. S. Rosenblatt, R. A. Hinde, C. Beer, & M. Busnel (eds), *Advances in the Study of Behavior*. Vol. 9. (pp. 1–51). New York: Academic Press, p. 44.

<sup>564</sup> Hinde, R. A. (1982) Attachment: Some conceptual and biological issues. In J. Stevenson-Hinde & C. Murray Parkes (eds), *The Place of Attachment in Human Behavior* (pp. 60–78). New York: Basic Books.

<sup>565</sup> Belsky, J. (2021) Beyond virtue. In E. Harcourt (ed.), *Attachment and Character: Attachment Theory, Ethics, and the Developmental Psychology of Vice and Virtue* (pp. 123–136). Oxford: Oxford University Press, p. 128.

<sup>566</sup> For example, Harwood, R. L., Miller, J. G., & Irizarry, N. L. (1995) *Culture and Attachment: Perceptions of the Child in Context*. New York: Guilford.

to develop a body of theory and research specifying what benefits insecurity might offer to whom, and when.<sup>567</sup>

Lamb, Marvin, Sagi-Schwartz, Chisholm, and Waters likewise criticized Main on the grounds that ‘despite her recognition of alternative or “conditional” attachment strategies, in referring to insecure attachment as a “secondary” strategy, Main may be clinging to the view that because secure attachment is “primary” it must also be “normal”’.<sup>568</sup> The same concern has been raised by anthropologist critics of attachment research.<sup>569</sup> Main’s collaborators, such as Granqvist, have generally defended her, arguing that humans will always look to form secure relationships where they can, given the benefits these offer across most, though not all, contexts.<sup>570</sup>

Belsky argued that ‘real differences in orientation remain between the modern evolutionary perspective advanced ... and traditional attachment theory. Whereas the latter places issues of mental health and psychological well-being at center stage in its effort to understand individual differences in attachment security, the former replaces such a concern with a focus upon reproducing one’s genes.’<sup>571</sup> He considered why the three organized types of attachment behaviour might have evolved. His focus on these three types was pragmatic rather than principled: ‘they have been the subject of most research and theory’. He was by no means of the view ‘that they are the only patterns that exist in nature or that 100% of infant–parent relationships can be neatly classified in such terms.’<sup>572</sup>

Belsky argued that, reflecting positive attitudes towards relationships, ‘security evolved to promote mutually beneficial interpersonal relations and high investment parenting’. This would have contributed to both individual and offspring survival under relatively more gentle conditions, where cooperation and high investment in parenting would not be penalized. Reflecting attitudes that devalue the importance of close relationships, ‘avoidant/dismissing attachment evolved to promote opportunistic interpersonal relations and low-investment parenting.’<sup>573</sup> This would have contributed to both individual and offspring survival under relatively more harsh conditions, where cooperation and high investment in parenting would be penalized.

Belsky was not exactly sure why resistant/preoccupied attachment would have evolved and contributed to individual and offspring survival. He offered the speculation that attitudes of concern with connectedness and fear of abandonment may have led individuals with resistant/preoccupied attachment to help other members of their family, and in doing so ensure survival and reproduction of the family as a protective unit. There are no anchor-points for this proposal in any research findings regarding resistant or preoccupied

<sup>567</sup> A parallel critique of the social psychological literature on attachment would later be developed by Ein-Dor. See Ein-Dor, T., Mikulincer, M., Doron, G., & Shaver, P. R. (2010) The attachment paradox: How can so many of us (the insecure ones) have no adaptive advantages? *Perspectives on Psychological Science*, 5(2), 123–141.

<sup>568</sup> Chisholm, J. S. (1996) The evolutionary ecology of attachment organization. *Human Nature*, 7(1), 1–37, p. 24. See also Lamb, M. E., Thompson, R. A., Gardner, W., & Charnov, E. L. (1985) *Infant–Mother Attachment: The Origins and Developmental Significance of Individual Differences in Strange Situation Behavior*. London: Routledge, pp. 53–56; Sagi, A. (1990) Attachment theory and research from a cross-cultural perspective. *Human Development*, 33(1), 10–22; Marvin, R. S. (1997) Ethological and general systems perspectives on child–parent attachment during the toddler and preschool years. In N. Segal, G. Weisfeld, & C. Weisfeld (eds), *Uniting Psychology and Biology: Integrative Perspectives on Human Development* (pp. 189–216). Washington, DC: American Psychological Association; Waters, E. (2002) Attachment theory—is it relevant universally? Paper presented at the International Society of Infant Studies, Toronto, Canada, April 2002.

<sup>569</sup> For example, Keller, H., & Kärtner, J. (2013) The cultural solution of universal developmental tasks. *Advances in Culture and Psychology*, 3, 63–116.

<sup>570</sup> Granqvist, P. (2020) *Attachment, Religion, and Spirituality: A Wider View*. New York: Guilford.

<sup>571</sup> Belsky, J. (1997) Attachment, mating, and parenting. *Human Nature*, 8(4), 361–381, p. 375.

<sup>572</sup> *Ibid.*, 366.

<sup>573</sup> *Ibid.*, 361.



attachment, and the tone of Belsky's proposal suggests that he knew he was clutching at straws here. He abandoned the idea in later discussions of evolutionary approaches to attachment. In a 2008 paper, he proposed that war and other threatening environments may contribute to avoidant/dismissing attachment and resistant/preoccupied attachment. However, he offers no account of what benefits resistant/preoccupied attachment might have under conditions of social threat.<sup>574</sup>

Belsky appears to have been unaware of Main's first journal article, a short note in *Behavioral and Brain Sciences*.<sup>575</sup> There Main proposed that the resistant conditional strategy was selected for by human evolution because it contributes to resource extraction within relationships. The strategy preempts trust in what others may offer by focusing attention on the other's willingness to give and protesting at signals of unavailability. She also considered that parallels of the avoidant and resistant conditional strategies may occur in all motivational systems, including sexuality and caregiving for offspring. In adults, there could be some congruence between the strategies used across different systems, though not always. As such, preoccupied states of mind could contribute to access to investment and support from a mate, where such access might otherwise be uncertain.

This proposal would converge with research on anxious attachment in social psychology.<sup>576</sup> Yet social psychologists too have argued that adult attachment styles may have only an attenuated association with caregiving styles, as care for offspring will be governed by a relatively distinct set of attitudes and motivational systems.<sup>577</sup> This is a point Belsky would later accept. Del Giudice and Belsky argued that, at a species level, the attachment motivational system of childhood may have been partly co-opted in human phylogenetic history to organize relating in couple relationships. But in terms of its functioning and potential benefits to an individual, 'it makes little sense to ask whether attachment in infants is "the same" as attachment in older children and in adults. In our framework, the motivational-behavioral system of attachment works differently at different life history stages.'<sup>578</sup>

Beyond attachment research, Belsky felt that the wider discipline of developmental science had failed to build from Bowlby's early demonstration of the value of evolutionary theory: 'It is still difficult to detect much impact of evolutionary thought on the discipline of developmental psychology as a whole, in marked contrast to its ever-expanding impact on so many other fields of psychological science.'<sup>579</sup>

Belsky sought to question the tendency across developmental science, including attachment research, to treat internalizing and externalizing behaviours as simply bad, without considering the possibility that there may be environmental niches in which these are

<sup>574</sup> Belsky, J. (2008) War, trauma and children's development: Observations from a modern evolutionary perspective. *International Journal of Behavioral Development*, 32(4), 260–271.

<sup>575</sup> Main, M. (1979) The 'ultimate' causation of some infant attachment phenomena: Further answers, further phenomena, further questions. *Behavioral and Brain Sciences*, 2, 640–643.

<sup>576</sup> Fraley, R. C., Brumbaugh, C. C., & Marks, M. J. (2005) The evolution and function of adult attachment: A comparative and phylogenetic analysis. *Journal of Personality and Social Psychology*, 89(5), 731; Schmitt, D. P. (2005) Is short-term mating the maladaptive result of insecure attachment? A test of competing evolutionary perspectives. *Personality and Social Psychological Bulletin*, 31, 747–768.

<sup>577</sup> Mikulincer, M. & Shaver, P. R. (2012) Attachment theory expanded: A behavioral systems approach to personality. In K. Deaux & M. Snyder (eds), *Oxford Handbook of Personality and Social Psychology* (pp. 467–492). Oxford: Oxford University Press.

<sup>578</sup> Del Giudice, M. & Belsky, J. (2010) Sex differences in attachment emerge in middle childhood: An evolutionary hypothesis. *Child Development Perspectives*, 4(2), 97–105, p. 101.

<sup>579</sup> *Ibid.*, parentheses suppressed.

adaptive behaviours.<sup>580</sup> Belsky argued that this represented not only an ahistorical perspective, but a kind of ethnocentrism: attachment theory and research treated internalizing and externalizing behaviours as bad without consideration of the many places in the world where they might help an individual survive. Self-destructive and risky behaviours that might appear as dysregulation or dysfunction to developmental scientists could also be viewed, in evolutionary perspective, as adaptive to environmental signals of threat or precarity. In his view, 'often these alternative ways of functioning are evolutionarily, biologically, and even psychologically sensible and strategic, not disturbed or disordered.'<sup>581</sup>

Belsky argued that this perspective has clinical implications in identifying targets for intervention. For instance, evolutionary theory would suggest that parents are most likely to neglect their children when they feel the child is seriously threatening their own resources and capacity to cope. If supported by research, this proposal would suggest that a priority target for intervention would be parents' perceptions of their child as a resource drain and their own resources as so constrained as to amount to a threat.

### Life-History Theory

Drawing on observations of animal and human behaviour, Hinde and Bowlby developed the idea that parents are more likely to invest time and resources in their children if they are not themselves under threat. In turn, children may use attachment behaviour such as crying and protesting to try to ensure parental availability. This set up the potential for parent-offspring conflict, which Hinde documented in studies of weaning in rhesus monkeys.<sup>582</sup> Reflecting on Hinde's observations of rhesus monkeys, the idea of parent-offspring conflict led biologists at Harvard to propose that natural selection might have led to the caregiving environment in childhood having signal value for humans, priming tendencies for their subsequent development.<sup>583</sup>

In population genetics and behavioural ecology, a basic idea is that individuals need to adjust their investment in survival (growth, maintenance) and in reproduction to the opportunities and threats of their environment. Since time and resources are limited, there may need to be trade-offs. Researchers observing animal populations documented that the energy and resources allocated to growth during development tends to delay the age of fertility. The time, energy and resources for ensuring the protection and provision for offspring may come at the expense of additional fertility, or even individual resources to support survival.<sup>584</sup>

Facing adversity and precarity, the Harvard researchers proposed that, biologically and socially, individuals may prepare for a shorter life span and pursue more rapid extraction of environmental resources to support reproduction, and have children at a younger age. They called this 'r-Reproductive strategy' or sometimes the 'fast' strategy. Facing a more benign and stable environment, other individuals might have children after gathering

<sup>580</sup> Belsky, J. (1997) Variation in susceptibility to environmental influence: An evolutionary argument. *Psychological Inquiry*, 8(3), 182–186, p. 183.

<sup>581</sup> Belsky, J. (2019) Early-life adversity accelerates child and adolescent development. *Current Directions in Psychological Science*, 28(3), 241–246, p. 244.

<sup>582</sup> See, for example, Hinde, R. A., Bowlby, T. E., & Spencer-Booth, Y. (1964) Behaviour of socially living rhesus monkeys in their first six months. *Proceedings of the Zoological Society of London*, 143 (4), 609–649.

<sup>583</sup> For example, MacArthur, R. H. & Wilson, E. O. (1967) *The Theory of Island Biogeography*. Princeton: Princeton University Press; Trivers, R. L. (1974) Parent-offspring conflict. *American Zoologist*, 14(1), 249–264.

<sup>584</sup> Krebs, J. R. & Davies, N. B. (1987) *An Introduction to Behavioural Ecology* (2nd ed.). New York: Blackwell.

more resources for their care. Biologically and socially, these individuals may prepare for a longer life span and pursue more efficient extraction of environmental resources to support survival of progeny.<sup>585</sup> This was called the 'K-reproduction strategy' or sometimes the 'slow' strategy. Drawing comparisons both between species and within species, research into these strategies became known as life-history theory.<sup>586</sup>

Following Stearns, often life-history theorists used financial metaphors to think about trade-offs.<sup>587</sup> The K-Reproductive strategy represented a strategy of saving resources for the future. This strategy makes good sense when inflation is not high, investments are predictable, and stand a good chance of bearing fruit. Yet when saving will not yield benefits, the r-Reproductive strategy makes sense as a way to make the most of resource before it disappears.

In a 1977 paper, Weinrich proposed that experiences of resource precarity during childhood may be of particular important, and associated with earlier reproduction, as individuals may have been disposed by evolutionary pressures to interpret childhood precarity as a signal that they should not bet on longer-term survival.<sup>588</sup> In 1982, Belsky's colleagues at Penn State, Patricia Draper and Henry Harpending applied these ideas from Harvard sociobiology to the contemporary social concern with children growing up in homes without a father.<sup>589</sup> Draper and Harpending surveyed anthropological evidence that patterns of sexual behaviour in adolescents and young adults varied as a result of whether these individuals grew up with their father present or absent. They observed that father absence was associated with early sexual behaviour and less interest in developing durable relationships with a mate in adulthood. Some studies had also observed that father absence was associated for boys with more aggressive and risk-taking behaviour, often in ways that might contribute to greater status among peers and in courtship rituals.

Influenced by Trivers and Weinrich, Draper and Harpending hypothesized that humans had evolved to interpret father absence during childhood as a signal that the environment may be less benign and stable, and as a prompt for a life strategy prioritizing reproduction rather than expecting long-term survival. Though controversial, and at times slated as deterministic, Draper and Harpending's paper met with great interest from the scientific community. For instance, Hinde was impressed and recommended the value of empirical research examining links between early care and later prosocial and aggressive behaviour.<sup>590</sup> For Hinde and his students, Draper and Harpending's proposal was analogous to the idea of parenting offering a 'weather forecast', alerting children for what they should wear, biologically and behaviourally, to best face the threats and opportunities of the environment.<sup>591</sup>

<sup>585</sup> MacArthur, R. H. (1962) Some generalized theorems of natural selection. *Proceedings of the National Academy of Sciences*, 48(11), 1893–1897.

<sup>586</sup> Pianka, E. R. (1970) On r- and K-selection. *The American Naturalist*, 104(940), 592–597; Stearns, S. C. (1976) Life-history tactics: a review of the ideas. *The Quarterly Review of Biology*, 51(1), 3–47; Stearns, S. C. & Koella, J. C. (1986) The evolution of phenotypic plasticity in life-history traits: Predictions of reaction norms for age and size at maturity. *Evolution*, 40(5), 893–913.

<sup>587</sup> Stearns, S. C. (1989) Trade-offs in life-history evolution. *Functional Ecology*, 3(3), 259–268.

<sup>588</sup> Weinrich, J. D. (1977) Human sociobiology: Pair-bonding and resource predictability (effects of social class and race). *Behavioral Ecology and Sociobiology*, 2(2), 91–118.

<sup>589</sup> Draper, P. & Harpending, H. (1982) Father absence and reproductive strategy: An evolutionary perspective. *Journal of Anthropological Research*, 38(3), 255–273.

<sup>590</sup> Hinde, R. A. (1986) Some implications of evolutionary theory and comparative data for the study of human prosocial and aggressive behaviour. In D. Olweus, J. Block, & M. Radke-Yarrow (eds), *Development of Antisocial and Prosocial Behaviour* (pp. 13–32). Orlando, FL: Academic Press.

<sup>591</sup> Bateson, P. (1994) The dynamics of parent–offspring relationships in mammals. *Trends in Ecology & Evolution*, 9(10), 399–403. See also Bateson, P., Barker, D., Clutton-Brock, T., Deb, D., D'Udine, B., Foley, R. A., ... & Sultan, S. E. (2004) Developmental plasticity and human health. *Nature*, 430(6998), 419–421.

Belsky was tremendously interested in the idea that natural selection might have led to the caregiving environment in childhood having signal value for humans, priming tendencies for their subsequent development. Belsky and Draper collaborated on a 1987 paper in the journal *Society*. Teenage motherhood had gained prominence in the United States in the period, framed in conservative policy and media discourse as contributing to welfare dependency and poor care for children, and prompting theorizing and research by social scientists.<sup>592</sup> Belsky and Draper accepted much of this political framing, arguing that action needed to be taken against teenage pregnancy to protect American society from 'the specter of generations of welfare dependency'.<sup>593</sup>

Many conservative commentators argued that teenage motherhood reflected a moral failing among young people. Belsky and Draper disagreed and distanced themselves from the tendency of commentators to use the term 'teenage parenthood' as a 'code phrase' for racist disparagement of poor black young people.<sup>594</sup> Instead, Belsky and Draper argued that evolutionary pressures have predisposed girls to early sexual activity when growing up in contexts of adversity and resource precarity. This predisposition may then be reinforced by social factors, such as pressure from relatives to add to the family and lack of optimism regarding alternative futures, such as employment and good health, that would offer benefits to delayed parenthood. As such, a predisposition from human evolutionary history, which may not be conscious, may point in the same direction as conscious, and quite rational, decision-making based on perceptions of the harshness and precarity of the environment. Between them, each may make early reproduction more probable, without either biological or social determinism being assumed.

In life-history theory terms, impoverished young women may experience biological and social cues that there is insufficient incentive to invest in the future through delayed reproduction. If so, Draper and Belsky felt that this conclusion had specific implications for intervention to reduce teenage pregnancy:

We suggest that adolescent development zones be established in which teenage girls actually receive periodic payments for remaining childless. These zones would be defined on the basis of demographic data identifying areas in which teenage parenthood can be considered to have reached epidemic proportions ... we presume that for the prevention effort to be maximally effective, it must bring immediate and tangible—not just delayed and long-term—benefits to the families of teenagers as well.<sup>595</sup>

Belsky was excited by these ideas and brought them for discussion with senior colleagues such as Bronfenbrenner and Rutter, as well as colleagues such as Chisholm, Cummings, and Weinraub. He also spoke with the ethologist Suomi.<sup>596</sup> Informed by these discussions, in papers from 1990 and 1991 Belsky, Draper, and Steinberg presented a more general theoretical argument, elaborating Weinrich's argument about the signal value of childhood experiences for development.<sup>597</sup> Belsky and colleagues suggested that what had been called the r- and K- reproductive strategies extended beyond reproduction. In fact,

<sup>592</sup> Luker, K. (1996) *Dubious Conceptions: The Politics of Teenage Pregnancy*. Cambridge, MA: Harvard University Press.

<sup>593</sup> Belsky, J. & Draper, P. (1987) Reproductive strategies and radical solutions. *Society*, 24(3), 20–24, p. 20.

<sup>594</sup> *Ibid.*, 21.

<sup>595</sup> Belsky, J. & Draper, P. (1987) Reproductive strategies and radical solutions. *Society*, 24(3), 20–24, p. 23.

<sup>596</sup> Belsky, J., Steinberg, L., & Draper, P. (1991) Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development*, 62(4), 647–670, p. 647.

<sup>597</sup> Draper, P. & Belsky, J. (1990) Personality development in evolutionary perspective. *Journal of Personality*, 58(1), 141–161; Belsky, J., Steinberg, L., & Draper, P. (1991) Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development*, 62(4), 647–670.

they represented alternate strategies to biological and psychosocial development, including puberty timing, mate attraction and selection, risk-taking, procreation and parental care, and general attitudes towards individualism versus reciprocity in relationships.

These strategies may or may not be conscious for individuals. In making reference to 'strategies', Belsky and colleagues were using the term in the same manner as Main's 'conditional strategies', in the ethological sense, to mean a pattern of traits and behaviours, made available as a repertoire by evolutionary history, and responsive to an individual's ecological niche. For Belsky and colleagues, though a strategy might well be shifted by subsequent experiences, this niche was first and foremost the early family environment. In their account, the child receives signals from their family about the level of threat they might face and is evolutionarily primed to begin to prepare for this, biologically and behaviourally, even before the child knows the wide world for which they are adapting themselves.

Belsky and colleagues acknowledged that the pattern might be less evident for fecundity in societies with access to features of modern medicine, with for instance access to contraceptives reducing the link between early sexual behaviour and number of offspring. However, otherwise across these ostensibly very different domains, Belsky and colleagues anticipated that r- and K- would display a package of distinct and opposite characteristics. While in reality there would be a continuum, in theory two life-history prototypes could be sketched:

One is characterized, in childhood, by a stressful rearing environment and the development of insecure attachments to parents and subsequent behavior problems; in adolescence by early pubertal development and precocious sexuality; and, in adulthood, by unstable pair bonds and limited investment in child rearing, whereas the other is characterized by the opposite.<sup>598</sup>

Social learning theory and psychoanalytic theory might offer aligned accounts of why adverse experiences in childhood might be linked to later opportunistic, short-term relationships, risk-taking, individualistic attitudes, and low-investment parenting. Yet Belsky was powerfully struck that only a sociobiological theory would predict both these outcomes and accelerated biological development including puberty timing:

It was not clear that a sophisticated evolutionary theory generated predictions any different from a more simple, psychological one. So why then, invoke the more sophisticated and seemingly less parsimonious explanation? What one needed, it seemed to me, was a unique and better yet, unusual prediction derived from evolutionary thinking that, if confirmed, could not simply be assimilated by a more proximate, psychological theory. It was thus a critical test of an evolutionary perspective that I found myself pondering. Fortunately, one came to me while teaching a graduate seminar on family relations one evening. And that was that in addition to shaping mating and parenting behavior, particular kinds of experience in the family might also affect somatic development, specifically, the timing of puberty. More specifically, I reasoned that a reproductive strategy emphasizing mating over parenting which would produce, at least in the environment of evolutionary adaptation, more progeny who were poorly cared for rather than few who well cared for, would be characterized by earlier maturation, as well as by more opportunistic mating with more sexual partners.<sup>599</sup>

<sup>598</sup> Ibid., 647.

<sup>599</sup> Belsky, J. (2000) Conditional and alternative reproductive strategies: Individual differences in susceptibility to rearing experience. In: J. Rodgers, D. Rowe, & W. Miller (eds), *Genetic Influences on Human Fertility and*

Pubertal timing was of particular conceptual significance as it could be anticipated to be a comparatively more pure index of psychosocial acceleration. Compared to pubertal timing, other aspects of the r- and K- strategies, such as fecundity and social attitudes, would be more impacted by social and institutional factors, such as the technological and welfare features of modern society.

Pubertal timing was a biologically and socially consequential matter. For example, endocrinologists had documented that even a few months earlier or later menarche could have considerable biological implications. First menstrual cycles are usually anovulatory: the time between menarche and regularly ovulatory cycles found to be around one year if menarche occurred before age 12, three years if menarche occurred around 12, and 4.5 years if menarche was at 13 or older.<sup>600</sup> In turn, developmental scientists had documented prediction from early puberty to later child behavioural and health outcomes, including vulnerability to mental health difficulties.<sup>601</sup>

To date developmental scientists had treated puberty timing as an independent variable, influencing later development. This reflected a broader tendency for developmental scientists in the period to treat biology as primary and nurture as secondary, assuming that biology produces the instrument and nurture writes the music. Against such assumptions, Belsky and colleagues proposed that puberty timing should be investigated as a dependent variable, *influenced* by early adversity and caregiving. Belsky wrote that he anticipated that child maltreatment would generally promote an r- strategy generally, and earlier puberty for girls specifically.<sup>602</sup> Indeed, he wondered whether, in human evolutionary history, maltreatment may have represented a way, whether conscious or unconscious, that parents prepare their offspring for a world they experience as harsh and precarious.<sup>603</sup>

In their 1990 paper, Draper and Belsky integrated their psychobiological theorizing with Belsky's interest in attachment relationships. They suggested that children with a history of secure attachment relationships may be disposed to pursue a K- strategy. From these early relationships, secure children will expect that close relationships will be rewarding and reliable. The secure attachment relationship supports the development of the interpersonal skills and psychological resources to sustain such relationships. Children with a history of insecure attachment relations may be disposed to pursue an r- strategy, based on the assumption that relationships with others cannot ultimately be trusted in the long-run, and perhaps with fewer skills for sustaining long-term relationships.

Draper and Belsky agreed with Bowlby that evolutionary pressures will have selected for the attachment motivational system because children's attachment behaviour helps

*Sexuality: Theoretical and Empirical Contributions from the Biological and Behavioral Sciences* (pp. 127–146). Boston: Kluwer, p. 131.

<sup>600</sup> Vihko, R. & Apter, D. (1984) Endocrine characteristics of adolescent menstrual cycles: Impact of early menarche. *Journal of Steroid Biochemistry*, 20(1), 231–236; Macmahon, B., Trichopoulos, D., Brown, J., Andersen, A. P., Aoki, K., Cole, P., ... & Woo, N. C. (1982) Age at menarche, probability of ovulation and breast cancer risk. *International Journal of Cancer*, 29(1), 13–16.

<sup>601</sup> For example, Patton, G. C., Hibbert, M. E., Carlin, J., Shao, Q., Rosier, M., Caust, J., & Bowes, G. (1996) Menarche and the onset of depression and anxiety in Victoria, Australia. *Journal of Epidemiology & Community Health*, 50(6), 661–666.

<sup>602</sup> Studies examining associations between maltreatment and early puberty have been inconsistent. Costello and colleagues would report findings from the Great Smoky Mountain Study that maltreated girls reached pubertal maturity eight months earlier than did nonmaltreated girls. Costello, E. J., Sung, M., Worthman, C., & Angold, A. (2007) Pubertal maturation and the development of alcohol use and abuse. *Drug and Alcohol Dependence*, 88, 50–59. However, no association has been reported by other studies, for example Hamlat, E. J., Prather, A. A., Horvath, S., Belsky, J., & Epel, E. S. (2021) Early life adversity, pubertal timing, and epigenetic age acceleration in adulthood. *Developmental Psychobiology*, 63(5), 890–902.

<sup>603</sup> Belsky, J. (1991) Psychological maltreatment: Definitional limitations and unstated assumptions. *Development and Psychopathology*, 3(1), 31–36, p. 34.

ensure the caregiver's availability for protection. However, they felt that this was only part of the story. Emergent findings of concordance between adult classifications on the Adult Attachment Interview and classifications of dyads in the Strange Situation suggested that attachment relationships also convey information. Building on Weinrich, Draper and Belsky argued that the early attachment relationship is a privileged conduit for passing information to the child about the extent to which the environment is adverse or benign, precarious or stable:

Child-rearing patterns which induce secure or insecure internal working models in the child serve the strategic function of preparing the child to successfully cope with (and reproduce) the interpersonal world which the parent (unconsciously) expects the child to encounter in the future. Thus, parents who are themselves mistrustful of close interpersonal bonds—most likely with good reason—rear their children to function effectively in an interpersonal world marked by short-term, opportunistic relationships. Parents with secure working models, in contrast, foster in their offspring interpersonal styles which will promote relationship and reproductive success in a world in which mutually rewarding, enduring relationships are the order of the day.<sup>604</sup>

A parallel argument about the role of attachment relationships in the transmission of information, seemingly unknown to Belsky and colleagues, had been made a few years earlier by the Grossmanns.<sup>605</sup> Parallels between Belsky and colleagues and the Grossmanns may stem from the fact that both sets of researchers were unusual among developmental psychologists in the period for keeping up to date with developments in evolutionary biology. A distinction is that whereas the Grossmanns considered that the attachment relationship may be important for the transmission of culture, Belsky and colleagues held that attachment relationships may be a means through which early experiences shape biological and behavioural strategies primed by human evolution.

Belsky was especially interested in attachment in this period and was inclined to draw attachment into the argument: he had first imprinted on Bowlby as a model for integrating evolutionary theory and developmental science.<sup>606</sup> Yet Belsky and colleagues underlined that there would be other sources of information available to children from their caregiving environment besides the quality of attachment relationships. Another

<sup>604</sup> Draper, P. & Belsky, J. (1990) Personality development in evolutionary perspective. *Journal of Personality*, 58(1), 141–161, p. 152.

<sup>605</sup> Grossmann, K. E., Grossmann, K., & Schwan, A. (1986) Capturing the wider view of attachment: A reanalysis of Ainsworth's Strange Situation. In C. E. Izard & P. B. Read (eds), *Measuring Emotions in Infants and Children*, Vol. 11. Cambridge: Cambridge University Press. For commentaries on the Grossmanns' proposal from a cultural anthropological perspective, see LeVine, R. A. & Norman, K. (2001) The infant's acquisition of culture: Early attachment reexamined in anthropological perspective. *Publications-Society for Psychological Anthropology*, 12, 83–104; Trommsdorff, G. & Kornadt, H. (2003) Parent–child relations in cross-cultural perspective. In Kuczynski L. (ed.), *Handbook of Dynamics in Parent–Child Relations* (pp. 271–305). Thousand Oaks, CA: Sage.

<sup>606</sup> Belsky, J. (2000) Conditional and alternative reproductive strategies: Individual differences in susceptibility to rearing experience. In J. Rodgers, D. Rowe, & W. Miller (eds), *Genetic Influences on Human Fertility and Sexuality: Theoretical and Empirical Contributions from the Biological and Behavioral Sciences* (pp. 127–146). Boston: Kluwer. 'Beyond some limited exposure to the work of developmental behavior geneticists, my training in the 1970s, just like that of many developmentalists to this very day, hardly dealt with evolution at all. In fact, in only one respect beyond behavior genetics had evolution even a category in my intellectual development. And this involved John Bowlby's (1969) theory of attachment, his notion of the environment of evolutionary adaptation that many developmentalists had come to deride, and the theoretical proposition that attachment behavior in the infant was selected it promoted survival. Given this personal intellectual history, it is thus not surprising that it was to Bowlby's (1969) theory of attachment that I first as I endeavored to think through the proximate "how" question that Draper and Harpending's (1982) provocative paper on father absence and reproductive strategy stimulated me to think about' (129).

especially important source might well be the presence or absence of coresident caregivers, and they pointed to evidence that daughters of divorced families tend to be more impulsive, to become sexually active at earlier ages, and to show other markers of a r- strategy.

Belsky and colleagues were also mindful of evidence reviewed by Bronfenbrenner and Crouter, which had documented how work conditions influence parenting. Employees who were more overloaded or with less job protection were found to be more irritable and less involved as parents.<sup>607</sup> For Belsky and colleagues, this implied that parents were, likely inadvertently, responding to difficult or precarious employment circumstances by signalling to their offspring to adopt an r- strategy rather than a K- strategy. Belsky and colleagues reflected that 'parents, via their rearing, are "preparing" their children for the world they expect them to encounter as adults.'<sup>608</sup> More than transmission of internal working models about close relationships, this represented a broader claim about the role of early family relationships in mediating associations between the harshness and precarity of parents' lives and the biological and social expectations of their offspring about their future.

Belsky and colleagues' primary intention was to propose that 'a principal evolutionary function of early experience—the first 5–7 years of life—is to induce in the child an understanding of the availability and predictability of resources (broadly defined) in the environment, of the trustworthiness of others, and of the enduringness of close interpersonal relationships':

Individuals whose experiences in and around their families of origin lead them to perceive others as untrustworthy, relationships as opportunistic and self-serving, and resources as scarce and/or unpredictable will develop behavior patterns that function to reduce the age of biological maturation (within their range of plasticity), accelerate sexual activity, and orient them toward short-term, as opposed to long-term, pair bonds.... In essence, we argue that early experiences and the psychological and biological functioning they induce lead individuals to engage in either a 'quantity' or a 'quality' pattern of mating and rearing.<sup>609</sup>

Belsky and colleagues reflected on why childhood experiences may have this important role. It may be that human evolution has made childhood a sensitive period for establishing a life-history strategy based on signals from caregivers. It may be, as Bowlby expected, that children's expectations in close relationships become self-perpetuating and in this way affect their adult life. It may also or alternately be that early experience results in neurological or endocrinal changes that affect biological and social development. However, Belsky and colleagues anticipated that a tendency towards an r- or a K- strategy may well be altered by subsequent experiences and development. They urged that further research might well be needed to examine the effects of perceptions of adverse/beneficial and stable/precarious environments across different life stages.

In general, these proposals received a relatively limited, but favourable response, mostly from colleagues interested in sociobiology and developmental science. In particular, the proposals received sustained discussion at symposia. This included a symposium chaired

<sup>607</sup> Bronfenbrenner, U. & Crouter, A. C. (1982) Work and family through time and space. In S. B. Kamerman & C. D. Hayes (eds), *Families that Work: Children in a Changing World*. Washington, DC: National Academy Press.

<sup>608</sup> Belsky, J., Steinberg, L., & Draper, P. (1991) Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development*, 62(4), 647–670.

<sup>609</sup> *Ibid.*, 650.



by Steinberg on 'Psychosocial Antecedents of the Timing of Puberty' at the biennial meeting of the Society for Research on Adolescence in Washington in 1992.<sup>610</sup> A symposium on 'Childhood in Life-history Perspective' was held at the Annual Meeting of the Society for Cross-Cultural Research in Santa Fe in 1994.<sup>611</sup>

Among commentators, Hinde's response was somewhat curmudgeonly in tone, but substantively favourable. He appreciated Belsky and colleagues' synthesis of work by the Harvard school of sociobiology with social scientific research such as attachment theory, and the generation of testable hypotheses.<sup>612</sup> Chisholm was even more enthusiastic and became a strong advocate for these ideas. He also argued for local mortality rates as another potential source of signal for children to adopt an r- strategy.<sup>613</sup> Klaus Grossmann found Belsky's proposals intriguing, though he felt that the links to attachment especially were speculative.<sup>614</sup>

Thompson was likewise generally positive but observed that associations between insecure attachment and adversity were too weak for attachment insecurity to have been assigned the role of barometer for adversity by human evolution.<sup>615</sup> Since Ainsworth, empirical studies have shown that many children raised in stable, well-resourced homes develop insecure attachments. Admittedly, Thompson acknowledged that associations between insecurity and adversity may have been stronger in the environment within which humans evolved than they would be now. He accepted that children's attachment relationships may have some kind of privileged role in shaping how children interpret and make meaning of their environment.

### Empirical Investigations of Psychosocial Acceleration

In a 1988 doctoral study supervised by Daly and Wilson at McMaster, Surbey examined contextual antecedents of menarche timing. She analysed survey data from 1,314 families in Ontario, Canada.<sup>616</sup> Total score on an inventory of difficult life events, was negatively correlated with girls' menarche ( $r = -0.14$ ), as was number of years of father absence from the home before the age of 10 ( $r = -0.13$ ). With life events controlled, years of father absence was still a predictor of timing of menarche, though the association was slightly reduced. Surbey found that the younger a girl was when her father left the home, the earlier her menarche. Additionally, she found that girls who lived with stepfathers before menarche tended to mature earlier than those who did not have stepfathers. There was no effect of family variables on puberty timing for boys.

<sup>610</sup> At which a draft was presented of Graberc, J. A., Brooks-Gunn, J., & Warren, M. P. (1995) The antecedents of menarcheal age: Heredity, family environment, and stressful life events. *Child Development*, 66(2), 346–359.

<sup>611</sup> At which a draft was presented of Chisholm, J. S. (1996) The evolutionary ecology of attachment organization. *Human Nature*, 7, 1–37.

<sup>612</sup> Hinde, R. A. (1991) When is an evolutionary approach useful? *Child Development*, 62(4), 671–675.

<sup>613</sup> Chisholm, J. S. (1993) Death, hope, and sex. *Current Anthropology*, 34(1), 1–24.

<sup>614</sup> Grossmann, K. E. (1996) Ethological perspectives on human development and aging. In C. Magai & S. H. McFadden (eds), *Handbook of Emotion, Adult Development, and Aging* (pp. 43–66). San Diego, CA: Academic Press.

<sup>615</sup> Thompson, R. A. (1998) Early sociopersonality development. In W. Damon & N. Eisenberg (ed.), *Handbook of Child Psychology: Social, Emotional, and Personality Development* (5th ed., pp. 25–104). John Wiley & Sons, Inc; Thompson, R. A. (2010) Attachment and life history theory: A rejoinder. *Child Development Perspectives*, 4(2), 106–108.

<sup>616</sup> Surbey, M. K. (1988) The timing of human menarche. Unpublished doctoral thesis, McMaster University; Surbey, M. K. (1990) Family composition, stress, and the timing of human menarche. In Ziegler, T. E. & Bercovitch, F. B. (eds), *Socioendocrinology of Primate Reproduction* (pp. 11–32). New York: Wiley.

Sternberg also reported in 1988 from a study with 157 adolescents and their parents.<sup>617</sup> Twice over the course of a year, parents and adolescents independently completed questionnaire measures of autonomy, conflict, and closeness in the parent–child relationship. Sternberg found that girls who reported fewer calm discussions with their mother and who reported more conflict with their mother had earlier menarche than their peers. Effect sizes were very similar to those reported by Surbey.<sup>618</sup> Maternal report on the relationship generally did not show this pattern, besides one finding, that mothers' report of mother–child cohesion was associated with later menarche. Again, Sternberg found no effect of family variables on puberty timing for boys.

Further support came from a 1992 study by Moffitt, Caspi, Belsky, and Silva, using data for girls from the 16-year follow-up from the large Dunedin longitudinal study.<sup>619</sup>

Moffitt was inclined to expect that puberty timing was largely heritable, so came into the study rather sceptical of the proposals of Belsky and colleagues. Yet, like Surbey, they found that father absence in childhood predicted an earlier age of youth-reported menarche ( $r = 0.12$ ). So did maternal report of family conflict ( $r = 0.13$ ). However, there was no association with limited family financial resources. This research seemed to suggest that father absence was not of unique importance, but rather was one among a number of potential signals received by children regarding whether their environment was challenging or supportive and stable or precarious. Belsky, Steinberg, and Draper reflected that it may be that 'it is not the absence of a father that speeds pubertal maturation, but the stress associated with divorce and with growing up in a single-parent household.'<sup>620</sup> Following Belsky's process model, they anticipated that family financial resources might not be relevant in themselves, but only insofar as they contributed to parenting.

Moffitt and colleagues found no association between maternal report of behavioural problems and early menarche. They acknowledged that this was contrary to the expectations of Belsky and Draper that early menarche and behavioural problems would cluster together as part of an *r*-strategy. Belsky, Steinberg, and Draper initially reflected that behavioural problems may be more relevant for the *r*-strategy in boys. As the 1990s went on, and this point received further criticism, they loosened their claim that all the components of the *r*-strategy would come as a package. They accepted Hill's criticism that puberty timing and number of offspring in animals and humans might well be shaped by different features of the environment.<sup>621</sup> Nonetheless, they defended the claim that earlier puberty would be somewhat associated with early sexual debut and reproduction across animals and humans, albeit moderated in humans by factors such as social mores and the availability of contraception.<sup>622</sup>

An article in 2000 in the *New York Times*, by Belkin, offered coverage of the theory. Belkin reported that Belsky had expected outrage and controversy. In fact, 'their work has been

<sup>617</sup> Steinberg, L. (1988) Reciprocal relation between parent–child distance and pubertal maturation. *Developmental Psychology*, 24(1), 122–128.

<sup>618</sup> See also Graber, J. A., Brooks-Gunn, J., & Warren, M. P. (1995) The antecedents of menarcheal age: Heredity, family environment, and stressful life events. *Child Development*, 66(2), 346–359.

<sup>619</sup> Moffitt, T. E., Caspi, A., Belsky, J., & Silva, P. A. (1992) Childhood experience and the onset of menarche: A test of a sociobiological model. *Child Development*, 63(1), 47–58.

<sup>620</sup> Belsky, J., Steinberg, L., & Draper, P. (1991) Childhood experience, interpersonal development, and reproductive strategy: An evolutionary theory of socialization. *Child Development*, 62(4), 647–670, p. 658.

<sup>621</sup> Hill, K. (1993) Life history theory and evolutionary anthropology. *Evolutionary Anthropology*, 2, 78–88.

<sup>622</sup> Steinberg, L. & Belsky, J. (1996) An evolutionary perspective on psychopathology in adolescence. In D. Cicchetti & S. L. Toth (eds), *Adolescence: Opportunities and Challenges, Volume 7 of Rochester Symposium on Developmental Psychology Series* (pp. 93–124). Rochester, NY: University of Rochester Press. See also Ibitoye, M., Choi, C., Tai, H., Lee, G., & Sommer, M. (2017) Early menarche: A systematic review of its effect on sexual and reproductive health in low-and middle-income countries. *PLoS One*, 12(6), e0178884.

met mostly with silence.’<sup>623</sup> Belkin quoted from an interview with Belsky, who offered his suspicion that the theory had been neglected as it transgressed symbolic boundaries that normally kept apart explanations of animal biology and explanations of human behaviour: ‘It is treated like a biological determinism theory, and that gives it a bad name among some people. They think we’re saying biology is destiny.’<sup>624</sup> Belkin observed that the proposals had really only gained traction among researchers already interested in sociobiology, and had been generally neglected by other developmental scientists.

Yet from the early 2000s, interest began to pick up, with growing interest from researchers in evolutionary psychology.<sup>625</sup> A particular advocate was Ellis. Following doctoral work in the evolutionary psychology of adult sexuality at Michigan, Ellis moved to Vanderbilt as a research associate, refocusing on developmental psychopathology. There he undertook a number of secondary analyses of prospective data, available through Vanderbilt colleagues, addressing psychosocial antecedents of menarche timing. First, Ellis and colleagues conducted a secondary analysis of prospective data from an eight-year longitudinal study with 173 US families. They found that fathers’ presence in the home, more time spent by fathers in child care, greater supportiveness in the parental dyad, more father–daughter affection, and more mother–daughter affection, all assessed prior to kindergarten, predicted daughters’ pubertal timing.<sup>626</sup> Though contrary to the expectations of Belsky and colleagues, there was no association between family conflict and accelerated pubertal timing.

Ellis and Garber also conducted secondary analysis of data from a longitudinal study Garber had conducted of the sequelae of maternal depression. Maternal depression was associated with early puberty, but this relationship was fully mediated by maternal report of family functioning and biological father absence. However, further investigation revealed that stepfather presence, more than biological father absence, best accounted for earlier puberty. Ellis and Garber proposed that family stress and stepfather presence represent two relatively distinct psychosocial pathways to early menarche for girls.<sup>627</sup>

Ellis dubbed the proposals of Belsky and colleagues ‘psychosocial acceleration theory’.<sup>628</sup> Ellis’s 2004 article in *Psychological Bulletin*, reviewing the theory and available evidence, was a milestone in their acceptance and update within developmental science. Ellis and colleagues highlighted Belsky and colleagues’ use of evolutionary theory to develop testable claims, their attention to biological and socioemotional development within the same frame, and their consideration of family relationships in childhood and adulthood, as especially impressive and fruitful contributions.<sup>629</sup> Though they criticized Belsky and colleagues for failing to be sufficiently explicit in attending to threat, unpredictability, and

<sup>623</sup> Belkin, L. (2000) The making of an 8-year-old woman. *New York Times*, 24 December 2000.

<sup>624</sup> Ibid.

<sup>625</sup> For example, Miller, W. B. & Pasta, D. J. (2000) Early family environment, reproductive strategy and contraceptive behaviour. In J. L. Rodger, D. C. Rowe, & W. B. Miller (eds), *Genetic Influences on Human Fertility and Sexuality* (pp. 183–230). Boston: Kluwer; Rowe, D. C. (2000) Environmental and genetic influences on pubertal development. In J. L. Rodgers, D. C. Rowe, & W. B. Miller (eds), *Genetic Influences on Human Fertility and Sexuality* (pp. 147–168). Boston: Kluwer.

<sup>626</sup> Ellis, B. J., McFadyen-Ketchum, S., Dodge, K. A., Pettit, G. S., and Bates, J. E. (1999) Quality of early family relationships and individual differences in the timing of pubertal maturation in girls. *Journal of Personality and Social Psychology*, 77, 387–401.

<sup>627</sup> Ellis, B. J. & Garber, J. (2000) Psychosocial antecedents of variation in girls’ pubertal timing: Maternal depression, stepfather presence, and marital and family stress. *Child Development*, 71(2), 485–501.

<sup>628</sup> Ellis, B. J. (2004) Timing of pubertal maturation in girls: An integrated life history approach. *Psychological Bulletin*, 130(6), 920–958.

<sup>629</sup> Ketelaar, T. & Ellis, B. J. (2000) Are evolutionary explanations unfalsifiable? Evolutionary psychology and the Lakatosian philosophy of science. *Psychological Inquiry*, 11(1), 1–21.

resource scarcity as different forms of adversity. In their view, threat, and unpredictability would make distinct contributions to psychosocial acceleration, more than resource scarcity.<sup>630</sup> This aligned with earlier work distinguishing caregiver threat, unpredictability, and neglect/withdrawal as quite different rearing experiences for a child, and with different developmental implications (Chapter 2).

Belsky accepted Ellis's criticism that his 1990 and 1991 papers with Steinberg and Draper had failed to distinguish *threat*, *unpredictability*, and *resource scarcity* in childhood.<sup>631</sup> In his subsequent work he has emphasized the importance of drawing distinctions between these three different kinds of adversity and has documented their distinct sequelae for child development.<sup>632</sup>

Belsky has offered a degree of riposte as well. He criticized Ellis's characterization of unpredictability, which was operationalized as an index of number of moves of residence, number of changes of paternal figure, and number of parental employment transitions. In an analysis of data from the NICHD and Minnesota studies, Belsky and collaborators decomposed this index into its constituent parts, and documented that it was only paternal transitions that predicted elements of the *r*-strategy, not moves of residence or number of employment transitions.<sup>633</sup> Nonetheless, Belsky felt that Ellis had been absolutely right that early experiences of precarity would be distinct from early experiences of a harsh environment, even if what Ellis thought he had captured with his construct of unpredictability was just the already-familiar finding of the role of father absence/stepfather presence.<sup>634</sup>

Consideration of Ellis's advocacy for psychosocial acceleration theory draws attention to something interesting: the timeframes for the uptake of differential susceptibility theory and psychosocial acceleration theory was essentially the same. With precursors in the 1980s, both were first substantively proposed by Belsky and colleagues in 1991 and elaborated a little in the late 1990s. Both then waited until the mid-2000s to receive significant interest within developmental science. Apparently, both theories needed to wait for the influx of biomedical measures and theory into developmental science from the early 2000s

<sup>630</sup> Ellis, B. J., Figueredo, A. J., Brumbach, B. H., & Schlomer, G. L. (2009) Fundamental dimensions of environmental risk: The impact of harsh versus unpredictable environments on the evolution and development of life history strategies. *Human Nature*, 20, 204–268. For later support, see Sumner, J. A., Colich, N. L., Uddin, M., Armstrong, D., & McLaughlin, K. A. (2019) Early experiences of threat, but not deprivation, are associated with accelerated biological aging in children and adolescents. *Biological Psychiatry*, 85(3), 268–278.

<sup>631</sup> Del Giudice, M. & Belsky, J. (2010) The development of life history strategies: Toward a multi-stage theory. In D. M. Buss & P. H. Hawley (eds), *The Evolution of Personality and Individual Differences* (pp. 154–176). Oxford: Oxford University Press. Though examination of the 1990 and 1991 papers with this point in mind suggests the criticism is somewhat harsh, as these distinctions are available, if not elaborated.

<sup>632</sup> Ellis, B. J., Sheridan, M. A., Belsky, J., & McLaughlin, K. A. (2022) Why and how does early adversity influence development? Toward an integrated model of dimensions of environmental experience. *Development and Psychopathology*, 34(2), 447–471. Others have offered contrary evidence, suggesting that adversity is best captured by a single latent factor, for example Bignardi, G., Dalmajer, E. S., & Astle, D. E. (2022) Testing the specificity of environmental risk factors for developmental outcomes. *Child Development*, 93(3), e282–e298.

<sup>633</sup> Hartman, S., Sung, S., Simpson, J. A., Schlomer, G. L., & Belsky, J. (2018) Decomposing environmental unpredictability in forecasting adolescent and young adult development: A two-sample study. *Development and Psychopathology*, 30(4), 1321–1332.

<sup>634</sup> In a recent paper, Usacheva, Belsky, and colleagues operationalized unpredictability using 12 indicators: 'four aimed to capture household composition changes (parental relationship status; change in parental relationships or living arrangements; number of serious relationships since child's birth; household composition reflective of relational ties & number of families living in the home); three changes in domicile and related areas of life (residential instability; unreliable transportation; regularity of child support payments); two of stability of child's living arrangements (how often child sees parent; who child lives with); and three indicative of irregular caregiving behavior (parental substance use interfering with work; coparenting issues—lack of agreement on parenting; coparenting issues—lack of trust in prudent parenting between child's caregivers)'. Usacheva, M., Choe, D., Liu, S., Timmer, S., & Belsky, J. (2022) Testing the empirical integration of threat-deprivation and harshness-unpredictability dimensional models of adversity. *Development and Psychopathology*, 34(2), 513–526, p. 517.

in order to find their audiences.<sup>635</sup> Once promising findings were reported by a few studies, research blossomed as both differential susceptibility theory and psychosocial acceleration theory could readily be investigated by researchers through additional tests of their already-collected data.<sup>636</sup>

Ellis continued to undertake secondary analyses of cohort data to provide evidence for psychosocial acceleration theory. In 2007 Ellis reported from two further studies. A first was secondary analysis of data from 120 families from the Wisconsin Study of Families and Work longitudinal study.<sup>637</sup> Ellis and Essex found that family socioeconomic status and a composite index of family non-supportiveness during the preschool years predicted advanced adrenarcheal status at age seven and more mature secondary sex characteristics at age 10. These findings indicate that the endocrinal changes associated with early menarche are predated by other biological changes several years earlier, likewise accelerated by childhood adversity.<sup>638</sup> Ellis and Essex also stressed the additive contributions made by family relationships and socioeconomic status: by fifth grade, only 11% of girls with high maternal supportiveness and high SES had reached Tanner Stage 3 compared to 44% of the rest of the sample.

From the perspective of evolutionary psychologists, hanging over psychosocial acceleration theory was the concern, raised by Moffitt, that family dysfunction and menarche timing might both be determined by genetic factors, rather than early stress having a causal effect. This concern has lingered.<sup>639</sup> However, initial indication that psychosocial acceleration was non-reducible to genetic confounding came in the late 2000s by a number of studies making use of a within-family sibling design to control for genetic confounds.

One was a 2008 report by Pesonen and colleagues, who followed up girls from Helsinki who had been young children during World War II, comparing sisters who had been evacuated to those who had stayed at home.<sup>640</sup> Bowlby's work on attachment theory had been partly prompted by his observations of children evacuated during World War II in England, as he saw the extreme stress separation from attachment figures could cause.<sup>641</sup> Bowlby believed that such major separations would contribute to mental health difficulties, and in unpublished notes reflected that they may also contribute to neuroendocrinal dysregulation.<sup>642</sup> It was an important finding for psychosocial acceleration theory that Pesonen and colleagues specifically reported that girls who were evacuated reported earlier menarche than sisters who stayed at home during World War II.

<sup>635</sup> Kochanska, G. & An, D. (2024) Developmental psychopathology: Our welcoming, inclusive, and eclectic intellectual home. *Development and Psychopathology*, early view: 'Research on biological factors fueled the highly influential and heuristically fertile frameworks of diathesis-stress, differential susceptibility, and plasticity.'

<sup>636</sup> Mishra, G. D., Cooper, R., Tom, S. E., & Kuh, D. (2009) Early life circumstances and their impact on menarche and menopause. *Women's Health*, 5(2), 175–190.

<sup>637</sup> Ellis, B. J. & Essex, M. J. (2007) Family environments, adrenarche, and sexual maturation: A longitudinal test of a life history model. *Child Development*, 78(6), 1799–1817.

<sup>638</sup> See also Fox, M. M., Hahn-Holbrook, J., Sandman, C. A., Marino, J. A., Glynn, L. M., & Davis, E. P. (2024) Mothers' prenatal distress accelerates adrenal pubertal development in daughters. *Psychoneuroendocrinology*, 160, 106671.

<sup>639</sup> For example, Richardson, G. B., Barbaro, N., Nedelec, J. L., & Liu, H. (2024) Testing environmental effects on age at menarche and sexual debut within a genetically informative twin design. *Human Nature*, early view.

<sup>640</sup> Pesonen, A. K., Räikkönen, K., Heinonen, K., Kajantie, E., Forsén, T., & Eriksson, J. G. (2008) Reproductive traits following a parent–child separation trauma during childhood: a natural experiment during World War II. *American Journal of Human Biology*, 20(3), 345–351.

<sup>641</sup> Bowlby, J. ([1939–1942] 2020) Psychological problems of evacuation. In R. Duschinsky & K. White (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 117–133). London: Routledge.

<sup>642</sup> Bowlby, J. ([1969] 2021) Anxiety, stress and homeostasis. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 34–45). New York: Wiley.

In 2007, Belsky, Steinberg, and NICHD investigator colleagues reported from a study using the NICHD data, examining familial rearing antecedents of puberty timing.<sup>643</sup> The analysis was only conducted for white participants, as the researchers felt there were too few ethnic minority families in the sample to draw distinctions. The researchers composited observed sensitivity\* with maternal report on their relationship with their child, and—unusually for a paper by the NICHD team—also examined data on fathers' report on their relationship with their child. Controlling for maternal age of menarche, both maternal and paternal care predicted pubertal development for girls, but no association was found for boys. No direct association was found between maternal sensitivity\* and puberty timing. Instead, it seemed to be harsh maternal and paternal behaviour that especially predicted pubertal timing, more than positive or supportive aspects of parenting. They found no association between father absence and early menarche, but the researchers suspected that this null finding may have stemmed from the high level of attrition of father-absent families.

Next, Belsky and colleagues tested for differential susceptibility based on infant negative emotionality. Rather than, as in previous studies, depending on parent report of infant negative emotionality, in this study the researchers operationalized negative emotionality as the mean level of observed infant distress during the three separation episodes of the Strange Situation administered at 15 months. The results ran counter to their expectations. Associations between harsh early care and age of menarche were significantly stronger for infants lower in negative emotionality than those with more moderate early temperament. By contrast, associations between harsh early care and age of menarche were negative for infants high in negative emotionality. This unexpected finding may stem from the atypical operationalization of negative emotionality. Children who show high negative emotionality in the Strange Situation separation episodes are typically classified as resistant or as secure (B3, B4 subtypes). Yet Ainsworth found that it was avoidant infants who showed the most negative emotionality at home.<sup>644</sup> As such, the use of the Strange Situation to assess negative emotionality may capture quite a different phenomenon to maternal report.

## Quantitative Syntheses

Over the decades, the body of secondary analyses of existing data to examine psychosocial acceleration theory has become increasingly mature, with sustained attention to the topic from researchers in evolutionary psychology, paediatrics, adolescent health, biological psychiatry, and developmental psychopathology. Convergent findings have generally been reported by research on nonhuman primates and rats.<sup>645</sup> That said, Knop, Van IJzendoorn, Bakermans-Kranenburg, and colleagues have noted species differences in the relative importance of body weight in regulating puberty onset as a source of some discrepant results.<sup>646</sup>

<sup>643</sup> Belsky, J., Steinberg, L. D., Houts, R. M., Friedman, S. L., DeHart, G., Cauffman, E., ... & NICHD Early Child Care Research Network (2007) Family rearing antecedents of pubertal timing. *Child Development*, 78(4), 1302–1321.

<sup>644</sup> Ainsworth, M. D. S. (1977) Social development in the first year of life: Maternal influences on infant–mother attachment. In J. M. Tanner (ed.), *Developments in Psychiatric Research* (pp. 1–20). London: Hodder & Stoughton, p. 17.

<sup>645</sup> For example, Cowan, C. S. & Richardson, R. (2019) Early-life stress leads to sex-dependent changes in pubertal timing in rats that are reversed by a probiotic formulation. *Developmental Psychobiology*, 61(5), 679–687.

<sup>646</sup> Knop, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Joëls, M., & van der Veen, R. (2019) The effects of different rearing conditions on sexual maturation and maternal care in heterozygous mineralocorticoid receptor knockout mice. *Hormones and Behavior*, 112, 54–64.

Researchers have also documented declines in age of menarche occurring when countries were affected by Covid-19. Though studies are still seeking to disentangle the factors involved including virus infection and increase in sedentary behaviour, there is emerging consensus in the endocrinological literature that girls' experience of stress will have been one factor accelerating pubertal timing and frequency of precocious puberty.<sup>647</sup>

Given scientific reports throughout the 2010s indicating associations with subsequent poorer cardiovascular and metabolic health,<sup>648</sup> menarche timing has become a recognized issue within public health in several countries, including China. Suggestions have been made that it should be monitored as a population health indicator like birth weight or life expectancy. This has led to several meta-analyses, often—though certainly not exclusively—by Chinese researchers.

Drawing together empirical research on psychosocial acceleration theory since 1988, a recent meta-analysis by Ding and colleagues identified 21 prospective studies, nine cross-sectional studies and three case-control studies that examined associations between adversity in childhood and later reproductive events such as menarche, first intercourse, and first birth.<sup>649</sup> A synthesis of effect sizes indicated that females with experiences of childhood adversity were around twice as likely to report earlier reproductive events. In general, Ding and colleagues found that the best predictor of earlier reproductive events was dysfunctional family dynamics.

Colich and colleagues looked more specifically at antecedents of menarche timing, in a meta-analysis of 25 studies.<sup>650</sup> They found that early adversity was associated with accelerated pubertal timing ( $d = -0.10$ ), with a stronger effect for adversities characterized by threat ( $d = -0.26$ ). In line with the expectations of Ellis and colleagues that threat and precarity would be more consequential than resource deprivation for psychosocial acceleration their meta-analysis found no prediction of menarche timing from low socioeconomic status in the absence of other forms of risk.

Webster and colleagues synthesized findings from 33 studies that had examined father-absence and daughters' earlier menarche. The weighted mean association was  $r = 0.14$ , which is consistent with the associations documented by the early studies of Surbey and Steinberg.<sup>651</sup> However, Sohn has pointed to methodological problems with the literature, such as non-random sampling, which raise the need for caution in interpreting results of the meta-analysis. It may be that there are moderators, such as differential susceptibility or contextual factors, which will help make sense of this heterogeneity of findings.<sup>652</sup> For instance, few studies have examined the cause of father absence, and the situation may

<sup>647</sup> Street, M. E., Ponzi, D., Renati, R., Petraroli, M., D'Alvano, T., Lattanzi, C., ... & Stagi, S. (2023) Precocious puberty under stressful conditions: New understanding and insights from the lessons learnt from international adoptions and the COVID-19 pandemic. *Frontiers in Endocrinology*, 14, 1149417.

<sup>648</sup> For example, Charalampopoulos, D., McLoughlin, A., Elks, C. E., & Ong, K. K. (2014) Age at menarche and risks of all-cause and cardiovascular death: a systematic review and meta-analysis. *American Journal of Epidemiology*, 180(1), 29–40; Kim, Y. & Je, Y. (2019) Early menarche and risk of metabolic syndrome: A systematic review and meta-analysis. *Journal of Women's Health*, 28(1), 77–86. Though see Behboudi-Gandevan, S., Moe, C. F., Skjesol, I., Arntzen, E. C., & Bidhendi-Yarandi, R. (2024) The J shaped association of age at menarche and cardiovascular events: Systematic review and metaanalysis. *Scientific Reports*, 14, 2695.

<sup>649</sup> Ding, W., Xu, Y., Kondracki, A. J., & Sun, Y. (2024) Childhood adversity and accelerated reproductive events: A systematic review and meta-analysis. *American Journal of Obstetrics and Gynecology*, early view.

<sup>650</sup> Colich, N. L., Rosen, M. L., Williams, E. S., & McLaughlin, K. A. (2020) Biological aging in childhood and adolescence following experiences of threat and deprivation: A systematic review and meta-analysis. *Psychological Bulletin*, 146(9), 721–764.

<sup>651</sup> Webster, G. D., Graber, J. A., Gesselman, A. N., Crosier, B. S., & Schember, T. O. (2014) A life history theory of father absence and menarche: A meta-analysis. *Evolutionary Psychology*, 12(2), 147470491401200202.

<sup>652</sup> Schlomer, G. L. & Marceau, K. (2022) Father absence, age at menarche, and genetic confounding: A replication and extension using a polygenic score. *Development and Psychopathology*, 34(1), 355–366.

well be different when a father is dead, overseas on deployment, or divorced and no longer co-resident but in regular contact.<sup>653</sup>

Exploring the respective contribution of different predictors, Guo and colleagues reported from a meta-analysis of seven articles that had examined the respective contributions of family-based stress and father absence to menarche timing.<sup>654</sup> They found that father absence had a direct association with menarche timing, and an indirect association via family-based stress. The association between family-based stress and menarche timing, however, appeared the more consequential predictor. Guo and colleagues acknowledged that these findings seemed well aligned with the theory of Belsky, Steinberg, and Draper, in which father absence is treated as a notable, but not unique, species of early family-based stress, functioning as a signal for accelerated maturation. They acknowledged that Sear and colleagues have documented that father-absence has proven a better predictor of menarche in US studies than those elsewhere in the world, suggesting that it may be a culturally specific indicator of early family-based stress.<sup>655</sup>

For boys, in general there have been far fewer positive results for prediction from childhood adversity to puberty timing specifically but growing evidence of other reproductive events occurring on an accelerated timescale. A meta-analysis by Xu and colleagues found that childhood socioeconomic status and father absence predicted age of first intercourse, number of sexual partners, age of first birth, and early marriage.<sup>656</sup> However, neither adverse childhood experience was predictive of the age of puberty onset. Despite these negative meta-analytic findings, it is nonetheless suggestive that the studies that have documented associations between childhood adversity and puberty in boys have been those with the strongest designs.<sup>657</sup> Knop, Van IJzendoorn, Bakermans-Kranenburg, and colleagues have reflected that, in studies of rodents, research to date has only found accelerated puberty following early-life stress in males, not females.<sup>658</sup> They anticipate that we will understand more about sex differences in psychosocial acceleration when we understand more about mechanisms and mediating factors.

Overall, the prediction that early family-based adversity will predict girls' puberty timing has been relatively well supported,<sup>659</sup> though many questions remain (e.g., the potential for genetic confounding).<sup>660</sup> By comparison, Belsky, Steinberg, and Draper's opposition

<sup>653</sup> Valge, M., Meitern, R., & Horak, P. (2022) Pubertal maturation is independent of family structure but daughters of divorced (but not dead) fathers start reproduction earlier. *Evolution and Human Behavior*, 43(2), 107–114.

<sup>654</sup> Guo, S., Lu, H. J., Zhu, N., & Chang, L. (2020) Meta-analysis of direct and indirect effects of father absence on menarcheal timing. *Frontiers in Psychology*, 1641.

<sup>655</sup> Sear, R., Sheppard, P., & Coall, D. A. (2019) Cross-cultural evidence does not support universal acceleration of puberty in father-absent households. *Philosophical Transactions of the Royal Society B*, 374(1770), 20180124.

<sup>656</sup> Xu, Y., Norton, S., & Rahman, Q. (2018) Early life conditions, reproductive and sexuality-related life history outcomes among human males: A systematic review and meta-analysis. *Evolution and Human Behavior*, 39(1), 40–51. See also Ho, T. C., Buttmann, J., Chahal, R., Miller, J. G., & Gotlib, I. H. (2024) Exploring sex differences in trajectories of pubertal development and mental health following early adversity. *Psychoneuroendocrinology*, 161, 106944.

<sup>657</sup> For example, Lian, Q., Zuo, X., Mao, Y., Zhang, Y., Luo, S., Zhang, S., ... & Zhou, W. (2018) The impact of the Wenchuan earthquake on early puberty: A natural experiment. *PeerJ*, 6, Article e5085.

<sup>658</sup> Knop, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Joëls, M., & van der Veen, R. (2019) The effects of different rearing conditions on sexual maturation and maternal care in heterozygous mineralocorticoid receptor knockout mice. *Hormones and Behavior*, 112, 54–64.

<sup>659</sup> Recently Bleil and colleagues have documented that breast development onset, pubic hair onset, and menarcheal age each contribute to mediation of the effects of childhood adversity on adult cardiometabolic risk. Bleil, M. E., Appelhans, B. M., Gregorich, S. E., Hiatt, R. A., Roisman, G. I., & Booth-LaForce, C. (2024) Pubertal timing: A life course pathway linking early life risk to adulthood cardiometabolic health. *Plos One*, 19(3), e0299433.

<sup>660</sup> Richardson, G. B., Bates, D., Ross, A., Liu, H., & Boutwell, B. B. (2024) Is reproductive development adaptively calibrated to early experience? Evidence from a national sample of females. *Developmental Psychology*, 60, 306–321.



between r- and K- strategies in humans has received more equivocal support. Researchers have found some coherence between puberty timing, age of sexual debut, mate attraction and selection, risk-taking, procreation and parental care, and general attitudes towards individualism versus reciprocity in relationships.<sup>661</sup> It is nonetheless a messy picture, and with considerable differences between samples and cross-culturally.<sup>662</sup> In particular, evidence that early puberty converges with risk-taking behaviour has been especially equivocal: these seem two potential sequelae of early adversity and precarity, with some small degree of co-occurrence,<sup>663</sup> but not necessarily part of a single pathway. Del Giudice has reflected that, looking back, 'Belsky and colleagues overestimated the importance of puberty as a node in the development of life history strategies.'<sup>664</sup>

In reviews of this literature, Sear has argued that the concept of r- and K- life-history strategies has misdirected researchers, who have too often assumed that the strategies will always look the same. But the inconsistent findings for gender across research in this area offers one illustration of how, in fact, trade-offs may be different depending on an individual's characteristics and context.<sup>665</sup> Sear has argued that future research should move more slowly, examining whether and when different biological and behavioural traits cluster. This may require setting aside life history theory as a spent force or reconsidering what specific predictions the theory can now advance, beyond providing an umbrella conceptualization of developmental adaptation. In this regard, Del Giudice has observed that 'today the approach is at a turning point.'<sup>666</sup>

One possibility is that life history theory will be brought into dialogue with other bodies of theory, allowing for multiple pathways towards differences in mating and parenting effort. Del Giudice and Belsky have proposed that some of the heterogeneity in the r- strategy may stem from different forms of insecure working models. Building on the account of adult attachment from the social psychological tradition, they proposed that adults with an avoidant attachment style may be promiscuous, less committed, more individualistic, and more coercive. On the other side of the coin, adults with an anxious attachment style may be motivated to pursue exclusive, intimate relationships, and to be more passive than aggressive, though with other features of an r- strategy.<sup>667</sup> These proposals regarding attachment styles have not been explicitly tested, though there is emerging evidence of two different

<sup>661</sup> For example, Međedović, J. (2021) Human life histories as dynamic networks: Using network analysis to conceptualize and analyze life history data. *Evolutionary Psychological Science*, 7(1), 76–90.

<sup>662</sup> Volk, A. A. (2023) Historical and hunter-gatherer perspectives on fast-slow life history strategies. *Evolution and Human Behavior*, 44, 99–109; Richardson, G. B., Bates, D., Ross, A., Liu, H., & Boutwell, B. B. (2024) Is reproductive development adaptively calibrated to early experience? Evidence from a national sample of females. *Developmental Psychology*, 60, 306–321.

<sup>663</sup> Ullsperger, J. M., & Nikolas, M. A. (2017) A meta-analytic review of the association between pubertal timing and psychopathology in adolescence: Are there sex differences in risk? *Psychological Bulletin*, 143(9), 903–938.

<sup>664</sup> Del Giudice, M. (forthcoming) A turning point for the life history approach to individual differences. In S. Kanazawa (ed.), *Genes, Environments, and Differential Susceptibility: Current Topics in Evolutionary Developmental Psychology*. Cambridge: Cambridge University Press.

<sup>665</sup> Wells, J. C., Cole, T. J., Cortina-Borja, M., Sear, R., Leon, D. A., Marphatia, A. A., ... & Menezes, A. M. B. (2022) Life history trade-offs associated with exposure to low maternal capital are different in sons compared to daughters: Evidence from a prospective Brazilian birth cohort. *Frontiers in Public Health*, 10, 914965.

<sup>666</sup> Del Giudice, M. (forthcoming) A turning point for the life history approach to individual differences. In S. Kanazawa (ed.), *Genes, Environments, and Differential Susceptibility: Current Topics in Evolutionary Developmental Psychology*. Cambridge: Cambridge University Press.

<sup>667</sup> Del Giudice, M. & Belsky, J. (2010) The development of life history strategies: Toward a multi-stage theory. In D. M. Buss & P. H. Hawley (eds), *The Evolution of Personality and Individual Differences* (pp. 154–176). Oxford: Oxford University Press. See also Szepeswol, O. & Simpson, J. A. (2019) Attachment within life history theory: An evolutionary perspective on individual differences in attachment. *Current Opinion in Psychology*, 25, 65–70.

forms of r- strategy, aligned with Del Giudice and Belsky's characterization of the two kinds of insecure life-history strategy.<sup>668</sup>

### Attachment and Psychosocial Acceleration

In their 1990 and 1991 papers, Belsky, Steinberg, and Draper assigned an important role to early attachment relationships in signalling to children what life-history strategy may be most suitable for their environment. Over the subsequent years, Belsky has generally assigned early attachment relationships a less critical importance for development, but still acknowledged their relevance. He contributed to three studies that sought to test whether early infant–mother attachment measured in the Strange Situation is associated with puberty timing. In general, these have been less well cited than his other papers testing psychosocial acceleration theory, perhaps reflecting that evolutionary psychologists have had less interest in findings from attachment data compared to more readily intelligible measures of early adversity.

As we saw above, in 2007 Belsky and colleagues reported from an analysis of the NICHD dataset that maternal report of harsh parenting, but not observed maternal sensitivity\*, was found to be associated with pubertal timing. Superficially, this ran contrary to the prominent role Belsky, Steinberg, and Draper assigned to attachment relationships. However, it was not telling evidence, since—as others have argued, such as Lyons-Ruth ([Chapter 2](#))—insensitivity may not adequately capture adverse forms of parenting behaviour. Such adverse experiences of care might be expected to be better captured by the Strange Situation.

In 2010, Belsky, Houts, and Fearon reported from an analysis of the NICHD study, using only the Strange Situation data from 15 months. Though interested in the Strange Situation as an index of adverse care, given the poor performance of the measure of disorganization in the NICHD infant Strange Situation in other studies, Belsky and colleagues nonetheless ignored disorganization and focused on the contrast between secure and insecure attachment. They found that insecure attachment at 15 months increased the odds of experiencing pubertal onset before the age of 10½ years by a factor of 1.60, though the association was somewhat attenuated when maternal age of menarche was controlled. They also found that insecure infant attachment increased the odds of completing puberty before the age of 13½ by a factor of 2, and this association remained unchanged with maternal age of menarche controlled.<sup>669</sup> These are comparable effects to maternal harshness at 4½ years old.

A second study, by Sung, Simpson and colleagues pursued secondary analysis of the NICHD dataset.<sup>670</sup> They found that greater family socioeconomic adversity, but not greater instability of paternal figures in the home, in a girl's first five years predicted early menarche. However, this effect was moderated by Strange Situation classification, with no association for children who were classified as securely attached to their mother in the Strange Situation. As such, secure infant–mother attachment buffered girls from the

<sup>668</sup> Gutiérrez, F., Peri, J. M., Baillès, E., Sureda, B., Gárriz, M., Vall, G., ... & Ruiz Rodríguez, J. (2022) A double-track pathway to fast strategy in humans and its personality correlates. *Frontiers in Psychology*, 13, 889730.

<sup>669</sup> Belsky, J., Houts, R. M., & Fearon, R. P. (2010) Infant attachment security and the timing of puberty: Testing an evolutionary hypothesis. *Psychological Science*, 21(9), 1195–1201.

<sup>670</sup> Sung, S., Simpson, J. A., Griskevicius, V., Kuo, S. I. C., Schlomer, G. L., & Belsky, J. (2016) Secure infant–mother attachment buffers the effect of early-life stress on age of menarche. *Psychological Science*, 27(5), 667–674.

effect of early socioeconomic adversity on pubertal timing. Attachment insecurity did not mediate the link between early socioeconomic adversity and age of menarche.<sup>671</sup>

These results suggested that Belsky, Steinberg, and Draper had been right to suggest that early attachment relationships are important for psychosocial acceleration. Though perhaps the central place given to security and insecurity in their 1990 and 1991 papers may have been too strong. Early attachment might better be considered among the various sources of information with this signal value, alongside other sources of information such as maternal harshness. This would align with Thompson's observation that were children to depend on their Strange Situation classification as a 'forecast' of the severity of their developmental environment, they would likely be misinformed, given the modest associations between environmental adversity and attachment insecurity.<sup>672</sup>

Bleil, Spieker, and colleagues followed up with a further study of NICHD data, reported in 2021.<sup>673</sup> They examined the contributions to menarche timing and progress through puberty of five predictors: childhood socioeconomic status; observed caregiver sensitivity\*; attachment assessed at 15 months and 36 months in the Strange Situation and at 24 months with the Attachment Q-Sort; maternal report of negative life events; and maternal report of child health problems. The only predictor that contributed unique variance to prediction of menarche timing and speed of progress through puberty was childhood socioeconomic status.

Though Belsky, Houts, and Fearon had earlier reported an association between infant attachment and timing of menarche, Bleil, Spieker, and colleagues found that when considered together with the other predictors, measures of attachment did not account for unique variance. This does not mean that childhood attachment was unimportant; only that it contributed to variance shared with other predictors. Furthermore, an index of secure versus insecure attachment across the three attachment assessments uniquely contributed to child Body-Mass Index in 1st grade, which in turn contributed to earlier puberty.<sup>674</sup>

As discussed earlier in the chapter, concerns have been raised about the quality of the Strange Situation coding on the NICHD data, resulting in underestimation of true effects, and underlining the importance of considering findings from other samples. A 2022 study by Bolhuis, Belsky, and colleagues conducted a secondary analysis of longitudinal data from 193 Dutch mother-child dyads.<sup>675</sup> Yet in contrast to research with the NICHD sample, this study found no association between insecurity in the Strange Situation and early

<sup>671</sup> See also Houbrechts, M., Bijttebier, P., Calders, F., Goossens, L., Van Leeuwen, K., Van Den Noortgate, W., & Bosmans, G. (2023) Cumulative family stress and externalizing problems: Secure base script knowledge as a protective factor. *Child Development*, 94(4), 941–955.

<sup>672</sup> Thompson, R. A. (2010) Attachment and life history theory: A rejoinder. *Child Development Perspectives*, 4(2), 106–108. See also Lu, H. J., Liu, Y. Y., & Chang, L. (2022) Child attachment in adjusting the species-general contingency between environmental adversities and fast life history strategies. *Development and Psychopathology*, 34(2), 719–730.

<sup>673</sup> Bleil, M. E., Spieker, S. J., Gregorich, S. E., Thomas, A. S., Hiatt, R. A., Appelhans, B. M., ... & Booth-LaForce, C. (2021) Early life adversity and pubertal timing: implications for cardiometabolic health. *Journal of Pediatric Psychology*, 46(1), 36–48.

<sup>674</sup> For convergent findings, see Anderson, S. E. & Whitaker, R. C. (2011) Attachment security and obesity in US preschool-aged children. *Archives of Pediatrics & Adolescent Medicine*, 165(3), 235–242; Goossens, L., Braet, C., Van Durme, K., Decaluwé, V., & Bosmans, G. (2012) The parent-child relationship as predictor of eating pathology and weight gain in preadolescents. *Journal of Clinical Child & Adolescent Psychology*, 41(4), 445–457; Kunkel, J. J., Magro, S. W., Bleil, M. E., Booth-LaForce, C., Vandell, D. L., Fraley, R. C., & Roisman, G. I. (2022) Early maternal sensitivity and markers of physical health: Enduring or transient associations from childhood to adulthood? *Developmental Psychology*, 58(12), 2252–2263.

<sup>675</sup> Bolhuis, E., Belsky, J., Frankenhuis, W. E., Shalev, I., Hastings, W. J., Tollenaar, M. S., ... & Beijers, R. (2022) Attachment insecurity and the biological embedding of reproductive strategies: Investigating the role of cellular aging. *Biological Psychology*, 175, 108446.

puberty, or other aspects of the r- strategy such as callous-unemotional traits, aggression, and risk-taking.

Yet a limitation was that the sample was characteristically of high socioeconomic status, with parents in stable marital relationships, and families in good health. Bolhuis, Belsky, and colleagues reflected that 'the overall risk, and thereby the overall stress levels, in this sample were too low to accelerate life history strategies. Important to appreciate is that attachment insecurity is thought to give rise to long-term developmental effects mostly in interaction with other psychosocial stressors in the rearing environment'.<sup>676</sup> This would fit with the findings of Sung and colleagues, mentioned above, which showed that attachment insecurity predicted accelerated pubertal development only under conditions of early life socioeconomic harshness.

Such a conclusion would align with research that has examined associations between the Strange Situation and risk-taking behaviour, as another component of the r- strategy. Delker and colleagues conducted a secondary analysis of the NICHD dataset, examining infant attachment in the Strange Situation and early childhood socioeconomic adversity as predictors of adolescent self-reported risk-taking behaviour at age 15.<sup>677</sup> They found that, compared to infants in disorganized dyads, infants in secure dyads later engaged in fewer risk-taking behaviour. Children whose family experienced socioeconomic adversity before they started school engaged in more risk-taking. There was also an interaction effect, where secure attachment reduced associations with risk-taking for families in poverty. These results agree with meta-analytic research documenting socioeconomic status as a potent moderator of the implications of early attachment relationships for later externalizing difficulties (Chapter 4).<sup>678</sup>

Delker and colleagues also examined sensitivity\* as a predictor of self-reported risk-taking behaviour at age 15. A composite of observed maternal sensitivity\* between 8 and 54 months predicted fewer self-reported risky behaviours in early adolescence. Unlike the infant Strange Situation classifications, there was no interaction with socioeconomic status. The reduction in risk-taking for secure children with a history of low socioeconomic status was unaffected by inclusion of sensitivity\* in the model. This would be a surprising finding if the measure of sensitivity was tapping a construct closely related to the quality of the infant-caregiver attachment relationship, as anticipated by attachment theory. However, as mentioned earlier, the measure of caregiving using by the NICHD clearly addressed important aspects of supportive caregiving but was not oriented towards assessing either Ainsworth's construct of sensitivity or safe haven provision, and empirically there was no association at all with children's Strange Situation classifications.

The Generation R sample (Chapter 4) has data for a sizeable subsample on attachment in the Strange Situation, observed caregiver sensitivity, and puberty timing. Yet this dataset has not been used to test the psychosocial acceleration hypothesis. The investigators of the Generation R study most interested in attachment, Van IJzendoorn and Bakermans-Kranenburg, have conducted comparatively less research on adolescence except when supporting collaborators,<sup>679</sup> and seem to regard it as somewhat outside their purview.

<sup>676</sup> Ibid.

<sup>677</sup> Delker, B. C., Bernstein, R. E., & Laurent, H. K. (2018) Out of harm's way: Secure versus insecure-disorganized attachment predicts less adolescent risk taking related to childhood poverty. *Development and Psychopathology*, 30(1), 283–296.

<sup>678</sup> Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010) The significance of insecure attachment and disorganization in the development of children's externalizing behavior: A meta-analytic study. *Child Development*, 81(2), 435–456.

<sup>679</sup> To be clear, this is a relative lack of attention to adolescence compared to other topics. Van IJzendoorn and Bakermans-Kranenburg have still conducted considerable research on adolescence. Most recently:

With Generation R data they have documented that insensitive parenting accelerates the development of the amygdala–medial prefrontal cortex circuit: ‘although a long childhood is critical for the development and practice of highly competent behavior and long-term well-being, it may be adaptive in the short run to self-regulate instead of rely on a parent for emotion regulation when quality of parental care is low, even at the cost of long-term health or well-being.’<sup>680</sup> They acknowledged that these findings would be in line with psychosocial acceleration theory. However, development of the amygdala–medial prefrontal cortex circuit was tested at age 10, so no comment could be offered about acceleration of development during puberty.

Overall, the study of attachment, sensitivity and psychosocial acceleration remains at a relatively early stage. Research appears to have been limited by a few factors. Most prominently, few datasets have both information about puberty timing and an observational measure of sensitivity or attachment. As a result, there has been considerable dependence on the NICHD dataset. Admittedly, this is likely not the only factor, given that other datasets, such as Generation R (Chapter 4), do have the relevant measures. The paucity of relevant datasets and analyses perhaps reflect a broader context in which attachment research has been slower than other areas of developmental science in the take-up of theory and methods from the biomedical sciences.

Yet the concerns of attachment research have been undergoing gradual metamorphosis. In her keynote address to the 2015 International Attachment Conference, Cassidy characterized the relationship between attachment and health as the field’s ‘new frontier,’<sup>681</sup> and there has been a growing literature.<sup>682</sup> For example, Jeffry Simpson and colleagues have used data from the Minnesota study to document remarkable associations between early attachment and sensitivity and later health outcomes.<sup>683</sup> However, with limited exceptions,<sup>684</sup> in general this research has focused almost exclusively on tracing and retracing potential associations between secure attachment relationships and better health outcomes. It has often taken place without a specific framework besides ‘the theory that all good things go together’, which Waters identified decades ago as a fall-back used by attachment researchers when they have stopped feeling empowered to re-engage with the specific propositions of attachment theory.<sup>685</sup>

Belsky’s work offers a model for a different approach to the study of attachment at the ‘new frontier’ with health. It regards this frontier as far from new, and instead emphasizes the basis of attachment theory in ethology and psychobiology, and with a central role for

Van Hoof, M. J., Riem, M., Garrett, A., Pannekoek, N., van der Wee, N., Van IJzendoorn, M., & Vermeiren, R. (2019) Unresolved–disorganized attachment is associated with smaller hippocampus and increased functional connectivity beyond psychopathology. *Journal of Traumatic Stress*, 32(5), 742–752.

<sup>680</sup> Thijssen, S., Muetzel, R. L., Bakermans-Kranenburg, M. J., Jaddoe, V. W., Tiemeier, H., Verhulst, F. C., ... & Van IJzendoorn, M. H. (2017) Insensitive parenting may accelerate the development of the amygdala–medial prefrontal cortex circuit. *Development and Psychopathology*, 29(2), 505–518, p. 506.

<sup>681</sup> Cassidy, J. (2015) Early relationships, later functioning: why and how a secure base matters. Keynote address presented at 7th International Attachment Conference, New York.

<sup>682</sup> Pietromonaco, P. R. & Beck, L. A. (2019) Adult attachment and physical health. *Current Opinion in Psychology*, 25, 115–120.

<sup>683</sup> Puig, J., Englund, M. M., Simpson, J. A., & Collins, W. A. (2013) Predicting adult physical illness from infant attachment: A prospective longitudinal study. *Health Psychology*, 32(4), 409–417; Farrell, A. K., Waters, T. E., Young, E. S., Englund, M. M., Carlson, E. E., Roisman, G. I., & Simpson, J. A. (2019) Early maternal sensitivity, attachment security in young adulthood, and cardiometabolic risk at midlife. *Attachment & Human Development*, 21(1), 70–86.

<sup>684</sup> For example, Haltigan, J. D., Del Giudice, M., & Khorsand, S. (2021) Growing points in attachment disorganization: looking back to advance forward. *Attachment & Human Development*, 23(4), 438–454.

<sup>685</sup> Waters, E. & Deane, K. E. (1985) Defining and assessing individual differences in attachment relationships: Q-methodology and the organization of behavior in infancy and early childhood. *Monographs of the Society for Research in Child Development*, 50(1/2), 41–65, p. 42.

the development of hypotheses. For Belsky, 'a good theory should do three things if it is to trump and replace existing ways of thinking: explain what is already understood, generate novel predictions, and, in consequence, generate discoveries that would not be expected or explicable on the basis of existing understanding'.<sup>686</sup>

Bowlby did not keep up to date with developments in this field, but his theory retains strong potential synergies with biological theory and for sustaining hypothesis-driven research. For this reason, Del Giudice and Belsky have urged that 'the time is ripe for new theories of development, on a scale undreamed of even by a pioneer like Bowlby. Thanks to his legacy, attachment researchers are ideally positioned to contribute to this enterprise'.<sup>687</sup> Some attachment researchers, such as Jeffery Simpson and Glenn Roisman at Minnesota, have embraced life-history theory and psychosocial acceleration theory. Szepesenwol and Simpson perceive strong alignment between these theories and results from the Minnesota longitudinal study documenting associations between secure attachment relationships in childhood and the quality of later romantic relationships and parenting behaviour.<sup>688</sup>

Yet, to date, it does not appear that most attachment researchers have been especially drawn to psychosocial acceleration theory. Like Thompson, it may be that they have not wanted to regard attachment security primarily as a barometer of environmental adversity, and its sequelae a derivative of that adversity. Nonetheless, it can be anticipated that future attachment theory and research will pursue thinking about attachment, evolution, and biological development. Together with the precedent of Belsky's work, the rapid growth in the availability and affordability of biological measures, and their prestige within developmental science, will no doubt contribute to the attractiveness of such lines of inquiry. Many studies with measures of attachment, including the NICHD study, have now added a focus on biological and medical assessment in recent follow-ups.<sup>689</sup>

## Concluding Remarks

For 40 years, Belsky has been a major and creative contributor to attachment research, bringing new ideas into the study of attachment, and communicating out to developmental psychopathology, early years research, evolutionary science, and beyond.<sup>690</sup> In particular, Belsky has been a counterweight against a tendency in developmental science to reify predictors and outcomes, and to assume that associations represent main effects rather than the consequence of interactions. The extent and manner in which the attachment research community has engaged with Belsky's contributions dramatize the priorities and state of the contemporary research paradigm, making visible what it has been able to take up and under what conditions. As in tragedy, the challenge posed by an agitator to their community (and to themselves) is also a commentary on this community, its authority, its internal

<sup>686</sup> Belsky, J. (2021) Beyond virtue. In E. Harcourt (ed.), *Attachment and Character: Attachment Theory, Ethics, and the Developmental Psychology of Vice and Virtue* (pp. 123–136). Oxford: Oxford University Press, p. 131.

<sup>687</sup> Del Giudice, M. & Belsky, J. (2010) Evolving attachment theory: Beyond Bowlby and back to Darwin. *Child Development Perspectives*, 4(2), 112–113, p. 113.

<sup>688</sup> Szepesenwol, O. & Simpson, J. A. (forthcoming) Evolutionary lifespan models of attachment and reproductive strategies. In S. Kanazawa (ed.) (2024), *Genes, Environments, and Differential Susceptibility: Current Topics and Controversies in Evolutionary Developmental Psychology*. Cambridge: Cambridge University Press.

<sup>689</sup> For example, Bleil, M. E., Appelhans, B. M., Gregorich, S. E., Hiatt, R. A., Roisman, G. I., & Booth-LaForce, C. (2024) Pubertal timing: A life course pathway linking early life risk to adulthood cardiometabolic health. *Plos One*, 19(3), e0299433.

<sup>690</sup> Szepesenwol and Simpson have stated that Belsky's 'groundbreaking theorizing and empirical work revolutionized developmental psychology and has inspired countless scholars' (ibid.).

diversity, the kind and degree of space it opens up, and what sense it makes of complexity and change.<sup>691</sup>

The orientation, and the desire to serve, that might have otherwise been channelled by Belsky into becoming a professional soldier, were instead channelled into science. He has consistently been a challenging, unplacating, and at times aggressive figure within developmental science and attachment research. Belsky has acknowledged that ‘I have a reputation of being a difficult person.’<sup>692</sup> These qualities have helped carve out a place for his ideas against the current. At the same time, they appear to have somewhat damaged his reputation or at least made him regarded as controversial.

Yet we need to consider not only the person but also the research environment. Early in his career, Belsky’s enthusiasm and desire to serve was caught, and remains caught, by the possibilities and threats entailed by the legacy of experiences of care for development. His contributions go beyond attachment research, but have been supported by some of its past and continuing strengths.

Belsky was initially drawn to Sroufe’s work by the latter’s combination of process thinking and faith in the predictive power of early experiences as measured by the Strange Situation. Sroufe’s work was electrified by the circulating current of this emphasis on process, on the one hand, and this emphasis on the legacy of early attachment, on the other.

Yet Belsky’s early enthusiasm for attachment research on the model of Sroufe was subsequently dampened by the in-group/out-group dynamics of the attachment research community. These had evolved to support the emergent attachment paradigm as it was getting established (Chapter 1). By the 1990s, Belsky felt that such dynamics, if initially protective, were now proving harmful to attachment research, hindering progress and openness. His commentaries on attachment research have recognized both strengths and weaknesses, and he has been especially critical when he has perceived conformity choking off scientific inquiry. Belsky’s attraction to attachment research was also tempered by the modest predictive power of the Strange Situation within the Pennsylvania Child and Family Development Project. Furthermore, Belsky assumed, perhaps incorrectly, that individual differences in attachment work like fixed substances or personality traits, which reduced his sympathy for attachment theory.

In particular, Belsky has argued that fidelity to (a particular image of) the ideas of Bowlby, Ainsworth, and Main has left attachment research slow to develop work exploring interactions between person and environment, and social and biological development. Interactions are difficult to address in developmental science. One strategy is through meta-analysis, where quantitative synthesis permits dependable identification of relevant moderators (Chapter 4). Another strategy, not incompatible, is through theory. However, by and large attachment research struggled to develop an effective theoretical tradition for identifying and conceptualizing moderators. When uneven findings were reported, for example the effects of social support on caregiver sensitivity, attachment theory had weak resources for mounting an interpretation or research agenda.

<sup>691</sup> For example, Danson, L. (1983) Henry V: King, chorus, and critics. *Shakespeare Quarterly*, 34(1), 27–43; Gagné, R., & Hopman, M. G. (eds) (2013) *Choral Mediations in Greek Tragedy*. Cambridge: Cambridge University Press. Such commentary perhaps has additional value in the context of criticisms of attachment theory and research that it specifically lacks authority, internal diversity, openness, or interest in complexity and change, for example Morelli, G. A. (2015) The evolution of attachment theory and cultures of human attachment in infancy and early childhood. In L. A. Jensen (ed.), *The Oxford Handbook of Human Development and Culture* (chap. 10, pp. 149–164). Oxford: Oxford University Press.

<sup>692</sup> Cited in Stolberg, S. G. (2001) Another academic salvo in the Nation’s ‘Mommy Wars’. *New York Times*, 21 April 2001.

A case in point is the opposition between attachment and temperament, which had been sustained by polemics between Kagan and Sroufe. The idea of differential susceptibility was hatched from Belsky's reflections on this debate. This idea has developed into a research programme, one that has made a profound contribution to cross-disciplinary studies of interactions between people and their environments. The idea of differential susceptibility has also been fruitful for attachment research, despite a relatively slow uptake in the United States—likely a legacy of bad blood between attachment and temperament researchers. With the growing affordability of genetic tests and growing consensus on what to examine, it may nonetheless be anticipated that in the coming years research on gene x environment interaction will gain greater prominence within attachment research. In turn, there may remain further potential for differential susceptibility theory to learn from attachment research, including in exploring secure attachment as a form of vantage sensitivity.

Another instance where Belsky has been critical of attachment researchers flying in formation has been their treatment of security and insecurity outside of an ethological-evolutionary perspective. Belsky has argued that this has resulted in a tendency to pathologize insecurity, and a lack of daring in the development of hypotheses, which too often devolve to prediction of positive associations for security and negative associations for insecurity. More generally, Belsky has alleged that attachment theory has lost its freedom to explore, in part due to neglect of its secure base in evolutionary science. Belsky's psychosocial acceleration theory has provided a striking illustration of the potential value of engaging with biological and evolutionary science to develop hypotheses.

There is a curiously promissory element to Belsky's work generally and his thinking about attachment and caregiving specifically. It seems linked to a kind of dialectic in his pursuit of, and defence from, process. Process-oriented elements of Belsky's thinking and research are introduced but get counterbalanced and diminished. Certain distinctions get reified, seemingly to help organize, and hold back, potential complexity. Yet many of these reifications seem to become frost-fractured by water in their cracks and the passing seasons; as they crumble, additional interactional processes are then revealed. This has been noted at times by colleagues: for example, Runze, Bakermans-Kranenburg, and collaborators have recently praised the lasting contribution of Belsky's process model, while urging for the need to push it further to be able to handle greater complexity.<sup>693</sup>

Fed by the initial influence of Bronfenbrenner and then by elements of Sroufe's work, a thread in Belsky's thinking has become more and more attentive to the dynamism, interaction and emergent properties that underlie what developmental science too often treats as self-enclosed and stable variables. On the one hand, Belsky has increasingly conceptualized the *environment* of development in process terms:

- An initial move towards process thinking can be seen in his doctoral dissertation, where he considered both positive and negative affect without assuming that one reduces to the opposite of the other. This was extrapolated to a broader both/and position, considering how the same contextual factors could both support and hinder caregiving in different ways.

<sup>693</sup> Runze, J., Bakermans-Kranenburg, M. J., Cecil, C. A., Van IJzendoorn, M. H., & Pappa, I. (2023) The polygenic and reactive nature of observed parenting. *Genes, Brain and Behavior*, 22(6), e12874: citing Belsky's process model, they write: 'We still need more complex sociopsychological process models of parenting.'



- In the early 1980s, his 'process model' argued against proposals of main effects on child development from the child's temperament, their parent's qualities, or their wider context, highlighting the interactive role of these factors. In the predominant narrative and [Figure 3.1](#), he placed emphasis on proximal mediators of relationships between context and individual development, sometimes clearly resulting in treatment of process as a substance, such as his overweighting of the role of parental personality. Though [Table 3.1](#) of the paper already suggested a more process-oriented model, acknowledging the emergent properties of interacting, cumulative risks.
- In the late 1980s, attachment relationships were assigned a critical mediating role, including in the effects of daycare on child development. By the 1990s, Belsky still considered individual differences in attachment important, but assigned a greater role to cumulative risk, with a causal role given to the emergent properties of the interaction of risk factors rather than the effects of any alone.
- Belsky developed a sustained argument for the negative effects of long hours in centre-based daycare, in contrast to home-based or childminder-based care. This had a somewhat awkward fit with his earlier process model, which privileged the importance of parents' personality and behaviour for child development and offered no tools for distinguishing centre-based care from childminder-based care. The case of daycare signals a wider environment experienced by the child beyond the framework of the process model, including other relationships such as peers.<sup>694</sup> The process model was updated by Belsky, Rosenberger, and Crnic, shifting towards a model of cumulative risk already suggested by [Table 3.1](#) of his process model paper. His thinking about environmental factors ultimately matured into the differentiated environment of Differential Susceptibility 2.0, including recognition of the peer environment.
- More recently an interest in harsh environments has permitted the consequences of socioeconomic factors to come more directly into consideration, with a distinction drawn between threat and deprivation. Though culture continues to be sidelined, as are social inequalities such as race and gender. The explanatory subordination of sociology to psychology enacted by the process model paper remains only partly eroded.

On the other hand, with the introduction of differential susceptibility theory, Belsky started to consider how the emergent properties of risk factors might interact with qualities of the individual *person*:

- The initial conceptualization of these qualities as prototypes of domain-general susceptibility or unsusceptibility has become more process-oriented over time. Belsky has recognized that susceptibility is likely to be a continuum, since there will be a range of factors contributing at different levels.
- In Differential Susceptibility 2.0, Belsky has come to agree with Van IJzendoorn and Bakermans-Kranenburg that the susceptibility of individuals may be differentiated by domain and provided initial evidence for this position.

<sup>694</sup> Beyond the Western family model, the distinction between family social support and the child's attachment network may also be less sharp. Meehan, C. L. & Hawks, S. (2013) Cooperative breeding and attachment among the Aka foragers. In N. Quinn & J. M. Mageo (eds), *Attachment Reconsidered: Cultural Perspectives on a Western Theory* (pp. 85–113). London: Palgrave Macmillan.

- In recent years he has acknowledged that whilst some susceptibility may be present from (or before) birth, there may also be ways in which susceptibility itself is a process, one that can be changed in the course of development. The concept of differential susceptibility really looks quite different now to when it was first introduced.<sup>695</sup>

To give a further example: Belsky's use of the contrast between r- and K- strategies sustained the assumption that early puberty and risk-taking behaviour would go together. Mounting empirical evidence that there is only some small degree of co-occurrence has not yet prompted Belsky to rethink the pathway, but the assumption of co-occurrence has been quietly dropped in recent work, and an explicit reworking may be anticipated on Belsky's direction of travel.

To inherit and support a tradition, including a scientific tradition, requires ongoing work of rejuvenation and renovation (Chapter 1). Despite its qualifications, Belsky's process-orientation has been a major resource for this rejuvenation and renovation, reopening the adventure of learning about, rather than assuming, the environment and person in the context of development.<sup>696</sup> Attachment researchers still rarely collect information on caregivers' ecology, resources, parental ethno-theories, parenting beliefs and values, exposure to forms of violence and oppression, and household, social, and caregiving practices.<sup>697</sup> Belsky's Penn State studies represent an important early exception. Furthermore, his subsequent research has represented a source of provocation for attachment research to pursue a more complex account of the transactional relationship between environment and person.

In several lines of research—including daycare debates, differential sensitivity, and life-history theory—Belsky's work has partly left attachment theory and research behind. However, in doing so, he has cut paths for ways that attachment research may learn from other areas of scientific inquiry, and resist a tendency to become parochial, caught up with idiosyncratic measures and questions rather opaque to others. Some of the benefit of Belsky's work in this regard is already clear for attachment research; some of the benefit still lies in potential. This potential may not be actualized, but it is still real: the unactualized dimensions of a research paradigm are just as much a part of the ongoing negotiation of its development as the actualized dimensions.<sup>698</sup>

Ultimately, the maintenance of a tradition requires decisions about where to invest limited time and resources. As life-history theory has emphasized, this means trade-offs.<sup>699</sup>

<sup>695</sup> A parallel may be drawn with the concept of mentalizing in Fonagy, which developed to be increasingly processual and complex over time, becoming a continuum, becoming differentiated by domain, becoming a property of communities as much as individuals. The tension between the substance and process-elements of Fonagy's ontology, which could not be comfortably reconciled within the concept of mentalizing, ultimately contributed to the turn to ideas of epistemic trust. Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press.

<sup>696</sup> Cummings and Warmuth have likewise argued that the most promising directions in contemporary attachment research have also been oriented by process thinking. See Cummings, E. M. & Warmuth, K. A. (2019) Parenting and attachment. In M. H. Bornstein (ed.), *Handbook of Parenting*, Vol. 5, (pp. 35–59). London: Routledge.

<sup>697</sup> Gaskins, S., Beeghly, M., Bard, K., Gernhardt, A., Liu, C., Teti, D., ... & Yovsi, R. (2017) Meaning and methods in the study and assessment of attachment. In H. Keller & K. Bard (eds), *The Cultural Nature of Attachment: Contextualizing Relationships and Development Nature of Relationships and Development* (pp. 195–229). Cambridge, MA: MIT Press; Selcuk, E., Asgill, E., & Gunaydin, G. (2024) A theoretical analysis and empirical agenda for understanding the socioecology of adult attachment. *European Review of Social Psychology*, early view.

<sup>698</sup> DeLanda, M. (2002) *Intensive Science and Virtual Philosophy*. London: Bloomsbury Publishing.

<sup>699</sup> Cf. Belsky, J., Schlomer, G. L., & Ellis, B. J. (2012) Beyond cumulative risk: distinguishing harshness and unpredictability as determinants of parenting and early life history strategy. *Developmental Psychology*, 48(3), 662–673: 'Due to structural and resource limitations, organisms cannot simultaneously maximize the major life functions of (a) bodily maintenance (e.g., immune function, predator defenses), (b) growth (acquisition of physical, social, and cognitive competencies), and (c) reproduction (mating and parenting)' (663).

Often due to differences in vantage and susceptibility to aspects of their respective contexts, researchers have ultimately had diverging priorities about how to help the study of attachment thrive.<sup>700</sup>

As we saw in [Chapter 1](#), Ainsworth's circle gave relative priority to imminent survival, seeking to provide the fundamental empirical supports to allow attachment research to harden into durability within developmental science, defended against potential predators. This included establishing infrastructure, such as the Strange Situation institutes, to offer socialization in tacit skills of observation, conceptualization, and judgement that, in turn, support access to the practical intricacies of attachment theory, such as the secure base/safe haven concept.

Several researchers coming to attachment research in the 1980s, such as Lyons-Ruth, have given relative priority to growth, elaborating on the scope or effectiveness of attachment theory and measures. Howard and Miriam Steele and Avi Sagi-Schwartz might offer other examples, focused on nurturing the life of attachment research over decades. For all that he was characterized for a long time as a critic, Thompson may similarly be regarded as concerned with the growth of attachment research, as he has passionately sought to refocus the paradigm on its actual rather than assumed competencies.<sup>701</sup>

Belsky has argued that attachment research has theoretically neglected elements of development relevant to reproduction (e.g., age of menarche), in favour of a focus on the early attachment relationships as contributing to infant survival. At a structural level, he has made a parallel criticism of the attachment research community as overly focused on providing evidence for existing theoretical propositions, rather than developing new hypotheses or entering into dialogue with other disciplines. As a result, attachment research has risked becoming something of a backwater within developmental science.

Belsky has continued to value the attachment research tradition and its relevance, as reflected in his co-authorship of the 2022 consensus statement on attachment and family court practice.<sup>702</sup> He has also been attentive to the limitations of attachment research that risk the paradigm running out of road. He has raised concerns about the complacency of many attachment researchers, who seem not to see that resources are scarce and that to continue and thrive, attachment research must change, and even accept the possibility of being superseded. In his work, Belsky has interbred attachment research with many other disciplines, deterritorializing it through the interplay of genres and forms of knowledge, contributing to the liveliness of attachment theory and research and to its contemporary relevance.<sup>703</sup> The same may be said of Van IJzendoorn and Bakermans-Kranenburg, whose work will be the focus of the next chapter.

<sup>700</sup> Some researchers have undergone considerable change in their priorities over time. For instance, Main interbred the Ainsworth Strange Situation categories with ideas from ethology, cognitive science and linguistics. She then applied these ideas in the 1980s to expanding the scope of attachment research. She made no attempt to supersede attachment research, or even to disseminate it, except to psychoanalytic audiences. For instance, study of unresolved states of mind added to attachment research, but no attempt was made to contribute to wider discussions of trauma. From the mid-1990s, Main experienced mental and physical health difficulties. With highly constrained resources, her overwhelming priority became maintenance of her work to date, even perhaps at the price of contributing to insularity and inhibition of further growth of attachment research.

<sup>701</sup> Thompson, R. A., Simpson, J. A., & Berlin, L. J. (2022) Taking perspective on attachment theory and research: Nine fundamental questions. *Attachment & Human Development*, 24(5), 543–560.

<sup>702</sup> Forslund, T., Granqvist, P., Van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M., ... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52.

<sup>703</sup> Cf. Bowlby, J. (1980) By ethology out of psycho-analysis: An experiment in interbreeding. *Animal Behaviour*, 28(3), 649–656.

## Marinus van IJzendoorn, Marian Bakermans-Kranenburg, and the Leiden Centre for Child and Family Studies

### Biographical Sketch

Van IJzendoorn and Bakermans-Kranenburg have been described as ‘two of the master minds of developmental science’.<sup>1</sup> This role has included helping to secure the study of attachment through longitudinal and intervention studies, as well as extensive meta-analytic research. Among the most influential of these empirical and meta-analytic studies were investigations of genetic differential susceptibility ([Chapter 3](#)), the ‘transmission gap’ between the Adult Attachment Interview and the Strange Situation, and the finding that brief attachment-based interventions focused on parenting behaviour may be generally more effective than long-term support. Van IJzendoorn and Bakermans-Kranenburg have been important advocates for the work of Mary Main, including providing essential psychometric support for the Adult Attachment Interview and defending the value of her disorganized and unresolved classifications against critics such as Roisman, Belsky, and Fraley. They have had considerable influence as mentors of future leaders of attachment research, as well as some of the most exceptional of the younger generation of researchers. They have also used money from bonuses and commissioned work to fund doctoral studies for colleagues from Africa. Over the decades, Van IJzendoorn and Bakermans-Kranenburg have made decisive contributions across many areas of attachment research including the cross-cultural study of attachment, attachment-based interventions, and neuroscience. Their work has contributed to national and international policies, for instance regarding the use of institutional care for children.<sup>2</sup> In 2004 Van IJzendoorn won the Spinoza Prize, the highest Dutch award in science, one of the first social scientists to win this award. The funds from the Prize helped support a range of further studies in attachment, maltreatment, and developmental psychopathology. The Leiden Centre for Child and Family Studies was dissolved in 2017. In the subsequent years, both Van IJzendoorn and Bakermans-Kranenburg have continued to be actively involved in research, and supervision of graduate students, mostly in ongoing projects in the Netherlands, such as Generation R (Erasmus), Father Trials (VU), and L-CID (Leiden), but also with international collaborators (e.g., Ramchandani, Galbally, Roisman, Madigan, Bosmans, Cárcamo, Dagan, Deneault).

<sup>1</sup> Endorsement by Pehr Granqvist for Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press.

<sup>2</sup> SagePolicyProfiles lists 642 policy documents that cite the work of Van IJzendoorn and Bakermans-Kranenburg, with very considerable cross-national spread.

## Introduction

Writing in 1994, Van der Veer, Van IJzendoorn, and Valsiner reflected that ‘in the middle of that polyphony of the drama of science is the birthplace of new knowledge, and the personal lives of the scientists.’<sup>3</sup> Reflections on the contribution of personal context to the drama of science are always to an extent speculative, even when there is comprehensive information available.<sup>4</sup> Furthermore, sometimes we know little of this personal context. Lyons-Ruth (Chapter 2) has a characteristic reserve, never giving an interview across her career, and even speaking comparatively rarely at conferences. Belsky (Chapter 3) has been resoundingly outspoken about everything—except his family life growing up.

For a long time, Van IJzendoorn directed interviewers to talk about his scientific work, not his biography.<sup>5</sup> However, in the aftermath of his retirement from Leiden, in response to anonymous media reports about a too demanding work environment in his Leiden team, there was growing pressure on Van IJzendoorn to speak more about himself and his motivations. Eventually Van IJzendoorn gave an interview to *De Volkskrant*, which was framed as offering his perspective against the simplifications and misinformation propagated by critics.<sup>6</sup>

The tone of this interview by Van IJzendoorn is at points candid and at points guarded, skirting vulnerability but ultimately focusing on defending his academic practice. Van IJzendoorn is characterized as ‘very demanding, of himself and others.’ Then the account suddenly jumps back from Van IJzendoorn’s work to his childhood. He is described working in the fields for his father, being told ‘Don’t nag. Work.’ There is an image of Van IJzendoorn as a small child, barely able to stretch his foot to the peddles of the combine-harvester, as it reaped, threshed, gathered, and winnowed the grain. Whether due to the narrative given to the interviewer, or the journalist’s framing, these early biographical details are not explicitly woven back to the present.

The reader is left with a sense of Van IJzendoorn ascribing his demanding academic practice to his father’s values. The beginnings of an alternate kind of story, about the feelings of a small child, and disidentification with his father, are not integrated into the narrative. This may have reflected the journalist’s account of the interview with Van IJzendoorn. Or perhaps Van IJzendoorn’s focus on refuting anonymous complaints about his demanding work style, rather than his biographical context. In the photograph accompanying the article, Van IJzendoorn looks intense, blue eyes flashing in a serious face.

Out of sight of this media flurry about Van IJzendoorn’s style of academic leadership, a book had been published several years earlier by Chris van Esterik about an elite secondary school, Stedelijk Gymnasium, in Tiel. As with many such ‘biographies’ of a school, Van

<sup>3</sup> Van der Veer, R., Van IJzendoorn, M. H., & Valsiner, J. (1994) Epilogue. In R. Van der Veer, Van IJzendoorn, M. H., & J. Valsiner (eds), *On Reconstructing the Mind. Replicability in Research on Human Development* (pp. 271–283). Norwood, NJ: Ablex, p. 283.

<sup>4</sup> This point is made in two doctoral theses supervised by Van IJzendoorn and Van der Veer pursuing the intellectual biography of John Bowlby, a case where there is an exceptional wealth of archive material available to historians: van Dijken, S. (1998) *John Bowlby: His Early Life: A Biographical Journey into the Roots of Attachment Theory*. New York: Free Association Press; Van der Horst, F. C. (2011) *John Bowlby—From Psychoanalysis to Ethology: Unravelling the Roots of Attachment Theory*. New York: John Wiley & Sons.

<sup>5</sup> Van IJzendoorn, M. H. (2013) Opvoeding bestuderen van molecuul tot maatschappelijke context. *NVO Bulletin*, 5, jaargang 14, 4–8: ‘He does not want to say much about his own childhood’ (4).

<sup>6</sup> Mudde, T. (2018) Tiran of zondebok: Geprezen hoogleraar Rien Van IJzendoorn (65) vertelt zijn kant van het verhaal, *De Volkskrant*, 27 January 2018, <https://www.volkskrant.nl/nieuws-achtergrond/tiran-of-zondebok-geprezen-hoogleraar-rien-van-ijzendoorn-65-vertelt-zijn-kant-van-het-verhaal~b46f78945/>.

Esterik's book contained interviews with former students.<sup>7</sup> Unusual for this genre, however, Van Esterik foregrounded the school experience of a set of four siblings in the 1960s, the Van IJzendoorns, who were known for their exceptional academic gifts (Gery, Mieke, Marinus, and Mariëtte). Van Esterik's account suggests that the Van IJzendoorn siblings faced extreme poverty, and maybe maltreatment. (In discussing Van Esterik's account, I will switch to first names briefly to distinguish the siblings.)

Today, children in this situation at an elite secondary school would likely receive safeguarding assessments and some kind of support or referral. Exceptionally gifted children would also likely receive assessment for their skills profile and neurodiversity, and access to enrichment opportunities. No assessment, and no help with their needs (except for free second-hand textbooks handed over secretly by teachers), was available to the Van IJzendoorn siblings. An aspect of Marinus's career would later be contributing to the relevant psychological science to help future children. This has included work on biomarkers of stress at school entry;<sup>8</sup> the prevalence of maltreatment;<sup>9</sup> child protection assessment;<sup>10</sup> effective interventions with maltreating parents;<sup>11</sup> the effect of intervention on school performance;<sup>12</sup> and how practitioners might distinguish troubled attachment relationships from neurodiversity and their respective implications for children's needs.<sup>13</sup>

In writing about the Van IJzendoorn family, Van Esterik drew upon interviews with the oldest sibling Gery, and Marinus, as well as accounts of them from other students. Whilst in the public domain, the story is sensitive. Knowing of my interest in understanding his work and interests, Van IJzendoorn directed me to Van Esterik's book. I sought agreement from him to discuss it in this chapter. Characteristically, Van IJzendoorn said he would prefer that I focus on discussing his scientific work but expected that I would regard it as relevant context. I should underline that any contextualizing links drawn between information from Van Esterik's book about Van IJzendoorn's childhood and his later intellectual work are inevitably speculative and my own reflections.

From interviews with the siblings, their father is described by Van Esterik as hard-working, smart, and innovative but also stern and even harsh,<sup>14</sup> very strict and demanding at times, and could resort to spanking when not obeyed immediately. Van Esterik observes that in the 1950s and early 1960s, spanking was still common in Dutch society, even in schools, though he also situates the harsh treatment of the Van IJzendoorn children in terms of the acute economic strains and stresses faced by the family. The small farmers' contractor business struggled for years to break even and did finally only become fully

<sup>7</sup> Van Esterik, C. (2011) *No Satisfaction. Hoe we werden wie we zijn*. Meppel: Uitgeverij Boom/SUN.

<sup>8</sup> Groeneveld, M. G., Vermeer, H. J., Linting, M., Noppe, G., van Rossum, E. F., & Van IJzendoorn, M. H. (2013) Children's hair cortisol as a biomarker of stress at school entry. *Stress*, 16(6), 711–715.

<sup>9</sup> Euser, S., Alink, L. R., Pannebakker, F., Vogels, T., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2013) The prevalence of child maltreatment in the Netherlands across a 5-year period. *Child Abuse & Neglect*, 37(10), 841–851.

<sup>10</sup> Van der Asdonk, S., de Haan, W. D., van Berkel, S. R., Van IJzendoorn, M. H., Rippe, R. C., Schuengel, C., ... & Alink, L. R. (2020) Effectiveness of an attachment-based intervention for the assessment of parenting capacities in maltreating families: A randomized controlled trial. *Infant Mental Health Journal*, 41(6), 821–835.

<sup>11</sup> Euser, S., Alink, L. R., Stoltenborgh, M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) A gloomy picture: A meta-analysis of randomized controlled trials reveals disappointing effectiveness of programs aiming at preventing child maltreatment. *BMC Public Health*, 15, 1–14.

<sup>12</sup> Van IJzendoorn, M. H. & Juffer, F. (2005) Adoption is a successful natural intervention enhancing adopted children's IQ and school performance. *Current Directions in Psychological Science*, 14(6), 326–330; Cyr, C. & Van IJzendoorn, M. H. (2007) Attachment in the schools: Toward attachment-based curricula. *Journal of Early Childhood and Infant Psychology*, 3, 95–118.

<sup>13</sup> Coughlan, B., Van IJzendoorn, M. H., Woolgar, M., Weisblatt, E. J., & Duschinsky, R. (2022) Differentiating 'attachment difficulties' from autism spectrum disorders and attention deficit hyperactivity disorder: Qualitative interviews with experienced health care professionals. *Frontiers in Psychology*, 12, 780128.

<sup>14</sup> Van Esterik, C. (2011) *No Satisfaction. Hoe we werden wie we zijn*. Meppel: Uitgeverij Boom/SUN, p. 155.

viable on the basis of unpaid labour by the children, who started work aged eight. Van Esterik places this use of child labour in the historical context, as not unusual for families in rural poverty in the Netherlands in the fifties and first half of the sixties. The siblings would get up at 5am to help with housework, farmwork or academic studies before school. During school holidays they would work from 8am to 8pm, digging, ploughing, harvesting potatoes, packing hay, threshing. Nearly all the energy of the young Van IJzendoorn siblings was funnelled into work, although there was some spare time for soccer and ice-skating with their father when work was done. From their interviews, there is no indication that the siblings doubted that they were making a needed contribution, even if they expressed sorrow at the extent and harshness of the demands on them.

The year Marinus began high school, the family moved to a different place outside of town with no water supply and no sewage. Marinus would drive the family tractor every Saturday to nearby Wadenoyen to reach the public water tap and collect drinking water for the family for the week. He was unable to control the tractor whilst sitting normally in the seat: only by standing using his full weight could he compress the stop pedal.

In describing the pressure on poor families to use their children within forms of industrialized labour, Marx wrote that 'insofar as machinery dispenses with muscular power, it becomes a means of employing labourers of slight muscular strength, and those whose bodily development is incomplete' 'usurping the place ... of the child's play'.<sup>15</sup> In fact, given his size, Marinus experienced considerable strain and alarm in trying to fulfil this role, and found driving the big combine-harvester very stressful. Indeed, he was once stopped by the police, who were alarmed at this small boy dutifully, and perhaps precariously, driving a huge piece of machinery through town.

The Van IJzendoorns were part of a stigmatized minority Catholic community within a Protestant majority country. Catholicism dominated the life of the Van IJzendoorn home. Gery recalled that 'the rules of the Church were taken seriously. Those rules mostly consisted of guilt, penance and obedience', and functioned to mandate their father's rule and harsh parenting.<sup>16</sup> Yet in one way their father did not get his way. Rather than attending the local Catholic home economics school, on the basis of outstanding test results Gery attended the Stedelijk Gymnasium in Tiel. She was followed by her sister Mieke and then Marinus and the youngest sister Mariëtte. Both parents only had primary school education. 'This will not end well', predicted the father, 'You're going to look down on me.'<sup>17</sup> But he was overruled by his wife. Schooling at the Gymnasium was accepted only on the condition that the children would not fail a class at school, and then contribute to the fledgling farmers' contracting business whenever not in school. The family offered acknowledgement to the Van IJzendoorn children for effort and talent and contribution towards an escape from poverty, with a precipice beyond these sources of value.

The siblings experienced a complicated tension between two different worlds, each uninterested in comprehending the other: the elegant, elite school environment and their sometimes harsh and always poor home life. This tension was hard to hold. Gery recalled that in primary school she had been a cheerful and self-assured child, one of the leaders of her class. In secondary school she outshone her peers academically, but her self-assurance 'disappeared and then never returned'.<sup>18</sup> Marinus recalled that it took around three years to

<sup>15</sup> Marx, K. ([1867] 1990) *Capital: A Critique of Political Economy*, Vol. 1, trans. B. Fowkes, London: Penguin, p. 547.

<sup>16</sup> Van Esterik, C. (2011) *No Satisfaction. Hoe we werden wie we zijn*. Meppel: Uitgeverij Boom/SUN, p. 155.

<sup>17</sup> *Ibid.*, 157.

<sup>18</sup> *Ibid.*, 151.

find his place with classmates, and to not feel alone.<sup>19</sup> Marinus's classmates were easy and fluent in conversation, and could take each other and the school for granted, supported by home environments aligned with the culture of the school. This was not the case for Marinus. His situation—being cleft between two fiercely different contexts—obstructed the capacity to take for granted what people said and intended.<sup>20</sup>

Despite this challenge, Marinus relished the knowledge on offer at the school. He excelled especially in mathematics and in classics. But the school also supported broader learning. He was provided with tools to critically consider what truth claims may be trusted, supporting intellectual emancipation through confrontation and debate: 'I was quite a reader. Sartre, novels and existentialist philosophy not in line with the straight Catholic path expounded by my parents. It was the classic clash of cultures in the Sixties: religious certainties versus philosophical doubt.'<sup>21</sup>

Despite Marinus's homemade clothes, low-class habitus, and extraordinary academic ability, Van Esterik's interviews with classmates indicate that by final year there was considerable solidarity felt towards him from his year-group.<sup>22</sup> Whilst it took time, the school environment did become a space in which Marinus felt that others found him intelligible and of value, with far less conditionality than his experiences at home. One especially important relationship for Marinus was with Adriana Bus: they started dating as teenagers, and ultimately became life partners, colleagues at Leiden, and collaborators on many studies.

During her final year at the school, Gery was top of her class and would have liked to prepare for university study in medicine or psychology. But her father needed her at work, so she missed a crucial examination. When the potato harvest had finished, she instead entered training as a surgical assistant rather than attending university. Though, reflecting on her own experiences at the grammar school, she later retrained as a teacher, and ultimately became a senior manager in education.

During his final year at the school, Marinus was forced to miss three weeks of school, reported as illness, as again his father urgently needed his labour. Unlike Gery, he did attend university, but 'a number of choices my grammar school teachers suggested were not real options': 'If I would have come from a higher class I might have made a different choice of topic for academic study. Probably I would have chosen medicine or science. That was the natural choice of children with a talent for science from an (upper) middle class, but not for children of our background.'<sup>23</sup>

Instead, Marinus selected to study pedagogy at the University of Amsterdam, a discipline without a simple equivalent in the anglophone world, but which encompasses child development, family studies, and education. Maybe the closest English term would be the study of children's 'upbringing'. Marinus found pedagogy attractive as it had 'everything I was interested in: from statistics and physiology to sociology and philosophy. But it was also an unassuming area of study without the dignified image of law or medicine.'<sup>24</sup>

<sup>19</sup> Ibid., 229.

<sup>20</sup> On cleft habitus, see Bourdieu, P. ([2004] 2007) *Sketch for a Self-Analysis*, trans. R. Nice, Cambridge: Polity.

<sup>21</sup> Van Esterik, C. (2011) *No Satisfaction. Hoe we werden wie we zijn*. Meppel: Uitgeverij Boom/SUN, p. 240.

<sup>22</sup> Ibid., 339.

<sup>23</sup> Ibid., 349.

<sup>24</sup> Ibid., 70. See also IJzendoorn, M. H. & Rosmalen, L. (eds) (2017) *Pedagogiek in Beeld: Een inleiding in de pedagogische studie van opvoeding, onderwijs en hulpverlening*. New York: Springer: 'Pedagogy is interesting from the outset because no one can do without upbringing or education. Every human being is personally involved in one way or another in upbringing and education. Pedagogy is also intellectually interesting because it covers a wide range of sciences. This is understandable, because knowledge and insights from all kinds of other scientific disciplines (such as psychology, biology, psychiatry, sociology) are indispensable for the development of a theory that aims to describe and explain phenomena such as upbringing, education and counselling. It is also a useful



It might additionally be suspected that, like Gery, Marinus had much to reflect on in terms of his own experiences of family and education, and knew first-hand of the power of these institutions, especially given children's relative openness and powerlessness.

In the event, Van IJzendoorn was right to think that he would be judged within higher education for his low-class background. Even in his Dies Lecture, to all faculty of Leiden University on the occasion of its anniversary, he would be looked down on by some of his colleagues for his evident working-class habitus. In the lecture, discussing attachment relationships across time and cultures, Van IJzendoorn quoted from book six of the *Iliad*, in which Homer offers a moving account of the use by the child Astyanax of his mother and father, Andromache and Hector, as safe havens when distressed. Afterwards, a colleague scoffed at Van IJzendoorn's reference to a classical text, presuming that he could not possibly have actually read it.<sup>25</sup> In fact, he had read Homer in the Greek at grammar school.

During his degree, Van IJzendoorn became very interested in philosophy. What he took from this philosophical reading was to have an incredibly significant and long-term influence on his life's work, so merits exploration.

The German philosopher Immanuel Kant had proposed that humans all begin in childhood in a state of passivity, without the skills or power to question the terms under which we live our lives. Supported by cognitive and moral development, we may start to question why we behave as we do, and doubt our immediate experience and expectations, which will have been shaped by assumptions and contexts not of our own choosing.

For Kant, this questioning allows one to reconsider the assumptions that have guided one's behaviour to date. It allows us to exit a state of 'immaturity' (*unmundigkeit*, literally: legal minority), of being unable to 'use one's own understanding without guidance from another.'<sup>26</sup> We can use reason to appraise our personal experience and the claims of others, and generate knowledge that is universal, dependable, and sharable. For Kant, the public testing of knowledge claims is critical to this process of enlightenment, and escape from immaturity: 'the touchstone whereby whether we decide whether our holding a thing to be true is conviction or mere persuasion is therefore external, namely, the possibility of communicating it and finding it to be valid for all human reason.'<sup>27</sup> Kant warned that if humans do not pursue this form of knowledge, they will always be subject to the tyranny of others who will seek to control them and legitimize this control in terms of distorted truths, much like a child is at the mercy of their parents.<sup>28</sup> He argued for the 'freedom to make public use of one's reason in all matters.'<sup>29</sup>

For Kant, 'reason must approach nature with the view indeed of receiving information from it, not however in the character of a pupil, who listens to all that his master chooses to tell him, but in that of a judge, who compels the witness to reply to those questions which

subject because pedagogical research on targeted and systematic interventions shows in practice how upbringing, education and support can be improved' (8).

<sup>25</sup> Van Esterik, C. (2011) *No satisfaction. Hoe we werden wie we zijn*. Meppel: Uitgeverij Boom/SUN, p. 352.

<sup>26</sup> Kant, I. ([1784] 1991) An answer to the question: 'What is enlightenment?', in H. Reiss (ed.), *Kant's Political Writings* (pp. 54–60). Cambridge: Cambridge University Press, p. 52.

<sup>27</sup> Kant, I. ([1787] 1963) *Critique of Pure Reason*. Trans. N. Kemp Smith. London: Macmillan, p. 645. cf. Benjamin, A. (2012) Towards an affective structure of subjectivity. Notes on Kant's 'An answer to the question: What is the enlightenment?', *Parallax*, 18(4), 26–41.

<sup>28</sup> Kant, I. ([1786] 1991) What does it mean to orient oneself in thinking? In *Religion and Rational Theology*, trans. A. W. Wood & G. di Giovanni. Cambridge: Cambridge University Press.

<sup>29</sup> Kant, I. ([1784] 1991) An answer to the question: 'What is enlightenment?', in H. Reiss (ed.), *Kant's Political Writings* (pp. 54–60). Cambridge: Cambridge University Press, p. 54. Kant elaborates: 'The public use of man's reason must always be free, and it alone can bring about enlightenment among men; the private use of reason may quite often be very narrowly restricted, however, without undue hindrance to the progress of the enlightenment. But by the public use of one's own reason I mean that use which anyone may make of it as a man of learning addressing the entire reading public' (55).

he himself thinks fit to propose.<sup>30</sup> This idea was developed by the German sociologist and philosopher, Jürgen Habermas, who characterized three kinds of desire for knowledge: hermeneutic attempts to understand the subjective meanings; empirical attempts to understand objective meanings; and ideological-critical attempts to interrogate the role of social power and control in shaping subjective and objective meanings.<sup>31</sup>

For Habermas, each form of knowledge alone had vulnerabilities. Yet Habermas felt that the three forms of knowledge could be reconciled through the activities of collectives of researchers: their individual efforts could be checked against one another and open to critique, reducing the risks of subjective or ideological distortion. In this way, knowledge could be stabilized as universal, dependable, and sharable, forming the ground and granite of effective decisions in policy and practice. Beyond the production and dissemination of scientific findings, the three forms of knowledge could also be reconciled through nurturing an effective public sphere conducive to engagement and debate. This would include the political and moral socialization of young people to become effective, rational actors within the public sphere, capable of offering and receiving robust and logical discussion of their views.<sup>32</sup>

One of the most important interlocutors for Habermas's views was the philosopher of science Karl Popper, another major influence on Van IJzendoorn.<sup>33</sup> Popper held that the path to objective knowledge entailed two primary stages: these intentionally echo Kant's account of the journey from immaturity to enlightenment. Reflecting on what he called 'Kant's challenge,' Popper wrote:

Science is not only, like art and literature, an adventure of the human spirit, but it is among the creative arts perhaps the most human: full of human failings and shortsightedness, it shows those flashes of insight which open our eyes to the wonders of the world and of the human spirit. Science is the direct result of that most human of all human endeavours – to liberate ourselves. It is part of our endeavour to see more clearly, to understand the world and ourselves, and to act as adult, responsible, and enlightened beings.<sup>34</sup>

In the *context of discovery*, researchers should develop testable hypotheses about the world, whether on the basis of theory, intuition, or initial empirical research.<sup>35</sup> New ideas are put forward to extend the bounds of what we know, representing a centrifugal force.

<sup>30</sup> Kant, I. ([1781] 1990) Preface, *Critique of Pure Reason*, trans. J. M. D. Meiklejohn (p. viii). New York: J. M. Dent & Sons.

<sup>31</sup> Habermas, J. ([1968] 2015) *Knowledge and Human Interests*. Trans. J. Shapiro. Oxford: John Wiley & Sons; Habermas, J. & Lenhardt, C. (1973) A postscript to knowledge and human interests. *Philosophy of the Social Sciences*, 3(2), 157–189. Habermas recalls that one of the sources of his personal fascination with dependence, vulnerability and the social nature of human beings was the trauma of hospitalization for surgery for a cleft palate as a child, which 'enduringly shattered my trust in the world around me'. From the start, then Habermas' concerns were already inflected by a resonance with issues relating to attachment theory. Habermas, J. ([2004] 2021) Public space and political public sphere—the biographical roots of two motifs in my thought. *The Journal of Philosophy of Disability*, 1, 105–115.

<sup>32</sup> Habermas, J. (1975) Moral development and ego identity. *Telos*, 1975(24), 41–55. See also Habermas, J. ([1962] 1989) *The Structural Transformation of the Public Sphere*, trans. T. Burger & F. Lawrence. Cambridge, MA: MIT Press.

<sup>33</sup> On reception of Popper among practicing scientists, see Mulkay, M. & Gilbert, G. N. (1981) Putting philosophy to work: Karl Popper's influence on scientific practice. *Philosophy of the Social Sciences*, 11(3), 389–407; Riesch, H. (2007) *Scientists' Views of the Philosophy of Science*. London: University College London. A point made by both Mulkay and Gilbert and by Riesch from his interview data was that, though most knew of Popper's ideas to a greater or lesser degree, it was rare for scientists to develop their research with Popper's recommendations in mind. Interest in Popper among scientists has surged, however, since the replication crisis in psychology. Derksen, M. (2019) Putting Popper to work. *Theory & Psychology*, 29(4), 449–465.

<sup>34</sup> Popper, K. ([1956] 1983) *Realism and the Aim of Science*. London: Routledge, p. 259.

<sup>35</sup> Van IJzendoorn, M. H. & van der Veer, R. (1983) Holzkamp's critical psychology and the functional-historical method: A critical appraisal. *Storia e critica della psicologia*, 4, 5–26: 'In Popper's critical rationalism a

By contrast, untestable claims (e.g., observations by sociologists about 'society' as a whole) are misleading, and a waste of breath.<sup>36</sup>

In the *context of justification*, researchers should attempt to directly evaluate hypotheses against new empirical evidence, with the potential for the hypothesis to be proven wrong. Dependable knowledge is established and solidified, representing a centripetal force. For Popper, failure to distinguish the context of discovery from the context of justification is not only a category error. It is a complete misunderstanding of the life-cycle of science knowledge. It is to fail to distinguish chrysalis from flying insect.

In the context of justification, science may achieve the Kantian ambition of 'mutual rational control by critical discussion.'<sup>37</sup> Supportive evidence can never prove a hypothesis absolutely. Still, the repeated survival of hypotheses of decisive empirical studies with the potential to disprove them can offer the jury of the scientific community confidence in their validity: 'The objectivity of science is not a matter of the individual scientists but rather the social result of their mutual criticism, of the friendly-hostile division of labour among scientists, of their co-operation and also of their competition.'<sup>38</sup> In his 1934 book *Logik der Forschung*, Popper emphasized that this process of co-operation and competition is facilitated by community feeling and norms.<sup>39</sup> Unfortunately these reflections were expunged in the 1959 revision/translation into English, *The Logic of Scientific Discovery*; Popper's students have speculated that these changes stemmed from a wish to avoid the implication that the validity of scientific truth rests on a social or community basis.<sup>40</sup> Nonetheless, even in his later work, Popper accepted that hypotheses are not merely a matter of individual propositions but rather a result of the generation of ideas and methods within traditions of knowledge.<sup>41</sup>

Habermas had political disagreements with Popper. Furthermore, he was more cautious than Popper regarding the extent to which the context of discovery or the context of justification could free themselves from norms and ideologies in the production of knowledge.<sup>42</sup> In particular, he held that the context of discovery will be profoundly shaped by societal values and priorities. The context of justification would also not be free from such social forces, which will shape what replications are conducted, how they are interpreted, and how the new knowledge is taken up. Nonetheless, he agreed with Popper that universal, dependable, and sharable knowledge was something the community of scientists could aspire to and work towards. He agreed with Popper that this work required 'the construction, critical discussion, evaluation, and critical testing, of competing conjectural

sharp distinction is made between the context of discovery of a new system of concepts, a new theory or a new hypothesis and the context of justification of propositions. In the first context, intuition and creativity may be used freely in formulating bold speculations which later are subjected to strict tests' (9).

<sup>36</sup> Popper, K. ([1961] 1976) The logic of the social sciences. In T. Adorno et al. (ed.) *The Positivist Dispute in German Sociology* (pp. 87–104). London: Heinemann; Popper, K. R. (1970) Reason or revolution? *European Journal of Sociology/Archives Européennes de Sociologie*, 11(2), 252–262.

<sup>37</sup> Popper, K. ([1934] 1972) *The Logic of Scientific Discovery*. Trans. J. Freed and L. Freed. 2nd ed., London: Hutchinson, p. 44.

<sup>38</sup> Popper, K. ([1961] 1976) The logic of the social sciences. In T. Adorno et al. (ed.), *The Positivist Dispute in German Sociology* (pp. 87–104). London: Heinemann, p. 95.

<sup>39</sup> Popper, J. ([1934] 1966) *Logik der Forschung: Zur Erkenntnistheorie der modernen Naturwissenschaft*. Tübingen: Mohr & Siebeck.

<sup>40</sup> Jarvie, I. C. (2001) *The Republic of Science: The Emergence of Popper's Social View of Science 1935–1945*. Amsterdam: Ripodi. See also Kochan, J. (2009) Popper's communitarianism. In Z. Parusniková & R. S. Cohen (eds), *Rethinking Popper* (pp. 287–303). Dordrecht: Springer Netherlands.

<sup>41</sup> Popper, K. ([1948] 1963) Towards a rational theory of tradition. In *Conjectures and Refutations: The Growth of Scientific Knowledge* (pp. 161–182). London: Routledge.

<sup>42</sup> Habermas, J. ([1961] 1976) The analytic theory of science and dialectic. In T. Adorno et al. (ed.) *The Positivist Dispute in German Sociology* (131–162). London: Heinemann.

theories.<sup>43</sup> These conditions could make possible the exercise of human reason and the development of cumulative knowledge, with the potential to contribute to the improvement of society.<sup>44</sup> Habermas accepted Popper's claim that science should be supported to operate with transparency and parsimony, like natural selection, such that only knowledge that survives clear attempts to criticize and disconfirm it may flourish over time.<sup>45</sup>

Inspired by Habermas, following his degree Van IJzendoorn went to study for a PhD, between 1976 and 1978, at the Free University of Berlin/Max Planck Institute for Human Development and Education in West Germany. He was interested in how children may be socialized to conservative or emancipated perspectives on the world. He chose to study with Wolfgang Lempert, who was working with Habermas's ideas, and Hans Oswald, undertaking empirical work on children's moral development and political reasoning.<sup>46</sup> While aligned with the Dutch discipline of pedagogy, the model for research inquiry in which Van IJzendoorn was immersed in Berlin had some distinctive features. Specifically, several oppositions usually separated in academic life in the period were brought together.

The Berlin researchers tackled problems of social significance (e.g., political participation; vocational training), often oriented by social democratic values, but representing a position considered independent from political or social interests. Nonetheless, it was acknowledged that 'no theoretical structure—not even in the natural sciences—can be completely reduced to so-called "bare facts". In every paradigm or research programme, norms, values and metaphysical convictions play a central role.'<sup>47</sup>

Integration across the human sciences was regarded as utterly natural by the Berlin researchers; indeed, a failure by researchers to learn from the theory, method, and findings of other disciplines was considered bizarre and self-defeating.<sup>48</sup> Quantitative research was the norm but expected to be highly philosophically informed. Even in research on individual development, researchers were enjoined to hold in mind that humans are fundamentally both biological and norm-saturated beings. For the Berlin researchers, rationalist ideas were prominent, but with a distinctive concern for the socio-developmental conditions under which humans can achieve rationality and live as enlightened citizens, rather than taking for granted human rationality.

In his doctoral study, Van IJzendoorn agreed with Habermas that an adequate level of cognitive-moral reasoning is a necessary prerequisite for a rational political attitude and maintenance of an emancipated public sphere in the face of the ever-present threat of political myths, bigotry, and misinformation.<sup>49</sup> He would later recall that essential to his teachers, such as Lempert, was the Habermasian idea that 'emancipation from fake facts and false beliefs is driven by the need for self-reflection, self-direction and agency without unjustifiably constraining bonds of hierarchy, prejudice and oppression.'<sup>50</sup>

<sup>43</sup> Popper, K. (1981) *Objective Knowledge: An Evolutionary Approach*. Oxford: Oxford University Press, p. 142.

<sup>44</sup> Habermas, J. (1970) Towards a theory of communicative competence. *Inquiry*, 13, 360–75. See also Habermas, J. (2001) From Kant's 'ideas' of pure reason to the 'idealizing' presuppositions of communicative action: Reflections on the detranscendentalized 'use of reason'. In W. Rehg & J. Bohman (eds), *Pluralism and the Pragmatic Turn* (pp. 11–39). Cambridge, MA: MIT Press.

<sup>45</sup> Stokes, G. (2016) Popper and Habermas: Convergent arguments for a postmetaphysical universalism. In J. Shearmur & G. Stokes (eds), *The Cambridge Companion to Popper* (pp. 318–351). New York: Cambridge University Press.

<sup>46</sup> Van IJzendoorn, M. H. (1980) *Moralität und politisches Bewusstsein*. Weinheim, Basel: Beltz.

<sup>47</sup> Van IJzendoorn, M. H. (1983) Moral and political education: A case for integration. *International Journal of Political Education*, 6(1), 25–41, p. 32.

<sup>48</sup> See, for example, Lempert, W. (1971) *Leistungsprinzip und Emanzipation*. Frankfurt a. M.: Suhrkamp.

<sup>49</sup> Van IJzendoorn, M. H. (1980) *Moralität und politisches Bewusstsein*. Weinheim, Basel: Beltz.

<sup>50</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 229, discussing Lempert, W. (1971) *Leistungsprinzip und Emanzipation*. Frankfurt a. M.: Suhrkamp.

Returning from Berlin, in 1978 Van IJzendoorn joined Leiden University as an Assistant Professor. This period was seeing increasing maternal employment and ensuing debates about daycare as a threat to child–caregiver attachment in the Netherlands:<sup>51</sup> ‘a small number of influential Dutch psychiatrists of the older generation felt compelled to act as defenders of the child. They rejected day-care centers and claimed that the mother should be the most important caregiver during the child’s first years. Relying mainly on the early Bowlby, they pleaded for childcare within the nuclear family, with a protecting father and a caring mother.’<sup>52</sup> International research on attachment was further galvanized by the publication of Ainsworth and colleagues’ *Patterns of Attachment* in 1978. Van IJzendoorn began a programme of empirical work on the topic of attachment, with a sample of 66 Dutch dyads, examining child–mother attachment in the Strange Situation with employed and home-rearing mothers, and the stability of Strange Situation classifications over time.

As discussed in [Chapter 1](#), Van IJzendoorn was initially critical, but by the start of the 1980s had become more positive towards attachment theory—and the Strange Situation as a measure. He wanted to address dynamics of harsh and insensitive care, which had featured so strongly in his childhood. In particular, he was interested to understand how and when children would trust or distrust the availability and dependability of their caregivers: developing a minor theme in Ainsworth’s writings little noticed by other attachment researchers, Van IJzendoorn conceptualized insecure attachment as a kind of *distrust* in the caregiver.<sup>53</sup>

For Van IJzendoorn, children’s expectations about whether they could trust their familiar adults was all the more important in a society in which children’s difficulties, especially their mental health, could often be devalued, especially due to their relative social powerlessness. An unappeasable urgency can be seen in Van IJzendoorn’s extreme productivity: just a few years after his PhD, he had more publications than many Dutch professors. He felt a moral pressure compelling his work: the miseries of children were a misery to him and would not let him rest: ‘it should not hurt to be a child’.<sup>54</sup>

It may be that Van IJzendoorn’s family and class background added pressure to the need for markers of recognition, reflecting a kind of distrust that he would be welcomed in academia without sky-high evidence of achievement. Also, as Van IJzendoorn later emphasized, he identified with the values of ‘Don’t nag. Work.’ Whereas other lead researchers in developmental psychology research groups tended to hand off laborious aspects of projects, such as coding, to assistants, Van IJzendoorn’s family and class background may have contributed to the fact that he has characteristically contributed directly to such

<sup>51</sup> Tavecchio, L. W., Van IJzendoorn, M. H., Goossens, F. A., & Vergeer, M. M. (1984) The division of labor in Dutch families with preschool children. *Journal of Marriage and the Family*, 46(1), 231–242.

<sup>52</sup> Clerkx, L. E. & Van IJzendoorn, M. H. (1992) Child care in a Dutch context. On the history, current status, and evaluation of nonmaternal child care in the Netherlands. In M. E. Lamb, K. J. Sternberg, C. P. Hwang, & A. G. Broberg (eds), *Child Care in Context. Crosscultural Perspectives* (pp. 55–81), Hillsdale, NJ: Erlbaum.

<sup>53</sup> The idea of insecure attachment as a kind of distrust can be found already in Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., & Vergeer, M. M. (1982) *Opvoeden in geborgenheid: Een kritische analyse van Bowlby’s attachmenttheorie*, Amsterdam: Van Loghum Slaterus, p. 61. The essence of security is also described as ‘children who trust their caregiver’ in Bus, A. G. & Van IJzendoorn, M. H. (1988) Attachment and early reading: A longitudinal study. *The Journal of Genetic Psychology*, 149(2), 199–210, p. 208. Cf. Ainsworth, M., Blehar, M., Waters, E. & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press: ‘If his experience has led him to distrust her accessibility or responsiveness, his set-goal for proximity may well be set more narrowly’ (13).

<sup>54</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2013) It should not hurt to be a child. *International Journal of Psychology*, 48(2), 79–80. Also, the title of a doctoral project they co-supervised, Stollenborgh, M. (2012) *It should not hurt to be a child: Prevalence of child maltreatment across the globe*. Unpublished doctoral dissertation. Leiden University. Cf. Keats’s description is of those ‘to whom the miseries of the world are misery / and will not let them rest’ (*Fall of Hyperion*, l.158–9).

laborious work. Within his research group he was often what the Dutch call a 'meewerkend voorman', a foreman who gets his hands dirty working on the construction site.

In his early career, Van IJzendoorn had a strong interest in poverty and inequalities. However, the Dutch welfare reforms of the early 1970s had considerably reduced the kind of rural hardship that he had experienced growing up. In 1962 Dutch welfare payments were average for the OECD; by 1972 they were fully double the average, and the most extensive worldwide.<sup>55</sup> This made poverty a personally less urgent target for research, at the same time as reducing variance between poverty and non-poverty, giving Van IJzendoorn the impression that the study of poverty would be a less promising focus on which to build a career. The question of how family dynamics are nested within social systems, highlighted by Bronfenbrenner, Belsky, and Cicchetti (Chapter 3), was not, with one rather wonderful exception,<sup>56</sup> pursued by Van IJzendoorn until 2004.<sup>57</sup> This coincides with his Spinoza Prize. It may have been that the topic of socioeconomic differences would have been too close to home during Van IJzendoorn's early career, still bearing some aspects of the habitus of a working-class and provincial outsider, until the consecration and security granted by the career-defining award.<sup>58</sup>

Not only the Dutch welfare state, but also the higher education sector was undergoing transition in the 1970s, following the passage of the University Government Reorganization Act in 1970, which reduced the autonomy and hierarchy of universities.<sup>59</sup> Universities were undergoing curricular reform and a reorientation of science policy, prioritizing applied and socially relevant research. There was considerable staff turnover. Within the discipline of pedagogy in the Netherlands and in Germany, there was a prevailing wind away from philosophical and humanistic research, and towards either empirical and quantitative inquiry or politically engaged critical psychology.

When the Chair in the Theory, Methodology, and History of Pedagogical Sciences at Leiden became vacant, Van IJzendoorn was encouraged by the search committee to apply. Despite being only 28 years old, his skills and experience in empirical research appealed to the direction of travel of the department. He already had papers defending empirical research within pedagogy against more humanistic perspectives,<sup>60</sup> empirical papers on moral development, and a strong emerging programme of empirical research on child attachment. In turn, the position of chair interested Van IJzendoorn, for all that there would

<sup>55</sup> Ellman, M. (1984) The crisis of the welfare state—the Dutch experience. In K. E. Boulding (eds), *The Economics of Human Betterment* (pp. 191–211), London: Palgrave.

<sup>56</sup> Bus, A. G., & Van IJzendoorn, M. H. (1995) Mothers reading to their 3-year-olds: The role of mother-child attachment security in becoming literate. *Reading Research Quarterly*, 30(4), 998–1015. Here Bus and Van IJzendoorn examined the role of socioeconomic factors in moderating the implications of attachment security on specific reading behaviours. It is a beautiful paper and signals a what-might-have-been had it been possible to integrate socioeconomic factors earlier into Van IJzendoorn and collaborators' research agenda.

<sup>57</sup> For example, Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Kroonenberg, P. M. (2004) Differences in attachment security between African-American and white children: Ethnicity or socio-economic status? *Infant Behavior and Development*, 27(3), 417–433; Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Bradley, R. H. (2005) Those who have, receive: The Matthew effect in early childhood intervention in the home environment. *Review of Educational Research*, 75(1), 1–26.

<sup>58</sup> It may also have been that Van IJzendoorn's childhood memories of rural poverty would not have been easy to revisit until later in life. A comparison could be drawn with Bowlby, who was adamant in his writings in the 1950s that poverty had a huge role in hindering and disrupting caregiving, making the poverty of parents a vital issue for policy and practice. He urged his readers to 'campaign unremittingly until it is remedied'. However, the traumatic loss of Bowlby's close friend, the Labour MP Evan Durbin, meant that this was no longer an issue Bowlby could think about, and attention to poverty dropped out of his writings. Bowlby, J. (1953) *The Roots of Parenthood*, London: National Children's Home, p. 14.

<sup>59</sup> Daalder, H. (1975) The Dutch universities between the 'New Democracy' and the 'New Management'. In P. Seabury (ed.), *Universities in the Western World* (pp. 195–231). New York: Free Press.

<sup>60</sup> For example, Van IJzendoorn, M. H. (1979) Operationaliseringsproblemen bij onderzoek naar de affectieve relatie tussen ouder en kind. *Pedagogische Studiën*, 56, 358–368.

be challenges to being appointed to the role so young. For someone with Van IJzendoorn's experience of rural poverty, a chair at Leiden offered a consummate marker of recognition and acceptance within the world of education.

In fulfilment of his role in leading study of the theory, methodology, and history of pedagogical sciences, Van IJzendoorn worked with colleagues and graduate students on two monographs in the history of science. A first was a historical account of the emergence of critical psychology,<sup>61</sup> offering considerable criticism from the perspective of an empirical-rationalist approach to scientific inquiry, drawing extensively on Habermas and Popper. A second monograph was a comprehensive and evaluative review of attachment theory (Chapter 1).<sup>62</sup>

As chair, Van IJzendoorn experienced considerable challenges helping the department survive through the funding cuts of the 1980s, and some sections of the department were lost. However, the department managed to retain most of its staff and functions through the decade. Though there was a considerable shift in culture towards greater expectation of research activity and productivity, often with colleagues getting involved in Van IJzendoorn's programme of work on attachment, such as contributing to meta-analyses. He also supported existing faculty members to undertake PhDs (e.g., Van der Voort, Van der Veer, Kroonenberg). He placed Habermas and Popper as essential parts of the undergraduate and graduate taught curriculum, requiring students to make their way through Habermas in German until Dutch translations became available.<sup>63</sup>

Van IJzendoorn continued to publish occasional empirical research on moral development and prosocial behaviour. Meanwhile, his research on early attachment became a consuming focus, and, despite early hopes for mutual relevance,<sup>64</sup> ultimately there were too few empirical links between attachment and moral behaviour for the two areas of inquiry to effectively synergize.<sup>65</sup> Though a line of continuity may still be drawn between Van IJzendoorn's early work on moral behaviour and his ongoing concern with prosocial and aggressive behaviour, its contexts, and implications.<sup>66</sup>

Bus, then at the University of Groningen, and Van IJzendoorn undertook research on associations between toddler–mother attachment in the Strange Situation and dyadic interactions during reading.<sup>67</sup> They documented that children in securely attached dyads were less distracted during reading, required less discipline, paid more attention to instructions, and engaged in more proto-reading.

<sup>61</sup> Van IJzendoorn, M. H., Van der Veer, R., & Goossens, F. A. (1981) *Kritische psychologie. Drie stromingen*. Baarn: Basisboeken Ambo. Revised translation published as Van IJzendoorn, M. H., & Van der Veer, R. (1984) *Main Currents of Critical Psychology*. Vygotskij, Holzkamp, Riegel. New York: Irvington Publishers.

<sup>62</sup> Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., & Vergeer, M. M. (1982) *Opvoeden in geborgenheid. Een kritische analyse van Bowlby's attachment theorie*. Deventer: Van Loghsum Slaterus.

<sup>63</sup> C. Schuengel, personal communication, September 6, 2024.

<sup>64</sup> Bowlby, J. (1951) *Maternal Health and Mental Health*, Geneva: World Health Organisation, pp. 52–53; Bretherton, I., Golby, B., & Cho, E. (1997) Attachment and the transmission of values. In J. E. Grusec & L. Kuczynski (eds), *Parenting and Children's Internalization of Values: A Handbook of Contemporary Theory* (pp. 103–134). New York: Wiley.

<sup>65</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2014) Prosocial development and situational morality: Neurobiological, parental, and contextual factors. In J. F. Leckman, C. Panter-Brick, & R. Salah (eds), *Pathways to Peace. The Transformative Power of Children and Families* (pp. 161–184). Cambridge, MA: The MIT Press, p. 167.

<sup>66</sup> For example Van IJzendoorn, M. H. (1997) Attachment, emergent morality, and aggression: Toward a developmental socioemotional model of antisocial behaviour. *International Journal of Behavioral Development*, 21(4), 703–728.

<sup>67</sup> Bus, A. G., & Van IJzendoorn, M. H. (1988) Attachment and early reading: A longitudinal study. *The Journal of Genetic Psychology*, 149(2), 199–210; Bus, A. G. & Van IJzendoorn, M. H. (1988) Mother–child interactions, attachment, and emergent literacy: A cross-sectional study. *Child Development*, 59(5), 1262–1272.

The study of attachment and language/cognitive development was somewhat controversial. Bowlby's first attempts to study the effects of hospitalization on children focused on academic development. But his lack of expertise with empirical research and the resulting poor quality of the assessments made the data unusable.<sup>68</sup> This initial failure hindered attention to the association between attachment and intellectual development among the early attachment research community. In the absence of published discussion of the topic by Bowlby or Ainsworth, Sroufe argued explicitly in the 1980s that there was no theoretical justification for expecting security to be associated with language and cognitive development.<sup>69</sup> Bus and Van IJzendoorn disagreed. They anticipated that the trust and availability of a secure relationship would facilitate learning, a prediction that would later receive considerable support.<sup>70</sup> In fact, Nivison and colleagues would later offer surprising evidence that the qualities of early attachment relationships predict language and cognitive development *more* strongly than they do socioemotional development (Chapter 3).<sup>71</sup>

When Bus moved to join Van IJzendoorn given the extent of prior emphasis on prediction from the special educational needs,<sup>72</sup> with a particular focus on diagnosis of learning problems, showing considerable problems with the validity of these assessments.<sup>73</sup> Van IJzendoorn and Bus also undertook a quantitative synthesis of research on the association between the Strange Situation and intelligence and language abilities. This synthesis of 32 studies, the first of which was Main's doctoral thesis, found that early attachment had a small but non-trivial association with intelligence ( $r = 0.09$ ), but a more sizeable association with language skills ( $r = 0.28$ ).<sup>74</sup> Whereas Sroufe had argued that attachment would be expected to be associated with socioemotional, not academic outcomes, Van IJzendoorn and Bus argued that secure attachment relationships will help parents pass knowledge to their children and help children be receptive to what they are taught. These ideas would later be influential for developments in attachment theory that conceptualized an important role for children's openness to learning from their caregivers.<sup>75</sup>

<sup>68</sup> Ainsworth, M. (1969) CPA Oral History of Psychology in Canada Interview, unpublished, <http://www.feministvoices.com/assets/Women-Past/Ainsworth/Mary-Ainsworth-CPA-Oral-History.pdf>.

<sup>69</sup> Sroufe, L. A. (1988) The role of infant-caregiver attachment in development. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 18–38), Hillsdale, NJ: Erlbaum.

<sup>70</sup> For example Dagan, O., Schuengel, C., Verhage, M. L., Madigan, S., Roisman, G. I., Bernard, K., ... & Volling, B. L. (2024) Configurations of mother-child and father-child attachment relationships as predictors of child language competence: An individual participant data meta-analysis. *Child Development*, 95(1), 50–69; Deneault, A. A., Duschinsky, R., Van IJzendoorn, M. H., Roisman, G. I., Ly, A., Fearon, R. P., & Madigan, S. (2023) Does child-mother attachment predict and mediate language and cognitive outcomes? A series of meta-analyses. *Developmental Review*, 70, 101093.

<sup>71</sup> Nivison, M., Caldo, P. D., Magro, S. W., Raby, K. L., Groh, A. M., Vandell, D. L., ... & Roisman, G. I. (2024) The predictive validity of the strange situation procedure: Evidence from registered analyses of two landmark longitudinal studies. *Development and Psychopathology*, early view.

<sup>72</sup> Van IJzendoorn, M. H., & Bus, A. G. (1994) Meta-analytic confirmation of the nonword reading deficit in developmental dyslexia. *Reading Research Quarterly*, 267–275. Bus also published a paper with Mieke Van IJzendoorn: Van IJzendoorn, W. J. E., & Bus, A. G. (1993) How valid are experts' prognoses on children with learning problems? *Journal of School Psychology*, 31(2), 317–325.

<sup>73</sup> These findings would be an influence on later studies by the Leiden group for example de Haan, W. D., van Berckel, S. R., van der Asdonk, S., Finkenauer, C., Forder, C. J., Van IJzendoorn, M. H., Schuengel, C., & Alink, L. R. A. (2019) Out-of-home placement decisions: How individual characteristics of professionals are reflected in deciding about child protection cases. *Developmental Child Welfare*, 1(4), 312–326; van der Asdonk, S., van Berckel, S. R., de Haan, W. D., Van IJzendoorn, M. H., Schuengel, C., & Alink, L. R. A. (2019) Improving decision-making agreement in child protection cases by using information regarding parents' response to an intervention: A vignette study. *Children and Youth Services Review*, 107, Article 104501.

<sup>74</sup> Van IJzendoorn, M. H., Dijkstra, J., & Bus, A. G. (1995) Attachment, intelligence, and language: A meta-analysis. *Social Development*, 4, 115–128.

<sup>75</sup> Duschinsky, R., & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press.



In 1990, Van IJzendoorn won a Pioneer grant from the Nederlandse Organisatie voor Wetenschappelijk Onderzoek, which he used to establish a research group, and begin development work towards what would become the Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD).<sup>76</sup> The first doctoral student he appointed with these funds was Marian Bakermans-Kranenburg, who had been involved in ongoing projects in the department as a research assistant and a tutor in statistics. Van IJzendoorn rang Bakermans-Kranenburg one day at 6am to propose that she undertake a funded PhD with him. She told him that 6am was not a polite or reasonable time to call, even with good news, and that he should call back later.<sup>77</sup> Though clearly Bakermans-Kranenburg had an appetite for demanding work. Her extraordinary doctoral study, described in [Chapter 1](#), established the psychometric basis for use of the Adult Attachment Interview (AAI), based on 166 interviews conducted with 83 women, together with a wide variety of other measures.

There is less information in print about Bakermans-Kranenburg's background, and her perspective distinct from Van IJzendoorn's. Bakermans-Kranenburg had come from a middle-class family. Although she left grammar school with the highest grades of her cohort, there was no expectation from her family that she would attend university: 'the university world was outside of the experience of my older brothers and sisters and wider family. It was not a prohibited area for me, but it was a terrain that seemed too difficult for me.'<sup>78</sup> She initially attended a sports academy after high school. This introduced her to courses in philosophy, psychology, and pedagogy. She loved them. Inspired, she left the sports academy and applied for undergraduate studies in pedagogy at Leiden.

Although Bakermans-Kranenburg had grown up in a religious Protestant family, after reading the patristic theology she converted to Catholicism. At university, she took a full courseload in pedagogy yet spent just as much time taking classes in theology and Christian ethics. She 'discovered that the university was an intellectual candy store: a wealth of elective courses that you could choose from to your heart's content.'<sup>79</sup> Her approach to both research and faith was organized and measured but fed by sincere passion.<sup>80</sup> She shared with Van IJzendoorn a sense of the ethical density of research to understand causes of children's suffering. This may have contributed to the intensity and duration of the career-defining collaboration between the two researchers. Like Van IJzendoorn, she also adopted a 'meewerkend voorman' role, with hands-on contributions to every stage of the research process. Their collaboration represented strengths that were more than the sum of the parts. It is not readily possible to pick out Bakermans-Kranenburg's distinct interests and contributions within cogenerated projects and publications with Van IJzendoorn, or vice versa. They have confirmed to me that neither regard it as of any importance to pick out their respective contributions to a fundamentally joint research enterprise.

In 1993 a tenure-track post, or two part-time posts, became available in the department at Leiden, as part of matched funding for the Pioneer grant. Bakermans-Kranenburg was

<sup>76</sup> On the history and context of the Pioneer grant in the Netherlands, see Franssen, T. & De Rijcke, S. (2019) The rise of project funding and its effects on the social structure of academia. In F. Cannizzo and N. Osbaldiston (eds), *The Social Structures of Global Academia* (pp. 144–161). Routledge: London.

<sup>77</sup> M. Bakermans-Kranenburg, personal communication, May 16, 2018.

<sup>78</sup> Bakermans-Kranenburg, M. J. (2008) *Werkster in de Wijngaard*. In C. Dekker (eds) *Geleerd & Gelovig: 22 wetenschappers over hun leven, werk en God*, Uitgeverij Ten Have.

<sup>79</sup> Ibid.

<sup>80</sup> Ibid.

looking for a part-time post to spend time raising her family. The other appointment went to Femmie Juffer, who likewise was looking for a part-time position. Juffer had conducted doctoral and postdoctoral studies at Utrecht University, with a focus on adoption and attachment-based interventions. Juffer embarked on a longitudinal study of 90 children who had been internationally adopted.<sup>81</sup> She and colleagues had conducted a three-session video-feedback intervention with 30 families, focused on helping mothers see and learn to respond to children's secure base and safe haven seeking behaviours. Compared to the other 60 in the control group, the mothers who received video-feedback were more likely to display sensitive caregiving.<sup>82</sup> Bakermans-Kranenburg and Juffer provided indispensable co-leadership of the research group, with a particular priority given to the development of a new attachment-based intervention.

The Spinoza Prize (1.5m Euros) was awarded to Van IJzendoorn in 2004. The citation described: 'an outstanding scientist of world class. He works in an extremely thorough and accurate manner. Van IJzendoorn and his group have furnished pedagogy in the Netherlands with an international reputation. He is full of plans and brimming with energy.'<sup>83</sup> The prize funds opened a new chapter for the research group in terms of propulsive force and research freedom. Van IJzendoorn had supervised an average of one PhD student a year until 2005. He then supervised three a year, including future colleague Lenneke Alink in the first cohort. Van IJzendoorn was able to support talented junior collaborators, Mesman and Alink, to find tenured positions at Leiden, contributing further leadership to the research team.

The team was located within the department of Algemene en Gezinspedagogiek (general and family psychology), which offered an undergraduate and later a graduate course in Gezinspedagogiek. The lack of clinical courses in that programme and the preponderance of theoretical and methodological courses meant that the team was able to train many cohorts of future PhD candidates. On the one hand, the lack of a clinical programme may have reduced opportunities to pursue dialogue with practitioners. On the other hand, the focus on research in teaching at undergraduate and graduate level likely contributed to the effectiveness and efficiency of mentorship and integration of talent into the research group. PhD candidates trained at Leiden could hit the ground running, based on a high level of existing research knowledge. More broadly, the epistemology and methodology of Van IJzendoorn and Bakermans-Kranenburg had a great impact on teaching and research in pedagogy, not just in Leiden but across the Netherlands, including through an award-winning and influential textbook.<sup>84</sup>

The extreme, popping, and fizzing productivity of Van IJzendoorn, Bakermans-Kranenburg, and Leiden colleagues has meant that their work has touched on most areas of attachment research, much of developmental psychopathology, and so much besides. Van IJzendoorn and Bakermans-Kranenburg have tended to produce about 8–15 co-

<sup>81</sup> Juffer, F. & Rosenboom, L. G. (1997) Infant-mother attachment of internationally adopted children in the Netherlands. *International Journal of Behavioral Development*, 20(1), 93–107.

<sup>82</sup> Juffer, F., Hoksbergen, R. A., Riksen-Walraven, J. M., & Kohnstamm, G. A. (1997) Early intervention in adoptive families: Supporting maternal sensitive responsiveness, infant-mother attachment, and infant competence. *Journal of Child Psychology and Psychiatry*, 38(8), 1039–1050.

<sup>83</sup> Netherlands Organisation for Scientific Research (2004) NWO Spinoza prize for chemist, educationist, astronomer and geologist. <https://www.eurekalert.org/news-releases/821549>.

<sup>84</sup> Van IJzendoorn, M. H. (2017) Methodologie: kennis door veranderen, de empirische benadering in de pedagogiek. In M. H. IJzendoorn & L. Rosmalen (eds), *Pedagogiek in Beeld: Een inleiding in de pedagogische studie van opvoeding, onderwijs en hulpverlening* (pp. 13–21). New York: Springer.

authored articles a year since 2005. Bibliometric analysis by Ioannidis and colleagues in 2023 identified Van IJzendoorn as among the 15 most influential modern developmental scientists worldwide.<sup>85</sup>

Some aspect of the work of Van IJzendoorn and Bakermans-Kranenburg is known to almost everyone who has read about the study of attachment. However, someone familiar with their recent work may not know of early contributions—some only published in German or Dutch—that serve as important context for fully understanding subsequent developments. Readers who know the work of Van IJzendoorn, Bakermans-Kranenburg, and colleagues on institutional care may not know their stance on the philosophy of science, or of the early writings by Van IJzendoorn and colleagues on the history of psychology. Readers who know of the work of Juffer, Bakermans-Kranenburg, and Van IJzendoorn in developing parenting interventions may have only a general sense of work by Van IJzendoorn and Bakermans-Kranenburg in collaboration with colleagues at Rotterdam on the neuroscientific correlates of early attachment.

Like the wind that lashes everything at once, the spread and volume of Van IJzendoorn and Bakermans-Kranenburg's contributions can make their ideas difficult to capture. Cross-cutting and underpinning aspects of their approach are little known. This includes the extent to which their research on these different topics in fact has been fed by a programmatic impulse and specific account of the nature of the truth in scientific inquiry.

Furthermore, following their interpretation of the philosophy of science, Van IJzendoorn and Bakermans-Kranenburg have assumed that if they make testable claims, these will be clear and well understood without much interpretive effort by relevant audiences. This assumption was not correct. My view is that Van IJzendoorn and Bakermans-Kranenburg follow Popper in too exclusive a focus on the 'context of justification' of truth in replication, and to an extent neglect the 'context of understanding'. Or, thanks to Popper's influence, they follow too exclusively Kant's *Critique of Pure Reason* at the expense of Kant's later reflections in the *Critique of Judgement* on how understanding is shaped by formal and informal education, and by communal feelings (*sensus communis*).<sup>86</sup> Access to truth is not solely constituted by repeatedly validated propositions but depends upon a penumbra of cultural repertoires and interpretations, and the means by which these are made available, or not.

Working against Van IJzendoorn and Bakermans-Kranenburg has been the history of concepts in attachment theory with floating meanings, such as 'attachment' and 'sensitivity', as well as mischief stemming from difficulties in the reception of Main's ideas. With diffuse and debased currency flooding the economy in how to interpret the meaning of attachment terminology, the sense of Van IJzendoorn and Bakermans-Kranenburg's claims has been difficult for their readers to pick out. This includes the meaning of the 'transmission gap', their thinking about the cross-cultural relevance of attachment theory and measures, and the target of their Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD) intervention. Consideration of the reception history of their work indicates need for clarification and re-evaluation. This chapter aims to provide a better sense of the stance, arguments, and contributions of Van IJzendoorn and Bakermans-Kranenburg.

<sup>85</sup> Ioannidis, J. P. A. (2023) October 2023 data-update for science-wide author databases of standardized citation indicators. Elsevier Data Repository, V6, doi: 10.17632/btchxktzyw.6.

<sup>86</sup> Kant, I. ([1790] 2000) *Critique of the Power of Judgment*, trans. P. Guyer & E. Mathews, Cambridge: Cambridge University Press. See also Kant I. ([1803] 2007) Lectures on pedagogy. In R. B. Loudon & G. Zöller (eds), *Anthropology, History, and Education* (pp. 434–485). Cambridge: Cambridge University Press.

## Philosophy of Science

### Scientific Truth

Van IJzendoorn's perspective on the philosophy of science was essentially fully formed by the mid-1980. This perspective has been immensely consequential for shaping his approach to teaching and research, and the criteria against which he has evaluated others' work. In a 1986 paper with his student Siebren Miedema, Van IJzendoorn considered the criteria for validity of different forms of social scientific research. The paper is profoundly revealing as a statement of Van IJzendoorn's values and priorities as a researcher. Though little known for decades outside of the Dutch pedagogic research community, the paper has recently been published in English translation in the journal *BMJ Medical Humanities*.<sup>87</sup>

Van IJzendoorn and Miedema argued for the essential role of replicability: 'the researcher has the responsibility to describe his/her activities and choices clearly and explicitly enough so that in principle colleagues could reconstruct and/or replicate the research done, step by step.'<sup>88</sup> So for example, historical research with good validity and reliability is likely to depend on sources that are, if not in the public domain, at least in archives consultable by others. It should be possible for readers to examine the sources themselves and find agreement or disagreement with the account offered by the historian. Van IJzendoorn and Miedema argued that, whether qualitative or quantitative, 'scientific practice is a uniquely "impersonal", collective and public matter.'<sup>89</sup> In this regard, Van IJzendoorn and Miedema argued that the difference in criteria for evaluating qualitative and quantitative research are differences in degree, not kind.

For example, Van IJzendoorn and Miedema pointed to the criticisms of attachment research by Lamb and Thompson ([Chapter 1](#)), stressing that quantitative and laboratory-based research can fail to achieve the ideal of a collective and public matter. The reporting of Ainsworth, Sroufe, and other early attachment researchers had a tendency to lack transparency and to deflect criticism rather than meet it head-on. This is a meaningful limitation in their capacity to contribute to the cumulative generation of dependable public knowledge. Science requires transparency of evidence, detection of biases, 'decisive confrontations between knowledge claims', and constructive debate.<sup>90</sup>

For Van IJzendoorn and Miedema steps towards replicable research, whether qualitative or quantitative, were victories for seriousness and for truth. Here and elsewhere, Van IJzendoorn's scientific writing reflected his scientific values: sharp, reasonable, open to a degree of compromise within adjudicated limits. But without pluralism about what truth looks like. There are some similarities to Popper.

There is a sense across Van IJzendoorn's early methodological writings that dependable knowledge is invested as a way of rectifying the world, of making a needful contribution, and so replicable research becomes a moral act, and a potentially emancipatory one. Truth has great value but comes at a steep and necessary price in terms of relentless commitment, rigour and transparency from start to finish through the research process. There is no contempt for other ways of pursuing scholarship, for instance interpretive qualitative research

<sup>87</sup> Van IJzendoorn, M. H. & Miedema, S. (1986) De kwaliteit van kwalitatief onderzoek, *Pedagogische Studiën*, 63, 498–505. Translated as Van IJzendoorn, M. H., & Miedema, S. (2024) The quality of qualitative research. *BMJ Medical Humanities*, early view.

<sup>88</sup> Ibid.

<sup>89</sup> Ibid.

<sup>90</sup> Ibid.

or Ainsworth's exploratory inquiry with her small sample. Indeed, such work is regarded as potentially generative, offering lines of possible insight, so long as it is not mistaken for anything shatter-proof.<sup>91</sup>

Against those with more expansive accounts of what constitutes truth and good research, Van IJzendoorn defended a narrow conceptualization. This lack of pluralism reflected Van IJzendoorn's intense awareness of the limited resource available for research. Limited resource should not be squandered on scholarship with weak capacity to contribute to cumulative knowledge. Inquiry in the context of discovery, such as exploratory and qualitative studies, have an important role to play. However, this had to be matched by intense activity in the context of justification, testing the durability of truth-claims against empirical findings. With limited corn, researchers should sow to reap, and carefully select and cultivate potential truth-claims to make knowledge, rather than risk squandering a limited resource. Van IJzendoorn had a 'taste for necessity': there was real work to do.<sup>92</sup>

Van IJzendoorn was critical of those who questioned the capacity of humans to generate cumulative and publicly accessible knowledge. Norms and ideology will always influence the questions and interpretations of scientific practice, but this does not undermine the possibility of universal, dependable, and sharable knowledge, even if this is only ever partially achieved and through huge labours over time. This includes the potential to describe associations between variables of interest; identify potential causal relations; and develop and test explanatory theory to make sense of how these causal relations work.<sup>93</sup> There are techniques that scientists can use, such as randomization, to reduce the exposure of variables of interest to the potentially infinite number of possible confounders, even if such techniques are never perfect and may come with their own limitations.

For Van IJzendoorn, humans are capable of asymptotically and indirectly approximating truth. This is how we stumbling humans may find our way in the dark:

As expressed in Kant's age-old ideal of enlightenment, science should direct itself to emancipating people from the superfluous powerlessness and dependence they have forced upon themselves. The unbiased but uncritical search for truth should be replaced by an interest in the pursuit of emancipatory knowledge, its central objective being emancipation from the whims of nature and excessive social and psychological coercion. This ideal of emancipation cannot be achieved by tossing 'traditional' science overboard.<sup>94</sup>

A central metaphor used by Van IJzendoorn was that of openness: scientific practice needed to be conducted in the open, available for criticism to identify errors and distortions; findings needed to enter into an open space, a commons, in which they could be confronted directly with new evidence. Proximally this language might be attributed to Popper and Habermas, key influences on Van IJzendoorn. For Popper, an 'open society' is supported by scientific practice itself characterized by openness to revaluation of theory and assumptions on the basis of new empirical research. In turn, tyranny is

<sup>91</sup> This position stands in contrast with many attachment researchers, in which qualitative research can be treated with condescension. Cf. Keller, H. (2008) Attachment—past and present. But what about the future? *Integrative Psychological and Behavioral Science*, 42, 406–415.

<sup>92</sup> On the taste for necessity as form of valuation shaped by a background of labour and hands-on work, see Bourdieu, P. ([1979] 1984) *Distinction: A Social Critique of the Judgement of Taste*, trans. R. Nice. Cambridge, MA: Harvard University Press, chapter 7.

<sup>93</sup> Van IJzendoorn, M. H. & Miedema, S. ([1986] 2024) The quality of qualitative research. *BMJ Medical Humanities*, early view.

<sup>94</sup> Van IJzendoorn, M. & van der Veer, R. (1984) *Main Currents of Critical Psychology*. Trans. M. Schoen. New York: Irvington Publishers, p. 229.

sustained when no accepted standards are available for evaluating truth-claims,<sup>95</sup> or when inappropriate standards are imposed as with political interference in scientific practice. Habermas likewise appealed to the language of openness in characterizing the public space of transparency, criticism, and deliberation, which he felt should characterize both the scientific community and the public deliberation of democracies.<sup>96</sup>

Another source of the metaphor of openness may have been Van IJzendoorn's graduate studies in Berlin. Plessner, and his student Lempert (Van IJzendoorn's supervisor), had conceptualized the relationship between humans and their environment in terms of mediators of openness and closedness.<sup>97</sup> As we saw in [Chapter 3](#), Van IJzendoorn and Bakermans-Kranenburg would later propose that the latent factor underpinning the various indicators of differential susceptibility may be 'openness to environmental stimuli'.<sup>98</sup> Considered in Plessner's terms, the openness of our practice as scientists is our susceptibility to learning from reality, our environment, rather than remaining closed off within our subjective impressions or communal echo-chambers. In illustrating the value of openness, Van IJzendoorn would later give the example, discussed in [Chapter 3](#), of his exchange with Nathan Fox on attachment and temperament, where both sides of the debate were able to learn from each other and in doing so gain insight into the nature of person x environment interaction.<sup>99</sup>

## Interference

For Van IJzendoorn, open scientific practice required freedom from interference by non-scientific actors. In the early 1980s he offered cautious support for action research, a form of inquiry focused on learning about social institutions by seeing what happens when researchers collaborate with publics to try to change them.<sup>100</sup> This support faded, as he saw in practice that the methodology lacked a pathway to producing objective, cumulative knowledge.<sup>101</sup> He observed that participatory methodologies often appealed to a democratic mandate for the involvement of experts-by-experience and publics, but in fact this turned out to be ventriloquism as those who participated were almost always an unrepresentative minority. Criticism of action research was the topic of his first international talk, in Buffalo.<sup>102</sup>

Van IJzendoorn and Bakermans-Kranenburg became increasingly convinced of the need for firm separations between research and politics. Contributing to this position may have been that the Netherlands had, and has, especially weak separations in this

<sup>95</sup> Popper, K. ([1945] 1961) *Open Society and its Enemies*, 2nd ed. London: Routledge.

<sup>96</sup> Habermas, J. ([1962] 1989) *The Structural Transformation of the Public Sphere*, trans. T. Burger & F. Lawrence. Cambridge, MA: MIT Press; Habermas, J. ([1981] 1987) *The Theory of Communicative Action*. Vol. 2, trans. T. A. McCarthy. Boston: Beacon Press.

<sup>97</sup> Dobeson, A. (2018) Between openness and closure: Helmuth Plessner and the boundaries of social life. *Journal of Classical Sociology*, 18(1), 36–54.

<sup>98</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2011) Differential susceptibility to rearing environment depending on dopamine-related genes: New evidence and a meta-analysis. *Development and Psychopathology*, 23(1), 39–52.

<sup>99</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. UCL Press, p. 218.

<sup>100</sup> Van IJzendoorn, M. & van der Veer, R. (1984) *Main Currents of Critical Psychology*. Trans. M. Schoen. New York: Irvington Publishers.

<sup>101</sup> Van IJzendoorn, M. H. (1984) Enkele hardnekkige paradoxen van kritisch-psychologisch actieonderzoek. *Tijdschrift voor Agologie*, 13, 95–106.

<sup>102</sup> Van IJzendoorn, M. H. (1984) Action research in critical psychology. Paper presented at the Department of Psychology, State University of New York at Buffalo, 9 April.

regard. As Van Daalen has observed, compared to many other countries, ‘the social scientific research agenda in the Netherlands is mostly set by the political issues of the day.’<sup>103</sup> Van IJzendoorn and Bakermans-Kranenburg’s stance became further entrenched when, in the early 2000s, representatives of private daycare providers attempted to interfere with research conducted by their group on the quality of daycare in the Netherlands.<sup>104</sup>

For Van IJzendoorn and Bakermans-Kranenburg, scientific research must not be left at the mercy of dominant powers in society. It needs and deserves protection to ensure the freedom of the scientific process. They argued that the formulation of testable hypotheses, operationalization of central constructs, data-processing, and reporting of the findings must be activities undertaken by—and only by—qualified experts. Van IJzendoorn was highly critical when Jaap de Hoop Scheffer, a former foreign affairs minister and a major instigator of Dutch involvement in the Iraq war, was appointed as Leiden Professor of Peace, Law, and Safety in 2009, without a doctorate or any publications. To Van IJzendoorn, this reflected the inadequacy of divisions between politics and academia in the Netherlands.<sup>105</sup>

Van IJzendoorn and Bakermans-Kranenburg accept that democratic consultation with policy-makers, practitioners, and experts-by-experience can offer guidance to the scientific community regarding broad priorities for research, and give advice on specific goals and values as needed. For example, Van IJzendoorn, Bakermans-Kranenburg, and colleagues consulted with Dutch Turkish minority families on how to adapt a caregiving intervention to ensure cultural sensitivity.<sup>106</sup> Stakeholders can also play a critical role in contributing to a democratic conversation about how and when firm conclusions from a scientific consensus should be implemented into policy and practice. Indeed, Van IJzendoorn and Bakermans-Kranenburg regard such contributions as one potential source for the ethical justification, which they regard as one of the pillars of translation, alongside replicable knowledge and cost-benefit analysis. Though in their account, stakeholder consultation is only one possible source of ethical justification: others include ethical principles or philosophy, and human rights frameworks (Figure 4.1).<sup>107</sup>

Van IJzendoorn and Bakermans-Kranenburg worry that forms of stakeholder involvement besides consultation on priorities and implications risk harm to the scientific process, mistaking the legitimacy of democratic deliberation for the legitimacy of the scientific process, and degrading each:

Obviously, policy makers and practitioners should be allowed to leave their mark on the formulation of the broad research question because they are the major participants of the discussion about the implications and applications of the research results. But applied scientific research is first and foremost aimed at the growth of knowledge and

<sup>103</sup> Van Daalen, R. (2010) Children and childhood in Dutch society and Dutch sociology. *Current Sociology*, 58(2), 351–368, p. 362.

<sup>104</sup> Van IJzendoorn, M. H. (2007) Onderzoek, beleid, praktijk: pleidooi voor gescheiden verantwoordelijkheden geïllustreerd aan de hand van de casus kinderopvang. In A. Soeteman & F. Van den Born (eds), *Ethiek van empirisch sociaal-wetenschappelijk onderzoek* (pp. 43–52), Koninklijke Nederlandse Akademie van Wetenschappen (KNAW).

<sup>105</sup> Van IJzendoorn, M. H. (2010) Zijn leerstoel zit ongemakkelijk. *Mare*, 4 February 2010, p. 10.

<sup>106</sup> Yagmur, S., Mesman, J. Malda, M., Bakermans-Kranenburg, M. J. & Ekmekci, H. (2014) Video-feedback intervention increases sensitive parenting in ethnic minority mothers: A randomized control trial. *Attachment & Human Development*, 16(4), 371–386.

<sup>107</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. (2024) What is evidence for impact? Keynote address at the International Conference on Adoption Research, Minnesota, July 2024.



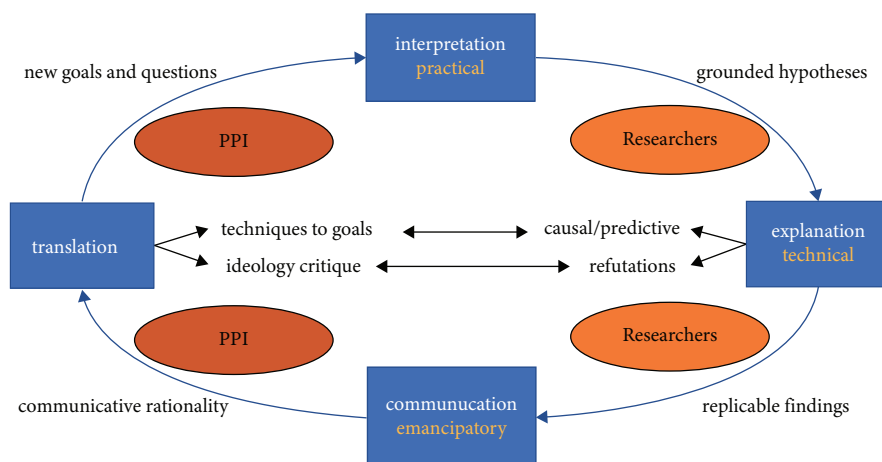


**Figure 4.1** A Cooperative Practitioners-Researchers model. Researchers are responsible for designing and conducting transparent and replicable research. Practitioners are involved in open communication about relevant research questions and about ethical implications of translating findings to policy or practice.

Source: From Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024). *Matters of Significance: Replication, translation and academic freedom in developmental science*. London: UCL Press, Figure 4.1.

the search for truth, and should be executed independently of the interests of stakeholders, policy makers, and politicians; otherwise research and researchers risk the chance of being corrupted.<sup>108</sup>

Though acknowledging that stakeholders should leave their mark on the formulation of research questions and interpretation of the implications of findings, Van IJzendoorn and Bakermans-Kranenburg have been concerned that the views elicited from experts-by-experience are often behind closed doors, lacking transparency. A recent analysis by Bakermans-Kranenburg and Van IJzendoorn of 50 papers included in two systematic reviews supportive of expert-by-experience involvement (one co-authored by Fearon) found that only a quarter of the studies met the conditions for replicability.<sup>109</sup> Van IJzendoorn and Bakermans-Kranenburg also expressed concern that such consultation may be misleading unless efforts are made to ensure that experts-by-experience are representative of the population they are speaking for.

Van IJzendoorn and Bakermans-Kranenburg appear ambivalent about the involvement of stakeholders in the interpretation of research findings. Above all, they regard it as critical that such support does not interfere with academic freedom and is described in a full and transparent way. Partly at my encouragement, a study by Van IJzendoorn, Bakermans-Kranenburg, and colleagues recently consulted with a diverse group of experts-by-experience during the interpretation of a quantitative synthesis of the effects of child maltreatment on mental health.<sup>110</sup> From the perspective of Van

<sup>108</sup> Van IJzendoorn M. H. & Vermeer H. J. (2015) How to protect scientific integrity under social and political pressure: Applied daycare research between science and policy. In R. Sternberg & S. T. Fiske (eds), *Ethical Challenges in the Behavioral and Brain Sciences* (pp. 212–216). Cambridge: Cambridge University Press, p. 212.

<sup>109</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2024) Anything goes for participant, patient and public involvement in youth mental health research. *JCPP Advances*, 2024; e12258.

<sup>110</sup> Coughlan, B., Duschinsky, R., Bakermans-Kranenburg, M. J., Bakkum, L., Skinner, G. C. M., Markham, A., Beckwith, H. & Van IJzendoorn, M. H. (2024) Equifinality and multifinality of child maltreatment: Umbrella



IJzendoorn and Bakermans-Kranenburg, this was clearly consultation rather than involvement of experts-by-experience in the research process, since the research team had already conducted a viable pass of analysis. Van IJzendoorn and Bakermans-Kranenburg described the consultation as a positive experience and as improving the resulting paper.<sup>111</sup>

### Distrusting Subjective Report

A common thread in the work of Van IJzendoorn and Bakermans-Kranenburg has been their critical stance on whether humans generally have a good grasp of the truth of themselves and the world. From the very start of Van IJzendoorn's career, he was acutely mindful that people can have misleading or distorted beliefs, and may even make up beliefs for themselves if facilitated by circumstances.<sup>112</sup> As we saw above, at school Van IJzendoorn had appreciated Sartre and existentialist philosophy as a support for contesting the Catholic path expounded by his parents, and supporting a principle of philosophical doubt in received assumptions. However in adulthood, humanist approaches, including Sartre, seemed to him naïve. Existentialist doubt in religion was generalized: for Van IJzendoorn, all subjective impressions should be doubted as potentially untrustworthy. We are, in Van IJzendoorn's view, no less more distant from ourselves than from anyone else.<sup>113</sup> At the same time, Van IJzendoorn felt that existentialism failed to acknowledge the value and viability of objectivity and empiricism.

The Berlin researchers with whom Van IJzendoorn had completed his graduate studies had been sceptical of individuals' self-knowledge, preferring to research their choices and behaviours.<sup>114</sup> From Kant and Habermas too, Van IJzendoorn inherited a career-long distrust in our immediate knowledge of ourselves. He was mindful that we develop, from childhood onwards, shaped by assumptions and contexts not of our own choosing, including forms of social pressure and control.<sup>115</sup>

Who can we trust? Not authorities. Not our own experiences. Not the statements of friends and family. Not those we meet claiming credibility. We have been exposed to all of these in our period of immaturity, but they are not dependable. On Van IJzendoorn's account, dependable truth, and its luminosity for our lives and projects, can be found *only* in a social consensus that has received due testing. As such, for Van IJzendoorn, the enlightenment and emancipation of an individual must be regarded as at best underway within their social context, rather than—as Kant sometimes implied—ever a settled individual achievement.

Van IJzendoorn's position here was aligned with a broader perspective in developmental science—especially apparent in Sroufe, and in Kohlberg (a key reference in Van IJzendoorn's PhD)—which considered the individual person as an emergent organization

synthesis on mental health correlates in over 19 million people. Manuscript under review; Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, chapter 16.

<sup>111</sup> Ibid., 191.

<sup>112</sup> Van IJzendoorn, M. H. (1984) Answers without questions: A note on response style in questionnaires. *Perceptual and Motor Skills*, 59(3), 827–831.

<sup>113</sup> Suggested emendation by Marinus Van IJzendoorn, 12/09/2024.

<sup>114</sup> De Mul, M. (ed.) (2014) *Plessner's Philosophical Anthropology: Perspectives and Prospects*. Amsterdam: Amsterdam University Press.

<sup>115</sup> Van IJzendoorn, M. & van der Veer, R. (1984) *Main Currents of Critical Psychology*. Trans. M. Schoen. New York: Irvington Publishers.

within their developmental context, rather than assuming the individual person as a category researchers can take for granted.<sup>116</sup> It was also aligned with a perspective common among attachment researchers, following Ainsworth, who held that parents who provide inadequate care, or maltreat their children, or generally participants with clinical needs, may not be aware of their own motivations or even fully aware of their own behaviour.<sup>117</sup> Whereas Kant took for granted an individual's basic capacity to know themselves and function effectively as an individual, for Van IJzendoorn this sociopsychological and political achievement was underpinned by families and other institutions capable of recognizing and responding to children's needs and provision of a secure base.<sup>118</sup>

Very occasionally, Van IJzendoorn has acknowledged that adults, too, may need access to forms of support and secure base provision to know themselves and function effectively, including in their role as caregivers. Generally, this acknowledgement has been pressed back by a countervailing perspective on adults as autonomous and responsible. As in Kant, Van IJzendoorn has generally assumed a stark opposition between minority and adulthood. Perhaps reflecting this perspective, measures of social support for adult caregivers have not been routinely included in studies by Van IJzendoorn and Bakermans-Kranenburg. Even when data on family structure and social support have been available (e.g., in the Generation R sample), these issues have not been examined by Van IJzendoorn and Bakermans-Kranenburg.

In general, in the scene of their observational research, the actors depicted are the dependent child and their caregiver. A contrast can be drawn with the Minnesota group, who conceptualized social and family support as a secure base for a parent's caregiving.<sup>119</sup> In Van IJzendoorn and Bakermans-Kranenburg's work the *adult's own dependence on sources of support*—what Kittay calls a caregiver's own 'nested dependences'<sup>120</sup>—is not in view, except perhaps security from their own experiences in childhood.<sup>121</sup> The absolute starkness of this scene contributes to the intense force of its exceptions, when Van IJzendoorn and Bakermans-Kranenburg have turned attention to institutionalized children (those without an attachment figure) and to interventions to improve positive parenting (an additional adult offering a secure base, together with constructive and kind feedback, but who should

<sup>116</sup> Sroufe, L. A. (1996) *Emotional Development*. Cambridge: Cambridge University Press; Carpendale, J. I. (2000) Kohlberg and Piaget on stages and moral reasoning. *Developmental Review*, 20(2), 181–205. Though anthropologist critics have argued that attachment researchers have not gone far enough in this regard for example Keeler, W. (2023) Attaching shame to hierarchy and hierarchy to some versions of attachment. *Ethos*, 51(1), 47–61.

<sup>117</sup> Crittenden, P. M. & Ainsworth, M. D. S. (1989) Child maltreatment and attachment theory. In D. Cicchetti & V. Carlson (eds), *Child Maltreatment: Theory and Research on the Causes and Consequences of Child Abuse and Neglect* (pp. 432–463). Cambridge: Cambridge University Press; Main, M. & Morgan, H. (1996) Disorganization and disorientation in infant Strange Situation behavior: Phenotypic resemblance to dissociative states. In L. Michelson & W. Ray (eds.), *Handbook of Dissociation: Theoretical, Empirical and Clinical Perspectives* (pp. 107–138). New York: Plenum. See also Muzi, S., Pace, C. S., & Steele, H. (2022) The friends and family interview converges with the inventory of parent and peer attachment in community but not institutionalized adolescents. *Journal of Child and Family Studies*, 31, 518–529.

<sup>118</sup> Cyr, C. & Van IJzendoorn, M. H. (2007) Attachment in the schools: Toward attachment-based curricula. *Journal of Early Childhood and Infant Psychology*, 3, 95–118.

<sup>119</sup> For example, Sroufe, L. A. (2005) Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*, 7(4), 349–367, p. 354. A similar concept was elaborated by the Circle of Security project in the idea of 'nested hands': the caregiver receives a secure base from others, and then is able to offer this to their child. Powell, B., Cooper, G., Hoffman, K., & Marvin, B. (2013) *The Circle of Security Intervention: Enhancing Attachment in Early Parent–Child Relationships*. New York: Guilford.

<sup>120</sup> Kittay, E. F. (1999) *Love's Labor: Essays on Women, Equality, and Dependency*. London: Routledge.

<sup>121</sup> For a striking exception, see Liang, X., Lin, Y., Van IJzendoorn, M. H., & Wang, Z. (2021) Grandmothers are part of the parenting network, too! A longitudinal study on coparenting, maternal sensitivity, child attachment and behavior problems in a Chinese sample. *New Directions for Child and Adolescent Development*, 2021(180), 95–116.

stay the minimum time necessary). Yet neither the immature child, nor the isolated adult should ideally be trusted to self-report, given the Popperian requirement of intersubjective agreement between mature adults as a requisite of dependable truth. Indeed, whether secure base provision is also relevant to adult researchers and their use of reason has not been addressed by Van IJzendoorn and Bakermans-Kranenburg. Likely due to Popper's influence, they have instead given greater precedence to the value of adversarial clashes between researchers about truth-claims as a constraint on individual misapprehensions.<sup>122</sup>

Ultimately, for Van IJzendoorn and Bakermans-Kranenburg, individual access to self-understanding and rationality cannot be trusted. This has considerable methodological consequences for psychological science. One consequence is the importance of inter-rater reliability. Even compared to other developmental scientists, Van IJzendoorn and Bakermans-Kranenburg have placed great emphasis on the need for dual coding of observational measures, and agreement between coders, to ensure the veracity of observations and actual, opaque contact with reality. They expressed delight in a recent meta-analysis, on finding that inter-rater reliability reported on the AAI has clearly increased over the years.<sup>123</sup>

On the other hand, they have disparaged scientific reports such as those of Lyons-Ruth, where subscales of coding systems were reported without inter-rater reliability. If Lyons-Ruth felt that the withdrawal scale of AMBIANCE was of critical importance, then Van IJzendoorn felt she and collaborators should have put the effort into inter-rater reliability. If inter-rater reliability could not be established, then Lyons-Ruth should be candid about this, and not report the subscale. For scientific papers to report findings from scales without inter-rater reliability is category mistake, since it presents as scientific findings the impressions of one individual, with no evidence that anyone else would see matters the same way.

Even more misleading and problematic from Van IJzendoorn's point of view are researchers reporting observations where inter-rater reliability might not even be possible (e.g., due to the idiographic qualities of the coding system).<sup>124</sup> On the one hand, for Van IJzendoorn, such an approach is misleading to the extent that it is represented as science. On the other hand, from his perspective, such an approach misses out on the excitement and risk and ultimately the majesty of science, where propositions can be hazarded and put to the trial of others' views (inter-rater reliability) and further evidence (appraisal in the context of justification). Inter-rater reliability was a technical procedure, but Van IJzendoorn did not take for granted the profundity of the kind of knowing it affords. An analogy may be drawn with the writings of James Joyce or Elizabeth Bishop, poets who wrote from a perspective drawn from self-exile and self-discovery in the perspectives of others. In these terms, one might say that, for Van IJzendoorn, inter-rater reliability permitted knowledge to 'move into a space that was impersonal, beyond the personal, and then allowed this impersonality to transform everything that lay beneath it or beyond its understanding, creating a music filled with risk and repetition.'<sup>125</sup>

Distrust in the self-understanding and rationality of individuals contributed to Van IJzendoorn's strong antipathy to self-report measures, which he shared with Ainsworth's

<sup>122</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press.

<sup>123</sup> Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A. & Van IJzendoorn, M. H. (2025) Celebrating more than 26,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status. *Attachment & Human Development*, forthcoming.

<sup>124</sup> Van IJzendoorn, M. H., Steele, M., & Granqvist, P. (2018) On exactitude in science: A map of the empire the size of the empire. *Infant Mental Health Journal*, 39(6), 652–655.

<sup>125</sup> Tóibín, C. (2015) *On Elizabeth Bishop*. New Haven: Princeton University Press, p. 59.

circle and the early attachment research community who took as their model the exacting, ethological studies of animal behaviour by scholars such as Tinbergen and Hinde.<sup>126</sup> Van IJzendoorn felt that self-report measures took for granted, incorrectly, that people understood their intentions and situation. Qualitative research faced the limitation that individuals may have systematic limitations in their understanding of themselves and others. However, credible qualitative research accepted this limitation in the questions asked and the way data was interpreted. Van IJzendoorn was not against the use of qualitative methods to understand individuals' perceptions of their experiences; he would co-author several qualitative papers over his career. By contrast, he regarded self-report measures in psychology as fool's gold, promising access to truths about the self but in fact trusting an unreliable source and failing to put in the labour to observe what individuals actually do: 'science cannot blindly rely upon the ability of the individual'.<sup>127</sup>

For instance, in the first empirical report from his programme of attachment research, Van IJzendoorn and colleagues documented that parents' report of their child's security or insecurity had barely any association with secure or insecure behaviour in the Strange Situation.<sup>128</sup> When Van Dam and Van IJzendoorn asked 39 mothers to complete the Attachment Q-Sort (AQS) for their child, they found it was not associated with either observed maternal sensitivity or security in the Strange Situation.<sup>129</sup> In a later meta-analysis, Van IJzendoorn and colleagues showed that this finding for the maternal-report AQS was replicated by subsequent studies, in contrast to more convergent findings when the AQS was completed by researchers.<sup>130</sup>

Similar to a labour theory of value, like Ricardo or Marx,<sup>131</sup> Van IJzendoorn felt that the value of psychological instruments required finding a rich vein, and then the hard work of digging. Individuals' immediate experience and self-knowledge, tapped by self-report measures, offered neither according to Van IJzendoorn. Indeed, he found that students would still complete nonsense questionnaires if asked, representing a broader tendency for self-report measures to ask participants artificial questions about themselves to which they must fabricate answers.<sup>132</sup> He was scornful of the endless proliferation of self-report measures in psychology in the 1980s, which he felt was apiece with the lightweight and unserious qualities of the methodology, hindering the ability to identify or excavate psychological truth in a cumulative way. Among exceptions, Van IJzendoorn was impressed

<sup>126</sup> Van Der Horst, F. C., Van der Veer, R., & Van IJzendoorn, M. H. (2007) John Bowlby and ethology: An annotated interview with Robert Hinde. *Attachment & Human Development*, 9(4), 321–335.

<sup>127</sup> Van IJzendoorn, M. H. & van der Veer, R. (1983) Holzkamp's critical psychology and the functional-historical method: A critical appraisal. *Storia e critica della psicologia*, 4, 5–26, p. 15.

<sup>128</sup> Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A., Vergeer, M. M., & Swaan, J. (1983) How B is B4? Attachment and security of Dutch children in Ainsworth's Strange Situation and at home. *Psychological Reports*, 52(3), 683–691.

<sup>129</sup> Van Dam, M., & Van IJzendoorn, M. H. (1988) Measuring attachment security: Concurrent and predictive validity of the Parental Attachment Q-set. *The Journal of Genetic Psychology*, 149(4), 447–457.

<sup>130</sup> Van IJzendoorn, M. H., Vereijken, C. M., Bakermans-Kranenburg, M. J., & Marianne Riksen-Walraven, J. (2004) Assessing attachment security with the attachment Q sort: Meta-analytic evidence for the validity of the observer AQS. *Child Development*, 75(4), 1188–1213. For later confirmatory findings, see Cadman, T., Diamond, P. R., & Fearon, P. (2018) Reassessing the validity of the attachment Q-sort: An updated meta-analysis. *Infant and Child Development*, 27(1), e2034.

<sup>131</sup> Marx, K. ([1867] 1990) *Capital: A Critique of Political Economy*, Vol. 1, trans. B. Fowkes, London: Penguin: 'Labour is the father of material wealth, the earth is its mother' (134).

<sup>132</sup> Van IJzendoorn, M. H. (1984) Answers without questions: A note on response style in questionnaires. *Perceptual and Motor Skills*, 59(3), 827–831. See also Runze, J., & Van IJzendoorn, M. H. (2024) Response bias is genetically biased: Another argument for Kagan's philippic against questionnaires in developmental psychology. *Developmental Psychology*, early view.

with the flair for experimental design of Mario Mikulincer.<sup>133</sup> Van IJzendoorn has used self-report measures when constrained by resource: as we shall see later, Van IJzendoorn and collaborators have repeatedly, reluctantly, relied on parent-report of child behavioural difficulties in trials of the Video-feedback to Promote Positive Parenting intervention.<sup>134</sup>

There may have been a political dimension to Van IJzendoorn's stance here. Extrapolating from some of Bowlby's claims, critics of attachment theory and research have characterized the paradigm as 'profoundly conservative',<sup>135</sup> and oriented by a 'destructive colonial/European/capitalist agenda'.<sup>136</sup> In fact, Van IJzendoorn's politics were firmly social democratic, emphasizing the role and responsibility of the state to provide universal services and additional support to those who need it. This ran contrary to a rising emphasis in international political discourse in the 1980s on individualism, self-sufficiency, and self-sovereignty, and negative attitudes towards the welfare state. In turn such attitudes influenced psychological research. As we saw in Chapter 3, this political context was a factor shaping Belsky's work and attitudes towards the welfare state. In the Netherlands, ideologies of individualism were also on the rise, even if more muted and somewhat later than, for instance, in the United States.<sup>137</sup>

Tacit political stakes may therefore be considered in Van IJzendoorn's methodological focus on the needs and non-autonomy of childhood, and the legacy of this time for the behaviour of adults—behaviour that may not be conscious and chosen by the adults themselves. This concern with developing individuals in their relational context, not as independent and autonomous choosers, aligned with a politics that emphasized the need for both universal and targeted welfare supports, as citizen self-sufficiency could not be taken for granted. Though whether or how Van IJzendoorn's political views influenced his philosophy of science, or vice versa, is of course not easily gauged.

Van IJzendoorn's critical attitude towards cultural narratives of individual self-sufficiency and self-sovereignty contributed to his tremendous excitement when Main and colleagues published their paper on the 'move to the level of representation' in 1985, which

<sup>133</sup> They supervised a doctoral student, Ayelet Erez, together in the mid-2000s. Erez, A., Sleafos, E., Mikulincer, M., Van IJzendoorn, M. H., Ellemers, N., & Kroonenberg, P. M. (2009) Attachment anxiety, intra-group (dis) respect, actual efforts, and group donation. *European Journal of Social Psychology*, 39(5), 734–746.

<sup>134</sup> As Runze and Van IJzendoorn acknowledged in a recent paper, 'both authors use questionnaires in their studies and do not feel able to go cold turkey yet'. Nonetheless, in their view, concerted action in developmental science is needed to get rid of self-report measures of child behaviour, which did great service to the field but should now belong to the past. Runze, J. & Van IJzendoorn, M. H. (2024) Response bias is genetically biased: Another argument for Kagan's philippic against questionnaires in developmental psychology. *Developmental Psychology*, early view. See also Starreveld, K. M., Overbeek, M. M., Willems, A. M., & Bakermans-Kranenburg, M. J. (in press) Video-feedback intervention to promote positive parenting and sensitive discipline in early elementary education (VIPP-School): A randomized controlled trial. *Attachment and Human Development*: 'It is important to note that the quality and generalizability of randomized controlled trials can differ, especially when relying on self-report data (Bakermans-Kranenburg et al., 2003) To mitigate this concern, we used observation by trained coders for the primary outcome measures. Self-reports were only employed for constructs where self-assessment was deemed most appropriate.'

<sup>135</sup> Contratto, S. (2002) A feminist critique of attachment theory. In M. B. Ballou & L. S. Brown (eds), *Rethinking Mental Health and Disorder: Feminist Perspectives* (pp. 29–47). New York: Guilford Press. See also Smith, M., Cameron, C., & Reimer, D. (2017) From attachment to recognition for children in care. *British Journal of Social Work*, 47(6), 1606–1623.

<sup>136</sup> Sosteric, M. & Ratkovic, G. (2022) It takes a village: Advancing attachment theory and recovering the roots of human health with the circle of seven essential needs. *Aotearoa New Zealand Social Work*, 34(1), 113–127, p. 123. See also Laubender, C. (2024) Communists, astronauts, and 'extreme feminists': John Bowlby and the pursuit of (national) security. In *The Political Clinic: Psychoanalysis and Social Change in the Twentieth Century* (pp. 201–231). New York: Columbia University Press. For discussion of the politics of attachment theory, see Duschinsky, R., Greco, M., & Solomon, J. (2015) The politics of attachment: Lines of flight with Bowlby, Deleuze and Guattari. *Theory, Culture & Society*, 32(7–8), 173–195.

<sup>137</sup> Oudenampsen, M. (2020) *The Rise of the Dutch New Right: An Intellectual History of the Rightward Shift in Dutch Politics*. London: Routledge.

introduced the Adult Attachment Interview and reported associations with the Strange Situation.<sup>138</sup> In his earliest writings about attachment research, Van IJzendoorn has been sceptical of the validity of the Strange Situation. His appreciation for the paradigm grew over the early 1980s, though the tone of his reflections remained that of an appreciative critic, not an insider.<sup>139</sup>

Reading the 'move to the level of representation' paper, and training in the Adult Attachment Interview in 1986 with Main, represented a step-change.<sup>140</sup> The Adult Attachment Interview offered a scientific instrument concerned to tap adult distortions in self-knowledge revealed by contradictions in their autobiographical narrative. It apparently predicted children's trust in the availability and dependability of their caregiver. This spoke directly to some of Van IJzendoorn's central interests. Data from Bakermans-Kranenburg's doctoral research showed that the AAI had no association with the Shaver and Hazen 'love quiz' as a self-report measure of conscious attachment representations: it was measuring something quite different to what people believed about their experiences in close relationships.<sup>141</sup>

The AAI adopted hard and labour-intensive observational measures to pursue insights into personal and dyadic psychological processes, appealing to Van IJzendoorn's sense of how truth can be achieved in psychological research. In the context of academic psychology becoming increasingly atheoretical, Main's research exemplified how attachment research remained a paradigm enriched by theoretical propositions and their extension, which Van IJzendoorn saw as well aligned with Popper's prescriptions for scientific method. Van IJzendoorn's loyalty to attachment research in the late 1980s may be suspected to have been shaped by a personal loyalty to Main.

After 1986, Van IJzendoorn wrote about attachment research as a member of the attachment research community, rather than as an outsider. Yet there was a critical difference between Van IJzendoorn and many other members of the attachment community in developmental science at this point. Whereas other attachment researchers in the period tended to come to attachment research as followers of Ainsworth, Van IJzendoorn's entry to a feeling of commitment and belonging occurred through Main. As such, the attachment theory to which he felt loyalty was ultimately quite radically different, commensurate with the

<sup>138</sup> Main, M., Kaplan, N., & Cassidy, J. (1985) Security in infancy, childhood, and adulthood: A move to the level of representation. In I. Bretherton & E. Waters (eds), *Growing points in attachment theory and research. Monographs of the Society for Research in Child Development*, 50, 66–106. For recollections on the excitement generated by this paper at the time, see Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A., & Van IJzendoorn, M. H. (2025) Celebrating more than 26,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status. *Attachment & Human Development*, forthcoming: 'The introduction of the AAI by Mary Main and her colleagues (1985) should be considered a truly revolutionary shift in the study of adult attachment because of its moving away from the conscious self-reported content of attachment experiences which questionnaires tap on, and emphasizing the "unconscious" linguistic characteristics of one's discourse in response to semi-structured interview questions.'

<sup>139</sup> For example, Van IJzendoorn, M. H., Goossens, F. A., Kroonenberg, P. M., & Tavecchio, L. W. C. (1985) Dependent attachment: B-4 children in the strange situation. *Psychological Reports*, 57(2), 439–451.

<sup>140</sup> For another account of training in the AAI as a conversion experience see Pederson, D. (2005) SRCD Oral History Interview, [https://www.srcd.org/sites/default/files/file-attachments/pederson\\_interview.pdf](https://www.srcd.org/sites/default/files/file-attachments/pederson_interview.pdf): 'My interest and understanding of how to do research on attachment developed. I think the big—what was the phrase you—sharp turn, for me these are kind of wiggly turns moving away and going out of being a behaviorist. I think the big sharp turn came much later. It came in 1990, when I took Mary Main's Adult Attachment Interview Institute, a two-week training course, and there was this suddenly, like, oh *this* is what psychology is about. You listen to what people say, and wonder why they said it, and wonder why they chose these particular words and what would be the meaning of this utterance. And so that those two weeks there was kind of like—it was like the previous part of my training was all in preparation for this. It was just, wow, this is what psychology really is about.'

<sup>141</sup> De Haas, M. A., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (1994) The Adult Attachment Interview and questionnaires for attachment style, temperament, and memories of parental behavior. *The Journal of Genetic Psychology*, 155(4), 471–486.

changes enacted by Main, which he regarded as 'revolutionary' (Chapter 1).<sup>142</sup> His subsequent commentaries on Ainsworth's work still adopted the position of an appreciative critic; his discussions of Main's work were resolutely positive.<sup>143</sup> In particular, Van IJzendoorn was excited by the possibilities of the Adult Attachment Interview for opening up new avenues for research. For instance, applied to the programme of work on attachment and early reading, Bus and Van IJzendoorn found that autonomous/secure speakers on the AAI were more likely to spend time reading to their children.<sup>144</sup>

From this perspective, it becomes rather clearer why Van IJzendoorn came to identify as an attachment researcher and feel a sense of responsibility for the paradigm from the late 1980s. At first sight this seems mysterious, given that his perspective in the 1970s and early 1980s had been that of a critical outsider. Furthermore, Van IJzendoorn's scientific values might have been expected to incline him towards a field closer to the natural sciences, rather than attachment research, often considered at the 'fluffy' end of developmental science, dealing with dyadic interactions and relationships.

A new sample of 80 families were recruited by Van IJzendoorn and Leiden colleagues, and the Strange Situation conducted with father, mother, and professional caregiver. Two years later mothers and fathers completed the Adult Attachment Interview and were observed in free-play to assess caregiver sensitivity. With this data, in a 1991 paper Van IJzendoorn and colleagues were able to offer support that the Adult Attachment Interview had expectable associations with the Strange Situation and with maternal sensitivity. Indeed, the replication held in many respects. Indeed, as with Main's Berkeley sample, it was only mothers' AAIs, not fathers', that predicted children's Strange Situation classification with their parent.<sup>145</sup>

Together with convergent findings from the Grossmanns at Regensburg, Ward, and Carlson at Cornell, and Fonagy, Steele, and Steele in London, the Leiden results offered important early validation of the AAI by replicating the relationships expected by Main with measures of caregiving.<sup>146</sup> Many of these researchers would become influential

<sup>142</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (1997) Intergenerational transmission of attachment. A move to the contextual level. In L. Atkinson & K. J. Zucker (eds), *Attachment and Psychopathology* (pp. 135–170). New York: Guilford, p. 138.

<sup>143</sup> For instance, he criticized Ainsworth's coding system for the Strange Situation for reducing all the complexity of child behaviour to three categories but would jump to the defence of Main's disorganized classification. Kroonenberg, P. M. & Van IJzendoorn, M. H. (1987) Exploring children's behavior in the Strange Situation. In L. W. C. Tavecchio & M. H. Van IJzendoorn (eds), *Attachment in Social Networks. Contributions to the Bowlby-Ainsworth Attachment Theory* (pp. 379–426). New York: Elsevier Science Publishers: 'There is a striking contrast between the intricacy of data collection procedures of the Strange Situation and the simplicity of its analysis and reported results' (379).

<sup>144</sup> Bus, A. G., & Van IJzendoorn, M. H. (1992) Patterns of attachment in frequently and infrequently reading mother-child dyads. *The Journal of Genetic Psychology*, 153(4), 395–403.

<sup>145</sup> See for example Van IJzendoorn, M. H., Kranenburg, M. J., Zwart-Woudstra, H. A., Van Busschbach, A. M., & Lambermon, M. W. (1991) Parental attachment and children's socio-emotional development: Some findings on the validity of the Adult Attachment Interview in the Netherlands. *International Journal of Behavioral Development*, 14(4), 375–394.

<sup>146</sup> Grossmann, K., Fremmer-Bombik, E., Rudolph, J., & Grossmann, K. E. (1988) Maternal attachment representations as related to patterns of infant-mother attachment and maternal care during the first year. In R. A. Hinde & J. Stevenson-Hinde (eds), *Relationships within Families: Mutual Influences* (pp. 241–260). Oxford: Clarendon; Fonagy, P., Steele, H., & Steele, M. (1991) Maternal representations of attachment during pregnancy predict the organization of infant-mother attachment at one year of age. *Child Development*, 62, 891–899; Levine, L. V., Tuber, S. B., Slade, A., & Ward, M. J. (1991) Mothers' mental representations and their relationship to mother-infant attachment. *Bulletin of the Menninger Clinic*, 55(4), 454–469. The Cornell findings for sensitivity were already circulating by 1991, but were formally presented in Ward, M. J. & Carlson, E. A. (1995) Associations among adult attachment representations, maternal sensitivity, and infant-mother attachment in a sample of adolescent mothers. *Child Development*, 66(1), 69–79.

advocates for Main's work, especially Van IJzendoorn, Carlson, and the Steeles.<sup>147</sup> Other groups that conducted analyses of the correlates of the AAI in the period suppressed their findings, such as Belsky (Chapter 3); Verhage and colleagues would later document considerable publication bias.<sup>148</sup>

Despite their mutually agreed dislike of self-report measures, as an experiment Main, Hesse, and Van IJzendoorn nonetheless did attempt to develop a self-report measure convergent with the Adult Attachment Interview: the Berkeley-Leiden Adult Attachment Questionnaire. This was a 200-item questionnaire, aiming to identify the four 'states of mind regarding attachment' from the AAI.<sup>149</sup>

The measure included two sub-scales for unresolved/disorganized states. The first was Unresolved States of Mind. This comprised items drawn directly from the coding manual for U/d on the AAI, with items designed to represent both lapses in reasoning (e.g., feelings of responsibility for a death in which the participant had no causal role) and lapses in discourse (e.g., feelings of lack of mental control when thinking about specific events). Additionally, 'because unresolved trauma in certain cases may have a relation to post-traumatic disorders and to the dissociative disorders, some items indicating symptoms of these disorders were included.'<sup>150</sup>

A second sub-scale contained items suggesting anomalous beliefs about time/space relations and causality, including beliefs in possession, mental telepathy, or precognition. The scales had strong reliability and stability over 12 months. The Unresolved States of Mind subscale had an association with U/d on the AAI of  $r = 0.63$ . The Unusual Beliefs subscale made a smaller but significant contribution, with the items for beliefs in possession performing especially well. Over 80% of participants could have been successfully classified on the AAI on the basis of their scores on the two scales. False positives were very rare; where misclassifications occurred, it was on the basis of false negatives.

However, Main, Van IJzendoorn and Hesse were ultimately disappointed by the overall Berkeley-Leiden Adult Attachment Questionnaire measure, which failed to replicate early successes. The sub-scales for unresolved/disorganized states were still deemed not good enough, especially with the potential for widespread use given the bandwagon for self-report measures. This is why the authors decided to leave the self-report scales for unresolved/disorganized states unpublished, and likewise their empirical studies trying to validate these scales.<sup>151</sup> As discussed in Chapter 1, Main has had difficulties bringing

<sup>147</sup> For example, Carlson, E. A. (1998) A prospective longitudinal study of attachment disorganization/disorientation. *Child Development*, 69(4), 1107–1128; Steele, H. & Steele, M. (eds) (2008) *Clinical Applications of the Adult Attachment Interview*. New York: Guilford Press.

<sup>148</sup> Verhage, M. L., Schuengel, C., Madigan, S., Fearon, R. M., Oosterman, M., Cassibba, R., ... & Van IJzendoorn, M. H. (2016) Narrowing the transmission gap: A synthesis of three decades of research on inter-generational transmission of attachment. *Psychological Bulletin*, 142(4), 337–366.

<sup>149</sup> A prompt for this work may have been Maylesse, who had developed a fourth 'disorganized' attachment style to add to the Shaver and Hazen love quiz. Mayseless, O. (1990, July) Attachment patterns of adults: New findings and a new scale. Paper presented at the Fifth International Conference on Personal Relationships, July 1990, Oxford, England. Yet in Bakermans-Kranenburg's doctoral sample, which included the Mayseless addition, 'the description of the disorganised style could not be distinguished from the ambivalent description'. Van IJzendoorn and colleagues therefore gave up on the Mayseless scale. It may nonetheless have contributed to motivation for the development of the Berkeley-Leiden Adult Attachment Questionnaire. De Haas, M. A., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (1994) The Adult Attachment Interview and questionnaires for attachment style, temperament, and memories of parental behavior. *The Journal of Genetic Psychology*, 155(4), 471–486, p. 476.

<sup>150</sup> Main, M., Van IJzendoorn, M. H., & Hesse, E. (1993) Unresolved/unclassifiable responses to the Adult Attachment Interview: Predictable from unresolved states and anomalous beliefs in the Berkeley-Leiden Adult Attachment Questionnaire. Unpublished manuscript. [https://openaccess.leidenuniv.nl/dspace/bitstream/1887/1464/1/168\\_131.pdf](https://openaccess.leidenuniv.nl/dspace/bitstream/1887/1464/1/168_131.pdf).

<sup>151</sup> Ibid.



work to publication. Van IJzendoorn's dislike of self-report methodology may have further contributed to the premature ending to this experiment.

As such, the Berkeley-Leiden Adult Attachment Questionnaire offered intriguing indications that some of what is measured by unresolved state of mind in the AAI is actually *conscious* to individuals. This avenue of research could, for example, have helped understand why, and when, unresolved states of mind is often, but by no means always, associated with self-report measures of dissociation<sup>152</sup> and trauma (Chapter 2).<sup>153</sup> However, the line of inquiry was abandoned by Main, Van IJzendoorn, and Hesse. Picking up these questions again many decades later and at much the same time, four different research groups would be unaware of this earlier work by Main and colleagues and so each would start again from scratch.<sup>154</sup>

Doubt of subjective report would remain a recurrent theme in Van IJzendoorn and Bakermans-Kranenburg's subsequent research. They would pursue with great interest the implications of discrepancies between parent, child, and professional report of child maltreatment and neglect.<sup>155</sup> He would criticize the tendency for research on gene x environment interaction to depend on self-report measures of the environment, sometimes even just a single question (Chapter 3). A frequently touchstone for their stance towards self-report measures was Niko Tinbergen's ethology and its emphasis on careful (experimental) observation of behaviour, foundational for early attachment research. As was Frans de Waal's beautiful observational work on nonhuman primates.<sup>156</sup>

<sup>152</sup> Schuengel, C., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (1999) Frightening maternal behavior linking unresolved loss and disorganized infant attachment. *Journal of Consulting and Clinical Psychology*, 67(1), 54–63; Zajac, K. & Kobak, R. (2009) Caregiver unresolved loss and abuse and child behavior problems: Intergenerational effects in a high-risk sample. *Development & Psychopathology*, 21(1), 173–187; Madigan, S., Vaillancourt, K., McKibbin, A., & Benoit, D. (2012) The reporting of maltreatment experiences during the Adult Attachment Interview in a sample of pregnant adolescents. *Attachment & Human Development*, 14(2), 119–143. No association was found by Stovall-McClough, K. & Cloitre, M. (2006) Unresolved attachment, PTSD, and dissociation in women with childhood abuse histories. *Journal of Consulting and Clinical Psychology*, 74(2), 219–228; or by Marcusson-Clavertz, D., Gušić, S., Bengtsson, H., Jacobsen, H., & Cardeña, E. (2017) The relation of dissociation and mind wandering to unresolved/disorganized attachment: An experience sampling study. *Attachment & Human Development*, 19(2), 170–190. Thomson and Jaque found an association between U/d and pathological forms of dissociation, but not absorption. Thomson, P. & Jaque, S. V. (2014) Unresolved mourning, supernatural beliefs and dissociation: A mediation analysis. *Attachment & Human Development*, 16(5), 499–514. However, the relationship with U/d is clouded by the diversity of measures of dissociation used across studies.

<sup>153</sup> Madigan, S., Vaillancourt, K., McKibbin, A., & Benoit, D. (2012) The reporting of maltreatment experiences during the Adult Attachment Interview in a sample of pregnant adolescents. *Attachment & Human Development*, 14(2), 119–143; Murphy, A., Steele, M., Dube, S. R., Bate, J., Bonuck, K., Meissner, P., ... & Steele, H. (2014) Adverse childhood experiences (ACEs) questionnaire and adult attachment interview (AAI): Implications for parent child relationships. *Child Abuse & Neglect*, 38(2), 224–233; Thomson, P. & Jaque, S. V. (2017) Adverse childhood experiences (ACE) and adult attachment interview (AAI) in a non-clinical population. *Child Abuse & Neglect*, 70, 255–263.

<sup>154</sup> Paetzold, R. L., Rholes, W. S., & Kohn, J. L. (2015) Disorganized attachment in adulthood: Theory, measurement, and implications for romantic relationships. *Review of General Psychology*, 19(2), 146–156; Meier, M. & Bureau, J.-F. (2018) The development, psychometric analyses, and correlates of a self-report measure on disorganization and role reversal. *Journal of Child and Family Studies*, 27(6), 1805–1817; Briere, J., Runtz, M., Eadie, E. M., Bigras, N., & Godbout, N. (2019) The Disorganized Response Scale: Construct validity of a potential self-report measure of disorganized attachment. *Psychological Trauma*, 11(5), 486–494; Pollard, C., Bucci, S., MacBeth, A., & Berry, K. (2020) The revised psychosis attachment measure: Measuring disorganized attachment. *British Journal of Clinical Psychology*, 59(3), 335–353.

<sup>155</sup> For example Buisman, R. S., Pittner, K., Tollenaar, M. S., Lindenberg, J., van den Berg, L. J., Compier-de Block, L. H., ... & Van IJzendoorn, M. H. (2020) Intergenerational transmission of child maltreatment using a multi-informant multi-generation family design. *PloS One*, 15(3), e0225839.

<sup>156</sup> For example, De Waal, F. B. M. (2019) *Mama's Last Hug: Animal Emotions and What They Tell Us about Ourselves*. W. W. Norton & Company. See Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 28.

In their work on attachment, the Leiden group would repeatedly report no statistically significant association between mothers' reports of whether they were sensitive and observer report of their caregiving sensitivity:

A possible reason for not finding a relation between sensitivity beliefs and behaviors could be that sensitivity is generally not an aspect of parenting that is consciously applied. The neural basis of sensitive parenting has been found to reflect a complex interplay of memory activation, self-regulation, recognizing others' emotions, and empathy. This suggests that 'automated' responses are at play, rooted in the caregiver's own childhood experiences. Indeed, several aspects of sensitivity refer to intuitive rather than planned behaviors, such as smiling back when a child smiles, or imitating infant vocalizations. In addition, sensitive parenting is very difficult to self-monitor, because self-monitoring requires recognition of the appropriateness of responses. Whereas a generally sensitive parent would be aware of a nonoptimal response to a child's cue (e.g., because of a competing demand, or tiredness), an insensitive parent will be unaware of the inappropriateness of a response, potentially leading to a mismatch between her beliefs and her behaviors.<sup>157</sup>

### Replicability

There is a consensus today that scientific objectivity does not rest on individual studies, no matter their quality. Instead, it demands consideration of collections of studies offering transparency regarding their methods, analyses and results, and the identification of replicable causal effects across these studies. Freese and Peterson have termed this 'statistical objectivity'.<sup>158</sup> This consensus was precipitated in academic psychology by widespread failures to replicate the sizeable effect sizes of high-profile and classic studies.<sup>159</sup> It also reflected a response to the heedless empiricism of publish-or-perish academic psychology, as well as slow changes in epistemological norms, with precursors decades earlier.

Van IJzendoorn was in the vanguard proposing statistical objectivity. Influenced by Habermas and Popper, Van IJzendoorn held that scientific truth could not be sought in the findings of any individual study. Instead, scientific truth emerges out of the ongoing scientific process, through the generation of hypotheses and their survival, or failure to survive, clear tests against new evidence.

In his view, exact replication of a study was generally not required: more relevant support would come from replications varying one or more parameters of the original study. One study might use a clinical rather than a community sample; another study might use a

<sup>157</sup> Ekmekci, H., Malda, M., Yagmur, S., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Mesman, J. (2016) The discrepancy between sensitivity beliefs and sensitive parenting behaviors of ethnic majority and ethnic minority mothers. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 48(1), 60–67, p. 64. Parentheses suppressed. See aligned findings see also Verschuere, K., Dossche, D., Marcoen, A., Mahieu, S., & Bakermans-Kranenburg, M. (2006) Attachment representations and discipline in mothers of young school children: An observation study. *Social Development*, 15(4), 659–675; Voorthuis, A., Out, D., van der Veen, R., Bhandari, R., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2013) One doll fits all: Validation of the Leiden Infant Simulator Sensitivity Assessment (LISSA). *Attachment & Human Development*, 15, 603–617.

<sup>158</sup> Freese, J. & Peterson, D. (2018) The emergence of statistical objectivity: Changing ideas of epistemic vice and virtue in science. *Sociological Theory*, 36(3), 289–313.

<sup>159</sup> Open Science Collaboration (2015) Estimating the reproducibility of psychological science. *Science*, 349(6251); Olsson-Collentine, A., Van Assen, M. A., & Hartgerink, C. H. (2019) The prevalence of marginally significant results in psychology over time. *Psychological Science*, 30(4), 576–586; Davis-Kean, P. E., & Ellis, A. (2019) An overview of issues in infant and developmental research for the creation of robust and replicable science. *Infant Behavior and Development*, 57, 101339.

different instrument to tap the same phenomenon; a further study might vary the exposure, intervention, or an aspect of the environment.<sup>160</sup> Like a fugue in music, research would comprise proposition, propagation, and permutation.<sup>161</sup> The composition of these varied replications would help provide confidence in a truth claim, redeeming initial findings from chance and incidental features of the study's context.

For Van IJzendoorn, findings from any single study remain jailed in a state of epistemic immaturity; only through access to and survival of confrontation and rough-and-tumble debate by the scientific community do the findings of a study contribute to potentially dependable knowledge. Partial replications stabilize access to the truth, link data to descriptive, predictive, and explanatory concepts, and open the research imagination for the effective elaboration of theory.

Yet Van IJzendoorn was acutely mindful of the many ways that scientific practice may not live up to this ideal. He was concerned with the priority given by scientific journals to the publication of new findings rather than replications, and especially the lack of interest in research with null findings. As such, he reflected that scientific journals would be filled with studies at considerable risk of reporting false positive results.<sup>162</sup> Scientists themselves could also fail to pursue partial replication of previous research or respond defensively to criticism or empirical confrontation.

These reflections led Van IJzendoorn to worry in the 1980s about the state of knowledge and theory development in developmental science generally, and attachment research specifically, where strong claims were being made on the basis of one or few studies. In 1987, Tavecchio and Van IJzendoorn published a book *Attachment in Social Networks: Contributions to the Bowlby-Ainsworth Attachment Theory*. One of the central themes was a concern about replication in empirical attachment research.<sup>163</sup> Bowlby had read Popper with great interest, and was passionate about the importance of empirical attempts to knock down or modify theory: 'however controversial my ideas may have been and still be, and however stringent the criticisms levelled at them, they are now being examined, amplified, modified and tested, possibly to destruction, by able workers in half a dozen disciplines. No one could ask for more.'<sup>164</sup>

Yet Bowlby's passion for Popper was not transmitted to Ainsworth and her circle of empirical researchers. It is perhaps indicative that, rather than Popper, Ainsworth and her circle were more likely to cite Thomas Kuhn—one of Popper's great opponents. For Kuhn, scientific research entailed using empirical work to solve puzzles generated by the theory and through this contribute to the theoretical tradition. It was not, as for Popper, primarily a matter of creating decisive empirical attempts to evaluate theoretical propositions.<sup>165</sup>

Van IJzendoorn and colleagues agreed with Lamb and Thompson (Chapter 1) that attachment researchers depended far too much on Ainsworth's original study. From Van IJzendoorn's perspective, this was valuable and pioneering work, but should be recognized,

<sup>160</sup> Van IJzendoorn, M. H. (1994) Process model of replication studies: On the relations between different types of replication. In R. van der Veer, Van IJzendoorn, M. H., & J. Valsiner (eds), *On Reconstructing the Mind. Replicability in Research on Human Development* (pp. 57–70). Norwood, NJ: Ablex.

<sup>161</sup> Denk, J. (2012) Bach's music, back then and right now. *The New Republic*, 15 November 2012.

<sup>162</sup> Van der Veer, R., Van IJzendoorn, M. H., & Valsiner, J. (1994) General introduction. In R. Van der Veer, Van IJzendoorn, M. H., & J. Valsiner (eds), *On Reconstructing the Mind. Replicability in Research on Human Development* (pp. 1–10). Norwood, NJ: Ablex.

<sup>163</sup> Tavecchio, L. W. C. & Van IJzendoorn, M. H. (eds) (1987) *Attachment in Social Networks. Contributions to the Bowlby-Ainsworth Attachment Theory*. New York: Elsevier Science Publishers.

<sup>164</sup> Bowlby, J. (1981) Perspective: a contribution by John Bowlby. *Bulletin of the Royal College of Psychiatrists*, 5(1) (Jan.), 2–4, p. 4.

<sup>165</sup> Kuhn, T. S. (1962) *The Structure of Scientific Revolutions*, Chicago: University of Chicago Press. See also Fuller, S. (2004) *Kuhn vs. Popper: The Struggle for the Soul of Science*. New York: Columbia University Press.

precisely, as pioneering rather than definitive. There were methodological limitations to Ainsworth's work. Not least, she developed her scales without being blind to the rest of the data in her sample, potentially overestimating the strength of links she found.

However, even were there no such limitations, the Ainsworth Baltimore study represented work in the context of discovery. Scientists could not rest weight on findings until they had been well replicated by independent research. Some important replications had been undertaken of elements of Ainsworth's study, for example at Minnesota and Berkeley. Yet many claims commonly made by attachment researchers remained supported only by Ainsworth's work. Van IJzendoorn was also appalled by the treatment of Lamb and Thompson, who he felt had been blacklisted by Ainsworth's students for raising valid scientific criticisms and seeking to generate just the kind of debate that nourishes scientific practice (Chapter 1).

In the 1980s, when Van IJzendoorn and colleagues were flagging the threat to the credibility of attachment research represented by the issue of replication, there was not much of an international conversation yet in academic psychology about this issue.<sup>166</sup> They were out of keeping with the prevailing epistemology and priorities of developmental science. Van IJzendoorn's different perspective on the philosophy of science put him in a different perceived world to other researchers in the period: there were fundamental differences in his stance on what science is and should be, and why it matters. Within the attachment research community, Van IJzendoorn's concerns generated relatively little response. The one review of *Attachment in Social Networks*, by Ainsworth's student Mark Greenberg, was favourable, but emphasized Van IJzendoorn's status as outside the US mainstream.<sup>167</sup>

If the book were published today, making the same arguments and reporting the same empirical work, it would likely prompt more response: there is considerably more interest in the necessity of replication and, commensurately, in Popper's work.<sup>168</sup> Van IJzendoorn was an early representative and advocate for this epistemological shift within developmental science. He was establishing the role, widespread and established today, of what Nelson has called a 'methodologist actor'—a scientist calling for reform to meet a higher epistemic standard.<sup>169</sup>

In *Attachment in Social Networks*, Van IJzendoorn and Tavecchio considered the state of attachment research in terms of the ideas of Imre Lakatos, a philosopher of science building on and responding to Popper and Kuhn.<sup>170</sup> For Lakatos, research programmes are organized by a 'hard core' of premises, concepts, and instruments. This hard core facilitates the generation of new ad hoc hypotheses and observational theories, some of which may survive empirical testing to become established over time as part of the hard core. Yet limitations and difficulties may emerge which threaten the hard core, which will require the research programme to either progress and adapt, or which will lead it to stagnate or be overturned. Where a research programme is proving effective in generating

<sup>166</sup> Though see for example Neuliep, J. W. (1990) Editorial bias against replication research. *Journal of Social Behavior and Personality*, 5(4), 85–90.

<sup>167</sup> Greenberg, M. T. (1989) Attachment in social networks: Contributions to the Bowlby-Ainsworth attachment theory edited by Louis W. C. Tavecchio and Marinus H. Van IJzendoorn (Book Review) *Contemporary Psychology*, 34 (3), p. 260.

<sup>168</sup> Derksen, M. (2019) Putting Popper to work. *Theory & Psychology*, 29(4), 449–465; O'Donohue, W. (2021) Are psychologists appraising research properly? Some Popperian notes regarding replication failures in psychology. *Journal of Theoretical and Philosophical Psychology*, 41(4), 233.

<sup>169</sup> Nelson, N. C. (2020) The methodologists: A unique category of scientific actors. *Engaging Science, Technology, and Society*, 6, 20–33. See also Peterson, D. & Panofsky, A. (2023) Metascience as a scientific social movement. *Minerva*, 61(2), 147–174.

<sup>170</sup> Lakatos, I. (1978) *The Methodology of Scientific Research Programmes*, J. Worrall and G. Currie (eds). Cambridge: Cambridge University Press.

hypotheses and subjecting these to testing, Lakatos characterizes it as 'progressive'. When the research programme is not providing effective in either regard, Lakatos characterizes it as 'degenerating'.

Van IJzendoorn and Tavecchio described four stages of a research programme:

- *Formulation*: intuitions are derived in the context of discovery that offer a sketch towards a developed theoretical position. At this stage researchers may discuss their ideas with close colleagues, but largely remain private.
- *Construction*: empirical research is undertaken, applying and elaborating theory.
- *Saturation*: there are diminishing returns on new empirical work for new discoveries or the elaboration of theory. Limitations and difficulties start to loom.
- *Exhaustion*: loyal researchers prioritize defence of the programme as competitors offer alternatives made attractive by the limitations and difficulties facing the research programme.

Van IJzendoorn and Tavecchio identified two components of the hard core of attachment research. A first was Bowlby's theory of the evolutionary advantages for children of care-seeking behaviour. The publication of Bowlby's book *Attachment* in 1969 was the culmination of the formulation stage. A second component of the hard core was the Strange Situation and its classifications, which made possible attachment research, in the construction stage, as a programme of cumulative work by 'enthusiastic attachment researchers'.<sup>171</sup> Implementation of these components of the hard core of the research programme by developmental scientists opened many avenues for fruitful research examining the correlates of secure and insecure infant-caregiver attachment.

Nonetheless, Van IJzendoorn and Tavecchio noted that limitations and difficulties had started to loom. Current challenges included the issue of stability and development of attachment over the lifespan, and the cross-cultural validity of the Strange Situation. Nonetheless, Van IJzendoorn and Tavecchio anticipated that these challenges would not be fatal, and that attachment theory and research could change and grow in response. In the event, Van IJzendoorn would find in Main's work a source of renewal for attachment research, bringing the research programme back to the stage of construction.

In *Attachment in Social Networks*, Van IJzendoorn and colleagues reported empirical work they had conducted to appraise claims made by Ainsworth and colleagues that sensitive care reduces infant crying. From the Baltimore home observation data, Bell and Ainsworth had reported in the early 1970s that when mothers responded promptly to infant fussing or crying in the first quarter, they fuss or cry less in the final quarter of the first year, and the dyad are more likely to be identified as securely attached in the Strange Situation.<sup>172</sup> These were major headline findings at the time, offering a symbolic victory for attachment theory. The findings ran directly contrary to the social learning theory that if infants fuss or cry, and parents jump to respond, giving the infant a positive reinforcement, children will learn to fuss or cry more in future.<sup>173</sup> Admittedly, though, the measure used by Bell and Ainsworth used was crude. Unlike Ainsworth's sensitivity scale, they did

<sup>171</sup> Van IJzendoorn, M. H. & Tavecchio, L. W. C. (1987) The development of attachment theory as a Lakatosian research program. In L. W. C. Tavecchio & M. H. Van IJzendoorn (eds), *Attachment in Social Networks. Contributions to the Bowlby-Ainsworth Attachment Theory* (pp. 3–31). New York: Elsevier Science Publishers, p. 16.

<sup>172</sup> Bell, S. M. & Ainsworth, M. D. S. (1972) Infant crying and maternal responsiveness. *Child Development*, 1171–1190.

<sup>173</sup> Newton, L. D. (1983) Helping parents cope with infant crying. *Journal of Obstetric, Gynecologic, & Neonatal Nursing*, 12(3), 199–204.

not distinguish whether the mother's response seemed to be accurately inferring the child's needs, only whether the mother responded to the child's signal.

Van IJzendoorn worked with a doctoral student, Frans Hubbard, to collect data on what would be a very intensive study. Data collection began in 1983 and took four years, using the new technology provided by an event recorder/FM audio registration unit. The findings were clear-cut: when caregivers responded to fuss or cry signals, infants cried more often by the end of the first year.<sup>174</sup> Hubbard and Van IJzendoorn proposed that a distinction needed to be drawn between low-level fussing and loud and prolonged cries. They speculated that whereas their technology-enabled methodology allowed them to track the former, it is likely that only the latter would have been recorded every time by Ainsworth's live observers, even if fussing was sometimes noted.

Low-level fussing is not, Hubbard and Van IJzendoorn argued, an attachment signal. Sensitive responsiveness to these behaviours may have little implication for informing the expectations that organize the attachment behavioural system; instead, they may encourage more fussing, especially when the caregiver's response is prompt and offers reinforcement. This is in contrast to loud and prolonged cries by the infant, which are attachment signals. For her part, Ainsworth was entirely persuaded by these distinctions.<sup>175</sup> Indeed, they aligned with her own procedure for coding of the Strange Situation, which distinguished between contact-seeking and general distress, and gave the former overriding precedence when coding for attachment security. They also aligned with an important aspect of her sensitivity scale. While sometimes implying that sensitivity entailed responsiveness to all and any child signals, on closer inspection the sensitivity scale asked coders to assess the extent to which a caregiver's response seemed an accurate interpretation of the meaning of their child's signals (Chapter 1).

Hubbard and Van IJzendoorn's distinction between sensitivity to distress and non-distress signals was taken up by Thompson,<sup>176</sup> who in turn transmitted it to McElwain and Booth-LaForce, who used it in their criticisms of the NICHD measure of sensitivity (Chapter 3), which addressed only caregiver response to non-distress signals. As McElwain and Booth-LaForce noted, citing Hubbard and Van IJzendoorn, a caregiver's response to distress signals may be expected to be more associated with a child's expectations of the caregiver as a safe haven in times of need.<sup>177</sup> The work of McElwain and Booth-LaForce in turn fed subsequent empirical investigations of responsiveness to distress signals, ultimately culminating in growing and convergent empirical evidence to suggest that caregiver safe haven provision in response to distress may be the core of the sensitivity construct.<sup>178</sup>

<sup>174</sup> Hubbard, F. O. A. & Van IJzendoorn, M. H. (1987) Maternal unresponsiveness and infant crying: A critical replication of the Bell & Ainsworth study. In L.W. C. Tavecchio & M. H. Van IJzendoorn (eds), *Attachment in Social Networks. Contributions to the Bowlby-Ainsworth Attachment Theory* (pp. 339–378). New York: Elsevier Science Publishers.

<sup>175</sup> In a personal communication to Van IJzendoorn, Ainsworth herself concluded: 'Even the most responsive mothers did not respond to a little cry that stopped spontaneously when a baby was put to sleep or a similar brief fuss when a baby was trying to turn over and could not manage by itself, however, succeeding next. But rarely did they fail to respond to a loud and prolonged cry.' Personal communication to Marinus Van IJzendoorn, cited in F. O. Hubbard & M. H. Van IJzendoorn (1991) Maternal unresponsiveness and infant crying across the first 9 months: A naturalistic longitudinal study. *Infant Behavior and Development*, 14(3), 299–312, p. 368.

<sup>176</sup> Thompson, R. A. (1997) Sensitivity and security: New questions to ponder. *Child Development*, 68, 595–597.

<sup>177</sup> McElwain, N. L. & Booth-LaForce, C. (2006) Maternal sensitivity to infant distress and nondistress as predictors of infant–mother attachment security. *Journal of Family Psychology*, 20(2), 247–255.

<sup>178</sup> Leerkes, E. M., Weaver, J. M., & O'Brien, M. (2012) Differentiating maternal sensitivity to infant distress and non-distress. *Parenting*, 12(2–3), 175–184; Woodhouse, S. S., Scott, J. R., Hepworth, A. D., & Cassidy, J. (2020) Secure base provision: A new approach to examining links between maternal caregiving and infant attachment. *Child Development*, 91(1), 249–265.

Besides this line of influence, the Hubbard and Van IJzendoorn findings have had little traction. Still today, the Ainsworth and Bell paper is widely cited to prove that prompt response to infant crying reduces subsequent crying, including in information taught to parents in attachment-based parenting interventions.<sup>179</sup> It would require the symbolic power of meta-analysis for Van IJzendoorn to be able to contend with Ainsworth's authority within attachment research: a single failed replication would not suffice.

## Meta-analysis as Methodology

### Meta-analysis and Objectivity

As we have seen, in the 1980s Van IJzendoorn perceived the study of attachment to be in a precarious position, over-dependent on one or a few studies for key claims. Worse, he felt that the community of researchers were failing to recognize the seriousness of this predicament. In 1977, Smith and Glass had introduced a new methodology into the social sciences, meta-analysis, a technique for quantitative synthesis of the results of several studies. Smith and Glass synthesized findings from 375 controlled trials and found that although psychotherapy tended to be helpful to patients, there was no significant difference between different types of psychotherapy. The findings supported the Dodo bird verdict from Alice's Adventures in Wonderland: 'Everybody has won, and all must have prizes.'<sup>180</sup>

In his inaugural lecture at Leiden, in 1983, Van IJzendoorn called for the application of meta-analysis within developmental science, to support a more quantitative instead of a subjective narrative synthesis of research findings.<sup>181</sup> Meta-analysis attracted Van IJzendoorn as a means of helping attachment research achieve the status of a full science, sustained by a body of well-tested findings.<sup>182</sup> Reflecting his distrust of subjective experience, he regarded meta-analysis as relatively more objective than narrative reviews, 'capable of contributing to resolution of debates' and 'bringing some degree of order to a large and inconsistent body of findings.'<sup>183</sup>

An illustration of the value of meta-analytic methodology in this regard is a study by Van IJzendoorn, Bakermans-Kranenburg, and Sagi-Schwartz, investigating the common assumption, upheld by narrative reviews, that the children of Holocaust survivors would experience increased mental health difficulties. In fact, Van IJzendoorn and colleagues

<sup>179</sup> For example, Dozier, M. & Bernard, K. (2019) *Coaching Parents of Vulnerable Infants: The Attachment and Biobehavioral Catch-up Approach*. New York: Guilford, p. 11.

<sup>180</sup> Smith, M. L. & Glass, G. V. (1977) Meta-analysis of psychotherapy outcome studies. *American Psychologist*, 32(9), 752–760.

<sup>181</sup> Van IJzendoorn, M. H. (1983) *Van wijsgerige naar theoretische pedagogiek. Over de taken van de theoretische pedagogiek bij onderzoek naar vroegkinderlijke opvoeding (oratie)*. Deventer: Van Loghum Slaterus. In 1987 Goldsmith and Alansky at the University of Oregon published the first meta-analytic study using the Strange Situation. In the debate about attachment and temperament they regarded both sides as cherry-picking individual studies to support their conclusions (Chapter 4) Goldsmith and Alansky conducted an analysis aggregating results of the handful of studies to date, reporting a small but non-trivial association ( $r = 0.18$ ). Goldsmith, H. H. & Alansky, J. A. (1987) Maternal and infant temperamental predictors of attachment: A meta-analytic review. *Journal of Consulting and Clinical Psychology*, 55(6), 805–816.

<sup>182</sup> Van IJzendoorn, M. H. (1994) Process model of replication studies: On the relations between different types of replication. In R. Van der Veer, M. H. Van IJzendoorn, & J. Valsiner (eds), *On Reconstructing the Mind: Replicability in Research on Human Development* (pp. 57–70). Norwood, NJ: Ablex.

<sup>183</sup> Wolff, M. S. & IJzendoorn, M. H. (1997) Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591, p. 572.



found that this pattern held only for nonclinical studies with convenience samples.<sup>184</sup> In adequately designed nonclinical studies, there was no evidence for the influence of parents' traumatic Holocaust experiences on their children. In clinical studies, the children of Holocaust survivors did show worse mental health than comparison groups. This suggested that the parent's trauma history was a vulnerability factor for their child, but not itself sufficient to cause mental health difficulties.

Meta-analysis as a methodology seeks to be judicious. Like a judge, the meta-analytic researcher wants to see all the available evidence. Yet unlike a judge, the meta-analytic researcher has quantitative tools available both for weighting this evidence, and making sense of variation among different witnesses, even those who at first sight appear to outright disagree. The extent of certainty or uncertainty about conclusions can be reported in a transparent way, shrinking confidence intervals from individual studies to the point that they give adequate signal. Meta-analysis therefore bypasses what Van IJzendoorn has characterized as the 'intolerable' limitations with reports of statistical significance such as p-values for 'statistical significance'. The presence or lack of statistical significance is often arbitrary, not hard for researchers to manipulate, and may easily offer false positives and false negatives depending on characteristics of the sample, including sample size.<sup>185</sup>

True, some imprecision might be introduced by the need to commensurate different measures of the same construct or convert the effect sizes reported by individual studies into a common, standardized effect estimation. The extent to which this imprecision undermines the objectivity of meta-analytic research is debated.<sup>186</sup> However, for Van IJzendoorn the social sciences never grasp the truth directly: at best research in the context of justification gives signal amidst noise. He did not regard meta-analysis as offering exact answers. As such, although the graininess of estimates stemming from commensuration or conversion of data should be held in mind, this does not undermine the explanatory power of meta-analytic methodology.

Above all, Van IJzendoorn perceived that the use of effect estimation and confidence intervals in meta-analytic reports offered a more dependable quantification of relationships under investigation than tests of statistical significance.<sup>187</sup> For instance, non-significant results from small-scale studies may reveal an important association when considered as an aggregate in a meta-analysis:

It is because of the powerful combination of studies that the lack of power in primary studies is not important any more: even when a small-scaled primary study does not yield a significant outcome, and at the same time lacks power to reduce the risk of a Type II error to an acceptable rate, the point estimate and confidence boundaries of this study contain important information. Meta-analysis can make these findings productive for further research. In this respect, meta-analysis may be a solution for the

<sup>184</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Sagi-Schwartz, A. (2003) Are children of Holocaust survivors less well-adapted? A meta-analytic investigation of secondary traumatization. *Journal of Traumatic Stress*, 16(5), 459–469.

<sup>185</sup> Van IJzendoorn, M. H. (1998) Meta-analysis in early childhood education: Progress and problems. In B. Spodek, A. D. Pellegrini, & O. N. Saracho (1998) (eds), *Issues in Early Childhood Education, Yearbook in Early Childhood Education* (pp. 156–176). New York: Teachers College Press, p. 168. See also Cumming, G. (2014) The new statistics: Why and how. *Psychological Science*, 25(1), 7–29.

<sup>186</sup> Simpson, A. (2017) The misdirection of public policy: Comparing and combining standardised effect sizes. *Journal of Education Policy*, 32(4), 450–466.

<sup>187</sup> See also Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2015) Genetic differential susceptibility on trial: Meta-analytic support from randomized controlled experiments. *Development and Psychopathology*, 27(1), 151–162.



obsession of our field with p-values and asterisks which led to an intolerable waste of energy and potential knowledge.<sup>188</sup>

It should be fully acknowledged that the validity of meta-analytic findings depends on the studies synthesized: a meta-analysis depicts ‘the state of the art in the real world of research, not in the ideal world of “true” variances.’<sup>189</sup> If there are systematic biases or limitations on inquiry in a particular area of research, a meta-analysis may well replicate these biases or limitations, unless the available evidence makes it possible to examine relevant moderators (e.g., sampling methodology, in the study of the influence of the Holocaust).<sup>190</sup> For instance, for heterogeneous samples, the role of demographic differences may be frustratingly difficult or impossible to examine effectively through a meta-analysis of published data.<sup>191</sup>

Limited by the available studies, meta-analysis as a methodology has been accused of simplifying the characteristics of true causal processes in the social sciences. Meta-analyses by Van IJzendoorn, Bakermans-Kranenburg, and colleagues have been criticized for bracketing the role of the family system in examining associations between maternal sensitivity and security in the Strange Situation.<sup>192</sup> In Van IJzendoorn and Bakermans-Kranenburg’s view, this is less a criticism of meta-analysis as a method than an expression of impatience with the slow work of science, as well as the slow penetration of family systems thinking into developmental research, which should be facilitated and encouraged.<sup>193</sup> Indeed, as more evidence has emerged, informed by and building on earlier studies with simpler designs, family systems thinking has been able to inform subsequent meta-analytic studies, undertaken with input from Van IJzendoorn and Bakermans-Kranenburg, addressing the interactive effects of maternal and paternal care on child development.<sup>194</sup>

<sup>188</sup> Van IJzendoorn, M. H. (1998) Meta-analysis in early childhood education: Progress and problems. In B. Spodek, A. D. Pellegrini, & O. N. Saracho (1998) (eds), *Issues in Early Childhood Education, Yearbook in Early Childhood Education* (pp. 156–176). New York: Teachers College Press, p. 168.

<sup>189</sup> *Ibid.*, 164.

<sup>190</sup> Hyman, R. (2010) Meta-analysis that conceals more than it reveals: Comment on Storm et al. (2010) *Psychological Bulletin*, 136, 486–490.

<sup>191</sup> For example, Stoltenborgh, Bakermans-Kranenburg, and Van IJzendoorn wanted to examine whether socioeconomic status was relevant for child neglect. However, there were too few studies, many did not report socioeconomic status, and there was weak variation when the researchers attempted a division into low, medium and high socioeconomic status. The information in published studies limited what could be said in the meta-analysis; to take inquiry further would require solicitation of the raw data from researchers. Stoltenborgh, M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2013) The neglect of child neglect: A meta-analytic review of the prevalence of neglect. *Social Psychiatry and Psychiatric Epidemiology*, 48(3), 345–355.

<sup>192</sup> Cowan, P. A. (1997) Beyond meta-analysis: A plea for a family systems view of attachment. *Child Development*, 68(4), 601–603. For a recent example of the kind of study Cowan would regard very favourably, see for example Foley, S., Álvarez, C., McCarthy, J., & Hughes, C. (2020) Two’s company, three’s a crowd? Maternal and paternal talk about their infant differs in associations with wellbeing, couple relationship quality, and caregiving sensitivity. *Frontiers in Psychiatry*, 11, 578632. Such research examines the intricate, systemic interplay of different family factors and their contribution to sensitive parenting. From Van IJzendoorn’s perspective, such analyses are likely too ideographic to contribute to cumulative and dependable knowledge any time soon, though they might in the fullness of time. At best, they might therefore be regarded as a long-term and speculative investment, rather than non-science. At worst, it might be held by Van IJzendoorn that the research resources could have gone towards a less speculative investment.

<sup>193</sup> Madigan, S., Fearon, R. M., Van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J., ... & Verhage, M. L. (2023) The first 20,000 strange situation procedures: A meta-analytic review. *Psychological Bulletin*, 149(1–2), 99–132: ‘Among the 285 nonoverlapping samples included in this synthesis of studies with the four attachment classifications, only 12 (4.2%) were infant–father dyads ... it is imperative for researchers to incorporate all members of the child’s attachment network into their research, including grandparents (Liang et al., 2021), and to do so from a family systems perspective (Cowan & Cowan, 2019)’ (118).

<sup>194</sup> Dagan, O., Schuengel, C., Verhage, M. L., Madigan, S., Roisman, G. I., Bernard, K., ... & Volling, B. L. (2024) Configurations of mother–child and father–child attachment relationships as predictors of child language competence: An individual participant data meta-analysis. *Child Development*, 95(1), 50–69.

Nonetheless, Van IJzendoorn has acknowledged that meta-analysis remains constrained to an extent by the data collected by the empirical studies from which it draws. As an illustration, it is vanishingly rare for attachment researchers to incorporate any measure of parental culture in their studies. Whilst meta-analytic research may look for proxies for culture, such as the country in which a study took place, ultimately the lack of data collection leaves meta-analysis considerably at a loss. Though in this predicament meta-analysis they may provide a platform from which to call for change in data collection in future primary studies.

Another limitation acknowledged by Van IJzendoorn is that meta-analysis always involves choices which may be inflected by social values and the context and priorities of the research team: 'Searching for a meta-analytic hypothesis the researchers cannot avoid using their creativity and common sense in exploring areas and issues in need of synthesis; interpreting the meta-analytic outcome the researchers again have to fall back on their 'hermeneutic' skills and to make creative sense of its implications.'<sup>195</sup> As a case in point, a study of 124 meta-analyses of antihypertensive drugs found that meta-analyses with links to drug companies were five times more likely to reach positive conclusions.<sup>196</sup>

So, the distinction between meta-analysis and narrative reviews in this regard is not absolute. For Van IJzendoorn, there is nonetheless a clear difference in their degree of objectivity, with reported effect sizes and confidence intervals helping the reader to make an informed judgement, rather than taking the word of the narrative reviewer.<sup>197</sup> As a case in point, narrative reviewers are frequently influenced by early pioneering (but often underpowered) studies, which set the tone for subsequent discussions. A meta-analysis will give no such greater weight to early studies. Compared to a narrative review, it is better able to attest to whether early work has been supported, qualified, or failed to replicate.<sup>198</sup>

In 1988, Van IJzendoorn and Kroonenberg published a meta-analysis of the distribution of Strange Situation classifications in cross-cultural research (discussed below).<sup>199</sup> This was followed in 1990 by a study of consistency in the coding of Strange Situation across seven studies; here data was drawn not from published papers, but directly received in raw form from different research groups, the first individual participant data meta-analyses in this field.<sup>200</sup> In 1992, Van IJzendoorn, Kroonenberg, and collaborators from the Toronto

<sup>195</sup> Van IJzendoorn, M. H. (2019) Commentary: Addressing the replication and translation crises taking one step forward, two steps back? A plea for slow experimental research instead of fast 'participatory' studies. In S. Hein & J. Weiland (eds), *Randomized Controlled Trials (RCTs) in clinical and community settings: Challenges, alternatives and supplementary designs. New Directions for Child and Adolescent Development*, 167, 133–140, p. 133.

<sup>196</sup> Yank, V., Rennie, D., & Bero, L. A. (2007) Financial ties and concordance between results and conclusions in meta-analyses: Retrospective cohort study. *BMJ*, 335(7631), 1202–1205. See also Ioannidis, J. P. A. (2016) The mass production of redundant, misleading, and conflicted systematic reviews and meta-analyses. *Milbank Quarterly*, 94, 485–514.

<sup>197</sup> Van der Veer, R., Van IJzendoorn, M. H., & Valsiner, J. (1994) Epilogue. In R. van der Veer, Van IJzendoorn, M. H., & J. Valsiner (eds), *On Reconstructing the Mind. Replicability in Research on Human Development* (pp. 271–283). Norwood, NJ: Ablex: 'No meta-analytic procedure in and by itself can give us an objective summary of the data, but instead the investigator's thoughtful sequence of decisions while performing meta-analysis and equally thoughtful interpretation of its results may lead us towards greater objectivity' (278).

<sup>198</sup> For example, Molendijk, M. L., Bus, B. A., Spinhoven, P., Kaimatzoglou, A., Voshhaar, R. C. O., Penninx, B. W., ... & Elzinga, B. M. (2012) A systematic review and meta-analysis on the association between BDNF val66met and hippocampal volume—a genuine effect or a winners curse? *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, 159(6), 731–740; Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2014) A sociability gene? Meta-analysis of oxytocin receptor genotype effects in humans. *Psychiatric Genetics*, 24(2), 45–51.

<sup>199</sup> Van IJzendoorn, M. H. & Kroonenberg, P. M. (1988) Cross-cultural patterns of attachment: A meta-analysis of the strange situation. *Child Development*, 147–156.

<sup>200</sup> Van IJzendoorn, M. H. & Kroonenberg, P. M. (1990) Cross-cultural consistency of coding the strange situation. *Infant Behavior and Development*, 13(4), 469–485.

group reported a meta-analysis of maternal and child factors predicting Strange Situation classifications in clinical samples.<sup>201</sup> Numerous further meta-analyses followed.<sup>202</sup>

The methodology became an important pillar of Van IJzendoorn's profile and identity as a researcher. It offered a means of claiming authority, even a kind of weapon, against the insularity and defensiveness of some aspects of US attachment research. However meta-analysis was, additionally, a means to modulating a relationship with attachment as an object of research. The judiciousness of meta-analysis helped mitigate the threat of researchers becoming ruled by their object of research, as to an extent happened at Minnesota. For Sroufe and Minnesota colleagues, attachment was situated as the deep truth of human socioemotional development, 'the core, around which all other experience is structured, whatever impact it may have', holding the 'central place in the hierarchy of development'.<sup>203</sup>

These quotes come from the most cited paper in the history of the journal *Attachment & Human Development*, reflecting their consensus status for many attachment researchers. The paper was written and published, on Van IJzendoorn's initiative, to celebrate Sroufe's honorary doctorate from Leiden as 'one of the most remarkable scientists in our field'.<sup>204</sup> Nonetheless, Van IJzendoorn and Bakermans-Kranenburg had points of disagreement. One was their commitment to meta-analysis, regarded as an essential tool for achieving a stable and dependable truth, more defensible than the account of the Minnesota group, but without losing hold of the expectation that the study of attachment would offer deep insights. In fact, for Van IJzendoorn and Bakermans-Kranenburg meta-analysis was a means of *sustaining* that expectation, resourcing it with truths that might endure.

The association between observed caregiver sensitivity and security in the Strange Situation documented by Ainsworth, and touted by Sroufe and colleagues, was of course eye-catching:  $r = 0.78$ . It was also preposterously strong and was identified by De Wolff and Van IJzendoorn as a statistical outlier from the results of other studies. This was an association identified based on the non-blind coding of data from only 21 dyads, in the context of discovery. The value of such findings, for Van IJzendoorn, was that it could offer signal for establishing 'the solid scientific fact of a moderately strong causal association' ( $r = 0.24$ ), revealed by meta-analysis in a 1997 paper.<sup>205</sup> In this way, meta-analysis may be seen as part of how Van IJzendoorn sought to both criticize and nurture the study of attachment as a genuine science.

Van IJzendoorn wanted to tow attachment research towards dependable knowledge, like a tugboat slowly moves a ship. Helpfully, research on attachment was unusually suitable for meta-analysis due to the presence of a widely used set of hegemonic measures and coding systems, and a theoretical framework for designing research that was at least partially shared between research groups. The Minnesota group anchored this consensus regarding

<sup>201</sup> Van IJzendoorn, M. H., Goldberg, S., Kroonenberg, P. M., & Frenkel, O. J. (1992) The relative effects of maternal and child problems on the quality of attachment: A meta-analysis of attachment in clinical samples. *Child Development*, 63(4), 840–858.

<sup>202</sup> Schuengel, C., Verhage, M. L., & Duschinsky, R. (2021) Prospecting the attachment research field: A move to the level of engagement. *Attachment & Human Development*, 23(4), 375–395.

<sup>203</sup> Sroufe, L. A. (2005) Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*, 7(4), 349–367, p. 353.

<sup>204</sup> Van IJzendoorn, M. H. (2005) A special section for a special scientist: L. Alan Sroufe. *Attachment & Human Development*, 7(4), 347–348, p. 347.

<sup>205</sup> De Wolff, M. S., & Van IJzendoorn, M. H. (1997) Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591, p. 585. See also Van IJzendoorn, M. H. & De Wolff, M. S. (1997) In search of the absent father—meta-analyses of infant–father attachment: A rejoinder to our discussants. *Child Development*, 68(4), 604–609.

theory and methods.<sup>206</sup> Originally these were the methods and theory associated with Ainsworth; subsequently this was a consensus associated with Main, albeit on the basis of problems in reception as noted in Chapter 1. Some, such as Belsky, expressed dismay at what they saw as the ‘Minnesota mafia’ or ‘attachment mafia’, bent on defending this consensus (Chapter 3). For his part, Van IJzendoorn was appalled by the censure of Lamb and Thompson for raising what he saw as legitimate methodological criticisms. However, he wholeheartedly appreciated the consensus regarding measures and theory, which contributed to greater homogeneity in study design than was usual in developmental science, supporting comparison and the development of cumulative knowledge.

As a case in point: attachment research had failed to come to consensus in methodology for doll play representational measures, with a dozen different approaches seeing use.<sup>207</sup> With such heterogeneity, doll play studies were, for Van IJzendoorn, not well suited to generating cumulative knowledge. A fundamental strength of attachment research was the consensus in use of measures such as the Strange Situation and Adult Attachment Interview. Attachment researchers began to term the ‘gold standard’ attachment measures in the early 1990s.<sup>208</sup> This was a metaphor Van IJzendoorn appreciated,<sup>209</sup> and was also widely used by other researchers. Though, in truth, it is a bizarre metaphor: the gold standard had been accepted as disastrous and abandoned in fiscal policy across the world by the early 1970s. It left economies with too little flexibility to respond to domestic or international changes.<sup>210</sup> This would have been well known to attachment researchers in the early 1990s. So, for the term ‘gold standard’ to be used as a term of praise by Van IJzendoorn and other attachment researchers seems to reflect the priority given to methodological stability even despite potential costs. The possibility of aggregating research through meta-analysis represented one potential justification for this priority in a field that Van IJzendoorn considered to be plagued by too many too small studies which were forced to deliver unique and ‘groundbreaking’ measures or discoveries.

Yet despite strengths stemming from consensus around theory and method, attachment research was especially vulnerable to false positive and negative findings and ensuing fruitless debates. A major contributor was the small samples generally used—as well as perhaps the preference, following Ainsworth, for treating data as categories rather than dimensions. The potential dangers of over-dependence of research in the context of discovery were only more pressing as the rate of scientific output in developmental science generally, and attachment research in particular, was rapidly expanding through the 1980s and 1990s.

<sup>206</sup> The role of the Minnesota group in anchoring consensus in attachment research is described in Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 4. See also Spies, R. & Duschinsky, R. (2021) Inheriting Mary Ainsworth and the strange situation: Questions of legacy, authority, and methodology for contemporary developmental attachment researchers. *Sage Open*, 11(3), 21582440211047577.

<sup>207</sup> For a review, see Woolgar, M. (1999) Projective doll play methodologies for preschool children. *Child Psychology and Psychiatry Review*, 4(3), 126–134.

<sup>208</sup> Reflecting an oral culture of use of the metaphor, its first mentions in print are references by doctoral students to a community of researchers referring to the Strange Situation and AAI as the gold standard measures, for example Michels, S. E. (1992) Maternal contributions to child competence in securely attached infants during the second year. Unpublished doctoral dissertation, University of Virginia; Dedrick, C. F. (1993) Socioemotional development of very high-risk preterm infants in the second year of life. Unpublished doctoral dissertation, University of Michigan.

<sup>209</sup> Van Rosmalen, L., Van IJzendoorn, M., & Bakermans-Kranenburg, M. J. (2014) ABC + D of attachment theory: The strange situation procedure as the gold standard of attachment assessment. In P. Holmes & S. Farnfield (eds), *The Routledge Handbook of Attachment: Theory* (pp. 11–30). London: Routledge.

<sup>210</sup> Bayoumi, T., Eichengreen, B., & Taylor, M. P. (eds) (1996) *Modern Perspectives on the Gold Standard*. Cambridge: Cambridge University Press; Eichengreen, B. J. & Flandreau, M. (eds) (1997) *The Gold Standard in Theory and History* (Vol. 2). London: Routledge.

Accumulating false findings would, over time, be harmful, potentially fatal, for attachment research. This accumulation could easily misdirect research efforts, leaving inquiry off-base and spinning wildly, or contribute to catastrophic reputational threat. For Van IJzendoorn, research needs a diet of dependable truths or there will be consequences for the health of a domain of knowledge. Research in the context of discovery only delivers some of what science needs: in itself it offers very poor nutrition.<sup>211</sup>

Where most attachment researchers, besides Lamb and Thompson, saw a field of inquiry that was healthy and growing, Van IJzendoorn saw impending disaster for the study of attachment. In childhood, Van IJzendoorn had been responsible for operating the massive combine-harvester, alone, to support his family's economic survival. Two decades later, Van IJzendoorn undertook meta-analysis after meta-analysis, working at a frantic pace, reaping, threshing, gathering, and winnowing the findings of empirical studies to support the generation of dependable knowledge about attachment.

There is a kind of archival impulse to meta-analysis. A wish, with similarities to historical research, to specify, include, and appreciate what the past can offer the present and the future. This wish may have an emancipatory dimension, seeking to give attention to aspects of the past that might otherwise be censored or devalued. Van IJzendoorn has been assiduous in seeking to ensure that null findings were included in meta-analyses, even when this went against what researchers wanted to hear. Furthermore, he wanted unpublished undergraduate, masters, and doctoral dissertations to be valued and given due weight, despite their lower status. Among their functions, 'meta-analyses save the investments of blood, sweat and tears of disappointed PhD students from oblivion.'<sup>212</sup> Against the uncounted, quantification is a kind of registering and rendering.

Meta-analysis quantifies the combined effect size of the included studies, known as the central tendency. It can identify fallow areas, where more work is needed.<sup>213</sup> It can also identify axes of variability within the included studies and consider this variability in terms of study characteristics as moderators.<sup>214</sup> As such, samples can be divided by their characteristics. This made possible the discovery by the Leiden group that parenting interventions are more effective for maltreating families than for non-maltreating families,<sup>215</sup> precisely contrary to the expectation of other researchers such as Sroufe and Egeland.<sup>216</sup> Or to take

<sup>211</sup> For an elaboration of this argument in the case of the Dynamic-Maturational Model of attachment, see Van IJzendoorn, M. H., Bakermans, J. J. W., Steele, M., & Granqvist, P. (2018) Diagnostic use of Crittenden's attachment measures in family court is not beyond a reasonable doubt. *Infant Mental Health Journal*, 39(6), 642–646. Crittenden and Spieker replied that research in the context of discovery is sufficiently dependable knowledge for what practitioners need. Crittenden, P. M. & Spieker, S. J. (2018) DMM vs. ABC+ D Assessments of attachment in child protection and treatment: Reply to Van IJzendoorn, Bakermans, Steele, & Granqvist, *Infant Mental Health Journal*, 39, 647–651.

<sup>212</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 44.

<sup>213</sup> A good example would be the discovery that the prevalence of neglect was always reported in epidemiological studies in combination with reports of the prevalence of child sexual abuse, child physical abuse, and/or child emotional abuse. So, the prevalence of child neglect was unknown. Stoltenborgh, M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2013) The neglect of child neglect: A meta-analytic review of the prevalence of neglect. *Social Psychiatry and Psychiatric Epidemiology*, 48(3), 345–355.

<sup>214</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Alink, L. R. A. (2011) Meta-analysis in developmental science. In B. Laursen, T. D. Little, & N. A. Card (eds), *Handbook of Developmental Research Methods* (pp. 667–686). New York: Guilford.

<sup>215</sup> Euser, S., Alink, L. R., Stoltenborgh, M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) A gloomy picture: A meta-analysis of randomized controlled trials reveals disappointing effectiveness of programs aiming at preventing child maltreatment. *BMC Public Health*, 15, 1–14.

<sup>216</sup> For example, Egeland, B., Weinfield, N., Bosquet, M., & Cheng, V. (2000) Remembering, repeating, and working through: Lessons from attachment-based interventions. In J. Osofsky (ed.), *WHIMH Handbook of Infant Mental Health*, Vol. 4, (pp. 35–89). New York: Wiley.

another example, in their 2004 meta-analysis of attachment in neurodiverse samples, Rutgers, Bakermans-Kranenburg, and IJzendoorn found that associations between autism and insecurity in fact stemmed from a third factor: the association between autism and intellectual disability. Autism in itself was not associated with insecurity, contrary to much of the common wisdom of the day.<sup>217</sup>

Meta-analysis can also examine the effect of features of study design. For instance, De Wolff and Van IJzendoorn found that the association between observed caregiver sensitivity and the Strange Situation declined the longer apart the time between the assessments, and was stronger in middle-class samples ( $r = 0.27$ ) than in samples facing adversity ( $r = 0.15$ ).<sup>218</sup> This led De Wolff and Van IJzendoorn to the conclusion that the controversial claims by Lamb, Thompson, and colleagues had ultimately been right: sensitivity may be an important condition of attachment security primarily when it remains stable across time, which may occur primarily in a stable social context.<sup>219</sup>

An analogy for Van IJzendoorn's image of meta-analytic research may be drawn with the proposals of the experimental theatre director and playwright Richard Maxwell. Maxwell urged that actors should repeat and repeat their performance in practice. Every repetition will always be new in a sense. There will always be variations. This may include time, place, audience, who else is on stage. These variations will clarify both the primary thrust of the performance and the factors that shape how and when it will work: 'once the action and lines become engrained, you can devote more energy to the unforeseen events happening in the exterior world.'<sup>220</sup> Similarly, for Van IJzendoorn meta-analysis does not simply give confidence regarding effect estimation. What is exciting and creative, what is dramatic, is that this confidence then permits attention to the factors that shape how and when an effect is identified.

For Van IJzendoorn, meta-analysis is, in fact, a tool for discovery. This is its 'more important function' compared to 'providing an overall combined effect size':<sup>221</sup> 'meta-analysis

<sup>217</sup> Rutgers, A. H., Bakermans-Kranenburg, M. J., IJzendoorn, M. H., & Berckelaer-Onnes, I. A. (2004) Autism and attachment: A meta-analytic review. *Journal of Child Psychology and Psychiatry*, 45(6), 1123–1134.

<sup>218</sup> De Wolff, M. S. & Van IJzendoorn, M. H. (1997) Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591. Though time between assessments and sample sociodemographic status were confounded, noted by Atkinson, L., Niccols, A., Paglia, A., Coolbear, J., H. Parker, K. C., Poulton, L., ... & Sitarenios, G. (2000) A meta-analysis of time between maternal sensitivity and attachment assessments: Implications for internal working models in infancy/toddlerhood. *Journal of Social and Personal Relationships*, 17(6), 791–810. It should also be acknowledged that the comparison of middle-class and samples facing adversity depends on the assumption that the standard deviation of caregiver sensitivity is the same across the samples—otherwise the reported  $r$  is not comparable.

<sup>219</sup> De Wolff, M. S. & Van IJzendoorn, M. H. (1997) Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591, p. 586. De Wolff and Van IJzendoorn recruit Sroufe's 1988 reply to Belsky as support for this claim. Sroufe, L. A. (1988) A developmental perspective on day care. *Early Childhood Research Quarterly*, 3(3), 283–291. As we saw in Chapter 4, Sroufe argued that any early negative effects of daycare would not be enduring for children with sensitive caregivers. However, this seems a distinct claim: that later sensitive care could be reparative for children's expectations of secure base and safe haven availability does not imply that sensitivity would influence these expectations only when it remains stable. The citation of Sroufe's 1988 paper is incisive in that it identifies a moment in Sroufe's writings furthest towards a process-oriented pole, where there could be common ground with Lamb, Thompson, and colleagues. Nonetheless, it neglects other statements by Sroufe that insist on the centrality and long-term implications of early experiences of care, which may be attenuated, but not eradicated, by later experiences, remaining as a latent vulnerability factor. For discussion of these two poles in Sroufe's work, see Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press.

<sup>220</sup> Maxwell, R. (2013) *Theatre for Beginners*. New York: Theatre Communications Group, p. 40.

<sup>221</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Alink, L. R. A. (2011) Meta-analysis in developmental science. In B. Laursen, T. D. Little, & N. A. Card, *Handbook of Developmental Research Methods* (pp. 667–686). New York: Guilford, p. 678.

provides not only a summary of research, it also produces new insights and facts.<sup>222</sup> In fact, almost all of Van IJzendoorn's elaboration of new theory has been on the basis of findings from meta-analysis, which appear to offer him greater security, and greater boldness, than the findings from single empirical studies.

The accumulation of meta-analytic results qualifying or adjusting assumptions within attachment provided a basis for international collaborations<sup>223</sup> and contributed to the international standing of the Leiden group. This accumulation of standing was successful even against countervailing forces such as a lack of genealogical link from the Dutch researchers to Ainsworth. It permitted Van IJzendoorn, Bakermans-Kranenburg, and colleagues to make credible, critical comments even about Ainsworth's own work.

Ainsworth's students and allies were not always happy with the results of the Leiden meta-analyses, which they felt underestimated true effects by giving equal weight to studies with weak designs. In particular, Ainsworth's students and allies pointed out that De Wolff and Van IJzendoorn's meta-analysis of the association between caregiver sensitivity and the Strange Situation treated as equivalent studies with long periods of detailed home observation and studies with brief periods of observation in the laboratory.<sup>224</sup> Nonetheless, despite these reservations, Ainsworth's students and allies cited this and other Leiden meta-analyses warmly, as offering the highest bar of evidence in support of the relationships Ainsworth had discovered and the validity of her measures.<sup>225</sup> In Weber's terms, meta-analysis provided a source of rational authority within the attachment research community, able to compete with the traditional and charismatic authority of Bowlby and Ainsworth, and with greater authority to the wider scientific community.<sup>226</sup>

As a case in point: on one level, Sroufe expressed frustration with Van IJzendoorn, Bakermans-Kranenburg, and colleagues' meta-analytic research on attachment and caregiving, which aggregated findings from studies of widely varying quality: 'Ainsworth viewed each case 72 hours. To really assess sensitivity one needs to see the pair several times in multiple situations (feeding, bathing, dressing, routine interactions). We felt that at the least we needed 3 home visits, each two hours. Most of the studies in the meta-analysis were less than one hour, many lasting just a few minutes, and mostly in one situation.'<sup>227</sup> Yet he was clearly delighted by the credibility the work by the Leiden group provided to attachment research, both through meta-analyses and high-quality longitudinal research. They have 'developed a superb international reputation. Everyone in the field of developmental psychology throughout the world knows the work of this Leiden group.' Among their contributions has been 'most notably bringing attention to the power of meta-analysis.'<sup>228</sup>

Beyond Ainsworth's circle, other developmental scientists entering attachment research were appreciative of the confirmation and qualification offered by the Leiden meta-analyses to the propositions of attachment theory. For Belsky the entry of meta-analysis

<sup>222</sup> Van IJzendoorn, M. H. (1998) Meta-analysis in early childhood education: Progress and problems. In B. Spodek, A. D. Pellegrini, & O. N. Saracho (eds), *Issues in Early Childhood Education, Yearbook in Early Childhood Education* (pp. 156–176). New York: Teachers College Press.

<sup>223</sup> For example Sagi, A., Van IJzendoorn, M. H., & Koren-Karie, N. (1991) Primary appraisal of the Strange Situation: A cross-cultural analysis of pre-separation episodes. *Developmental Psychology*, 27(4), 587–596.

<sup>224</sup> For a review of discussions of this point see Posada, G., & Kaloustian, G. (2010) Attachment in infancy. In J. G. Bremner & T. D. Wachs (eds) *The Wiley-Blackwell Handbook of Infant Development* (483–509), Volume 1. New York: Wiley.

<sup>225</sup> For example Waters, E., Hamilton, C. E., & Weinfield, N. S. (2000) The stability of attachment security from infancy to adolescence and early adulthood: General introduction. *Child Development*, 71(3), 678–683.

<sup>226</sup> Weber, M. ([1922] 1978) *Economy and Society*, ed. Guenther Roth and Claus Wittich. Berkeley: University of California Press.

<sup>227</sup> Alan Sroufe, cited in Karen, R. (2024) *Becoming Attached*, 2nd ed. Oxford: Oxford University Press, p. 363.

<sup>228</sup> Sroufe, L. A. (2016) Midterm Evaluation: Institute of Education and Child Studies. Unpublished document. Marinus Van IJzendoorn personal archive.

into attachment research represented a new era, in which discussions could hopefully be dominated by empirically-grounded consensus rather than discipleship, community norms, and citations of Ainsworth and Bowlby.<sup>229</sup> A bibliometric study by Kroonenberg and Stoltenborgh documented rapidly increasing citation of Van IJzendoorn and Bakermans-Kranenburg over time by chapter authors in the authoritative *Handbook of Attachment* (e.g., 24 citations in 1999; 87 citations in 2008), and much of this citation was of their meta-analytic work.<sup>230</sup> Even if meta-analytic research by Van IJzendoorn and Bakermans-Kranenburg addressed specific topics, consideration of citations of their work in the 2008 and 2016 editions of the *Handbook* indicate that it actually affected the whole electrical grid: the existence of this programme of meta-analytic work shaped how developmental scientific research on attachment conceived of the dependability of its knowledge and methods.

For clinically facing attachment researchers, such as Lyons-Ruth and Fonagy, the De Wolff and Van IJzendoorn meta-analysis was of foundational importance in confirming the centrality of caregiving for children's socioemotional development, highlighting the value of parenting as a site for intervention. Additionally, these researchers observed that the moderate effect size of the association between sensitivity and attachment security signalled the need to differentiate forms of insensitivity, rather than assuming that Ainsworth's sensitivity scale would be sufficient for assessing dyads with clinical needs.<sup>231</sup> De Wolff and Van IJzendoorn documented that caregiver synchrony and reciprocity had associations with attachment security of roughly equivalent size to sensitivity. This suggested that other aspects of caregiver behaviour may be important for the development of a secure infant-caregiver relationship, supporting further exploratory research.<sup>232</sup>

The sociologist of science, Bruno Latour, has offered the concept of 'centres of calculation' to refer to locations within the scientific community where materials are continually drawn in and metabolized into credible claims about the truth.<sup>233</sup> In these terms, Van IJzendoorn's early and passionate commitment to meta-analysis as a method, to the point of a symbolic ownership of the approach within attachment research, established the Leiden group as a centre of calculation for international attachment research.

In introducing the concept of 'centres of calculation', Latour was critical of such centres as generally controlling and oppressive. He implied that centres of calculation often assert their superiority over the contexts where their materials come from. Latour's account suggests an image of centres of calculation as beasts with jaws wide, ingesting data like

<sup>229</sup> Belsky, J. (1997) Theory testing, effect-size evaluation, and differential susceptibility to rearing influence: The case of mothering and attachment. *Child Development*, 68(4), 598–600.

<sup>230</sup> Kroonenberg, P. M. & Stoltenborgh, M. (2023) Handbooks as a means of mapping a discipline: An exploration of the world of attachment. In A. Okada, K. Shigemasu, R. Yoshino, & S. Yokoyama (eds), *Facets of Behaviormetrics: The 50th Anniversary of the Behaviormetric Society* (pp. 123–143). New York: Springer, Figure 4.

<sup>231</sup> Even decades later, this use of the 1997 De Wolff and Van IJzendoorn meta-analysis can still be seen for example Lyons-Ruth, K., Ahtam, B., Li, F. H., Dickerman, S., Khoury, J. E., Sisitsky, M., ... & Grant, P. E. (2023) Negative versus withdrawn maternal behavior: Differential associations with infant gray and white matter during the first 2 years of life. *Human Brain Mapping*, 44(12), 4572–4589.

<sup>232</sup> See for example Huth-Bocks, A. C., Levendosky, A. A., Bogat, G. A., & von Eye, A. (2004) The impact of maternal characteristics and contextual variables on infant–mother attachment. *Child Development*, 75, 480–496; Nievar, M. A. & Becker, B. J. (2008) Sensitivity as a privileged predictor of attachment: A second perspective on De Wolff and Van IJzendoorn's meta-analysis. *Social Development*, 17(1), 102–114; Whipple, N., Bernier, A., & Mageau, G. A. (2011) Broadening the study of infant security of attachment: Maternal autonomy-support in the context of infant exploration. *Social Development*, 20(1), 17–32; Morelli, G. A. & P. Henry (2013) Afterwards: Cross-cultural challenges to attachment theory. In N. Quinn & J. M. Mageo (eds), *Attachment Reconsidered: Cultural Perspectives on a Western Theory* (pp. 241–150). New York: Palgrave.

<sup>233</sup> For example, Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.



krill, metabolizing this into authority; Latour's underpinning model is capitalist extraction in which value is created through dispossession. Subsequent historians of science have contested such a characterization, arguing that centres of calculation may or may not be exploitative.<sup>234</sup> This relates to a broader debate in critical sociology about the meaning of exploitation. From this debate, perhaps the key dimension is whether the drawing in, commensuration, and synthesizing process of meta-analysis nourishes or depletes the environments on which it draws.<sup>235</sup> Other relevant dimensions are whether the process nourishes or depletes solidarity between people, and whether it nourishes or depletes their understanding of what they are doing.

Van IJzendoorn's position has been that meta-analysis affirms and, in turn, nourishes forms of research with convergent methods in identifying dependable associations, and when they might be expected to occur. It values and affirms the work of all researchers reporting relevant effect sizes, whether a professor or an undergraduate student, and whether findings appear exciting or disappointing. Meta-analysis of attachment research brings dependable truths back into a research ecosystem otherwise overdependent on, and at risk of harm from, still-feral, undependable research occurring in the context of discovery. Meta-analysis offers a centripetal force, one that can help hold attachment together as a science.

Van IJzendoorn has acknowledged the potential for depletion. Since it depends on the subset of measures reported repeatedly by quantitative studies, and their commensurability, meta-analysis does often offer limited attention to important aspects of context, culture and contingency, potentially reifying claims.<sup>236</sup> This in turn may contribute to reduced understanding by researchers of what they are actually researching, and audiences of what they are reading, especially with already complicated constructs such as disorganized attachment or the Adult Attachment Interview. However, from Van IJzendoorn's perspective, the most important aspect of meta-analysis is, in fact, the ability to examine aspects of context as moderators or mediators of a central tendency once sufficient data is available. This granularity is often increased by meta-analysis using pooled raw data, but the principle applies also to meta-analysis of published findings.

Where aspects of context, culture, and contingency cannot be reliably coded or reported quantitatively, Van IJzendoorn regards them as outside what scientists can make dependable truth-claims about. If there is a price to this depletion, Van IJzendoorn has situated this as a necessary and pragmatic one: these dependable truths are essential as the secure base and safe haven for the process of scientific exploration and consolidation, for movement away from and back towards consensus.

### The Transmission Gap

As we saw in [Chapter 1](#), attachment theory and research in the 1980s constituted a body of knowledge organized to a considerable extent by implicit knowledge and oral culture. In turn, the research community was structured to a large extent by personal networks and

<sup>234</sup> For example, Kaiser, D. (2005) *Drawing Theories Apart: The Dispersion of Feynman Diagrams in Postwar Physics*. Chicago: University of Chicago Press.

<sup>235</sup> Postone, M. (1996) *Time, Labor, and Social Domination: A Reinterpretation of Marx's Critical Theory*. Cambridge: Cambridge University Press; Nail, T. (2020) *Marx in Motion: A New Materialist Marxism*. Oxford: Oxford University Press.

<sup>236</sup> On the implications of this cutting away process, conceptualized as deterritorializing smoothing, see Guattari, F. ([1992] 1995) *Chaosmosis: An Ethico-aesthetic Paradigm*. Trans. P. Bains & J. Pefanis. Indianapolis: Indiana University Press.

lines of filiation, based around laboratories led by Ainsworth's students and allies. Developmental psychologists without a direct link to Ainsworth could enter into the attachment research community through use of the Strange Situation. Nonetheless, it was difficult for them to establish authority. For instance, Lyons-Ruth's lack of filiation from Ainsworth and her criticisms of Main have hindered engagement with her work, especially in the United States (Chapter 2).

In his youth, Van IJzendoorn had escaped from his family's history of rural poverty through academic success. Additionally, in empirical studies and, especially, through meta-analytic research, Van IJzendoorn and Leiden colleagues were disturbing the established hierarchy of filiation, establishing a source of authority within the international attachment research community. Personally and professionally, Van IJzendoorn knew the power of what gets handed down. However, he knew inheritance could be interrupted. A speculation may be offered about some of the high personal stakes here: around 1989/1990, Van IJzendoorn became preoccupied with the question of continuity or discontinuity in harsh parenting behaviour across generations. His son, David, was born in 1990. Perhaps he took reassurance from research, including results from Minnesota, showing that over two-thirds of caregivers who recalled maltreatment in their own childhood did not go on to abuse their own children.<sup>237</sup>

Beyond a possible personal stake for Van IJzendoorn, this question of the 'transmission' of parental behaviour had been gaining prominence in attachment theory in the late 1980s. This drew on a heritage from Darwin, who had written extensively about the concept. Darwin theorized that 'transmission and development are distinct powers. Occasionally these two powers seem to be antagonistic, or incapable of combination in the same individual; for several cases have been recorded in which the son has not directly inherited a character from his father.'<sup>238</sup> Darwin's reflections would be picked up by Bowlby, via the work of Robert Hinde. Bowlby and Hinde were interested in motivations and behaviours, especially care-seeking and caregiving. Both seemed to draw from both transmission and development.

Bowlby and Hinde's discussions led them to conclude that the groundplan for care-seeking and caregiving desires and behavioural repertoires are pre-primed by evolution. Within this groundplan: how, what, and when we feel and act will depend on experience. Bowlby wrote that 'the form they take in an adult turns in some degree on the kind of environment in which that adult is reared. The advantage of this is that the form ultimately to be taken by the system is in some degree left open so that it can, during development, become adapted to the particular environment in which the individual finds himself.'<sup>239</sup> Even for behaviours that are primed by human evolution, 'observational learning provides a powerful means for the cultural transmission.'<sup>240</sup>

Bowlby's ideas about transmission received renewed attention following three developments. A first was work in the early 1980s by Cicchetti and colleagues reflecting on the

<sup>237</sup> A first presentation on the topic would be given in late 1989: Van IJzendoorn, M. H. (November, 1989) Inter-generational transmission of parenting. Invited contribution to the Seminar on Psychopedagogical Problems of Infancy, University of Pavia, Pavia (Italy). See also Lambermon, M. W. E. & Van IJzendoorn, M. H. (1990) Over de appel en de boom; intergenerationele overdracht bij verwaarlozing en mishandeling in gehechtheidstheoretisch perspectief. *Nederlands Tijdschrift voor Opvoeding, Vorming en Onderwijs*, 7, 66–82.

<sup>238</sup> Darwin, C. ([1868] 1988) *The Variation of Animals and Plants under Domestication, The Works of Charles Darwin*, Vol. 20. Cambridge: Cambridge University Press, p. 52. See also Darwin, C. ([1871] *The Descent of Man*, chapter 18.

<sup>239</sup> Bowlby, J. (1969/1982) *Attachment*. London: Penguin, p. 129.

<sup>240</sup> Bowlby, J. (1973) *Separation*. London: Penguin, p. 158.

‘intergenerational transmission of child maltreatment’.<sup>241</sup> The metaphor of transmission was used to consider factors that might contribute to or protect against abused children in turn becoming abusive parents.

A second development was a 1984 paper by Egeland and Minnesota colleagues, which reported that about a third of caregivers who reported that they had been abused went on to abuse their own child: a much higher proportion than matched controls but overall a minority of cases.<sup>242</sup> The abused mothers in the sample who did not go on to abuse their child were distinguished by three kinds of experience: some had emotional support from a non-abusive adult during their childhood; some had participated in therapy; some had a stable and emotionally supportive relationship with their adult partner. Egeland and colleagues observed that what these three experiences have in common is that they are experiences in which a secure base and safe haven has been provided, a ‘basis for developing alternative or transformed models of relationship’.<sup>243</sup> Such findings suggested an important role for adults’ processing of attachment-relevant information for continuities or discontinuities in the intergenerational transmission of parenting behaviour, a conclusion supported by later meta-analytic evidence.<sup>244</sup>

A third, and perhaps the most direct, development contributing to interest in attachment and transmission was the publication of Main, Kaplan, and Cassidy’s 1985 paper introducing the Adult Attachment Interview. This paper described *both* the Adult Attachment Interview and the Strange Situation as assessing ‘internal working models of attachment’. Main and colleagues also reported continuity between the two measures, downplaying that this result was achieved semi-inductively. This was later reinforced by Ainsworth and Eichberg’s paper reporting a near-perfect association between mothers’ AAI and mother–infant attachment classifications in the Strange Situation, with readers failing to notice that the authors were explicit that the coding system had been adapted to fit the sample (Chapter 1). These publications gave readers the impression that the Adult Attachment Interview and the Strange Situation were both measures of a single property ‘attachment’, or internal working models of attachment, with individual differences transmitted like a stable property from parent to child.

At the meeting of the Society for Research in Child Development in Baltimore in June 1987, Mary Main spent time with Robert Hinde, who chided her for the misleading impression given by her 1985 paper. Hinde acknowledged that the Adult Attachment Interview and Strange Situation might have intriguing parallels. A dismissing speaker seemed to be turning attention away from memories relevant to attachment-related needs; a child in an avoidant attachment relationship seemed to be turning attention away from a caregiver not expected to respond to direct care-seeking behaviour. Yet Hinde encouraged Main to recognize that this by no means implied that the two measures were assessing the same thing. Main wrote to Bowlby to report that she took Hinde’s point.<sup>245</sup> From 1987 onwards, she would cease equating states of mind regarding attachment and internal working models.

<sup>241</sup> Cicchetti, D. & Rizley, R. (1981) Developmental perspectives on the etiology, intergenerational transmission, and sequelae of child maltreatment. *New Directions for Child and Adolescent Development*, 1981(11), 31–55.

<sup>242</sup> Egeland, B., Jacobvitz, D., & Sroufe, L. A. (1988) Breaking the cycle of abuse. *Child development*, 59(4), 1080–1088.

<sup>243</sup> *Ibid.*, 1082.

<sup>244</sup> Schofield, T. J., Lee, R. D., & Merrick, M. T. (2013) Safe, stable, nurturing relationships as a moderator of intergenerational continuity of child maltreatment: A meta-analysis. *Journal of Adolescent Health*, 53(4), 32–38.

<sup>245</sup> Main, M. (1987) Letter to John Bowlby, 3 June 1987, PP/Bow/B.3/36/1.

And in the late 1990s Main acknowledged in print Hinde's concern that the characterization the AAI and Strange Situation as assessment of internal working models of attachment was, ultimately, 'misleading and unwarranted'.<sup>246</sup>

Meanwhile, the discovery of an association between the AAI and Strange Situation had come to be understood by the attachment research community and practitioner audiences as a 'transmission' of internal working model or individual differences in a substance called 'attachment' from parent to child. This narrative of a property of a parent passed on to become the exact same property in the child was supported by analogy with the work by Cicchetti and colleagues on the transmission of maltreating behaviour, and possibly also by the broader scientific metaphor since Darwin of transmission as hereditary inheritance.<sup>247</sup> An ethnographic study of a mother-baby unit by Masciantonio found that practitioners held the intergeneration of attachment patterns to be an essential premise of attachment theory. They believed that 'in accordance with principles of Attachment Theory, the transmission of attachment patterns was transgenerational; it was reasoned that attachment templates were transmitted from one generation to the next in a process likened to genetic transmission implicating biological processes'.<sup>248</sup>

The metaphor of transmission helped train attention on factors that might contribute or hinder associations between the characteristics of a parent and the characteristics of their child. For example, Bus and Van IJzendoorn worked together on a meta-analysis of the intergenerational transmission of literacy, documenting the critical importance of book reading.<sup>249</sup> A disadvantage of the metaphor of transmission as used in attachment research was that it implied that, like literacy in a parent and child, the AAI and Strange Situation were measuring the same thing.

In 1989, Van IJzendoorn had a sabbatical as Fulbright Fellow at the University of California, Berkeley, spending time with Main. He heard from her about her attentional model of the AAI and Strange Situation and received a copy of an important manuscript about what the AAI measures, which was accepted by the journal *Developmental Psychology*, but which Main abandoned before publication. As mentioned in [Chapter 1](#), in a 1992 paper, Van IJzendoorn cited this unpublished manuscript from Main to advocate that what the AAI and Strange Situation have in common is that they assess 'the direction and organization of attention and memory' relating to attachment-relevant information, as well as related affective and behavioural aspects.<sup>250</sup> Van IJzendoorn did not perceive the AAI and Strange Situation as measuring the same quality, or that this quality was being passed on from parent to child. He knew from Main that the Adult Attachment Interview was so-called

<sup>246</sup> Main, M. (1999) Epilogue. Attachment theory: Eighteen points with suggestions for future studies. In J. Cassidy & P. Shaver, *Handbook of Attachment*, (pp. 845–887) New York: Guilford, p. 877.

<sup>247</sup> Ricks, M. H. (1985) The social transmission of parental behavior: Attachment across generations. *Mono-graphs of the Society for Research in Child Development*, 50(1/2), 211–227; Bretherton, I. (1990) Communication patterns, internal working models, and the intergenerational transmission of attachment relationships. *Infant Mental Health Journal*, 11(3), 237–252.

<sup>248</sup> Masciantonio, S. C. (2015) Mothering and mental illness: An ethnography of attachment in an institutional context. Unpublished doctoral dissertation, University of Adelaide, p. 186.

<sup>249</sup> Bus, A. G., Van IJzendoorn, M. H., & Pellegrini, A. D. (1995) Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research*, 65(1), 1–21.

<sup>250</sup> Van IJzendoorn, M. H. (1992) Intergenerational transmission of parenting: A review of studies in nonclinical populations. *Developmental Review*, 12(1), 76–99, p. 80. Other researchers close to Main and with access to her unpublished works have described 'state of mind' as referring to 'the way adults process attachment-related thoughts, memories and feelings'. Again, the difference from the ready connotations of the term 'attachment representations' is striking. Dozier, M. & Bates, B. C. (2004) Attachment state of mind and the treatment relationship. In L. Atkinson & S. Goldberg (eds), *Attachment Issues in Psychopathology and Intervention* (pp. 167–180), London: Erlbaum, p. 167.

because it was an interview about a speaker's experiences of attachment relationships, not because it necessarily measured a construct called 'attachment' in adulthood.

Examination of the citation history of his papers suggests that readers, including Van IJzendoorn's critics, did not pick up on any of these points.<sup>251</sup> They ran contrary to Van IJzendoorn's use of the metaphor of transmission and his shorthand references to the AAI as measuring 'parental attachment' or 'adult attachment'. Van IJzendoorn appears to have assumed that since Main's ideas and measures were being used by researchers, there was adequate understanding of their meaning to facilitate comprehension of his own claims. This may have reflected something of a blindspot in his Popperian epistemology, which brackets and ignores the possibility of falsifiable but easily misinterpretable claims.<sup>252</sup> Popper failed to understand criticism of him, for instance by Wittgenstein, on this issue.<sup>253</sup> Habermas likewise has had the same limitation in his work.<sup>254</sup> Popper, Habermas, and here Van IJzendoorn, generally assumed that scientists are able to discern the meaning of scientific terms, and distinguish them from other potential uses of these terms.

In fact, there were serious problems in the dissemination and reception of Main's ideas, including regarding what the AAI measures (Chapter 1). Main's written style also gave the impression of transparency, but in fact considerable effort was required of readers to understand her exact argument.<sup>255</sup> For example, Main tended to assume readers' familiarity with her previous work in her writings, leaving holes in the comprehension of those without this background. Or again, whereas Popper assumed that scientists would define their terms so that they could be understood,<sup>256</sup> Main used terms impressionistically and almost never offered a definition. In reading about the 'intergenerational transmission of attachment' in the work of Van IJzendoorn, researchers in developmental science and their audiences understandably followed cues interpretable as congruent with prevailing misunderstandings of Main's work.<sup>257</sup> It was assumed that a thing called 'attachment', operating like a substance, was being transmitted from parent to child. This was likewise the assumption picked up by the social psychological tradition of attachment research,<sup>258</sup>

<sup>251</sup> For example, Putallaz, M., Costanzo, P. R., Grimes, C. L., & Sherman, D. M. (1998) Intergenerational continuities and their influences on children's social development. *Social Development*, 7(3), 389–427; Lubiewska, K. (2013) Intergenerational congruence of attachment: Limitations of findings. In I. Albert, D. Ferring, & T. Michels (eds), *Intergenerational Relations: European Perspectives in Family and Society* (pp. 85–100). Bristol: Policy Press.

<sup>252</sup> See the issue nearly raised but ultimately elided in Popper, K. R. (1946) Logic without assumptions. *Proceedings of the Aristotelian Society*, 47, 251–292; Popper, K. R. ([1965] 1994) The myth of the framework. In *The Myth of the Framework* (pp. 33–64). London: Routledge.

<sup>253</sup> Klagge, J. C. & Nordmann, A. (eds) (2004) *Ludwig Wittgenstein: Public and Private Occasions*, London: Rowman & Littlefield. For Popper's dismissive account of his debate with Wittgenstein (the infamous 'poker' incident), see Popper, K. (1973) *Unended Quest*. London: Routledge, chapter 26. See also Philipse, H. (2006) The nature of philosophical problems: Popper versus Wittgenstein. In I. Jarvie, K. Milford, & D. Miller (eds), *Metaphysics and Epistemology* (pp. 73–85). London: Routledge.

<sup>254</sup> Taylor, C. (1989) *Sources of the Self: The Making of the Modern Identity*. Cambridge, MA: Harvard University Press. 'The fact that the self is constituted through exchange in language ... doesn't in any way guarantee us against loss of meaning, fragmentation, the loss of substance in our human environment and our affiliations. Habermas ... elides the experiential problem under the public, as though the two could be solved for the price of one' (509–510).

<sup>255</sup> Duschinsky, R. & Solomon, J. (2017) Infant disorganized attachment: Clarifying levels of analysis. *Clinical Child Psychology and Psychiatry*, 22(4), 524–538.

<sup>256</sup> Popper, K. (1959) *The Logic of Scientific Discovery*. London: Routledge, chapter 5.

<sup>257</sup> Wilson, D. & Sperber, D. (2012) *Meaning and Relevance*. Cambridge: Cambridge University Press; Sperber, D. & Wilson, D. (2015) Beyond speaker's meaning. *Croatian Journal of Philosophy*, 15(44), 117–149.

<sup>258</sup> For example, Besser, A. & Priel, B. (2005) The apple does not fall far from the tree: Attachment styles and personality vulnerabilities to depression in three generations of women. *Personality and Social Psychology Bulletin*, 31(8), 1052–1073.

and by practitioner audiences.<sup>259</sup> From the 1990s onwards, it would be widely held that ‘intergenerational transmission of attachment is one of the core premises of attachment theory’.<sup>260</sup>

In 1992, Van IJzendoorn organized and chaired an invited symposium on the ‘intergenerational transmission of attachment’ at the International Congress of Psychology, Brussels, in July 1992, where several international groups presented findings on correspondence between the Adult Attachment Interview and the Strange Situation. In 1995 he published a meta-analysis drawing on data from 18 samples, comprising 854 parent–child dyads. Influenced by the presentation in Main and colleagues’ 1985 paper and prevailing discourses of ‘attachment transmission’, the international community of attachment researchers were expecting a very strong association between the AAI and Strange Situation categories. Van IJzendoorn’s 1995 meta-analysis offered clear support for an association between the two measures, a dramatic confirmation given the considerable differences between them. Yet the association was considerably less strong than in Main and colleagues’ 1985 report. For secure/insecure classifications, agreement was  $r = 0.47$ ; when using the different insecure classifications, agreement was  $r = 0.19$ .<sup>261</sup> As in Main’s original study, the meta-analysis found minimal association between preoccupied states of mind on the AAI and resistance in the Strange Situation.

One of Van IJzendoorn’s most salient findings, then, was the ‘transmission gap’, demonstrating that the association between the AAI and Strange Situation was only partly mediated by caregiver sensitivity and quantifying how much unexplained transmission remained when parenting sensitivity as a mediator was taken into account.<sup>262</sup> Contrary to a common misunderstanding,<sup>263</sup> Van IJzendoorn was not intending this phrase to refer to the degree of correspondence between the AAI and Strange Situation, but to the extent of mediation by caregiver sensitivity. At the time and subsequently attachment researchers have described the transmission gap as ‘mysterious’, haunting and taunting attachment theory.<sup>264</sup>

In retrospect the finding of partial mediation may not be all that surprising: replicated findings of complete mediation are vanishingly rare in the social sciences. However, the mediation was so far from complete that the finding had major theoretical implications. Part of the association between the AAI and Strange Situation was explained by differences in parental sensitivity, but this part was much smaller than expected. Thus, it was the first testable quantitative model in attachment theory, making clear what was missing in the

<sup>259</sup> Dubois, T. (2014) Attachment theory in child welfare: Exploring the integration of attachment theory in child welfare practice. Unpublished doctoral thesis, University of Manitoba; Salberg, J. (2015) The texture of traumatic attachment: Presence and ghostly absence in transgenerational transmission. *The Psychoanalytic Quarterly*, 84(1), 21–46;

<sup>260</sup> Sümer, N., Lubiewska, K., Aran, Ö., Głogowska, K., & Żegleń, M. (2024) Maternal reflective functioning and intergenerational transmission of attachment orientations in Poland, the Netherlands, and Turkey. *Journal of Child and Family Studies*, 33(1), 288–303, p. 288.

<sup>261</sup> Van IJzendoorn, M. H. (1995) Adult attachment representations, parental responsiveness, and infant attachment. A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin*, 117, 387–403.

<sup>262</sup> *Ibid.*, 399.

<sup>263</sup> For example MacBeth, A., Christie, H., Golds, L., Morales, F., Raouna, A., Sawrikar, V., & Gillespie-Smith, K. (2023) Thinking about the next generation: The case for a mentalization-informed approach to perinatal and intergenerational mental health. *Psychology and Psychotherapy: Theory, Research and Practice*, early view: ‘One of the ongoing conundrums of attachment research has been the transmission gap, by which parental attachment does not have a one-to-one match to child attachment.’

<sup>264</sup> For example, Fonagy, P. & Target, M. (2005) Bridging the transmission gap: An end to an important mystery of attachment research? *Attachment & Human Development*, 7(3), 333–343; Cassidy, J., Jones, J. D., & Shaver, P. R. (2013) Contributions of attachment theory and research: A framework for future research, translation, and policy. *Development and Psychopathology*, 25(4pt2), 1415–1434.



equation and prompting research precisely to address the questions raised. In particular, this model was generative in underlining the need to look beyond sensitivity in predicting attachment security.<sup>265</sup> Van IJzendoorn reflected that ‘correlated measurement errors, genetic influences, and interactive transmission mechanisms yet to be discovered might, in combination, account for the transmission gap’.<sup>266</sup> For instance, measurement error of constructs may be reduced by longer assessments (as urged by Ainsworth’s circle, as we have seen) or repeated measurement at different timepoints (though this is a topic of current debate; [Chapter 5](#)).

Van IJzendoorn and Bakermans-Kranenburg argued that contextual factors (e.g., adversity, social support) would likely moderate associations between the AAI and caregiving behaviour; and child characteristics (e.g., temperament, disability) would likely moderate associations between caregiving behaviour and an infant’s expectations of secure base and safe haven availability. There has been considerable research prompted by these proposals, with supportive findings.<sup>267</sup>

Van IJzendoorn and Bakermans-Kranenburg also reflected on Belsky’s process model ([Chapter 3](#)). Their emphasis on moderators aligned with the process model. That said, Van IJzendoorn and Bakermans-Kranenburg argued that Belsky had overestimated the role of parental personality, or conceptualized it too expansively. Furthermore, they felt that he had underestimated the specific role of attentional and communicative processes considered by Main ([Chapter 1](#)).<sup>268</sup>

The philosopher Stanley Cavell observed that ‘the measure of the quality of a new text is the quality of the texts it arouses’.<sup>269</sup> In these terms, Van IJzendoorn’s 1995 paper on the transmission gap was a special one, as well as among his most cited. On the one hand, it affirmed some central components of attachment theory, with parental psychological processes influencing the sensitivity of caregiving behaviour, and caregiver sensitivity predicting attachment security. On the other hand, the quantitative model simultaneously put a spotlight on limitations to this theory, offering a provocation for further theory and research. This included Belsky’s theoretical elaboration of the concept of differential susceptibility ([Chapter 3](#)).<sup>270</sup> Indeed, research to identify genetic contributions to the intergenerational transmission of attachment provided some of the first evidence for genetic differential susceptibility.<sup>271</sup>

<sup>265</sup> De Wolff, M. S. & Van IJzendoorn, M. H. (1997) Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591.

<sup>266</sup> Van IJzendoorn, M. H. (1995) Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin*, 117(3), 387–403, p. 399.

<sup>267</sup> For reviews, see Tarabulsy, G. M., Bernier, A., Provost, M. A., Maranda, J., Larose, S., Moss, E., ... & Tessier, R. (2005) Another look inside the gap: Ecological contributions to the transmission of attachment in a sample of adolescent mother–infant dyads. *Developmental Psychology*, 41(1), 212–224; Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2019) Bridges across the intergenerational transmission of attachment gap. *Current Opinion in Psychology*, 25, 31–36.

<sup>268</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (1997) Intergenerational transmission of attachment. A move to the contextual level. In L. Atkinson & K. J. Zucker (eds), *Attachment and Psychopathology* (pp. 135–170). New York: Guilford, pp. 150–151.

<sup>269</sup> Cavell, S. (1979) *The Claim of Reason: Wittgenstein, Skepticism, Morality, and Tragedy*. Cambridge, MA: Harvard University Press.

<sup>270</sup> Belsky, J. (2002) Why the ‘transmission gap’ in attachment research: Differential susceptibility to rearing influence. *Journal of Infant, Child, and Adolescent Psychotherapy*, 2(4), 163–183.

<sup>271</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2006) DRD4 7-repeat polymorphism moderates the association between maternal unresolved loss or trauma and infant disorganization. *Attachment & Human Development*, 8(4), 291–307.

The idea of a transmission gap was a spur for generative research on parents' reflective functioning by Slade, Fonagy, and others,<sup>272</sup> parents' secure base scripts by Waters and colleagues (Chapter 1), the quality of couples' relationships by the Cowans and others,<sup>273</sup> and the contribution of intelligence and neurodiversity to how relationships and stressful situations are interpreted.<sup>274</sup> Researchers have also identified some possible factors, such as parental age, that in fact seem unrelated to the extent of correspondence between the AAI and Strange Situation.<sup>275</sup>

Van IJzendoorn's call to think beyond sensitivity has prompted efforts to refine attachment theory and research by considering more precisely what aspects of caregiver behaviour may influence security.<sup>276</sup> As we saw in Chapter 2, this was a spur for Lyons-Ruth's research.<sup>277</sup> It has also stimulated studies to understand similarities and differences between the effects of maternal and paternal care, and different family forms.<sup>278</sup>

One subsequent study that sought to shed light on the transmission gap was a doctoral study by Carlo Schuengel, supervised by Van IJzendoorn and Bakermans-Kranenburg. Schuengel and colleagues conducted the AAI and home observations with 85 mothers who had experienced a major bereavement.<sup>279</sup> This study was among the first to document an association between alarming caregiver behaviour and disorganized attachment. No corresponding association was found between insensitive caregiver behaviour and disorganized attachment. As such, part of the transmission gap appeared to lie in the role of alarming caregiver behaviour as another relevant factor, not reducible to sensitivity/insensitivity.<sup>280</sup>

<sup>272</sup> Fonagy, P. & Target, M. (2005) Bridging the transmission gap: An end to an important mystery of attachment research? *Attachment & Human Development*, 7(3), 333–343; Slade, A., Grienerberger, J., Bernbach, E., Levy, D., & Locker, A. (2005) Maternal reflective functioning, attachment, and the transmission gap: A preliminary study. *Attachment & Human Development*, 7(3), 283–298. See also Arnott, B. & Meins, E. (2007) Links among antenatal attachment representations, postnatal mind-mindedness, and infant attachment security: A preliminary study of mothers and fathers. *Bulletin of the Menninger Clinic*, 71(2), 132–149.

<sup>273</sup> Cowan, P. A. & Cowan, C. P. (2009) Couple relationships: A missing link between adult attachment and children's outcomes. *Attachment & Human Development*, 11(1), 1–4; Dickstein, S., Seifer, R., & Albus, K. E. (2009) Maternal adult attachment representations across relationship domains and infant outcomes: The importance of family and couple functioning. *Attachment & Human Development*, 11(1), 5–27.

<sup>274</sup> Del Giudice, M. & Haltigan, J. D. (2023) A new look at the relations between attachment and intelligence. *Developmental Review*, 67, 101054; Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Pappa, I., Runze, J., & Witte, A. M. (2023) Intergenerational transmission of attachment: The role of intelligence. *OSF*, <https://osf.io/etb47>.

<sup>275</sup> Belsky, J., Hancox, R. J., Sligo, J., & Poulton, R. (2012) Does being an older parent attenuate the intergenerational transmission of parenting? *Developmental Psychology*, 48(6), 1570–1574.

<sup>276</sup> For example, Bernier, A., Matte-Gagné, C., Bélanger, M. È., & Whipple, N. (2014) Taking stock of two decades of attachment transmission gap: Broadening the assessment of maternal behavior. *Child Development*, 85(5), 1852–1865; Woodhouse, S. S., Scott, J. R., Hepworth, A. D., & Cassidy, J. (2020) Secure base provision: A new approach to examining links between maternal caregiving and infant attachment. *Child Development*, 91(1), e249–e265.

<sup>277</sup> Lyons-Ruth, K. (2003) Discussion for symposium: Coding the Adult Attachment Interview with adults who experienced catastrophic parental loss during childhood. *SRCD*, 2003. Karlen Lyons-Ruth personal archive: 'These are likely to be the states of mind associated with very adverse life experiences, with clinical symptomatology in many cases, and, also probably, with the 47% of disorganized infants whose parents are not classified Unresolved on the AAI. We've been referring to this 47% as part of a transmission block in relation to disorganization. Describing these additional AAI profiles is likely to be one route through which we can resolve at least a part of this transmission block.'

<sup>278</sup> For example, Miljkovitch, R., Danet, M., & Bernier, A. (2012) Intergenerational transmission of attachment representations in the context of single parenthood in France. *Journal of Family Psychology*, 26(5), 784–792.

<sup>279</sup> Schuengel, C., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (1999) Frightening maternal behavior linking unresolved loss and disorganized infant attachment. *Journal of Consulting and Clinical Psychology*, 67(1), 54–63.

<sup>280</sup> In later work, Van IJzendoorn and Bakermans-Kranenburg would also consider the dimension of protective parenting or its absence as distinct from sensitivity and insensitivity. Though not addressed directly by Van IJzendoorn and Bakermans-Kranenburg in relation to the transmission gap, protective parenting or its absence may also have bearing. Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2017) Protective parenting: Neurobiological and behavioral dimensions. *Current Opinion in Psychology*, 15: 45–49.



As we have seen, after winning the Spinoza Prize, Van IJzendoorn appears to have felt greater licence to directly address the contribution of socioeconomic factors to development. Cyr and Leiden collaborators conducted a meta-analysis of studies reporting results from the Strange Situation and adversities experienced by families. They coded for: (a) low income, (b) maternal substance abuse (including children who were prenatally exposed to alcohol/drug and children with a parent currently using alcohol/ drug), (c) ethnic minority group, (d) single parenthood, (e) mother in adolescence, and (f) low education. They were able to draw data from 69 samples: 59 samples ( $N = 4,336$ ) with children without documented maltreatment, and 10 samples ( $N = 456$ ) of children with documented maltreatment.

Questions of the demographic contribution to early attachment had been left on the margins by attachment researchers, with a few exceptions such as Thompson (Chapter 1). In terms of the meta-analysis, this was a kind of advantage, as there was no evidence of publication bias across any of the tests conducted by Cyr and collaborators: researchers had not been motivated to select or distort what they published due to presiding orthodoxies. The researchers found that maltreatment was massively associated with frequency of insecurity ( $d = 2.10$ , CI 1.82–2.37) and disorganization ( $d = 2.19$ , CI 1.53–2.85). Low income predicted insecurity ( $d = 0.49$ , CI 0.32–0.65) disorganization ( $d = 0.48$ , CI 0.20–0.76), as did adolescent motherhood (insecurity  $d = 0.73$ , CI 0.42–1.03; disorganization  $d = 0.74$ , CI 0.17–1.31).<sup>281</sup> Substance use was a potentially potent predictor of disorganization ( $d = 0.79$ , CI 0.22–1.36), but with no significant effect for insecurity.

Additionally, Cyr and colleagues examined the effect of cumulative risk. For the eight samples facing five or more of the adversities, rates of disorganized were equivalent to samples with documented maltreatment (around two-thirds).<sup>282</sup> An implication of these findings is that child–caregiver attachment may be improved by policy and practice interventions that reduce parental feelings of helplessness or fear. It is not unusual to hear people who are insufficiently familiar with attachment research claim that attachment implies that applied practitioners should focus on parents and their behaviour, rather than their circumstances, to make improvements in the lives of children.<sup>283</sup> This is a false opposition. Many validated attachment-based interventions with families living with poverty and neighbourhood violence routinely include tangible support in terms of helping parents achieve safe housing, meaningful paid work, and cope with food insecurity.<sup>284</sup> Any adversity that makes parents routinely feel chronically overwhelmed, or require extreme prioritization of short-term survival needs, may be anticipated to have a serious and negative impact on their availability and responsivity to their children. In Kantian terms: there are emotional and practical ‘conditions of possibility’ for forms of caregiving that do not routinely alarm children.

<sup>281</sup> See also Madigan, S., Fearon, R. M. P., Van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J., Ly, A., Cooke, J. E., Deneault, A.-A., Oosterman, M., & Verhage, M. L. (2024) The first 20,000 Strange Situation procedures: A meta-analytic review. *Psychological Bulletin*, forthcoming.

<sup>282</sup> Cyr, C., Euser, E. M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2010) Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development & Psychopathology*, 22(1), 87–108.

<sup>283</sup> For example, Narey, M. (2014) *Making the Education of Social Workers Consistently Effective*. London: Department for Education.

<sup>284</sup> Steele, H. & Steele, M. (eds) (2017) *Handbook of Attachment-Based Interventions*. New York: Guilford Publications.

## Reappraising Transmission

In his 1995 paper, Van IJzendoorn expressed concern that ‘correlated measurement errors’ might have contributed to inflated results regarding associations between the AAI and Strange Situation.<sup>285</sup> At the 2013 conference of the Society for Research in Child Development, Fearon, Schuengel, and Madigan reflected on having seen discrepant results on associations between the AAI and Strange Situation from later studies, and especially unpublished and file drawer data:

A group of us had been talking about this ... we started saying, you know that effect size, have you got any studies that didn’t really find this association between adult attachment and child attachment? And we all started confessing that, yes, indeed we did. And we didn’t really know what to make of it. And we started to have doubts. And we worried about whether this was something you could even say, given that this was such an established finding. And then, and then we thought, well, wait a minute, this is a really important question. And actually, that, you know, we need to look at this.<sup>286</sup>

Fearon, Schuengel and Madigan observed that it would be hard for researchers to publish null results for intergenerational transmission, not only because it went against such strong findings from the early studies and Van IJzendoorn’s 1995 meta-analysis, but also because many such studies would be underpowered. To address the question, new meta-analytic research was needed.

Fearon, Schuengel, and Madigan wanted to undertake an individual participant data meta-analysis, pooling the raw data from research studies. They were persuaded by Van IJzendoorn to start with a traditional meta-analysis. This was published in 2016, authored by Verhage, Schuengel, Madigan, Fearon, Oosterman, Cassibba, Bakermans-Kranenburg, and Van IJzendoorn.<sup>287</sup> As against the 19 studies in the 1995 meta-analysis, they were able to report findings from 95 samples ( $N = 4,819$ ). Evidence of associations between the AAI and Strange Situation remained, though smaller than in 1995. Associations between autonomous states of mind and security in the Strange Situation were  $r = 0.24$ , CI 0.20–0.27 (compared to  $r = 0.47$  in 1995). Whereas the AAI had previously been considered a more powerful predictor of security than caregiver sensitivity based on the 1995 meta-analysis, Verhage and colleagues found equivalent aggregate effect sizes.

There was considerable evidence of publication bias, a metric of the presiding theoretical and methodological hegemony over the previous decades. As anticipated by Fearon, Schuengel, and Madigan, effect sizes were smaller in unpublished and more recent studies. Associations between unresolved states of mind and disorganization in the Strange Situation were  $r = 0.21$ , CI 0.16–0.26 (compared to  $r = 0.31$  in 1995). Again, effect sizes were smaller in unpublished and more recent studies. The dominant expectation of ‘transmission of attachment’ appeared to have distorted what findings had been published, providing some artificial support for this framing over time. Nonetheless, these are still

<sup>285</sup> Van IJzendoorn, M. H. (1995) Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the Adult Attachment Interview. *Psychological Bulletin*, 117(3), 387–403, p. 399.

<sup>286</sup> Fearon, P. (2019) Myth-busting around attachment theory. <https://www.acamh.org/freeview/myth-busting-around-attachment-theory-professor-pasco-fearon/>.

<sup>287</sup> Verhage, M. L., Schuengel, C., Madigan, S., Fearon, R. M., Oosterman, M., Cassibba, R., ... & Van IJzendoorn, M. H. (2016) Narrowing the transmission gap: A synthesis of three decades of research on intergenerational transmission of attachment. *Psychological Bulletin*, 142(4), 337–366.

material associations.<sup>288</sup> Moreover, the role of sensitivity in bridging associations between the AAI and Strange Situation was replicated: ‘The proportion of the association between caregiver attachment representation and child–caregiver attachment explained by caregiver sensitivity equalled  $(.20 \times .35) = .07$ , which is approximately 25% of the raw correlation  $r = 0.25$ . The unexplained association remained  $r = .18$ .’<sup>289</sup>

A follow-up paper by Verhage and colleagues in 2018 further investigated the question of intergenerational transmission. They went ahead with requesting and pooling the raw data from studies. They received data from 58 studies comprising 4,396 parent–child dyads. This was a major achievement. In the 1990s, Van IJzendoorn had been pessimistic about the prospects of gathering the raw data from studies, citing survey evidence that less than a quarter of scientists are willing to make their data available.<sup>290</sup> Some efforts to collect raw data in other areas of psychological science had ended in failure.<sup>291</sup> However, when Verhage and colleagues came calling in the 2010s, 67% of attachment researchers shared their data, a testament to the strong community spirit among developmental attachment researchers.<sup>292</sup>

Verhage and colleagues began the paper by arguing against the dominant interpretation of Van IJzendoorn’s 1995 paper, in which it has been assumed that a thing called ‘attachment’ is ‘transmitted’ from parent to child. Instead, they argued that associations between the AAI and Strange Situation likely reflect ‘one parental characteristic predicting *another* in the child’ rather than ‘transmission of the same qualities from parent to child.’<sup>293</sup>

The use of pooled raw data rather than published results increased the power and specificity of moderator analyses. One important finding by Verhage was that in general the association between the AAI and the Strange Situation was weaker for families facing specific risks and adversities ( $r = 0.14$ , CI 0.06–0.21) and stronger for families recruited from the general population ( $r = 0.39$ , CI 0.30–0.46).

Further evidence of publication bias was identified. For example, the association between dismissing states of mind on the AAI and avoidant attachment in the Strange Situation was  $r = 0.41$  across 19 published papers, compared to  $r = 0.15$  across 33 unpublished papers. In fact, regardless of an adult’s AAI classification, the most likely classification for their child’s attachment relationship was secure. For instance, among parents with dismissing classifications, 40% of child–parent relationships were classified as secure in the

<sup>288</sup> By way of comparison, these effect sizes are in the same region as meta-analytic findings by Madigan and colleagues on the intergenerational transmission of maltreatment. Madigan, S., Cyr, C., Eirich, R., Fearon, R. P., Ly, A., Rash, C., ... & Alink, L. R. (2019) Testing the cycle of maltreatment hypothesis: Meta-analytic evidence of the intergenerational transmission of child maltreatment. *Development and Psychopathology*, 31(1), 23–51. The researchers reported  $d = 0.45$ , CI 0.37–0.54.

<sup>289</sup> Verhage, M. L., Schuengel, C., Madigan, S., Fearon, R. M., Oosterman, M., Cassibba, R., ... & Van IJzendoorn, M. H. (2016) Narrowing the transmission gap: A synthesis of three decades of research on intergenerational transmission of attachment. *Psychological Bulletin*, 142(4), 337–366, p. 350

<sup>290</sup> Van IJzendoorn, M. H. (1994) Process model of replication studies: On the relations between different types of replication. In R. van der Veer, Van IJzendoorn, M. H., & J. Valsiner (eds), *On Reconstructing the Mind. Replicability in Research on Human Development* (pp. 57–70). Norwood, NJ: Ablex, p. 65.

<sup>291</sup> For example, Jaspers, G. J. & DeGrauwe, P. L. J. (2014) A failed attempt to conduct an individual patient data meta-analysis. *Systematic Reviews*, 3, Article 97.

<sup>292</sup> See also Verhage, M. L., Schuengel, C., Duschinsky, R., Van IJzendoorn, M. H., Fearon, R. P., Madigan, S., ... & Collaboration on Attachment Transmission Synthesis (2020) The collaboration on attachment transmission synthesis (CATS): A move to the level of individual-participant-data meta-analysis. *Current Directions in Psychological Science*, 29(2), 199–206.

<sup>293</sup> Verhage, M. L., Fearon, R. P., Schuengel, C., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Madigan, S., ... & Ward, M. J. (2018) Examining ecological constraints on the intergenerational transmission of attachment via individual participant data meta-analysis. *Child Development*, 89(6), 2023–2037, p. 2024, italics added.

Strange Situation, whereas 29% were classified as avoidant.<sup>294</sup> Child–parent relationships seem to have a tendency to *default to security*. This could be because conditional strategies are secondary alterations of the basic functioning of the attachment system, as Main argued.<sup>295</sup> Or it could be that children are able to draw safe haven availability from their parent precisely through their conditional strategies and in doing so build expectations that their caregiver is available in times of need.

Rather than simple lines of correspondence between attachment patterns, dismissing, and preoccupied discourse are actually linked, in a general way, to insecure attachment classifications of whatever kind. For example, among parents with preoccupied representations, 21% were part of dyads classified as resistant in the Strange Situation, 22% disorganized, and 18% avoidant. The relationship between the AAI classification and children's expectations about safe haven availability appears to be more complex than one-to-one correspondence, as may inadvertently have been suggested by the metaphor of attachment 'transmission'. Furthermore, these findings may suggest, as Everett Waters has often argued, that the important distinction to draw is between security and insecurity, with the distinction between avoidance and resistance somewhat less important.<sup>296</sup>

### Sequelae of Early Attachment

Earlier meta-analyses had documented caregiving antecedents of early attachment relationships, including the de Wolff and Van IJzendoorn meta-analysis on sensitivity mentioned above, and the meta-analysis by Madigan and colleagues on alarming caregiving behaviour (Chapter 2). This work had confirmed, but qualified and further elaborated, the empirical link Ainsworth had discovered between sensitive caregiving and children's expectations of secure base and safe haven availability. Cyr and colleagues had also found suggestive evidence that ramifying socioeconomic adversities may cause caregivers to feel chronically overwhelmed or give extreme prioritization to short-term survival needs, may be anticipated to have a negative impact on their availability and responsiveness to their children.

Meanwhile, the question of the sequelae of early attachment relationships remained an open question. Chris Fraley and Glenn Roisman at the University of Illinois were interested in understanding the scope and limits of Sroufe's strong claims for the enduring role of early attachment relationships in shaping later development. Roisman had joined the team of NICHD collaborators (Chapter 3) and drew on this data in collaborations with Fraley. One dimension of this work was empirical and meta-analytic inquiry to understand the degree of convergence or divergence between observational measures of attachment used by developmental scientists and self-report measures of adult attachment used by social

<sup>294</sup> Madigan, S., Verhage, M. L., Schuengel, C., Fearon, R. M. P., Duschinsky, R., Roisman, G. I., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Cassidy, J., Tarabulsi, M. G. M., Cyr, C., Oosterman, M., Behrens, K. Y., Wong, M. S., Gojman-De-Millan, S., Priddis, L., & The Collaboration on Attachment Transmission Synthesis (2024) In search of patterns of cross-transmission from parental attachment representations to child attachment: An Individual Participant Data meta-analysis. *manuscript in preparation*.

<sup>295</sup> Main, M. (1990) Cross-cultural studies of attachment organization: Recent studies, changing methodologies, and the concept of conditional strategies. *Human Development*, 33(1), 48–61.

<sup>296</sup> For example, Waters, E. & Deane, K. E. (1985) Defining and assessing individual differences in attachment relationships: Q-methodology and the organization of behavior in infancy and early childhood. *Monographs of the Society for Research in Child Development*, 50(1/2), 41–65.

psychologists.<sup>297</sup> A second dimension was empirical research using the NICHD dataset to examine the role of early caregiving on social competence and academic skills through childhood up to age 15.<sup>298</sup>

A third dimension was plans for meta-analytic research on the sequelae of early attachment relationships. Roisman submitted a grant application to the National Science Foundation proposing a series of meta-analyses to test Sroufe's specific prediction, made in an earlier debate with Fraley, that avoidance and resistance would have distinct associations with peer-directed behaviours including social skills and peer aggression.<sup>299</sup> This focus was shaped by the focus of the NSF on funding basic scientific, rather than health research. The project was framed as a response also to Kagan's criticisms of the associations of the Strange Situation as in fact driven by child temperament.<sup>300</sup>

When the research was funded, Roisman shared the news with Belsky, whom he knew well through the NICHD study. Belsky introduced Roisman to Van IJzendoorn and Bakermans-Kranenburg, who already had a meta-analysis underway, together with Fearon, on the association between early attachment and children's externalizing behaviour. Roisman, Fearon, Van IJzendoorn, and Bakermans-Kranenburg agreed to join forces in undertaking a series of meta-analyses together. The collaboration was fruitful: these would be among the most cited and influential of these researchers' respective papers and set up many subsequent collaborations. The role of these meta-analyses in helping to cement an international 'invisible college' of quantitatively minded attachment researchers should not be underestimated.<sup>301</sup>

From Van IJzendoorn and Bakermans-Kranenburg's perspective, the need for meta-analytic research on the sequelae of early attachment was prompted especially by the proliferation of studies with small, underpowered samples. Some studies, such as the Harvard Family Pathways Study (Chapter 2), had reported considerable and eye-catching associations between the Strange Situation classifications, especially disorganized attachment, and later externalizing behaviours. Quantitative synthesis was called for to understand whether such findings were dependable. Such findings were also discrepant with the poor performance of the Strange Situation, especially the infant classifications, in predicting anything in the large and high-profile NICHD study (Chapter 3).

As a point of comparison, Van IJzendoorn worked with Minnesota colleagues on a large meta-analysis of the sequelae of positive and negative parenting generally for children's externalizing behaviour. Within developmental psychopathology, externalizing behaviour was regarded as a good general marker of a child experiencing socioemotional difficulties.<sup>302</sup> The study drew data from 28,097 families. The combined effect sizes were in the expected direction, but not striking in magnitude. Positive parenting was associated with

<sup>297</sup> For example, Roisman, G. I., Holland, A., Fortuna, K., Fraley, R. C., Clausell, E., & Clarke, A. (2007) The Adult Attachment Interview and self-reports of attachment style: An empirical rapprochement. *Journal of Personality and Social Psychology*, 92(4), 678.

<sup>298</sup> Roisman, G. I. & Fraley, R. C. (2013) Developmental mechanisms underlying the legacy of childhood experiences. *Child Development Perspectives*, 7(3), 149–154; Fraley, R. C., Roisman, G. I., & Haltigan, J. D. (2013) The legacy of early experiences in development: Formalizing alternative models of how early experiences are carried forward over time. *Developmental Psychology*, 49(1), 109–126.

<sup>299</sup> Sroufe, L. A. (2003) Attachment categories as reflections of multiple dimensions: Comment on Fraley and Spieker (2003) *Developmental Psychology*, 39(3), 413–416.

<sup>300</sup> Roisman, G. (2006) The antecedents and enduring significance of early attachment experiences. Grant application to the National Science Foundation. Glenn Roisman personal archive.

<sup>301</sup> Schuengel, C., Verhage, M. L., & Duschinsky, R. (2021) Prospecting the attachment research field: A move to the level of engagement. *Attachment & Human Development*, 23(4), 375–395.

<sup>302</sup> Rutter, M. & Sroufe, L. A. (2000) Developmental psychopathology: Concepts and challenges. *Development & Psychopathology*, 12(3), 265–296.

less child externalizing difficulties ( $r = -0.06$  for mothers,  $r = -0.08$  for fathers). Harsh parenting was associated with more child externalizing difficulties ( $r = 0.11$  for mothers,  $r = 0.12$  for fathers). Disengaged or uninvolved parenting was also associated with more child externalizing difficulties ( $r = 0.07$  for mothers, absent for fathers).<sup>303</sup> Admittedly, these effect sizes were likely attenuated by aggregation. They raised the question of what might be found by drilling down to just looking at the child–caregiver attachment relationship.

The first of the meta-analytic studies of the sequelae of the Strange Situation classifications and AQS was a 2010 paper by Fearon, Bakermans-Kranenburg, Van IJzendoorn, Lapsley, and Roisman.<sup>304</sup> The study synthesized data from 69 samples—5,947 dyads—where the Strange Situation had been used together with a measure of child externalizing difficulties. Disorganized attachment was associated with externalizing difficulties ( $d = 0.34$ ), with a stronger association when externalizing difficulties was measured by a researcher ( $d = 0.58$ ) rather than by parent-report ( $d = 0.22$ ).<sup>305</sup> The magnitude of the association with observed externalizing difficulties was equivalent to the pioneering report from the Harvard study (Chapter 2), which helped establish the standing of the disorganized classification. These meta-analytic findings were also in direct contrast to the results of the NICHD study, where disorganized attachment at 12 or 36 months was not found to predict externalizing difficulties. Fearon and colleagues reported weaker effects for avoidance ( $d = 0.12$ ) and resistance ( $d = 0.11$ ).<sup>306</sup>

Another important finding from the 2010 meta-analysis was that associations between the Strange Situation and child externalizing difficulties were not moderated by socioeconomic status. Fearon and colleagues had expected that an insecure child–caregiver relationship would make more of a contribution to child externalizing difficulties for families facing additional other pressures. Certainly, other research in developmental science had established socioeconomic adversity as a potent predictor of behavioural difficulties.<sup>307</sup> Yet Fearon and colleagues found no significant interaction between insecurity and socioeconomic status. This suggested that each was making a contribution, contrary for instance to the predominant narrative of Belsky's process model, in which socioeconomic pressures on the family would contribute to child externalizing difficulties only via problems in the child–caregiver relationship (Chapter 3).

Another surprising finding was that the age of the child at the point that externalizing difficulties were assessed was not a moderator. The association between the measure of the attachment relationship and child behaviour outcome was just as strong if the assessment of child behaviour took place a month or many years later. Indeed, for the 43 studies reporting from the Strange Situation, the association with child externalizing difficulties *increased* over time. This was contrary to the expectation that prediction from one assessment during early childhood to later development would decrease over time given all the child's intervening experiences. However, the finding was directly in line with the bold

<sup>303</sup> Kawabata, Y., Alink, L. R., Tseng, W. L., Van IJzendoorn, M. H., & Crick, N. R. (2011) Maternal and paternal parenting styles associated with relational aggression in children and adolescents: A conceptual analysis and meta-analytic review. *Developmental Review*, 31(4), 240–278.

<sup>304</sup> Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010) The significance of insecure attachment and disorganization in the development of children's externalizing behavior: A meta-analytic study. *Child Development*, 81(2), 435–456.

<sup>305</sup> It may be relevant for interpreting this considerable difference that parents generally reported aggression of the child towards themselves or siblings, whereas researchers generally reported aggression towards peers.

<sup>306</sup> An equivalent effect size was documented for fathers. Deneault, A. A., Bakermans-Kranenburg, M. J., Groh, A. M., Fearon, P. R., & Madigan, S. (2021) Child–father attachment in early childhood and behavior problems: A meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 43–66.

<sup>307</sup> Bradley, R. H. & Corwyn, R. F. (2002) Socioeconomic status and child development. *Annual Review of Psychology*, 53(1), 371–399.

prediction of Sroufe and Minnesota colleagues that secure or insecure early attachment would have a cumulative contribution over time, with positive or negative implications each time a child was faced with a relevant new developmental challenge.<sup>308</sup> For Sroufe, the early attachment relationship, as captured by the Strange Situation, represented the foundations of a child's socioemotional development, like the foundations of a house, and so may increase in importance as further floors are added to the structure.

A further notable finding from the meta-analysis by Fearon and colleagues was the association between the AQS and externalizing difficulties. The association was much higher than for the Strange Situation:  $d = 0.70$ . In small part, this may be due to the NICHD null results dragging down the associations of the Strange Situation. Yet, beyond this, the AQS performed well.<sup>309</sup> These findings provided support for the claims of Waters and colleagues that the AQS, assessing ordinary interaction between a child and caregiver in naturalistic settings, may have greater acuity than the prompts and interactions of the Strange Situation.

Additionally, it appears that the association between the Strange Situation and externalizing difficulties was suppressed by the way the Strange Situation's categorical data were transformed into a standardized difference for the meta-analysis. The researchers used the equations provided by the *Comprehensive Meta-analysis* software developed by Borenstein, Rothstein, and Cohen.<sup>310</sup> The issue is that these equations use an unweighted point-biserial correlation rather than a biserial correlation and, as such, give a systematic underestimation when computing effect sizes from categorical data.<sup>311</sup> If one takes the continuous data like the AQS results, dichotomizes it, converts it to an odds ratio, and uses the Borenstein formula, the result is an effect size considerably smaller than the original results.

Categorical data generally capture less variance: this may be Borenstein and colleagues' reason for underestimation when computing effect sizes. The implication is that the AQS may represent the more accurate picture of the correlates of early security and insecurity. To illustrate the point: in their landmark 1997 meta-analysis De Wolff and Van IJzendoorn reported associations with caregiver sensitivity of  $r = 0.24$  (CI 0.19–0.28) for the Strange Situation and  $r = 0.33$  (CI 0.28–0.39) for the AQS.<sup>312</sup> If one were to apply the Borenstein, Rothstein and Cohen equations to the AQS data, as if it were categorical/dichotomized data, it would yield a suppressed effect size broadly *equivalent to that reported for the Strange Situation*. This is despite the fact that the confidence intervals for the effect sizes reported for the Strange Situation and AQS only barely brush one another.

Ainsworth, Sroufe and subsequent attachment researchers have essentially bet that the value of the distinction between forms of insecurity, achieved through use of categorical data, would be worth the loss of variance captured.<sup>313</sup> The discrepancy in

<sup>308</sup> Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2009) *The Development of the Person: The Minnesota Study of Risk and Adaptation from Birth to Adulthood*. New York: Guilford Press.

<sup>309</sup> Some of the association was attributed by Fearon and colleagues to the fact that the Attachment Q-Sort can be used with two-year-olds and this may be a developmental stage of particular importance for the development of conduct problems. However, Fearon and colleagues found that the Attachment Q-Sort also had a considerably stronger association with externalizing difficulties than the Cassidy and Marvin adaptation of the Strange Situation for use with preschoolers. Their argument on this front is therefore not persuasive.

<sup>310</sup> Borenstein, M., Rothstein, D., & Cohen, J. (2005) *Comprehensive Meta-analysis: A Computer Program for Research Synthesis* [Computer software]. Englewood Cliffs, NJ: Biostat. See also Hedges, L. V., Higgins, J. P. T., Rothstein, H. R., & Borenstein, M. (2009) *Introduction to Meta-Analysis*. New York: Wiley.

<sup>311</sup> Jacobs, P. & Viechtbauer, W. (2017) Estimation of the biserial correlation and its sampling variance for use in meta-analysis. *Research Synthesis Methods*, 8(2), 161–180.

<sup>312</sup> De Wolff, M. S., & Van IJzendoorn, M. H. (1997) Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591, Figure 2.

<sup>313</sup> Ainsworth, M. D. S. (1990) Epilogue: Some considerations of attachment theory and assessment relevant to the years beyond infancy. In M. T. Greenberg, D. Cicchetti, & M. Cummings (eds), *Attachment in the Preschool Years: Theory, Research, and Intervention* (pp. 463–488). Chicago: University of Chicago Press; Sroufe, L. A.



prediction between the Strange Situation and AQS suggests that the loss of variance may well have come at a price. Though it should be acknowledged that the Strange Situation and AQS are different measures, applied in different settings, so like-to-like comparison is certainly hindered by the involvement of a material number of confounders.

A later meta-analysis by Deneault, Bakermans-Kranenburg, Groh, Fearon, and Madigan revisited the Fearon and colleagues' 2010 meta-analysis, but with a focus on studies of child–father dyads.<sup>314</sup> From 15 samples (1,304 dyads), they reported that insecurity had an association with externalizing difficulties of  $d = 0.37$  (CI 0.20–0.55). This compared to  $d = 0.31$ , (CI 0.25–0.37) for child–mother dyads. Several attachment researchers had predicted that relationships with fathers and mothers would have different developmental correlates, due to the social norms that shape their respective roles in children's lives.<sup>315</sup> Fathers may be socialized to engage in more roughhousing and exciting/activating forms of engagement with their child.<sup>316</sup> Bureau and colleagues reported from a Canadian sample that child–father attachment insecurity was a better predictor of externalizing difficulties than child–mother insecurity, perhaps due to the greater role assigned to fathers in regulating aggressiveness in Canadian society.<sup>317</sup> The effect size for fathers in the meta-analysis of externalizing difficulties was a little stronger than for mothers. That said, confidence intervals were overlapping with the association for mothers, suggesting that the consequences for child externalizing difficulties were equivalent for child–father and child–mother relationships (Chapter 5).<sup>318</sup>

Following Fearon and colleagues' meta-analysis of measures of early attachment and later externalizing difficulties, another major meta-analysis addressing prediction of internalizing difficulties was published in 2012. This work was led by Ashley Groh, a doctoral student with Roisman at the University of Illinois, together with Roisman, Van IJzendoorn, Bakermans-Kranenburg, and Fearon. The meta-analysis was able to synthesize data from 42 samples, comprising 4,614 dyads. The field of attachment research was expecting this meta-analysis to report a considerable association between early attachment and

(2003) Attachment categories as reflections of multiple dimensions: Comment on Fraley and Spieker (2003) *Developmental Psychology*, 39(3), 413–416.

<sup>314</sup> Deneault, A. A., Bakermans-Kranenburg, M. J., Groh, A. M., Fearon, P. R., & Madigan, S. (2021) Child–father attachment in early childhood and behavior problems: A meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 43–66.

<sup>315</sup> For example, Grossmann, K., Grossmann, K. E., Fremmer-Bombik, E., Kindler, H., Scheuerer-Engelsch, H., & Zimmermann, A. P. (2002) The uniqueness of the child–father attachment relationship: Fathers' sensitive and challenging play as a pivotal variable in a 16-year longitudinal study. *Social Development*, 11(3), 301–337; Dumont, C., & Paquette, D. (2013) What about the child's tie to the father? A new insight into fathering, father–child attachment, children's socio-emotional development and the activation relationship theory. *Early Child Development and Care*, 183(3–4), 430–446; Bretherton, I. (2014) Fathers in attachment theory and research: A review. *Emerging Topics on Father Attachment*, 9–23; Bakel, H. J. V. & Hall, R. A. (2020) The father–infant relationship beyond caregiving sensitivity. *Attachment & Human Development*, 22(1), 27–31.

<sup>316</sup> Majdandžić, M., de Vente, W., & Bögels, S. M. (2016) Challenging parenting behavior from infancy to toddlerhood: Etiology, measurement, and differences between fathers and mothers. *Infancy*, 21(4), 423–452; St George, J., & Freeman, E. (2017) Measurement of father–child rough-and-tumble play and its relations to child behavior. *Infant Mental Health Journal*, 38(6), 709–725; Volling, B. L., Stevenson, M. M., Safyer, P., Gonzalez, R., & Lee, J. Y. (2019) In search of the father–infant activation relationship: A person-centered approach. *Monographs of the Society for Research in Child Development*, 84(1), 7–160.

<sup>317</sup> Bureau, J.-F., Martin, J., Yurkowski, K., Schmiedel, S., Quan, J., Moss, E., Deneault, A.-A., & Pallanca, D. (2017) Correlates of child–father and child–mother attachment in the preschool years. *Attachment & Human Development*, 19(2), 130–150.

<sup>318</sup> See also Fagan, J., Day, R., Lamb, M. E., & Cabrera, N. J. (2014) Should researchers conceptualize differently the dimensions of parenting for fathers and mothers? *Journal of Family Theory & Review*, 6(4), 390–405; Dagan, O., Schuengel, C., Verhage, M. L., Van IJzendoorn, M. H., Sagi-Schwartz, A., Madigan, S., ... & Collaboration on Multiple Parents and Outcomes Synthesis. (2021) Configurations of mother–child and father–child attachment as predictors of internalizing and externalizing behavioral problems: An individual participant data (IPD) meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 67–94.



internalizing difficulties. Bowlby had predicted that insecure attachment would make a strong contribution to vulnerability to later anxiety and depression.<sup>319</sup> Main had predicted the same for disorganized attachment.<sup>320</sup> It was anticipated that a history of insecure and disorganized attachment is characterized by obstacles to the effective use the attachment figure to relieve negative emotions when distressed. The Minnesota group had reported associations between infant disorganized attachment and teacher-reported internalizing problems in elementary ( $r = 0.19$ ) and high school ( $r = 0.18$ ).<sup>321</sup>

In fact, in the meta-analysis of Groh and colleagues, only avoidant attachment in the Strange Situation was associated with later internalizing difficulties ( $d = 0.17$ , CI 0.03–0.31), not the other classifications.<sup>322</sup> Looking back, Roisman and Groh have commented that the absence of association between resistant or disorganized attachment and internalizing difficulties represented an important discovery, as so many researchers at the time had expected there to be an association.<sup>323</sup> These findings would contrast with a later meta-analysis by Dagan and colleagues, which documented an association ( $d = 0.35$ , CI 0.19–0.50) between preoccupied status on the AAI and internalizing difficulties.<sup>324</sup> The association between unresolved status on the AAI and internalizing difficulties was attributable to overlap between unresolved and preoccupied states of mind. Main's discussions of the resistant and preoccupied classifications often situated them as equivalent, and this was an assumption reinforced by the narrative of 'transmission' of attachment from parent to child. However, such findings of different mental health correlates underline that resistance and preoccupation should not be taken as necessarily having the same meaning. It may be noted, historically, that in Main's own sample there was no association between resistant attachment in the Strange Situation and preoccupied state of mind on the AAI, and minimal association in subsequent studies.<sup>325</sup>

Independently from Groh and colleagues, a Canadian team led by Madigan were also pursuing a meta-analysis of associations between early observations of child attachment and later internalizing difficulties. They reported convergent findings. One additional test they undertook was whether disorganized attachment was more associated with internalizing difficulties than secure attachment. They found evidence of publication bias, suggesting that researchers who had failed to find the association expected and pushed by Main had

<sup>319</sup> For example, Bowlby, J. ([1977] 1979) The making and breaking of affectional bonds. In *The Making and Breaking of Affectional Bonds* (pp. 150–188). London: Routledge.

<sup>320</sup> For example, Main, M. (1995) Recent studies in attachment: Overview, with selected implications for clinical work. In S. Goldberg, R. Muir, & J. Kerr (eds), *Attachment Theory: Social, Developmental and Clinical Perspectives* (pp. 407–470). Hillsdale, NJ: Analytic Press.

<sup>321</sup> Carlson, E. A. (1998) A prospective longitudinal study of attachment disorganization/disorientation. *Child Development*, 69(4), 1107–1128, Table 5.

<sup>322</sup> Groh, A. M., Roisman, G. I., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Fearon, R. P. (2012) The significance of insecure and disorganized attachment for children's internalizing symptoms: A meta-analytic study. *Child Development*, 83(2), 591–610. Again, equivalent effect size was documented for fathers. Deneault, A. A., Bakermans-Kranenburg, M. J., Groh, A. M., Fearon, P. R., & Madigan, S. (2021) Child–father attachment in early childhood and behavior problems: A meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 43–66.

<sup>323</sup> Roisman, G. & Groh, A. (2021) The legacy of early attachments: Past, present, future. In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 187–194). New York: Guilford.

<sup>324</sup> Dagan, O., Facompré, C. R., Nivison, M. D., Roisman, G. I., & Bernard, K. (2020) Preoccupied and dismissing attachment representations are differentially associated with anxiety in adolescence and adulthood: A meta-analysis. *Clinical Psychological Science*, 8(4), 614–640; Dagan, O., Groh, A. M., Madigan, S., & Bernard, K. (2021) A lifespan development theory of insecure attachment and internalizing symptoms: Integrating meta-analytic evidence via a testable evolutionary mis/match hypothesis. *Brain Sciences*, 11(9), 1226.

<sup>325</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, Chapter 3.

not published or not been able to publish their findings. With publication bias taken into account, there was no association.<sup>326</sup>

Another notable finding from additional analyses by Madigan was that, like Fearon and colleagues, they reported a considerably stronger association with internalizing difficulties for the AQS ( $d = 0.54$ , CI 0.34–0.73) compared to the Strange Situation. Though this point was later qualified by meta-analytic work by Dagan, Schuengel, Verhage, Van IJzendoorn, Bakermans-Kranenburg, and collaborators demonstrated that the network of insecure attachments to father *and* mother effectively predicted internalizing problems.<sup>327</sup> The AQS had a secondary status compared to the Strange Situation through the 2000s, but the impressive findings from the meta-analyses by Fearon and colleagues and Madigan and colleagues in the early 2010s contributed to increased reputation for the measure within the attachment research community, and growing acknowledgement that early attachment was not synonymous with the Strange Situation.<sup>328</sup>

Later work by Kok, Linting, Bakermans-Kranenburg, and colleagues may have relevance for interpreting findings regarding associations between early attachment and later internalizing difficulties. In the Generation R sample (discussed below), maternal sensitivity during infancy was found to be negatively associated with maternal report of child internalizing difficulties ( $r = -0.07$ ); but maternal report of child internalizing difficulties at age six was *positively* predicted by maternal sensitivity during infancy ( $r = 0.07$ ) and in the preschool years ( $r = 0.09$ ).<sup>329</sup> Equivalent findings were also reported for the NICHD sample (Chapter 3).<sup>330</sup> The lack of association between early attachment and later internalizing difficulties in the Groh and Madigan meta-analyses may in part result from an averaging out, if caregiver sensitivity has both positive and negative associations with internalizing difficulties. Kok and colleagues theorized that there may be a U-shaped curve, where the highest levels of sensitivity in fact express caregiver anxiety, and perhaps lack of self-care, which in turn contribute to child anxiety as the child gains the maturational abilities to pick up these difficulties. More recently, in an analysis of data from a large high-risk sample, Mitsven and colleagues reported a U-shaped curve in the relationship between caregiver responsiveness in interaction with their infant at four months and a classification of the dyad as disorganized in the Strange Situation at 12 months.<sup>331</sup>

A further meta-analysis by Groh and colleagues, published in 2014, reported on associations between early observed attachment and social competence.<sup>332</sup> With Bowlby's predictions of associations between early care and later social relationships (Chapter 1),

<sup>326</sup> Madigan, S., Atkinson, L., Laurin, K., & Benoit, D. (2013) Attachment and internalizing behavior in early childhood: A meta-analysis. *Developmental Psychology*, 49, 672–689.

<sup>327</sup> Dagan, O., Schuengel, C., Verhage, M. L., Van IJzendoorn, M. H., Sagi-Schwartz, A., Madigan, S., ... & Collaboration on Attachment to Multiple Parents and Outcomes Synthesis. (2021) Configurations of mother–child and father–child attachment as predictors of internalizing and externalizing behavioral problems: An individual participant data (IPD) meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 67–94.

<sup>328</sup> Lieneman, C., Kohlhoff, J., Cibralic, S., Wallace, N., Hawkins, E., Morgan, S., & McNeil, C. B. (2022) Observational measurement of attachment in toddlers with disruptive behavior using the Strange Situation procedure and Attachment Q-Set. *Journal of Child and Family Studies*, 31(12), 3385–3404.

<sup>329</sup> Kok, R., Linting, M., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Jaddoe, V. W., Hofman, A., ... & Tiemeier, H. (2013) Maternal sensitivity and internalizing problems: Evidence from two longitudinal studies in early childhood. *Child Psychiatry & Human Development*, 44, 751–765.

<sup>330</sup> Kerns, K. A., Siener, S., & Brumariu, L. E. (2011) Mother–child relationships, family context, and child characteristics as predictors of anxiety symptoms in middle childhood. *Development and Psychopathology*, 23(2), 593–604.

<sup>331</sup> Mitsven, S. G., Prince, E. B., Messenger, D. S., Tenenbaum, E. J., Sheinkopf, S. J., Tronick, E. Z., ... & Lester, B. M. (2022) Testing the mid-range model: Attachment in a high risk sample. *Developmental Science*, 25(3), e13185.

<sup>332</sup> Groh, A. M., Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Steele, R. D., & Roisman, G. I. (2014) The significance of attachment security for children's social competence with peers: A meta-analytic study. *Attachment & Human Development*, 16(2), 103–136.

this had been the most common correlate investigated by studies of attachment in developmental psychology.<sup>333</sup> Indeed, Ainsworth's students and the Minnesota group had initially founded the validity of the Strange Situation and attachment research on the capacity of the measure to predict social competence.<sup>334</sup> So the meta-analysis had particular symbolic importance. Where temperament researchers had expected that lack of distress in the Strange Situation would be associated with social competence, Sroufe and Minnesota colleagues documented that avoidance was associated with reduced social competence. And whereas social learning theorists expected that security in the Strange Situation would be associated with continued independence, Sroufe and Minnesota colleagues documented that early security was associated with a child's later capacity to be vulnerable, share feelings, and trust within close relationships.<sup>335</sup>

Groh and colleagues were able to draw on 80 samples, with findings from 4,441 dyads. Groh and colleagues reported that the global association between child–mother security and social competence was  $d = 0.39$  (CI 0.32–0.47), and once again not moderated by the age at which the outcome was assessed. Avoidance ( $d = 0.17$ , CI 0.05–0.30), resistance ( $d = 0.29$ , CI 0.09–0.48) and disorganization ( $d = 0.25$ , CI 0.10–0.40), were also significantly associated with lower peer competence, though with wide confidence intervals. These findings were of equivalent magnitude to the reports from Minnesota; they were later confirmed by Deneault as equivalent to findings with fathers.<sup>336</sup> There was no significant effect in the few studies that had examined child–father security and later social competence, though Groh and colleagues suspected that tests may have been underpowered.

Once more, in this meta-analysis, there were larger effect sizes for the AQS than the Strange Situation in predicting social competence ( $d = 0.50$ , CI 0.38–0.62), as Waters had anticipated when introducing the Q-sort measure.<sup>337</sup> Though confidence intervals were overlapping. A meta-regression by Groh and colleagues also suggested that part of the better performance of the AQS may be due to its use with older children. Additionally, Deneault, Hammond, and Madigan observed that the meta-analysis by Groh and colleagues drew from a number of studies using both maternal-report AQS and maternal-report for social competence, potentially inflating the association.<sup>338</sup>

An interesting finding from the 2014 paper by Groh and colleagues was that there was a considerably stronger association between early observed attachment and social competence with non-friends ( $d = 0.41$ , CI 0.35–0.47) compared to with friends ( $d =$

<sup>333</sup> Ly, A., Deneault, A.-A., Duschinsky, R., Schuengel, C., & Madigan, S. (2024) The Child Attachment Studies Catalogue and Data Exchange (CASCADE) dataset, a repository of all child–parent attachment studies conducted using observational measures. Poster presented at the International Attachment Conference, Rouen, France, July 2024

<sup>334</sup> Lieberman, A. F. (1977) Preschoolers' competence with a peer: Relations with attachment and peer experience. *Child Development*, 48(4), 1277–1287; Sroufe, L. A., Fox, N. E., & Pancake, V. R. (1983) Attachment and dependency in developmental perspective. *Child Development*, 54(6), 1615–1627.

<sup>335</sup> For example Sroufe, L. A., Carlson, E. A., & Shulman, S. (1993) Individuals in relationships: Development from infancy through adolescence. In D. C. Funder, R. D. Parke, C. Tomlinson-Keasey, & K. Widaman (eds), *Studying Lives through Time* (pp. 315–342), Washington, DC: American Psychological Association.

<sup>336</sup> Deneault, A. A., Bakermans-Kranenburg, M. J., Groh, A. M., Fearon, P. R., & Madigan, S. (2021) Child–father attachment in early childhood and behavior problems: A meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 43–66: child–mother attachment [Groh]:  $d = 0.15$  (CI 0.08–0.22); child–father attachment:  $d = 0.17$  (CI 0.08–0.26).

<sup>337</sup> Park, K. A. & Waters, E. (1989) Security of attachment and preschool friendships. *Child Development*, 60(5), 1076–1081.

<sup>338</sup> In contrast, in their meta-analysis of associations between early attachment and prosociality, there were considerably fewer studies with both maternal report AQS and maternal report for prosociality. In this meta-analysis the association was no different between the AQS and Strange Situation. Deneault, A. A., Hammond, S. I., & Madigan, S. (2023) A meta-analysis of child–parent attachment in early childhood and prosociality. *Developmental Psychology*, 59(2), 236–255.

0.15, CI 0.04–0.26). In fact, the association for friends was barely significant for the effects of security, and no or minimal association was discerned for avoidance, resistance, and disorganization.<sup>339</sup> These findings suggest that early attachment relationships play less of a role in shaping behaviour within established relationships in which a bond has been formed, and the friend is serving to an extent as a secure base for the child. Early attachment relationships play more of a role in shaping behaviour in unfamiliar situations where less is known about the peer, and the child has to operate on the basis of their existing assumptions. These findings aligned with Van IJzendoorn and Sagi-Schwartz's theory of the attachment network, in which individuals may experience multiple sources of potential secure base and safe haven availability, differing considerably in degree and kind (Chapter 3). Additionally, they offered important support for those such as Fraley and the Steeles, who had proposed that friendships can be attachment relationships of sorts, with some dependence and some independence on early parental attachment relationships, and of consequence for subsequent secure base/safe haven expectations.<sup>340</sup>

Following up on the work of Groh and colleagues on social competence, Deneault, Hammond, and Madigan looked at associations between early child attachment security and child prosocial behaviour.<sup>341</sup> Across 35 studies (4,611 dyads), secure child–mother relationships were associated with prosocial behaviour ( $r = 0.19$ , CI 0.14–0.23). Across eight studies (402) dyads, secure child–father relationships had a similar effect ( $r = 0.11$ , CI 0.02–0.23). The size of the association for prosociality was almost identical to the effects reported by Groh and colleagues for child–caregiver attachment and social competence. The study by Deneault and colleagues offered further support to the findings from Groh and colleagues that secure attachment relationships can contribute to positive relational qualities, as anticipated by attachment theory.<sup>342</sup>

In 2017 Groh and colleagues reported from a further meta-analysis, this time addressing associations between observations of early attachment and child temperament.<sup>343</sup> As we saw in Chapter 3, this was a controversial issue, as critics of attachment research had argued that differences in children's secure base and safe haven behaviour could be explained simply in terms of differences in their innate temperament.<sup>344</sup> A major polemic raged between Sroufe and critics of attachment research on the issue. Yet Bowlby and Ainsworth

<sup>339</sup> This was contrary to an earlier meta-analysis by Schneider, B. H., Atkinson, L., & Tardif, C. (2001) Child–parent attachment and children's peer relations: A quantitative review. *Developmental Psychology*, 37(1), 86–100. Groh and colleagues reflected on methodological problems with the Schneider study in their discussion section, such as some studies being missed and others counted twice.

<sup>340</sup> Fraley, R. C. (2007) A connectionist approach to the organization and continuity of working models of attachment. *Journal of Personality*, 75(6), 1157–1180; Steele, H. & Steele, M. (2005) The construct of coherence as an indicator of attachment security in middle childhood: The Friends and Family Interview. In Kerns, K. A. & Richardson, R. A. (eds), *Attachment in Middle Childhood* (pp. 137–160). New York: Guilford Press. See also Muzi, S., Rogier, G., & Pace, C. S. (2022) Peer power! Secure peer attachment mediates the effect of parental attachment on depressive withdrawal of teenagers. *International Journal of Environmental Research and Public Health*, 19(7), 4068.

<sup>341</sup> Deneault, A. A., Hammond, S. I., & Madigan, S. (2023) A meta-analysis of child–parent attachment in early childhood and prosociality. *Developmental Psychology*, 59(2), 236–255. The categories of behaviour examined were empathy, helping others, wishes to help others, and committed cooperation and compliance with others.

<sup>342</sup> Gross, J. T., Stern, J. A., Brett, B. E., & Cassidy, J. (2017) The multifaceted nature of prosocial behavior in children: Links with attachment theory and research. *Social Development*, 26(4), 661–678; Deneault, A.-A. & Hammond, S. I. (2021) Connecting the moral core: Examining moral baby research through an attachment theory perspective. *Social Cognition*, 39(1), 4–18.

<sup>343</sup> Groh, A. M., Narayan, A. J., Bakermans-Kranenburg, M. J., Roisman, G. I., Vaughn, B. E., Fearon, R. M., & IJzendoorn, M. H. (2017) Attachment and temperament in the early life course: A meta-analytic review. *Child Development*, 88(3), 770–795.

<sup>344</sup> Kagan, J. (1987) Perspectives on infancy. In J. D. Osofsky (ed.), *Handbook of Infant Development* (2nd ed., pp. 1150–1198). New York: Wiley.

fully agreed that temperament might make a contribution to fussy and whiney behaviour. Indeed, Ursula Bowlby was reflecting on this in print already in the 1950s.<sup>345</sup> In *Patterns of Attachment*, Ainsworth had explicitly proposed that negative emotionality might increase likelihood of resistant attachment.<sup>346</sup> In fact, in interview, she stated that this was rather obvious:

I don't think for a minute that there's a gene or a combination of genes that makes for secure versus insecure attachment. You can have infants that really are very badly put together to start with—very fussy, whiny, difficult—but if the mother is able to be responsive to the behavior anyhow, despite the difficulties, they can wind up being securely attached. But when you get a mother who finds it difficult to be responsive because of her own personality and a baby that is badly put together, then you have trouble.... Everybody knows that.<sup>347</sup>

Pursuing this line of reasoning further, Sagi-Schwartz and Lamb developed the specific prediction that some of what was coded as resistant attachment might reflect aspects of a child's temperament, such as emotional reactivity or fearfulness.<sup>348</sup> Such aspects of temperament might help explain the degree of concordance between child–mother and child–father attachment relationships.<sup>349</sup>

Groh and colleagues drew data from 109 samples, comprising 11,440 dyads. Confidence intervals suggested that temperament was not materially associated with avoidant ( $d = 0.10$ , CI  $-0.02$ – $0.19$ ) or disorganized ( $d = 0.11$ , CI  $-0.03$ – $0.25$ ) attachment. However, the association with resistant attachment was material ( $d = 0.30$ , CI  $0.21$ – $0.40$ ). Associations for fathers were equivalent to those for mothers.

These results could be interpreted as suggesting that aspects of temperament, such as liability to negative emotionality, may contribute to the likelihood of resistant attachment, perhaps in interaction with caregiver insensitivity.<sup>350</sup> This conclusion was supported by a later individual participant data meta-analysis by Dagan and colleagues (including Van IJzendoorn and Bakermans-Kranenburg; and myself), which found that negative emotionality significantly predicted a child's number of secure ( $d = -0.12$ ) and insecure-resistant ( $d = 0.11$ ) attachment relationships. Furthermore, Dagan and colleagues documented

<sup>345</sup> Bowlby, U. (1955) The dependent child. *Parents*, April 1955, p. 39: 'He may have lacked a secure relationship with his mother early on or he may have been away from her in hospital or he may just have been born with a clinging nature. And it happens just as often with members of large families as with only children' (39).

<sup>346</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press.

<sup>347</sup> Ainsworth, M. (1997) Peter L. Rudnytsky—the personal origins of attachment theory: An interview with Mary Salter Ainsworth, *Psychoanalytic Study of the Child*, 52, 386–405.

<sup>348</sup> Sagi, A., Lamb, M. E., & Gardner, W. (1986) Relationship between Strange Situation behavior and stranger sociability among infants on Israeli kibbutzim. *Infant Behavior and Development*, 2, 271–282. See also Moran, G. & Pederson, D. R. (1998) Proneness to distress and ambivalent mother–infant relationships observed in the home. *Infant Behavior and Development*, 21, 493–503.

<sup>349</sup> Van IJzendoorn, M. H. & De Wolff, M. S. (1997) In search of the absent father—meta-analyses of infant–father attachment: A rejoinder to our discussants. *Child Development*, 68(4), 604–609. See also Pinquart, M. (2022) Attachment security to mothers and fathers: A metaanalysis on mean-level differences and correlations of behavioural measures. *Infant and Child Development*, 31(6), e2364. Pinquart reported a meta-analytic association between the classification of attachment in the Strange Situation with respective parents as  $r = 0.26$ .

<sup>350</sup> For later supportive evidence, see for example Tchalova, K., Lydon, J. E., Atkinson, L., Fleming, A. S., Kennedy, J., Lecompte, V., ... & Bartz, J. A. (2024) Variation in the mu-opioid receptor gene (OPRM1) moderates the influence of maternal sensitivity on child attachment. *Translational Psychiatry*, 14(1), 181; An, D. & Kochanska, G. (2023) Sequelae of infants' negative affectivity in the contexts of emerging distinct attachment organizations: Multifinality in mother–child and father–child dyads across the first year. *Development and Psychopathology*, 35(4), 2011–2027.

higher negative emotionality in children with insecure-resistant attachment relationships with both parents compared to those with one or none ( $d = 0.19$ ).<sup>351</sup>

Groh and colleagues accepted that resistant attachment may be predisposed by such negative emotionality. However, they also considered two alternative or additional factors that might account for the empirical link. First, some of what is coded as resistant attachment may in fact be temperament. A child in episode 8 of the Strange Situation who is taking an interest in toys again on a parent's knee, but still occasionally irritable, might be coded as resistant, when a child less temperamentally irritable would have been coded as secure.

Second, observational measures of child temperament are often conducted with a parent present, which might confound the assessment of temperament with attachment. Resistant attachment does not necessarily require much activation of the attachment motivational system to be somewhat visible, perhaps merely the presence of a stranger. As such, the observational measures of temperament could be functionally equivalent to episode 3 of the Strange Situation, in which the stranger comes in, and in which children with resistant attachment may become fussy.

Part of Roisman's motivation for undertaking work on the series of meta-analyses was to appraise Sroufe's defence of the four-category system for conceptualizing individual differences in attachment. Sroufe had claimed that the four categories have different correlates, which supports the need for distinctions between them. Ultimately the findings of the series of meta-analyses were equivocal. Roisman broadly claimed the findings as a failure for the four-category system. He argued that the primary axis of relevant individual differences seemed to be secure versus insecure, with the exception of the link between disorganization and externalizing. Resistance and disorganization could be folded together as a second factor, opposed to avoidance, in a two-factor model (Chapter 3).

Van IJzendoorn and Bakermans-Kranenburg broadly claimed the findings as support for the four-category system. They stressed that externalizing behaviour was associated with disorganization and, to an extent, avoidance, showing the value of these categories. They argued that stronger evidence of the predictive power of the two-factor model, advocated by Roisman, would be needed to justify losing the disorganized classification.

This is not to say that Van IJzendoorn and Bakermans-Kranenburg had any great love of categories. They were mindful of the variance that may be lost by inappropriate categorical treatment of continuous data, and indeed have argued that mental health is generally best treated as a latent dimension.<sup>352</sup> In measures developed by their group, scales were preferred;<sup>353</sup> when categories were used they were complemented by continuous scales.<sup>354</sup> In their view, the continuous rating scale for disorganization might arguably be preferred above the Strange Situation classification in research. In any case, Van IJzendoorn and Bakermans-Kranenburg have frequently defended the distinctiveness of disorganization,

<sup>351</sup> Dagan, O., Schuengel, C., Verhage, M. L., Madigan, S., Roisman, G. I., Van IJzendoorn, M., ... & Oosterman, M. (2024) Attachment relationship quality with mothers and fathers and child temperament: An individual participant data meta-analysis. *Developmental Psychology*, early view.

<sup>352</sup> For example Sallis, H., Szekely, E., Neumann, A., Jolicoeur-Martineau, A., Van IJzendoorn, M., Hillegers, M., ... & Wazana, A. (2019) General psychopathology, internalising and externalising in children and functional outcomes in late adolescence. *Journal of Child Psychology and Psychiatry*, 60(11), 1183–1190.

<sup>353</sup> For example Mesman, J., Alink, L. R., van Zeijl, J., Stolk, M. N., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., ... & Koot, H. M. (2008) Observation of early childhood physical aggression: A psychometric study of the system for coding early physical aggression. *Aggressive Behavior*, 34(5), 539–552.

<sup>354</sup> For example, Out, D., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2009) The role of disconnected and extremely insensitive parenting in the development of disorganized attachment: Validation of a new measure. *Attachment & Human Development*, 11(5), 419–443.



and its non-reducibility to other forms of insecurity, as well as its particular value in research with clinical samples.<sup>355</sup>

For example, in a 2023 paper Van IJzendoorn and Makino reported analysis of 95 samples, comprising 4,819 dyads.<sup>356</sup> They reported that associations between the AAI and Strange Situation are best accounted for by two latent dimensions, but not the ones anticipated by Roisman. Rather than secure-insecure and avoidant-resistant dimensions, Van IJzendoorn and Makino found that associations were better accounted for by a secure-avoidant dimension and a secure-disorganized dimension. This model accounted for 87% of total variance. Leaving aside preoccupation on the AAI and resistance in the Strange Situation had no material consequence for the effectiveness of the model. Van IJzendoorn and Makino suggest that their findings add to growing evidence questioning the discriminant and predictive validity of resistant attachment.<sup>357</sup>

Despite their disagreements, Roisman, Van IJzendoorn, and Bakermans-Kranenburg, all agreed that the resistant classification had not shown a distinct set of correlates, besides a possible confounding with temperament. This evidence was convincing even to Sroufe, who acknowledged that meta-analytic research had failed to show distinct antecedents or sequelae for the classification.<sup>358</sup>

The meta-analyses of the 2010s on the sequelae of early attachment can be seen as a threshold, with the field of attachment research reaching a new stage of maturity. For Van IJzendoorn and Bakermans-Kranenburg, these studies offered dependable knowledge confirming the importance of early attachment relationships for later socioemotional development.<sup>359</sup> Yet hanging over these assertions was a concern about causal pathways, raised by Lamb and Thompson and colleagues in the mid-1980s (Chapter 1): could it be that attachment predicted later outcomes only because caregiver sensitivity was a mutual cause of *both* attachment and those outcomes?

No public response was offered at the time to Lamb and Thompson by Ainsworth's circle. Yet in private discussions Ainsworth and her closest collaborators acknowledged that this was a major question: 'Serious empirical issue: Two children with same current security status but different prior status or histories. What is value of knowing prior history

<sup>355</sup> For example, Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A., & Van IJzendoorn, M. H. (2024) Celebrating more than 26,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status. *Attachment & Human Development*, forthcoming: 'The correspondence analysis of the current study showed that the unresolved classification in the AAI represents an important independent vector, and is particularly relevant for clinical groups. The unresolved vector is clearly different from the preoccupied vector when the four-way AAI classifications of the norm group are projected on three two-dimensional spaces. In all three projections the unresolved vector is different from the dismissing and preoccupied vectors. Furthermore, our correspondence analysis makes clear why the unresolved category is perhaps redundant for describing (clusters of) typical groups but is indispensable to make sense of AAIs from respondents with atypical psychological symptoms or functioning. It is clear that the unresolved classification does not contribute much to the differentiation of mothers from fathers or "non-mothers", or pregnant mothers from expectant fathers. But the AAI distributions of all clinical groups except adults with physical handicaps hover around the point of gravity occupied by the U/CC classification.'

<sup>356</sup> This was a re-analysis of data from Verhage, M. L., Schuengel, C., Madigan, S., Fearon, R. M. P., Oosterman, M., Cassibba, R., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2016) Narrowing the transmission gap: A synthesis of three decades of research on intergenerational transmission of attachment. *Psychological Bulletin*, 142(4), 337–366.

<sup>357</sup> Van IJzendoorn, M. H. & Makino, N. (2023) In defense of unresolved attachment: Re-modelling intergenerational transmission of attachment. *Attachment & Human Development*, 25(2), 311–321.

<sup>358</sup> Sroufe, L. A. (2016) The place of attachment in development. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (3rd ed., pp. 997–1011). New York: Guilford, p. 1008.

<sup>359</sup> Van IJzendoorn, M., Fearon, P., & Bakermans-Kranenburg, M. (2017) Attachment—public and scientific discourse. *The Psychologist*, 30, 6–9; Groh, A. M., Fearon, R. P., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Roisman, G. I. (2017) Attachment in the early life course: Meta-analytic evidence for its role in socioemotional development. *Child Development Perspectives*, 11(1), 70–76.

for concurrent and predictive assessment?... Are patterns of anxious attachment related to patterns of psychopathology? If so, what explains this (care -> working model -> pathology pattern, or merely continuity of deviant care gives attachment pattern and then latter also gives pattern of pathology?).<sup>360</sup>

This issue, raised by Lamb and Thompson was generally sidelined by attachment researchers, at least in public. It was given prominence again by Thompson in a high-profile chapter the first (1999) and second (2008) editions of the *Handbook of Attachment*,<sup>361</sup> and then raised explicitly again by Fearon and colleagues in their 2010 meta-analysis:

Few studies have directly considered the possibility that certain parenting characteristics may be common determinants of both attachment insecurity and externalizing behaviour problems. Thus, the extent to which attachment processes per se can be shown to make a specific and causal contribution to children's externalizing problems, either independently of parenting or as a causal mediator of its effects, remains to be seen.<sup>362</sup>

Fearon's reflection here were likely influenced by an earlier study he had conducted together with Belsky, who in turn may have been influenced by his friendship with Thompson. Using secondary analysis of NICHD data, Belsky and Fearon found that associations between security of attachment in the infant Strange Situation and socioemotional and cognitive-linguistic outcomes at age three were stronger when caregiver sensitivity was stable across assessments.<sup>363</sup> Though perhaps due to the weakness of prospective prediction from Strange Situation data in the NICHD study, these effects partially disappeared when controlling for family socioeconomic status. Nonetheless, the findings highlighted for Fearon the possibility that associations between attachment security and child outcomes might not reflect the effects of security, but rather that both security and child outcomes reflected the effects of caregiving behaviour.

These questions had long been on the minds of Van IJzendoorn and Bakermans-Kranenburg, ever since reading Lamb, Thompson, and colleagues (Chapter 1), and they raised them in teaching for graduate students, if not in print.<sup>364</sup> Following the 2010 meta-analysis by Fearon and colleagues, they were addressed directly by Beijersbergen, Juffer,

<sup>360</sup> Waters, E. (1987) Outline for Winter Attachment Project: Compiled from written briefs (12/87) Unpublished manuscript.

<sup>361</sup> Thompson, R. A. (1999) Early attachment and later development. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment* (pp. 265–286). New York: Guilford Press; Thompson R. A. (2008) Early attachment and later development: Familiar questions, new answers. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment* (2nd ed., pp. 348–365). New York: Guilford Press.

<sup>362</sup> Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010) The significance of insecure attachment and disorganization in the development of children's externalizing behavior: A meta-analytic study. *Child Development*, 81(2), 435–456, p. 451. Suggesting that it was a position that Van IJzendoorn and Bakermans-Kranenburg were reflecting on, a similar point was also made in the same period by Luijk, M. P., Roisman, G. I., Haltigan, J. D., Tiemeier, H., Booth-LaForce, C., Van IJzendoorn, M. H., ... & Bakermans-Kranenburg, M. J. (2011) Dopaminergic, serotonergic, and oxytonergic candidate genes associated with infant attachment security and disorganization? In search of main and interaction effects. *Journal of Child Psychology and Psychiatry*, 52(12), 1295–1307, p. 1304.

<sup>363</sup> Belsky, J. & Fearon, R. P. (2002) Early attachment security, subsequent maternal sensitivity, and later child development: Does continuity in development depend upon continuity of caregiving? *Attachment & Human Development*, 4(3), 361–387.

<sup>364</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. (2003) Attachment: State of the art. Graduate seminar, Leiden University, Marinus Van IJzendoorn personal archive: 'The bottom line is that a strong prototype interpretation is implausible, but the verdict on prototype [causal effect of infant attachment expectations on later outcomes] versus context [causal effect of caregiver sensitivity on later outcomes] is still pending.'



Bakermans-Kranenburg, and Van IJzendoorn in a 2012 paper.<sup>365</sup> Beijersbergen and colleagues conducted a follow-up with 125 adolescents who had been adopted early in their childhoods. Maternal sensitivity and infant attachment were assessed at 12 months of age. When the children were 14 years old, maternal sensitivity was assessed again during a discussion around difficult and conflict-evoking topics. The AAI was used to assess the adolescents' state of mind regarding attachment.

The researchers found no continuity of attachment between infant attachment in the Strange Situation and states of mind regarding attachment in the AAI. However, maternal sensitivity in infancy and adolescence predicted continuity of secure attachment. Furthermore, a change from maternal insensitivity in infancy to sensitivity in adolescence predicted a change in attachment patterns from insecure to secure. The researchers concluded that continuity of attachment seems dependent on continuity of the caregiving context, as Lamb and Thompson (Chapter 1) had both predicted: 'We therefore submit that attachment theory should be a theory of sensitive parenting as much as it is a theory of attachment.'<sup>366</sup>

At age 23, the sample was asked to complete Waters and Waters' attachment script assessment (Chapter 1). The same results appeared. There was no continuity of attachment from infancy to young adulthood. Sensitive care during childhood, but not adolescence, was a good predictor of secure base scripts at age 23.<sup>367</sup>

This was a controversial finding given the extent of prior emphasis on prediction from the Strange Situation. In their 2014 meta-analysis on attachment and competence, Groh, Fearon, Bakermans-Kranenburg, Van IJzendoorn, Steele, and Roisman reflected on the 'urgent need for theory-driven studies that address mediating processes that account for such enduring effects, for example by addressing questions concerning whether such long-term continuities are due to the ongoing supportive function of attachment relationships and/or the early effects of attachment experiences on the construction of stable psychological structures.'<sup>368</sup>

As we saw in Chapter 3, Nivison and colleagues, including Groh and Roisman, later conducted analyses using both the Minnesota and NICHD studies, and found considerably greater prediction from measures of observed caregiver sensitivity than from the Strange Situation or AQS.<sup>369</sup> Was it perhaps caregivers' secure base and safe haven provision pulling the strings all along, rather than the child's expectations about caregiver availability generally?

This is a very live question for contemporary attachment research, with implications for theory, study design, and the targeting of family interventions. It has nonetheless been a question to which meta-analytic research has been strangely slow to respond. In principle

<sup>365</sup> Beijersbergen, M. D., Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2012) Remaining or becoming secure: Parental sensitive support predicts attachment continuity from infancy to adolescence in a longitudinal adoption study. *Developmental Psychology*, 48(5), 1277–1282.

<sup>366</sup> Ibid., 1281. Similar findings were also reported earlier by Grossmann, K., Grossmann, K. E., & Kindler, H. (2005) Early care and the roots of attachment and partnership representation in the Bielefeld and Regensburg Longitudinal studies. In K. E. Grossmann, K. Grossmann, & E. Waters (eds), *Attachment from Infancy to Adulthood: The Major Longitudinal Studies* (pp. 98–136). New York: Guilford Press.

<sup>367</sup> Schoenmaker, C., Juffer, F., Van IJzendoorn, M. H., Linting, M., van der Voort, A., & Bakermans-Kranenburg, M. J. (2015) From maternal sensitivity in infancy to adult attachment representations: A longitudinal adoption study with secure base scripts. *Attachment & Human Development*, 17(3), 241–256.

<sup>368</sup> Groh, A. M., Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Steele, R. D., & Roisman, G. I. (2014) The significance of attachment security for children's social competence with peers: A meta-analytic study. *Attachment & Human Development*, 16(2), 103–136, p. 126.

<sup>369</sup> Nivison, M., Caldo, P. D., Magro, S. W., Raby, K. L., Groh, A. M., Vandell, D. L., ... & Roisman, G. I. (2024) The predictive validity of the strange situation procedure: Evidence from registered analyses of two landmark longitudinal studies. *Development and Psychopathology*, early view.

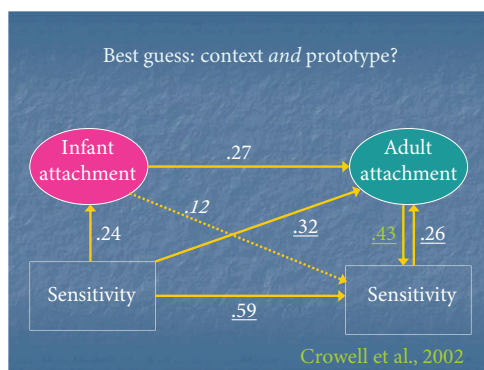


**Figure 4.2** A meta-analytic structural equation model of associations between sensitivity, the Strange Situation and the Adult Attachment Interview.

it might be thought that the question would appeal to Van IJzendoorn and Bakermans-Kranenburg. Given their distrust of individual subjectivity, observed caregiver sensitivity might be thought to have precedence over the Strange Situation, which measures behaviour suggestive of a child's subjective expectations of secure base and safe haven availability. Certainly, in the 2022 consensus statement on attachment and family court practice, Forslund, Van IJzendoorn, and colleagues advocated for the greater relevance of measures of caregiver behaviour than measures of attachment for understanding the adequacy of care children are receiving.<sup>370</sup>

In a 2003 graduate seminar, Van IJzendoorn and Bakermans-Kranenburg presented a meta-analysis of eight studies with data on caregiver sensitivity, the Strange Situation and a later AAI with the young person.<sup>371</sup> The conclusion was that parental sensitivity appeared to be more stable over time and of greater long-term influence than infant expectations assessed in the Strange Situation (Figure 4.2). This unpublished meta-analysis contributed to Van IJzendoorn and Bakermans-Kranenburg's confidence in the value of interventions to increase caregiver sensitivity, contributing to the development of VIPP-SD (discussed later). Nonetheless, the meta-analysis remained unpublished, likely due to the small number of available studies with all three measures. Other outcomes besides the AAI, where considerably more studies with relevant measures were available, were not addressed.

Ultimately, Van IJzendoorn and Bakermans-Kranenburg appear not to have regarded meta-analytic research on the sequelae of caregiver sensitivity as a priority. Perhaps this may be attributed to the priority given to the Strange Situation and observations of child behaviour within attachment research since the 1980s. Developmental scientists who entered the paradigm in the 1980s, including Van IJzendoorn, having gained ritual entry to attachment research through use of the Strange Situation (Chapter 1), may have had a degree of difficulty countenancing its potential redundancy to observations of caregiver behaviour. Alternatively, it could be that Van IJzendoorn and Bakermans-Kranenburg were more interested in the sequelae of the Strange Situation than caregiver sensitivity due to their interest in the disorganized classification, and loyalty to Main's work.

<sup>370</sup> Forslund, T., Granqvist, P., Van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M., ... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52.

<sup>371</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. (2003) Attachment: State of the art. Graduate seminar, Leiden University, Marinus Van IJzendoorn personal archive.

It may also be worth considering the statistical methods readily available. Meta-analytic examination of the respective contributions of observed caregiver and child behaviour to later child outcomes may have been hindered by the fact that the statistical tools for such work were only just gaining purchase in developmental science in the 2010s.<sup>372</sup> With such tools in hand, one of the research groups that has subsequently pursued meta-analytic work on the longitudinal implications of sensitivity is the Calgary team of Madigan and colleagues, who will be discussed in Chapter 5.

## Maltreatment

At the same time as pursuing meta-analytic research on the sequelae of the Strange Situation classifications, Van IJzendoorn and Bakermans supervised a doctoral student, Marije Stoltenborgh, in conducting a series of meta-analytic studies of the international prevalence of child maltreatment. The research has had considerable traction in policy, receiving discussion in the Dutch Parliament as well as in many international policy documents and clinical guidelines.<sup>373</sup> Van IJzendoorn was proud that this work spotlighted how many children were suffering from abuse and neglect.<sup>374</sup> Perhaps from Stoltenborgh, perhaps from the wider team of co-authors, the articles reporting on this research have a distinctive quality, a calm pain present in the tone, not the words.

One finding from Stoltenborgh's doctoral study was that an extreme gap existed between the combined prevalence of abuse in self-report studies and those drawing on professional informant report. Self-report studies for sexual abuse yielded a combined rate 30 times higher than the rate of informant studies (127 per 1,000 children vs 4 per 1,000 children).<sup>375</sup> The discrepancy was even stronger for emotional abuse, where self-report studies had a combined rate 121 times higher than the rate of informant studies (363 per 1,000 children vs 3 per 1,000 children).<sup>376</sup> Reflecting on these findings, Van IJzendoorn and Bakermans-Kranenburg suspected that informant reports may well underestimate prevalence rates, whereas self-report studies likely overestimate prevalence. The sheer difference in prevalence between self-report and informant-based measures also raises

<sup>372</sup> For example, Trivette, C. M., Dunst, C. J., & Hamby, D. W. (2010) Influences of family-systems intervention practices on parent-child interactions and child development. *Topics in Early Childhood Special Education*, 30(1), 3–19; Klahr, A. M. & Burt, S. A. (2014) Elucidating the etiology of individual differences in parenting: A meta-analysis of behavioral genetic research. *Psychological Bulletin*, 140(2), 544–586. The first paper to use meta-analytic structural equation modelling within attachment research was Zeegers, M. A., Colonna, C., Stams, G. J. J., & Meins, E. (2017) Mind matters: A meta-analysis on parental mentalization and sensitivity as predictors of infant-parent attachment. *Psychological Bulletin*, 143(12), 1245–1272.

<sup>373</sup> For example, European Parliamentary Research Service (2018) Domestic Sexual Abuse of Girls, [https://www.europarl.europa.eu/thinktank/en/document/IPOL\\_STU\(2018\)608837](https://www.europarl.europa.eu/thinktank/en/document/IPOL_STU(2018)608837); Asmussen, K., Fischer, F., Drayton, E., & McBride, T. (2020) Adverse childhood experiences: What we know, what we don't know, and what should happen next. *Early Intervention Foundation*, 92, <https://www.justice-ni.gov.uk/sites/default/files/publications/justice/eif-adverse-childhood-experiences-report-2020.pdf>; United Nations Children's Fund (2020) *Action to End Child Sexual Abuse and Exploitation*. New York: UNICEF; World Health Organization (2022). *Responding to Child Maltreatment: A Clinical Handbook for Health Professionals*. Geneva: World Health Organization.

<sup>374</sup> For example, Van IJzendoorn, M. H. (2013) Opvoeding bestuderen van molecuul tot maatschappelijke context. *NVO Bulletin*, 5, jaargang 14, 4–8/

<sup>375</sup> Stoltenborgh, M., Van IJzendoorn, M. H., Euser, E. M., & Bakermans-Kranenburg, M. J. (2011) A global perspective on child sexual abuse: Meta-analysis of prevalence around the world. *Child Maltreatment*, 16(2), 79–101, p. 87.

<sup>376</sup> Stoltenborgh, M., Bakermans-Kranenburg, M. J., Alink, L. R. A., & Van IJzendoorn, M. H. (2012) The universality of childhood emotional abuse: A meta-analysis of worldwide prevalence, *Journal of Aggression, Maltreatment & Trauma*, 21(8), 870–890.

questions about similarities or differences in their correlates,<sup>377</sup> including their respective relationship with insecure and disorganized attachment, which empirical research is yet to unpick.

Stoltenborgh and colleagues observed that the literature was overwhelmingly dominated by self-report studies of sexual abuse (323 studies), in contrast to few studies of child neglect (physical neglect: 13 studies; emotional neglect: 16 studies). Whilst they could report a synthesis of studies of self-report on the prevalence of neglect (163/1,000 for physical neglect, and 184/1,000 for emotional neglect), there were too few studies to examine most moderators, including the role of socioeconomic factors. There were also too few studies with informant report to attempt a synthesis. The researchers' tone is stubbornly sad as they described how child neglect had itself been neglected by the research community. They were struck that research on the prevalence of neglect was always reported in combination with other forms of abuse, indicating that 'studies on the prevalence of neglect were by-products rather than a primary interest'.<sup>378</sup>

Nonetheless, the meta-analytic evidence of the epidemiology of neglect from self-report studies was already an important contribution, showing that between a fifth and a sixth of people hold that they were physically and/or emotionally neglected in childhood. These findings underline the arguments of Bowlby,<sup>379</sup> Sroufe,<sup>380</sup> and Lyons-Ruth and colleagues (Chapter 2), that attachment research needs to attend to the spectrum of deprivation children experience, which may have different implications to forms of threat. Lyons-Ruth has especially pointed to a role for caregiver withdrawal behaviours in affecting the child-caregiver attachment relationship and later child socioeconomic development. The distinction between threat and deprivation has likewise been a growing theme in wider developmental psychopathology (Chapter 3).

The meta-analytic study by Stoltenborgh and colleagues signalled the considerable prevalence of forms of neglect, and that it has been profoundly understudied. These findings appear to have helped stimulate a research agenda around the antecedents of protective or lack of protective caregiving behaviour for Van IJzendoorn and Bakermans-Kranenburg.<sup>381</sup> That said, Van IJzendoorn and Bakermans-Kranenburg have not pursued whether or how this construct relates to alarming caregiving behaviour.

Stoltenborgh and colleagues also reported a curious and surprising finding from their synthesis of research on rates of child neglect: studies using a broad definition of emotional abuse yielded a similar prevalence rate to studies using narrow definition, essentially pertaining to verbal abuse of the child. Stoltenborgh and colleagues reflected that the findings

<sup>377</sup> Cf. Buisman, R. S., Pittner, K., Tollenaar, M. S., Lindenberg, J., van den Berg, L. J., Compier-de Block, L. H., ... & Van IJzendoorn, M. H. (2020) Intergenerational transmission of child maltreatment using a multi-informant multi-generation family design. *PloS One*, 15(3), e0225839; Baldwin, J. R., Coleman, O., Francis, E. R., & Danese, A. (2024) Prospective and retrospective measures of child maltreatment and their association with psychopathology: A systematic review and meta-analysis. *JAMA Psychiatry*, early view.

<sup>378</sup> Stoltenborgh, M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2013) The neglect of child neglect: A meta-analytic review of the prevalence of neglect. *Social Psychiatry and Psychiatric Epidemiology*, 48(3), 345–355, p. 352.

<sup>379</sup> For example, Bowlby, J. (1971) Evidence presented on 6/4/1971 to the Committee on the Adoption of Children, Home Office and Department of Health and Social Security, The National Archives, Kew, BN 29/2340. Bowlby argued that there is an 'urgent need' for 'a really adequate research study of emotional neglect', given potential implications for attachment and socioemotional development.

<sup>380</sup> Sroufe, L. A. (1985) Attachment classification from the perspective of infant-caregiver relationships and infant temperament. *Child Development* 56(1), 1–14. In the Minnesota study, 86% of children identified as experiencing emotional neglect by researchers received an insecure classification in the Strange Situation.

<sup>381</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2017) Protective parenting: Neurobiological and behavioral dimensions. *Current Opinion in Psychology*, 15, 45–49.

may imply that it is sufficient to use verbal abuse as an indicator of emotional abuse.<sup>382</sup> This is in line with Bowlby, who emphasized that repeated frightening verbal remarks alone by a caregiver may be sufficient to frighten a child and cause emotional difficulties, and especially if the remarks obstruct the capacity of the child to seek help from their caregiver in making sense of their fear and seeking comfort.<sup>383</sup> Mesman has expressed caution about Bowlby's emphasis on frightening verbal remarks, arguing that they may be interpreted by the child as symbolic rather than meaningful threats.<sup>384</sup> However, the importance of verbal source of fear in the meta-analytic research of Stoltenborgh and colleagues aligns well with these theoretical proposals by Bowlby. Additionally, they offer another source of support for a decision made by Jacobvitz in the 1990s, to adapt Main and Hesse's frightened/frightening (FR) coding system to include detailed assessment of verbal remarks by the caregiver that might frighten the child, including a wider set than Main and Hesse.<sup>385</sup> Jacobvitz's study would be the only one using the FR coding system to find full mediation between unresolved states of mind on the AAI and disorganization in the Strange Situation.<sup>386</sup>

Another salient finding from the work of Stoltenborgh and colleagues was a null finding for cultural-geographical differences in physical abuse.<sup>387</sup> Studies in different countries in fact reported equivalent prevalence. Furthermore, there were no significant differences in reported prevalence between ethnicities within countries. The researchers acknowledged that common wisdom in policy and practice took as given that some ethnic groups were more likely to physically abuse their children. They argued that such common wisdom was likely conflating ethnicity with strain on the family from socioeconomic pressures and stigma. Their meta-analytic results implied that cultural-geographical or ethnic differences alone were not material for the prevalence of physical abuse.

<sup>382</sup> Stoltenborgh, M., Bakermans-Kranenburg, M. J., Alink, L. R., & Van IJzendoorn, M. H. (2012) The universality of childhood emotional abuse: A meta-analysis of worldwide prevalence. *Journal of Aggression, Maltreatment & Trauma*, 21(8), 870–890.

<sup>383</sup> Bowlby, J. ([1937–9] 2000) Guilt and family contracts. In R. Duschinsky & K. White (eds), *Trauma and Loss: Key Texts from the John Bowlby Archive* (pp. 141–164). London: Routledge; Bowlby, J. (1985) The role of childhood experience in cognitive disturbance. In M. J. Mahoney & A. Freeman (eds), *Cognition and Psychotherapy* (pp. 181–200). New York and London: Plenum. See also Bowlby, J. (1986) Transcript of interview by Lange, PP/BOW/A.5/16 'To you and me "rock school" means nothing particular. But in the context of this particular family the father in this case had explained to this girl, his daughter, that if she was naughty, she would be sent to a school on a rocky island off the coast of Scotland which was surrounded by sharks. A kind of Devil's Island. So the word "rock school" meant an immense amount of fright to this daughter.'

<sup>384</sup> For example, Mesman, J. & Emmen, R. A. G. (2021) Cultural perspectives on parenting. In V. A. Weekes-Shackelford & T. K. Shackelford (eds), *The Oxford Handbook of Evolutionary Psychology and Parenting* (pp. 97–114). Oxford: Oxford University Press, p. 104.

<sup>385</sup> Jacobvitz, D., Hazan, N., Zackagnino, M., Mesina, S., & Beverung, L. (2011) Frightening maternal behavior, infant disorganization, and risks for psychopathology. In D. Cicchetti & G. Roisman (eds), *The Origins and Organization of Adaptation and Maladaptation* (pp. 283–322). New York: Wiley. 'When the children in our sample were 24 months old, mothers were videotaped playing with them in a laboratory playroom for 20 minutes, followed by a 10-minute period in which they were to ask their toddler to clean up the toys. Videotapes of these interactions were coded for instances of mothers' nonverbal FR behaviors but added frightening speech contents that were observable in the context of play. These included catastrophizing on the part of the mother as an aspect of frightening behavior' (299).

<sup>386</sup> Jacobvitz, D., Leon, K., & Hazen, N. (2006) Does expectant mothers' unresolved trauma predict frightened/frightening maternal behavior? Risk and protective factors. *Development and Psychopathology*, 18(2), 363–379. Conversely, on the importance of verbal support as a protective factor within attachment relationships, see also Thompson, R. A. (2010) Feeling and understanding through the prism of relationships. In S. D. Calkins & M. A. Bell (eds), *Child Development at the Intersection of Emotion and Cognition* (pp. 79–95), Washington, DC: American Psychological Association.

<sup>387</sup> Stoltenborgh, M., Bakermans-Kranenburg, M. J., IJzendoorn, M. H., & Alink, L. R. (2013) Cultural-geographical differences in the occurrence of child physical abuse? A meta-analysis of global prevalence. *International Journal of Psychology*, 48(2), 81–94.

In 2015, Euser, Alink, Stoltenborgh, Bakermans-Kranenburg, and Van IJzendoorn followed up this work on prevalence with a further meta-analysis, focused on randomized-control trials of interventions aiming at preventing child maltreatment. They analysed data from 23 trials, conducted with 4,883 families. The results were disheartening. The combined effect on maltreatment of these interventions was  $d = 0.13$ . Even this small effect disappeared after a trim-and-fill approach that took into account publication bias against smaller studies without significant results. So, on average, there appeared no effect.

Euser and colleagues titled their paper ‘a gloomy picture.’<sup>388</sup> However, an important contributor to this null finding was the aggregation of different kinds of interventions, with ineffective interventions dragging down the combined effect. Euser and colleagues found that there was no effect for interventions that solely offered support to the family, and no effect for preventative interventions for families identified as at risk of maltreating their children rather than with substantiated maltreatment already taking place. Considerably more effective were interventions where maltreating families were provided training as well as support ( $d = 0.37$ ). Euser and colleagues found that interventions with a moderate duration (6–12 months) or a moderate number of sessions (16–30) had significantly greater effects compared to shorter or longer interventions and those with fewer or more sessions.

A further review was published in 2019, by Van IJzendoorn, Bakermans-Kranenburg, and two former graduate students, Reijman and Coughlan. This paper used an umbrella methodology: a meta-analysis of meta-analyses. Van IJzendoorn, Bakermans-Kranenburg, and colleagues drew data from 11 meta-analyses that had examined antecedents of child maltreatment, in turn reporting from research with 1.5 million participants. This included a meta-analysis of the antecedents of child maltreatment by Madigan and colleagues (Chapter 5).

The most potent antecedent of child maltreatment was a parent’s own experience of maltreatment ( $d = 0.47$ ). Van IJzendoorn, Bakermans-Kranenburg, and colleagues acknowledged that this was a sizeable association, but also urged recognition that ‘many parents maltreated in childhood escape this cycle of abuse’:

There is only a 64% chance that a parent picked at random from the group with childhood maltreatment experiences will maltreat their own children than a person picked at random from the nonmaltreated group. Consequently, maltreatment experiences are by no means doomed to be repeated in next generations.<sup>389</sup>

Another finding that may have had a personal meaning for Van IJzendoorn was that financial adversity was an antecedent of child maltreatment ( $d = 0.34$ ). Furthermore, there was evidence of publication bias, with studies documenting an association *less* likely to be published. An influence on the non-publication of positive findings may have been the dominance of theories like Belsky’s process model, which assert that socio-economic factors will only influence maltreatment indirectly (Chapter 3). Trim-and-fill correction increased the association between financial adversity and child maltreatment to  $d = 0.48$ . That is to say, the effect was *as strong as a parent’s own history of abuse*,

<sup>388</sup> Euser, S., Alink, L. R., Stoltenborgh, M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) A gloomy picture: A meta-analysis of randomized controlled trials reveals disappointing effectiveness of programs aiming at preventing child maltreatment. *BMC Public Health*, 15(1), 1068.

<sup>389</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Coughlan, B., & Reijman, S. (2020) Annual research review: Umbrella synthesis of meta-analyses on child maltreatment antecedents and interventions: Differential susceptibility perspective on risk and resilience. *Journal of Child Psychology and Psychiatry*, 61(3), 272–290, p. 282, parentheses suppressed.



usually considered the more relevant risk factor in the research and practice literatures. Van IJzendoorn, Bakermans-Kranenburg, and colleagues reflected that 'limited social and material resources for families are among the most potent predictors and robust correlates of elevated maltreatment risks', and they argued for the potential benefit of financial interventions to reduce strain on families at risk of maltreatment.<sup>390</sup>

Van IJzendoorn, Bakermans-Kranenburg, and colleagues also synthesized findings from 11 meta-analyses that examined the effectiveness of interventions to reduce maltreatment. The umbrella analysis reported an effect size of  $d = 0.27$  for interventions seeking to address substantiated maltreatment. Van IJzendoorn, Bakermans-Kranenburg, and colleagues reflected that this means that if 100 families receive an intervention, *only eight* more will have a more favourable outcome compared to those without an intervention. The effect sizes for the antecedents of child maltreatment were substantially greater than the effect size for the effectiveness of intervention to reduce maltreatment. These results signal that social welfare interventions with families can have a positive effect but highlight the relative powerlessness of child welfare professionals in very many of their cases.

A follow-up umbrella review was conducted by Coughlan, Van IJzendoorn, Bakermans-Kranenburg, and colleagues (including myself), examining the mental health sequelae of child maltreatment.<sup>391</sup> This umbrella review combined effect sizes from 183 meta-analyses, including around 19 million people. The findings were curious. It might have been assumed that child maltreatment would have a greater association with specific mental health outcomes, such as depression. In fact, maltreatment had generally equivalent associations with *all* measured mental health outcomes ( $d = 0.43$ – $0.56$ ). An implication is that diagnosis-centric mental health provision may be especially unsuitable for people with experiences of child maltreatment, leaving considerable unmet need.

Furthermore, the association between different forms of child maltreatment and later mental health difficulties was also of much the same magnitude. This finding ran contrary to the widespread assumption, which can be found in the family courts and in the prioritization of research, that some forms of maltreatment (e.g., sexual abuse) are more harmful than other forms of maltreatment (e.g., neglect).<sup>392</sup> Furthermore, the finding ran contrary to the assumption that the form of maltreatment will influence the form of mental health difficulty, for instance with physically abused children copying their abusing parent and showing more externalizing than internalizing difficulties. Scholars have defended related positions: as we saw in [Chapters 2 and 3](#), Lyons-Ruth and Belsky have both argued that experiences of threat and deprivation will have different sequelae, including for mental health.<sup>393</sup> Such arguments were not supported by the umbrella findings.

<sup>390</sup> Ibid., 284.

<sup>391</sup> Coughlan, B., Duschinsky, R., Bakermans-Kranenburg, M. J., Bakkum, L., Skinner, G. C. M., Markham, A., Beckwith, H. & Van IJzendoorn, M. H. (2024) Equifinality and multifinality of child maltreatment: Umbrella synthesis on mental health correlates in over 19 million people. *JCPP Advances*, forthcoming.

<sup>392</sup> These results are congruent with an earlier cross-cultural study by Mbagaya, Oburu, and Bakermans-Kranenburg, which found that self-reported neglect made *no less* a contribution to mental ill health than physical or sexual abuse, and in fact potentially made a stronger contribution. Mbagaya, C., Oburu, P., & Bakermans-Kranenburg, M. J. (2013) Child physical abuse and neglect in Kenya, Zambia and the Netherlands: A cross-cultural comparison of prevalence, psychopathological sequelae and mediation by PTSS. *International Journal of Psychology*, 48(2), 95–107.

<sup>393</sup> Ellis, B. J., Sheridan, M. A., Belsky, J., & McLaughlin, K. A. (2022) Why and how does early adversity influence development? Toward an integrated model of dimensions of environmental experience. *Development and Psychopathology*, 34(2), 447–471.

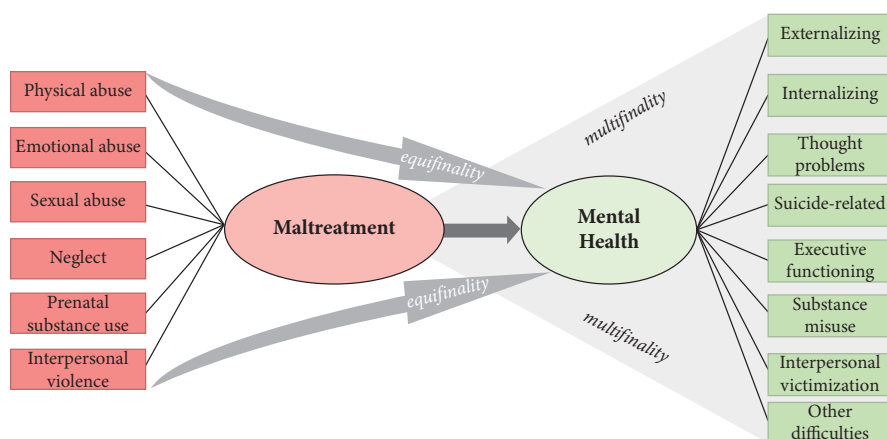


**Figure 4.3** A model of multifinality and equifinality in associations between early maltreatment and later mental health.

Source: From Coughlan et al. (2024).

Various forms of maltreatment seem to have equivalent sequelae (equifinality), just as various forms of mental health difficulty seem to stem from maltreatment (multifinality).<sup>394</sup> Despite the apparent differences between forms of maltreatment, Coughlan and colleagues reflected that their findings might best be explained by a role for common mechanisms conferring higher risk for various mental health difficulties following any form of child maltreatment. Such common mechanisms might include affect dysregulation, executive function difficulties, or breakdown of trust (Figure 4.3).

It should be acknowledged that a major limitation with the umbrella review is that it fails to address co-occurrence. Earlier work by Van IJzendoorn and colleagues using child protection records over a five-year period in the Netherlands reported that 55% of cases had documented one type of maltreatment, 30% documented two different types, 13% documented three types, and 2% documented four or more types.<sup>395</sup> Apparent similarities in the effects of different forms of maltreatment in the umbrella review may stem in part from co-occurrence between the different forms of maltreatment. That said, this qualification would not undermine either of the main conclusions from Coughlan and colleagues' paper: that a transdiagnostic approach to supporting people with experience of child maltreatment may be most helpful; and that it may not be assumed that some forms of child maltreatment are more harmful than others for subsequent mental health.

Various attachment researchers, such as Sroufe and Fonagy, and clinicians such as Schore and Siegel, have proposed that a common mechanism linking maltreatment to transdiagnostic mental health difficulties may be disorganized attachment.<sup>396</sup> This has

<sup>394</sup> Cicchetti, D. & Rogosch, F. A. (1996) Equifinality and multifinality in developmental psychopathology. *Development and Psychopathology*, 8(4), 597–600.

<sup>395</sup> Euser, S., Alink, L. R., Pannebakker, F., Vogels, T., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2013) The prevalence of child maltreatment in the Netherlands across a 5-year period. *Child Abuse & Neglect*, 37(10), 841–851. For the importance of poly-victimization, see Racine, N., Zhu, J., Hartwick, C., & Madigan, S. (2022) Differences in demographic, risk, and protective factors in a clinical sample of children who experienced sexual abuse only vs. poly-victimization. *Frontiers in Psychiatry*, 12, 2425.

<sup>396</sup> Siegel, D. J. (1999) *The Developing Mind: Toward a Neurobiology of Interpersonal Experience*. New York: Guilford Press; Fosha, D. (2000) *The Transforming Power of Affect*. New York: Basic Books; Schore, A. N. (2003) *Affect Regulation and the Repair of the Self*. New York: Norton; Fonagy, P., Gergely, G., Jurist, E. L. & Target, M. (2004) *Affect Regulation, Mentalization and the Development of the Self*. London: Routledge; Sroufe, L. A. (2005)



sparked what Ecker and colleagues call the ‘great attachment debate’ in the clinical literature, with extreme claims made for and against a causal role of individual differences in attachment for mental health trajectories.<sup>397</sup> Van IJzendoorn and Bakermans-Kranenburg have tended to be cautious about aetiological claims for attachment, and in the umbrella review did not propose this as a possible common mechanism. Disorganized attachment and maltreatment are not infrequently lumped together in clinical discourses. This has been identified by Beckwith, Van IJzendoorn, and colleagues (including myself) as part of the translation gap between researchers and clinicians in their respective understandings of attachment theory.<sup>398</sup>

Certainly disorganized and insecure attachment is higher in samples of maltreated children.<sup>399</sup> However, a sizeable minority of children in maltreated samples, around 25%, are still classified as secure. Clinically oriented commentators have situated this as a challenge to contemporary attachment theory. Explanations put forward by researchers include measurement error, limitations to the disorganized attachment classification, child differential susceptibility to threat (Chapter 3), or potentially that the child generally receives responsive care except when specific triggers for maltreatment are present.<sup>400</sup> Interventions that reduce maltreatment also contribute to increases in attachment security, indicating a potential causal relationship.<sup>401</sup>

Nonetheless, the meta-analytic research of Van IJzendoorn, Bakermans-Kranenburg, and collaborators has documented that, while there may be some overlap, insecure/disorganized attachment and maltreatment appear to have quite distinct correlates.<sup>402</sup> As we have seen, diverse forms of maltreatment appear to have equivalent associations with various forms of mental health difficulty, with a magnitude of around  $d = 0.43$ – $0.56$ . By comparison, meta-analytic associations between disorganized attachment

Attachment and development: A prospective, longitudinal study from birth to adulthood, *Attachment & Human Development*, 7(4), 349–367.

<sup>397</sup> Ecker, B., Ticic, R., & Hulley, L. (2024) *Unlocking the Emotional Brain: Eliminating Symptoms at Their Roots Using Memory Reconsolidation*. London: Routledge, chapter 5.

<sup>398</sup> Beckwith, H., Van IJzendoorn, M., Freeston, M., Woolgar, M., Stenner, P., & Duschinsky, R. (2022) A ‘transmission gap’ between research and practice? A Q-methodology study of perceptions of the application of attachment theory among clinicians working with children and among attachment researchers. *Attachment & Human Development*, 24(6), 661–689. See also Duschinsky, R., Bakkm, L., Mannes, J. M., Skinner, G. C., Turner, M., Mann, A., ... & Beckwith, H. (2021) Six attachment discourses: Convergence, divergence and relay. *Attachment & Human Development*, 23(4), 355–374, Table 4.

<sup>399</sup> Baer, J. C. & Martinez, C. D. (2006) Child maltreatment and insecure attachment: A meta-analysis. *Journal of Reproductive and Infant Psychology*, 24(3), 187–197; Cyr, C., Euser, E. M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2010) Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, 22(1), 87–108.

<sup>400</sup> See, for example, Lamb, M. E., Gaensbauer, T. J., Malkin, C. M., & Schultz, L. A. (1985) The effects of child maltreatment on security of infant-adult attachment. *Infant Behavior and Development*, 8(1), 35–45; Cicchetti, D., & Barnett, D. (1991) Attachment organization in maltreated preschoolers. *Development and Psychopathology*, 3(4), 397–411; Crittenden, P. (2017) *Raising Parents: Attachment, Representation, and Treatment*, 2nd ed. London: Routledge.

<sup>401</sup> For example, Cicchetti, D., Rogosch, F. A., & Toth, S. L. (2006) Fostering secure attachment in infants in maltreating families through preventive interventions. *Development and Psychopathology*, 18(3), 623–649; Steele, H., Murphy, A., Bonuck, K., Meissner, P., & Steele, M. (2019) Randomized control trial report on the effectiveness of Group Attachment-Based Intervention (GABI©): Improvements in the parent–child relationship not seen in the control group. *Development and Psychopathology*, 31(1), 203–217; Zajac, L., Raby, K. L., & Dozier, M. (2020) Sustained effects on attachment security in middle childhood: Results from a randomized clinical trial of the Attachment and Biobehavioral Catch-up (ABC) intervention. *Journal of Child Psychology and Psychiatry*, 61(4), 417–424.

<sup>402</sup> On the small association between attachment and trauma, and problems with the eliding of this distinction in clinical discourse, see Cushing, T., Robertson, S., Mannes, J., Marshall, N., Carey, M. J., Duschinsky, R., & Meiser-Stedman, R. (2024) The relationship between attachment and posttraumatic stress in children and adolescents: A meta-analytic review. *Development and Psychopathology*, early view.

and internalizing difficulties are weak, with only avoidance having a statistically significant association. Resistant attachment has little in the way of developmental correlates.

Yet a comparison between meta-analytic findings for maltreatment and early attachment is obstructed by a missing third term. As mentioned above, over time attachment researchers, including Van IJzendoorn and Bakermans-Kranenburg, have been coming to an interpretation of the Strange Situation and AQS as indirect measures of caregiving. As proposed by Lamb and Thompson (Chapter 1), certain parenting characteristics, such as secure base and safe haven unavailability, may be common determinants of both attachment insecurity and externalizing behaviour problems. At this point, the relationship with maltreatment is foggy. Nonetheless, the work of Van IJzendoorn, Bakermans-Kranenburg, and colleagues using meta-analytic methodology has provided ample reason to expect that quantitative synthesis will be central, not only to synthesizing results, but to new discoveries in this area.

## Attachment, Culture, and Context

### Early Reflections

When Van IJzendoorn began studies with the Strange Situation in the early 1980s, only very few studies using the measure had been conducted outside the United States. The Grossmanns had published their Bielefeld findings in 1981, with a greater frequency of avoidant infants than Ainsworth or other US colleagues.<sup>403</sup> Then Lamb and colleagues published findings from a Swedish sample in 1982 (Chapter 1),<sup>404</sup> and Durrett and colleagues reported findings from Japan in 1984,<sup>405</sup> both with equivalent distributions to Ainsworth. In the influential *Growing Points* special issue in 1985 edited by Bretherton and Waters, Sagi-Schwartz, and colleagues then published findings from an Israeli study, reporting a greater frequency of resistant infants than Ainsworth or other US colleagues.<sup>406</sup>

Subsequent research with German samples failed to replicate the Bielefeld distribution. And once the disorganized attachment classification was included in Israeli studies from the mid-1990s, the rates of resistance were also no longer discrepant. In retrospect, Bielefeld had received extremely heavy bombing and family displacement during World War II, and the parents in the Israeli samples had experienced war, with data collection occurring during the first intifada. Alkalay and Sagi-Schwartz have reflected that the initial findings may have reflected a combination of (i) traumatized families and (ii) an absence of a disorganized classification for capturing the relational fallout.<sup>407</sup> They noted

<sup>403</sup> Grossmann, K. E., Grossmann, K., Huber, F., & Wartner, U. (1981) German children's behavior towards their mothers at 12 months and their fathers at 18 months in Ainsworth's Strange Situation. *International Journal of Behavioral Development*, 4, 157–181.

<sup>404</sup> Lamb, M. E., Hwang, C. P., Frodi, A., & Frodi, M. (1982) Security of mother- and father-infant attachment and its relation to sociability with strangers in traditional and non-traditional Swedish families. *Infant Behavior and Development*, 5, 355–367.

<sup>405</sup> Durrett, M. E., Otaki, M., & Richards, P. (1984) Attachment and the mother's perception of support from the father. *International Journal of Behavioral Development*, 7, 167–176.

<sup>406</sup> Sagi, A., Lamb, M. E., Lewkowicz, K. S., Shoham, R., Dvir, R., & Estes, D. (1985) Security of infant–mother, father, metapelet attachments among kibbutz-reared Israeli children. In I. Bretherton & E. Waters (eds), *Growing Points of Attachment Theory and Research. Monographs of the Society for Research in Child Development*, 50(1–2), 257–275.

<sup>407</sup> Alkalay, S. & Sagi-Schwartz, A. (2024) The legacy of Mary Main in attachment and developmental research in Israel. *Attachment & Human Development*, early view. See also Kaiser, M., Kuwert, P., Braehler, E., & Glaesmer, H. (2018) Long-term effects on adult attachment in German occupation children born after World War II

that samples collected in peacetime in Israel have had considerably lower incidence of disorganized attachment (e.g., the Haifa Study of Early Child Care; [Chapter 3](#)). Alkalay and Sagi-Schwartz considered that such patterns support the idea that frightening national events and societal-level stress can shape the ecology in which attachment relationships develop.<sup>408</sup>

At the time, however, the initial reports of differences from Ainsworth results in Germany and Israel generated considerable interest from developmental scientists. They perhaps resonated with cultural stereotypes in the 1980s about repressed Germans and loud, emotional, close-knit Israelis families, which may have contributed to the impression that the distribution in Strange Situation classifications represented meaningful and important cross-cultural differences in children's development. These early, unreplicated findings have continued to be cited over and over by subsequent researchers, despite the lack of replication, as they set the terms of discussion of attachment and culture.<sup>409</sup> They have also been reported prominently in general psychology and developmental psychology textbooks, misinforming perceptions of attachment research for countless students.

The Leiden group were the next to publish results from the Strange Situation outside of the United States. The early publications therefore had titles flagging that they represented 'the Dutch case'.<sup>410</sup> At this point, for Van IJzendoorn and colleagues to pursue research on attachment was, ineluctably, to undertake cross-cultural research, since the United States was an unnegotiable point of comparison as the centre of gravity for the study of attachment. The papers of the 1980s by Van IJzendoorn and the Leiden team reflected an interested but not uncritical stance towards Ainsworth and the Strange Situation. There is a sense of an evaluation of the claims of early attachment research from a distance, geographical and theoretical. Van IJzendoorn did not yet identify with attachment research: at this point he was still an outsider to the community.

As a consequence, in these early papers we see criticisms of attachment research that stand out against Van IJzendoorn's later role as advocate for the paradigm. In his early remarks on the cross-cultural validity of the Strange Situation, Van IJzendoorn expressed a considerable degree of scepticism. He did not question children's use of their caregiver as a safe haven in times of need, or that differences in how children used their caregiver in this way might reveal their assumptions about the relationship. However, he did worry that caregivers' cultural values may influence the kinds of behaviours they respond to, and so children's repertoires for seeking care would also be influenced by cultural factors.<sup>411</sup>

Ainsworth was mindful of this issue. In her view, 'environmental influences play no significant role in the infant's basic need for an attachment figure who can be trusted. But culture-related differences in ecologies and expectations will certainly affect how some specific aspects of that organization are expressed under particular conditions—I am thinking

in comparison with a birth-cohort-matched representative sample of the German general population. *Aging & Mental Health*, 22(2), 197–207.

<sup>408</sup> Cf. Cummings, E. M., Taylor, L. K., Merrilees, C. E., Goeke-Morey, M. C., & Shirlow, P. (2016) Emotional insecurity in the family and community and youth delinquency in Northern Ireland: A person-oriented analysis across five waves. *Journal of Child Psychology and Psychiatry*, 57(1), 47–54.

<sup>409</sup> For example, Mousavi, P. S. S., Mazaheri, M. A., Aslafi, T., Khalighi, F., & Poorganji, M. (2020) Attachment and culture: Mother's perception of attachment related components and beliefs in Iran, Iraq and Afghanistan. *Early Child Development and Care*, 190(11), 1778–1790.

<sup>410</sup> Van IJzendoorn, M. H., Goossens, F. A., Kroonenberg, P. M., & Tavecchio, L. W. C. (1985) Dependent attachment, B4-children in the Strange Situation. *Psychological Reports*, 57, 439–451; Goossens, F. A., Van IJzendoorn, M. H., Tavecchio, L. W. C., & Kroonenberg, P. M. (1986) Stability of attachment across time and context in a Dutch sample. *Psychological Reports*, 58, 23–32.

<sup>411</sup> Van IJzendoorn, M. H. (1979) Operationaliseringsproblemen bij onderzoek naar de affectieve relatie tussen ouder en kind. *Pedagogische Studien*, 56, 358–368, p. 358.

here, for instance, of proximity seeking.<sup>412</sup> Indeed, Ainsworth observed with interest that many of her Uganda sample clapped when their mother re-entered the room, but she never saw this behaviour in the home observations of her Baltimore sample.<sup>413</sup> Ainsworth did not anticipate that such differences would interfere with the capacity of a coder to distinguish security and insecurity. In her view, culture shapes many aspects of parenting and might sometimes influence caregivers' response to infants' distress signals. She felt the question was 'worthwhile pursuing', though she predicted that culture was unlikely to influence caregivers' response to infant distress consistently.<sup>414</sup>

Van IJzendoorn was not so sure. The high level of resistant attachment seen in Sagi-Schwartz and colleagues' Israeli sample might partly reflect genuine lack of confidence in caregiver availability and/or a learnt response for signalling need in a society with high expressed affect:

We feel justified in assuming that attachment behavior such as proximity-seeking, crying, and contact-maintaining is indeed the outcome of universally 'programmed' lower psychological processes. Patterns of attachment, however, are the expression of nonverbally mediated higher processes that can be strongly culture-bound. The same patterns of attachment could in different cultures fulfil different functions in the transaction between the child and its environment.<sup>415</sup>

The culture-bound functions of patterns of attachment behaviour might be unpicked by naturalistic observation of the dyad. However, the structured interactions of the Strange Situation made it deeply unsuited for this purpose.

More to the point, dyads are situated within a broader context. Culture may well be expected to influence triadic interaction between fathers, mothers, and infants, and the interaction with parents of other figures who offer varying kinds and degrees of secure base and safe haven availability such as older siblings, grandparents, and daycare providers. These interactions may shape the kind of secure base and safe haven availability experienced by infants, with implications for infants' expectations about caregivers' availability in the context of the Strange Situation. (However, as discussed in [Chapter 5](#), based on the currently available set of studies, the strengths of associations between maternal and paternal sensitivity and the Strange Situation are much the same.)

So, in his early writings, on the one hand Van IJzendoorn was heedful that infant's Strange Situation behaviour may be influenced by parental responses shaped by cultural values. He felt that attachment researchers needed to give this more attention. On the other hand, he criticized those who wished to draw analogies between infants' behaviour and the characteristics (viz. stereotypes) of particular cultures.<sup>416</sup> Where other developmental

<sup>412</sup> Ainsworth, M. D., & Marvin, R. S. (1995) On the shaping of attachment theory and research: An interview with Mary DS Ainsworth (Fall 1994) *Monographs of the Society for Research in Child Development*, 60(2/3), 3–21.

<sup>413</sup> Ainsworth, M. (1967) *Infancy in Uganda*. Baltimore: The Johns Hopkins Press, p. 340.

<sup>414</sup> Ainsworth, M. D., & Marvin, R. S. (1995) On the shaping of attachment theory and research: An interview with Mary DS Ainsworth (Fall 1994) *Monographs of the Society for Research in Child Development*, 60(2/3), 3–21: 'My intuition is that mothers who come to reject their child's proximity bids as a matter of principle—"because this is the way to do things, it's the way my mother taught me"—may not be as consistent in rejecting the baby's requests and desires' (8–9).

<sup>415</sup> Van IJzendoorn, M. H. (1986) The cross-cultural validity of the Strange Situation from a Vygotskian perspective. *The Behavioral and Brain Sciences*, 9, 558–559.

<sup>416</sup> This mode of analysis can also be seen in many of the contributions to Crittenden, P. M. & Claussen, A. H. (eds) (2000) *The Organization of Attachment Relationships: Maturation, Culture, and Context*. Cambridge: Cambridge University Press. The approach of Crittenden and colleagues has been praised by anthropologists as representing greater recognition of the role of culture than mainstream cross-cultural attachment research, for example Rothbaum, F., & Morelli, G. (2005) Attachment and culture: Bridging relativism and universalism. In W.

psychologists in the period, including attachment researchers, leapt on the bandwagon of overinterpreting the Bielefeld findings of a high proportion of avoidant infants as reflecting avoidance and suppression of feeling as indicative of German values, Van IJzendoorn made no such interpretation, and regarded such accounts as overhasty in moving between levels of explanation.

For Van IJzendoorn, infants are influenced by their cultural context, and this may be investigated in interesting ways through naturalistic observation. In principle, interviews with caregivers might be utilized, though this methodology did not appeal to him.<sup>417</sup> However, ultimately Van IJzendoorn did not regard the Strange Situation as an especially revealing tool for understanding how infants are influenced by their culture, since the scene is dominated by the infant's use of a particular caregiver as a safe haven, which is only one aspect of the infant's enculturation. This enculturation is also more extensive later in development. If the Main and Cassidy six-year system had been promulgated and used cross-culturally, this might have provided more insight into how secure base and safe haven use is inflected by children's developing understanding of their culture and cultural context. Unfortunately, as we saw in [Chapter 1](#), this measure was, in practice, abandoned by Main in the context of her ill health.

### Cross-cultural Distributions

In 1988, Van IJzendoorn published a meta-analysis with his Leiden colleague Pieter Kroonenberg, which examined the distribution of Strange Situation classifications across all research to date. The dataset comprised: 18 US samples ( $N = 1,230$ ), several Dutch studies, mostly from Leiden ( $N = 251$ ), 3 German studies ( $N = 136$ ), 2 Israeli samples collected by Sagi and colleagues ( $N = 113$ ), 2 Japanese samples ( $N = 96$ ), a UK study ( $N = 72$ ), Lamb and Frodi's Swedish sample ( $N = 51$ ), and a Chinese study ( $N = 36$ ). These figures reflect the absolute dominance of US-based attachment research in the period. Though they also reflect the important, rising profile of attachment research in the Netherlands, in large part resulting from empirical studies at Leiden.

The findings from the Van IJzendoorn and Kroonenberg meta-analysis were that the variance between countries was 1.5 times smaller than the variance within countries. In fact, the differences in distributions between US and non-US samples was close to zero. The secure classification was most common in almost all countries.

These were explosive results. The developmental scientific community could almost not believe it. On the basis of high-profile and much-touted findings of cross-cultural differences in distributions, such as the results from Bielefeld, the scientific community had been anticipating that differences between cultures would command the stage. Critics of attachment research had argued that the Strange Situation was biased by Western ways of thinking and would result in lower rates of children being classified as secure in other ethnic or cultural groups. Since no such differences were found, Van IJzendoorn and Kroonenberg's results were interpreted by readers in developmental science, seemingly partly against the authors intentions, as vindicating the Strange Situation for use outside of the

Friedlmeier, P. Chhokar, & B. Schwarz (eds), *Culture and Human Development: The Importance of Cross-cultural Research for the Social Sciences* (pp. 99–123). New York: Psychology Press.

<sup>417</sup> An interview-based approach was later developed by Rothbaum and colleagues: Rothbaum, F., Kakinuma, M., Nagaoka, R., & Azuma, H. (2007) Attachment and amae: Parent-child closeness in United States and Japan. *Journal of Cross Cultural Psychology*, 38, 465–486.

United States. This is certainly how their meta-analysis has subsequently been framed in textbooks.

In fact, Van IJzendoorn and Kroonenberg made no claim that their findings vindicated the Strange Situation. Their claims were cautious, only observing that the expectation that Western bias would result in lower rates of security in other ethnic or cultural groups was not met. They acknowledged that 'data from less Western-oriented cultures such as Africa, South America, and Eastern European socialist countries will be needed to establish a more truly global and better-informed cross-cultural perspective.'<sup>418</sup> Among Ainsworth's circle, Van IJzendoorn and Kroonenberg's meta-analysis was not taken as support for the validity of the Strange Situation, but precisely as demonstrating the need for further thought and research on the cross-cultural relevance of elements of attachment theory.<sup>419</sup>

In 1990, Van IJzendoorn edited a special issue of the journal *Human Development* focused on the cross-cultural validity of attachment research. In his contribution to the special issue he strongly criticized those who had taken the Van IJzendoorn and Kroonenberg meta-analysis as vindication of attachment theory or the Strange Situation. The distributions reported in the meta-analysis could provide neither vindication nor indictment. Sagi-Schwartz and the Grossmanns published papers in agreement, with arguments drawn from their own samples.<sup>420</sup>

Van IJzendoorn argued that 'the cross-cultural validity of attachment theory should be confirmed or falsified through the *testing of theoretical predictions across cultures, instead of looking for resemblances and differences between attachment classification distributions*.'<sup>421</sup> He proposed four hypotheses to guide future research:

1. The universality hypothesis suggests that all infants without severe neurophysiological impairments will form attachments to one or more specific caregivers when given the opportunity.
2. The normativity hypothesis posits that the majority of infants will develop secure attachments in environments that do not pose a significant threat to their health and survival. Normativity here means majority, that is, being the quantitative norm, which does not suggest any ethical implication.

<sup>418</sup> Van IJzendoorn, M. H. & Kroonenberg, P. M. (1988) Cross-cultural patterns of attachment. A meta-analysis of the Strange Situation. *Child Development*, 59, 147–156, p. 154.

<sup>419</sup> Waters, E. (1988) Whither attachment theory? Normal science questions. Unpublished manuscript, Everett Waters archive: '—Are we to regard all cultural adaptations as equally valuable (cultural relativism)? Example: kibbutz child—rearing, the Mundogamoor (Mead), the Alorese (DuBois).

- Is it correct to say that child-rearing practices are designed to produce the culturally valued adult (a la Erikson)? For example, Tronick's findings in pigmy tribes or the Tikopia (fostering sharing, going counter to exclusivity)
- What about cases where sensitive child-rearing conflicts with cultural values? (example: Bali as described by Bateson and Mead) Would sensitive child-rearing a la attachment theory still lead to a culturally adapted adult?
- How do we best study attachment in different cultures?

What is universal about infant–parent attachment?

<sup>420</sup> Grossmann, K. E., & Grossmann, K. (1990) The wider concept of attachment in cross-cultural research. *Human Development*, 33(1), 31–47; Sagi, A. (1990) Attachment theory and research from a cross-cultural perspective. *Human Development*, 33(1), 10–22.

<sup>421</sup> Van IJzendoorn, M. H. (1990) Developments in cross-cultural research on attachment: Some methodological notes. *Human Development*, 33(1), 3–9. Italics in original.



3. The sensitivity hypothesis proposes that the security of an infant's attachment is related to the responsiveness of their caregivers, particularly in regard to promptly responding to the infant's attachment signals.
4. The competence hypothesis states that secure attachment is linked to adaptive child outcomes in various areas of development in environments without significant threats to health or survival.<sup>422</sup>

Across their papers, Van IJzendoorn, Sagi-Schwartz, and the Grossmanns all agreed that the true test for attachment theory and research was whether security and insecurity was associated cross-nationally with caregiver behaviour on the one hand, and child development on the other.<sup>423</sup> A somewhat different position was later offered by Stevenson-Hinde.<sup>424</sup> She agreed that attachment theory and research could not be validated by distributions, but—perhaps reflecting her personal links with Bowlby—argued for focus on the sequelae of early attachment relationships (the competence hypothesis, in Van IJzendoorn's terms), *not* on caregiving antecedents (Van IJzendoorn's sensitivity hypothesis). Highly conspicuous in its absence from all this discussion was the claim that avoidance, resistance and disorganization would be expected to have equivalent antecedents and sequelae. This was not assumed by Van IJzendoorn, Sagi-Schwartz, the Grossmanns, or by Stevenson-Hinde, or regarded as a priority for cross-cultural research.

There were several other notable contributions to the special issue. One was Main's paper on conditional strategies (Chapter 1). There were also contributions by critics of attachment research. Takahashi published findings from a third Japanese sample: 68% of the sample of 60 infant–mother were classified as secure, 32% were classified ambivalent/resistant, and not a single infant was classified as avoidant. As Behrens has subsequently observed, the Takahashi findings resonated with a trend in social scientific research in the period to emphasize the uniqueness of Japan, and the lack of relevance of research paradigms developed on non-Japanese samples.<sup>425</sup> Certainly, the Japanese infants seem to have been less familiar with brief separations and found the Strange Situation more distressing than US samples.<sup>426</sup> However, there is considerable evidence that the

<sup>422</sup> The wording of the four hypotheses was clarified in minor emendations in subsequent years, without changing the meaning, for example clarification of what was meant by 'normativity'. The wording here is taken from Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 127.

<sup>423</sup> Van IJzendoorn, M. H. (1990) Developments in cross-cultural research on attachment: Some methodological notes. *Human Development*, 33(1), 3–9.

<sup>424</sup> Stevenson-Hinde, J. (1998) Parenting in different cultures: Time to focus. *Developmental Psychology*, 34(4), 698–700.

<sup>425</sup> Behrens, K. Y. (2016) Reconsidering attachment in context of culture: Review of attachment studies in Japan. *Online Readings in Psychology and Culture*, 6(1), 7.

<sup>426</sup> A recent study by Umemura and colleagues compared three East Asian samples, one Korean and two Japanese, with two Western samples, one US and one Czech. They found that the East Asian samples found the pre-separation episodes more distressing than the Western samples, but did not cry more in the reunion episodes. Umemura and colleagues suggest that the Strange Situation may be more valid when used after 18 months in East Asian samples, when children will have more experience of brief separations. They suggest that this cross-cultural difference may impact the distribution of Strange Situation classifications, reducing the validity of the assessment, but not eliminating it: they do not regard the Strange Situation as inappropriate in an East Asian context, but expect more noise and less signal regarding children's expectations of secure base and safe haven availability in children under 18 months. Umemura, T., Kyoung Jin, M., Kondo-Ikemura, K., Lacinova, L. (2024) Crying during the Strange Situation Procedure: Comparisons between East-Asian and Western infants. Paper presented at the International Attachment Conference, Rouen, France, July 2024. These findings converge with points made in Rothbaum, F., & Morelli, G. (2005) Attachment and culture: Bridging relativism and universalism. In W. Friedlmeier, P. Chakkarath, & B. Schwarz (eds), *Culture and Human Development: The Importance of Cross-cultural Research for the Social Sciences* (pp. 99–123). New York: Psychology Press.

Strange Situations were misconducted and miscoded, with the infants separated longer from their caregivers than advised by Ainsworth's protocols.<sup>427</sup> The study was conducted and coded by researchers without good familiarity with Ainsworth's work. The findings were discrepant with other, less touted findings from Japanese samples.<sup>428</sup> Furthermore, when Takahashi's sample was re-coded by the Grossmanns, very different results were found.<sup>429</sup>

Sroufe has recalled from conversations with Takahashi, including review of the Strange Situation recordings together, that she was under institutional pressure to claim that the findings cast doubt on the cross-cultural applicability of the Strange Situation, rather than risk shame to her institution by admitting limitations in the conduct of the research.<sup>430</sup> Van IJzendoorn remembers the tapes as 'horrifying to watch and listen to'; the distress of the children 'was heartbreaking and unnecessary'.<sup>431</sup> However, the public shaming of Lamb, and questioning of his coding, for discrepant results was very much on Van IJzendoorn's mind; he regarded such actions as both unscientific and unconscionable (Chapter 1). The Grossmanns were already recoding the Takahashi sample. Van IJzendoorn ultimately concluded that it would be better to publish the results, rather than attempt to police publications using the Strange Situation.

There was a cost to this decision. The Takahashi findings generated considerable critical discussion, often forming a plank in arguments against the validity of attachment research.<sup>432</sup> From Van IJzendoorn's perspective these criticisms have likely been in bad faith, since they celebrate one discrepant set of results, with 'selective inattention' to other convergent findings from Japanese samples where the Strange Situation was conducted appropriately.<sup>433</sup>

In fact, the Takahashi findings stirred a high-profile critique of the cross-cultural applicability of attachment research by Rothbaum and colleagues, published in *American Psychologist*.<sup>434</sup> Rothbaum and colleagues argued that the findings demonstrated that attachment measures were not valid across cultures, and in turn demonstrated that attachment theory had limited cross-cultural validity. Yet Rothbaum would later scale back this criticism. In the lead-up to a symposium of the International Society of Infant Studies, Rothbaum met with Waters.<sup>435</sup> He ultimately came to agree with Waters that all infants are capable of using their caregiver as a secure base and safe haven; that confidence in

<sup>427</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 2. Across *Patterns of Attachment*, Ainsworth and colleagues recommended curtailing separations if the infant became distressed on five different occasions. Unfortunately, each was relatively well buried, which likely contributed to the mistake by Takahashi and collaborators.

<sup>428</sup> For example, Durrett, M. E., Otaki, M., & Richards, P. (1984) Attachment and the mother's perception of support from the father. *International Journal of Behavioral Development*, 7, 167–176; Mizuta, I., Zahn-Waxler, C., Cole, P. M., & Hiruma, N. (1996) A cross-cultural study of preschoolers' attachment security and sensitivity in Japanese and U.S. dyads. *International Journal of Behavioral Development*, 19, 141–159.

<sup>429</sup> Grossmann, K. E. & Grossmann, K. (1996) Kulturelle perspektiven der bindungsentwicklung japan in und deutschland. In G. Trommsdorff & H.-J. Konrad (eds), *Gesellschaftliche und individuelle Entwicklung Japan in und Deutschland* (pp. 215–235), Konstanz: Universitätsverlag Konstanz.

<sup>430</sup> A. Sroufe, personal communication, January 2019.

<sup>431</sup> M. Van IJzendoorn, personal communication, August 20, 2024.

<sup>432</sup> For example, Burman, E. (2007) Between orientalism and normalization: Cross-cultural lessons from Japan for a critical history of psychology. *History of Psychology*, 10(2), 179–198.

<sup>433</sup> Van IJzendoorn, M. H., & Sagi, A. (2001) Cultural blindness or selective inattention? *American Psychologist*, 56(10), 824–825.

<sup>434</sup> Rothbaum, F., Weisz, J., Pott, M., Miyake, K., & Morelli, G. (2000) Attachment and culture: Security in the United States and Japan. *American Psychologist*, 55(10), 1093–1104.

<sup>435</sup> Waters, E. & Rothbaum, F. (2002) Attachment theory—is it relevant universally? Symposium held at the International Society of Infant Studies, Toronto, Canada, Everett Waters personal archive.



the caregiver arises from experience; and that confidence in the caregiver may prove a developmental asset.<sup>436</sup>

Rothbaum and Waters agreed that not all infants actually use their caregiver as a secure base and safe haven. They agreed that the proportion of secure infants would not be expected to be equal in different cultures. Additionally, they agreed that infants may display a variety of behaviour in their use of their caregiver as a secure base and safe haven, more than attachment researchers tended to assume or investigate.<sup>437</sup> Rothbaum's remarks at the International Society of Infant Studies remained unpublished. However, his subsequent criticisms of attachment research focused on the Strange Situation, and were more positive about the cross-cultural relevance of study of secure base and safe haven behaviour.<sup>438</sup> Still, from the perspective of Van IJzendoorn, Rothbaum's position in these later published works was still unduly critical, depending too much on a single set of discrepant findings for criticism of the Strange Situation, and ignoring other convergent evidence even from other Japanese samples.<sup>439</sup>

In 1990, Van IJzendoorn and Kroonenberg published a further study, examining consistency in the coding of the Strange Situation across samples from different countries. As we saw in [Chapter 1](#), accusations had been levelled at Lamb that his coding of the Strange Situation was out of keeping with other research groups. Beyond this, it had been proposed by LeVine that the Ainsworth coding system could only be applied cross-culturally through covert adaptations that masked cultural differences and protected the impression of the validity of the measure.<sup>440</sup> In fact, Van IJzendoorn and Kroonenberg reported 'a remarkable cross-cultural consistency in classifying the Strange Situation'.<sup>441</sup> The strength of the convergence seemed to surprise even Van IJzendoorn and Kroonenberg.

Where cultural differences were observed, they were not material to the capacity of the coding system to distinguish categories. For example, infants in Dutch samples coded as secure showed on average somewhat less proximity-seeking and contact-maintaining, and

<sup>436</sup> Ibid., Rothbaum: 'We expect that there are universals. It would be silly to expect otherwise given what we have learned about so many other psychological processes, from those far removed from attachment (color perception and language) to those that are closely related (emotional expression) What do we expect the universals to be?'

- 1) Proximity seeking and contact maintaining
- 2) Suffering due to loss (including distress accompanying shortterm separation and emotional disorder accompanying longterm separation)
- 3) We also expect that we will identify important consequences (social imitation)
- 4) Antecedents (protection; responding to distress)
- 5) Patterns of individual difference (secure versus insecure)

Predictable sequences of behavior (from proximity seeking, to stranger anxiety, to using the caregiver as a safe haven).'

<sup>437</sup> Ibid., Rothbaum: 'I think there has been a failure to adequately examine concepts indigenous to other cultures that might point us toward other key secure base dynamics.' Similar points were made in an earlier meeting between attachment and anthropology scholars: Marvin, R. S., VanDevender, T. L., Iwanaga, M., LeVine, S., & LeVine, R. A. (1977) Infant-caregiver attachment among the Hausa of Nigeria. In Fl. M. McGurk (ed.), *Ecological Factors in Human Development* (pp. 247-260) Amsterdam: North Holland.

<sup>438</sup> Rothbaum, F. & Kakinuma, M. (2004) Amai and attachment. *Human Development*, 47(1), 34-39; Rothbaum, F. & Morelli, G. (2005) Attachment and culture: Bridging relativism and universalism. In W. Friedlmeier, P. Chakkarath, & B. Schwarz (eds), *Culture and Human Development: The Importance of Cross-cultural Research for the Social Sciences* (pp. 99-123) New York: Psychology Press.

<sup>439</sup> Van IJzendoorn, M. H. & Sagi, A. (2001) Cultural blindness or selective inattention? *American Psychologist*, 56(10), 824-825.

<sup>440</sup> LeVine, R. A. & Miller, P. M. (1990) Commentary on 'Cross-cultural validity of attachment theory'. *Human Development*, 33, 73-80.

<sup>441</sup> Van IJzendoorn, M. H. & Kroonenberg, P. M. (1990) Cross-cultural consistency of coding the strange situation. *Infant Behavior and Development*, 13(4), 469-485, p. 481.

more avoidance, than secure infants in most other sample. There was nonetheless clear blue water between their profile and the profile of infants classified as avoidant. Van IJzendoorn and Kroonenberg suggested that the distinction between the coding of security and avoidant really seemed to be categorical, though whether this was an effect of the coding system or the underlying distribution of children's behaviour could not be known from the data. The exception was the Takahashi study, where some avoidant dyads appeared to have been misclassified as secure, and some secure dyads misclassified as resistant. When international norms were applied to the dataset using an algorithm, the distribution was no longer an outlier.<sup>442</sup>

### Cross-cultural Research on Mothers' Values

Where Van IJzendoorn and Kroonenberg documented that researchers' coding of the Strange Situation was convergent across countries, Posada and colleagues took this further. They used maternal-report AQS data from seven samples to examine whether even mothers' own appraisals of children's behaviour were convergent or, as predicted by critics of attachment research, would diverge along the lines of cultural group membership.<sup>443</sup> The samples were drawn from China, Colombia, Germany, Israel, Japan, Norway, and the United States. The data were analysed to examine mothers' account of what behaviour they saw as desirable in their child.<sup>444</sup>

Posada and colleagues found that the similarity of mothers' preferences within national groups ( $r = 0.38\text{--}0.64$ ) was close to that of mothers' preferences across national groups ( $r = 0.33\text{--}0.58$ ). Furthermore, across samples, mothers' preferences strongly agreed with attachment researchers' criterion sort for secure infant behaviour ( $r = 0.67\text{--}0.91$ ). As discussed in [Chapter 1](#), the AQS is primarily focused on children's secure base and safe haven behaviour, but also captures cognate behaviours such as affective sharing and social referencing. The items of strongest cross-sample agreement were those that related most directly to safe haven provision and, to an extent, secure base provision, as Waters had predicted.

Subsequent studies have replicated the findings of Posada and colleagues in other countries including Japan and among Muslim minority mothers in Israel. In all cases, there has been striking convergence between mothers' preferences for their child's behaviour, and the AQS criterion sort for security.<sup>445</sup>

Yet this is a curious finding, given that empirically many children have expectations about their caregiver, based on experiences of that relationship, that lead them to struggle to use the caregiver as a secure base and safe haven. That is to say: despite caregivers' apparent preference for infants to show behaviours that reflect secure base and safe haven usage, the behaviour of many caregivers does not appear to facilitate this use. Posada and

<sup>442</sup> Grossmann, K. E. & Grossmann, K. (1996) Kulturelle perspektiven der bindungsentwicklung Japan in und Deutschland. In G. Trommsdorff & H.-J. Konrad (eds), *Gesellschaftliche und individuelle Entwicklung Japan in und Deutschland* (pp. 215–235), Konstanz: Universitätsverlag Konstanz.

<sup>443</sup> LeVine, R. A. & Miller, P. M. (1990) Commentary on 'Cross-cultural validity of attachment theory'. *Human Development*, 33, 73–80. See also Neckoway, R., Brownlee, K., & Castellan, B. (2007) Is attachment theory consistent with Aboriginal parenting realities? *First Peoples Child & Family Review*, 3(2), 65–74.

<sup>444</sup> Posada, G., Gao, Y., Wu, F., Posada, R., Tascon, M., Schöelmerich, A., ... & Synnevaag, B. (1995) The secure-base phenomenon across cultures: Children's behavior, mothers' preferences, and experts' concepts. *Monographs of the Society for Research in Child Development*, 60(2–3), 27–48.

<sup>445</sup> Vereijken, C. M., Riksen-Walraven, J. M., & Van Lieshout, C. F. (1997) Mother–infant relationships in Japan: Attachment, dependency, and amae. *Journal of Cross-Cultural Psychology*, 28(4), 442–462; Zidan, E. (2022) The association between maternal sensitivity and attachment: The case of Muslim mothers in the Arab society in Israel. Unpublished doctoral thesis, University of Haifa.

colleagues proposed that mothers of insecure children must, to some degree, be aware of the discrepancy, perhaps unconsciously. Referring to work on the Adult Attachment Interview, they anticipated that mothers' distortions of attachment-relevant information contribute to both insensitive caregiving behaviour and reduced ability to reflect and adjust when they notice indicators of their child's difficulty in using them as a secure base and safe haven.<sup>446</sup>

An alternative explanation was put forward by Emmen, a doctoral student of Van IJzendoorn and Mesman's, who argued that there is no need to appeal to distortions of attachment-relevant information.<sup>447</sup> A simpler explanation may be that, though mothers in insecure dyads regard secure base and safe haven provision as important, their own upbringing provided little opportunity to learn to offer this provision. Emmen reflected that another simpler explanation might be that mothers' current circumstances and lack of social support may prove a contextual constraint. That is to say, caregivers may be well aware that they are not offering a secure base and safe haven, but not have the skills or support to do otherwise.

In Posada and colleagues' study, despite convergence in mothers' preference for their infant to use them as a secure base and safe haven, there were other differences between mothers' accounts of ideal infant behaviour. For instance, on the 'Proximity to mother' scale, the scores of Colombian mothers were significantly higher than in all other samples. On the 'Smooth interactions with mother' scale, the scores of Israeli mothers were significantly lower than those of US and Japanese mothers. Posada and colleagues considered that this preference may relate to the higher frequency of resistance in the Strange Situation in Israeli samples. They concluded that 'regardless of differences in sociocultural context, mothers ideally would like their children to use them as a secure base for exploration. The specific ways in which they would like their children to do so, however, may vary in different contexts.'<sup>448</sup> This variation, in turn, may increase over the course of development.

A potential criticism of this research was that the AQS represented a pre-established set of descriptors. Cross-cultural convergence might represent an arte fact of the available descriptors, rather than genuine agreement. To respond to this concern, Posada and colleagues conducted extensive (16–18 hours) of unstructured observations of infant–mother interactions in 27 homes in Colombia.<sup>449</sup> Ethnographical analysis of these observations by researchers without a background in attachment theory generated 11 domains for describing maternal behaviour: promptness of response, response effectiveness, maternal behavioural consistency, balance between responding to the baby and to other demands, balance between physical caregiving and social interaction with the baby, frequency of physical contact, quality of physical contact, enjoyment of interaction, interactive harmony, frequency of verbal communication, and diversity of functions of maternal verbal communications.

<sup>446</sup> Posada, G., Waters, E., Crowell, J., & Lay, K. L. (1995) Is it easier to use a secure mother as a secure base? Attachment q-set correlates of the adult attachment interview. In E. Waters, B. Vaughn, G. Posada, & K. Kondo-Ikemura (eds), *Caregiving, Cultural and Cognitive Perspectives on Secure-Base Behavior and Working Models: New Growing Points of Attachment Theory and Research*. *Monographs of the Society for Research in Child Development*, 60(2–3), 133–145.

<sup>447</sup> Emmen, R. (2014) Positive parenting in ethnic minority families. Challenges and outcomes. Unpublished doctoral thesis, Leiden University, p. 103.

<sup>448</sup> Posada, G., Gao, Y., Wu, F., Posada, R., Tascon, M., Schöelmerich, A., ... & Synnevaag, B. (1995) The secure-base phenomenon across cultures: Children's behavior, mothers' preferences, and experts' concepts. *Monographs of the Society for Research in Child Development*, 60(2–3), 27–48, p. 48.

<sup>449</sup> Posada, G., Carbonell, O. A., Alzate, G., & Plata, S. J. (2004) Through Colombian lenses: Ethnographic and conventional analyses of maternal care and their associations with secure base behavior. *Developmental Psychology*, 40(4), 508–518.

Given the domains generated, the researchers seem to have been interested in positive maternal behaviours or their absence, rather than domains of harsh or negative maternal behaviour. The researchers then averaged the scores across the 11 domains to generate a composite score. A separate set of researchers coded the observations for maternal sensitivity, using the MBQS (Chapter 1), based on 3–4 hours of additional observation.

The association between maternal sensitivity and the ethnographic composite was very extensive,  $r = 0.47$ , and the association of every one of the 11 domains with sensitivity was positive. Both the ethnographic composite and maternal sensitivity were clearly associated with infant security as assessed using the AQS. The association was strongest for the ethnographic composite:  $r = 0.61$ , which may reflect the additional value of the ethnographic observations, the much longer observations, or both.

The measure of maternal sensitivity performed well, if not as well, as the ethnographic composite:  $r = 0.42$ . If this data had been in the hands of another researcher, they may well have conducted a regression analysis to examine the respective contributions of the ethnographic composite and maternal sensitivity to security. However, Posada was a former student of Everett Waters and seems to have inherited the latter's focus on hypothesis-driven research and methodological distrust of regression analysis as too dependent on what variables are included.

Overall, Posada and colleagues concluded that their findings support the application of naturalistic observational measures of attachment and caregiving across cultures for understanding secure base and safe haven provision, even if there are limits to what these measures will capture for understanding caregiving. Yet one important limitation in the work of Posada and colleagues is their oscillation between reference to (i) caregiver sensitivity and (ii) caregiver secure base and safe haven provision. As we saw in Chapter 1, these are not the same construct, and an empirical study by Cassidy and colleagues found little association (though this finding has yet to be replicated).<sup>450</sup> The issue has misdirected readers of his research, including the arguments of critics.<sup>451</sup> In fact, Posada, following Waters, had his sights set on secure base and safe haven behaviour. His use of the term 'sensitivity' seems in part a holdover, or way of helping his claims achieve intelligibility in the context of mid-1990s attachment research and available debates about its validity.

Another limitation in the work of Posada and colleagues was raised by Van IJzendoorn and Bakermans-Kranenburg. They observed that both criticisms of the cross-cultural validity of attachment research and the defence provided by the research of Posada and colleagues used the term 'culture' to refer to a caregivers' context. Such interpretations may be confounded by other aspects of the context, and especially by socioeconomic factors.<sup>452</sup>

As an illustration: in the NICHD study, African-American children's mean score on the AQS was substantially lower (0.20) than that of white children's (0.30). This could be interpreted as evidence that the measure lacks cross-cultural validity, confounding insecurity and ethnic minority culture.<sup>453</sup> However, Bakermans-Kranenburg, Van IJzendoorn, and Kroonenberg argued that, as with the Strange Situation, the distribution of children across secure or insecure is not in itself relevant to debates about the cross-cultural validity of a measure. Much more important is whether a measure has expectable correlates.

<sup>450</sup> Woodhouse, S. S., Scott, J. R., Hepworth, A. D., & Cassidy, J. (2020) Secure base provision: A new approach to examining links between maternal caregiving and infant attachment. *Child Development*, 91(1), 249–265.

<sup>451</sup> Keller, H. (2021) *The Myth of Attachment Theory: A Critical Understanding for Multicultural Societies*. London: Routledge.

<sup>452</sup> On trouble caused by the polyvalent concept of 'culture', see for example Fornäs, J. (2017) *Defending Culture: Conceptual Foundations and Contemporary Debate*. London: Palgrave.

<sup>453</sup> See Contratto, S. (2002) A feminist critique of attachment theory. In M. B. Ballou & L. S. Brown (eds), *Rethinking Mental Health and Disorder: Feminist Perspectives* (pp. 29–47). New York: Guilford Press.

Bakermans-Kranenburg and colleagues showed that there was equivalent prediction of security for both African-American and white children from measures of the quality of maternal care.

Furthermore, Bakermans-Kranenburg and colleagues showed that what appeared to be the effect of ethnicity was actually a consequence of low income. African-American families faced on average a great deal more economic adversity. It was this economic pressure that was important for predicting insecurity.<sup>454</sup> In line with the predominant narrative of Belsky's process model, much of the effect of economic insecurity on attachment insecurity was via the quality of caregiving behaviour (Chapter 3). Yet contrary to Belsky's account, some of the effect of economic insecurity was unmediated by observed caregiver behaviour. Bakermans-Kranenburg and colleagues considered that there may be many ways in which African-American and white children experience different forms of care as a result of their family culture. However, these aspects of their care do not appear to alter the expectable association between toddlers' security and their experiences of sensitive care.

The Leiden group were inspired by the work of Posada and collaborators in further investigation of these issues. In line with Van IJzendoorn's distrust of self-report, studies by the Leiden group had repeatedly shown that caregivers' beliefs about sensitivity and the actual sensitivity of their caregiving was unrelated.<sup>455</sup> That being said, caregivers' beliefs about sensitivity were still interesting for understanding the cross-cultural acceptability of measures of sensitivity and differences in cultural attitudes. As well as a core interest of Van IJzendoorn's, cultural aspects of parenting were a growing interest of Mesman's. Emmen, Van IJzendoorn, Mesman, and colleagues examined maternal beliefs about the 'ideal' form of caregiving among ethnic majority Dutch mothers, and minority Turkish and Moroccan mothers with immigrant backgrounds. They used the items from the MBQS (Chapter 1), asking participants to sort those they thought characterized the ideal caregiver. Their 2012 paper reported that ethnic minorities were less likely to endorse sensitivity as their ideal for parental care ( $r = -0.31$ ).<sup>456</sup>

On first glance, these findings seemed to support critics of attachment research who held that measures of sensitivity are confounded by evaluations of cultural differences. Yet a regression analysis suggested that the association between ethnic minority status and beliefs about sensitive care was completely mediated by socioeconomic status. Emmen and colleagues concluded that cultural beliefs and practices likely shape *how* caregivers offer sensitive care (e.g., comparative weight given to carrying/bodily contact or affective signals

<sup>454</sup> These findings converged with earlier work with Dutch, Surinamese-Dutch, Japanese, and Sundanese-Indonesian mother-infant dyads, documenting that socioeconomic factors had a stronger impact on caregiver sensitivity than cultural factors. Van IJzendoorn, M. H. (1990) Attachment in Surinam-Dutch families: A contribution to the cross-cultural study of attachment. *International Journal of Behavioral Development*, 13, 333–344; Zevalkink, J., & Marianne Riksen-Walraven, J. (2001) Parenting in Indonesia: Inter- and intracultural differences in mothers' interactions with their young children. *International Journal of Behavioral Development*, 25(2), 167–175.

<sup>455</sup> For example, Van Zeijl, J., Mesman, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., ... & Alink, L. R. (2006) Attachment-based intervention for enhancing sensitive discipline in mothers of 1-to 3-year-old children at risk for externalizing behavior problems: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74(6), 994–1005; Ekmekci, H., Malda, M., Yagmur, S., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Mesman, J. (2016) The discrepancy between sensitivity beliefs and sensitive parenting behaviors of ethnic majority and ethnic minority mothers. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, 48(1), 60–67.

<sup>456</sup> Emmen, R. A. G., Malda, M., Mesman, J., Ekmekci, H., & Van IJzendoorn, M. H. (2012) Sensitive parenting as a cross-cultural ideal: Sensitivity beliefs of Dutch, Moroccan, and Turkish mothers in the Netherlands. *Attachment and Human Development*, 14, 601–619.

and exchanges), but not *whether* they regard it as good to provide to the child.<sup>457</sup> By contrast, socioeconomic status seems to have relevance for the value given to these behaviours by caregivers.

An analysis of the individual items revealed that mothers facing socioeconomic insecurity were less likely to endorse statements reflecting prioritization of attention to their child (e.g., 'Seeks contact with her child') compared to other demands. Again, these findings supported the view that across majority Dutch mothers and minority Turkish and Moroccan mothers, secure base and safe haven provision was regarded as an ideal when the requirements of day-to-day survival and coping did not intrude. Under conditions of socioeconomic insecurity, mothers regarded good parenting as requiring juggling these conflicting demands and stressors.<sup>458</sup> The authors underlined that sensitive care may understandably not be a caregiver's priority when basic survival and coping are on the line.

Research by Pape, supervised by Van IJzendoorn and Mesman, elaborated this point. Pape argued that socioeconomic insecurity was an illustration of a kind of family stress associated with ethnic minority status. Living in an unsafe neighbourhood, single motherhood and teenage pregnancy might be more frequent in ethnic minority families. Building on an earlier argument by Van IJzendoorn, Pape also emphasized that 'ethnic minority families may have to deal with stressors that specifically arise from their minority status like discrimination, illegal status or acculturation stress'.<sup>459</sup> Where such forms of family stress are felt by caregivers, and especially when they ramify and caregivers feel overwhelmed, Pape acknowledged that sensitive care may not be a caregiver's priority.<sup>460</sup> Similar arguments would later be made in print by Neuhauser<sup>461</sup> and Dawson, Bain and Mesman,<sup>462</sup> and provided with meta-analytic support by Booth and colleagues.<sup>463</sup>

Emmen and colleagues concluded from the Q-Sort study of mothers' ideals for caregiving that 'our findings suggest that culture-specific measurement of maternal sensitivity is

<sup>457</sup> Cf. Bornstein, M. H., Putnick, D. L., Suwalsky, J. T. D., Venuti, P., deFalco, S., Zingman de Galperin, C., Gini, M., & Heslington Tichovolsky, M. (2012) Emotional relationships in mothers and infants: Culture-common and community-specific characteristics of dyads from rural and metropolitan settings in Argentina, Italy, and the United States. *Journal of Cross-cultural Psychology*, 43(2), 171–197.

<sup>458</sup> See also Respler-Herman, M., Mowder, B. A., Yasik, A. E., & Shamah, R. (2012) Parenting beliefs, parental stress, and social support relationships. *Journal of Child and Family Studies*, 21, 190–198; Emmen, R. A. G., Malda, M., Mesman, J., Van IJzendoorn, M. H., Prevoe, M. J. L., & Yeniad, N. (2013) Socioeconomic status and parenting in ethnic minority families: Testing a minority family stress model. *Journal of Family Psychology*, 27(6), 896–904.

<sup>459</sup> Pape, M. (2013) Sensitive parenting as universal ideal: Beliefs about sensitive parenting among mothers in Zambia and mothers from a minority and majority group in The Netherlands. Unpublished masters thesis. See also Van IJzendoorn, M. H. (1990) Attachment in Surinam-Dutch families: A contribution to the cross-cultural study of attachment. *International Journal of Behavioral Development*, 13(3), 333–344.

<sup>460</sup> For a valuable, critical conceptual and methodological review on attachment and coping, see Magro, S. W., VanMeter, F., & Roisman, G. I. (2023) Attachment, regulation, and the development of coping. In E. A. Skinner & M. J. Zimmer-Gembeck (eds), *The Cambridge Handbook of the Development of Coping* (pp. 79–108), Cambridge: Cambridge University Press.

<sup>461</sup> Neuhauser, A. (2018) Predictors of maternal sensitivity in at-risk families. *Early Child Development and Care*, 188(2), 126–142.

<sup>462</sup> Dawson, N., Bain, K., & Mesman, J. (2021) Observing maternal sensitivity in a South African township: An exploratory study into behavioral features using different measures. *Attachment & Human Development*, 23(2), 150–163.

<sup>463</sup> Tudehope Booth, A., Macdonald, J., & Youssef, G. (2018) Contextual stress and maternal sensitivity: A meta-analytic review of stress associations with the maternal behavior Q-Sort in observational studies. *Developmental Review*, 48, 145–177. For a valuable discussion, see Kitagawa, Y., Thorpe, D., & Bernard, K. (2023) Ecological predictors of maternal nurturance to distress and beliefs about infant crying: Examining the roles of household and neighborhood resources. *Parenting*, 23(2), 115–139.

not required'.<sup>464</sup> This is, admittedly, quite a jump from a study of caregivers' attitudes. Mesman would later disavow this conclusion.<sup>465</sup> For her part, Emmen maintained the claim in her later unpublished doctoral thesis, but used the extra space not available in a journal article to give some qualifications:

However, this does not mean that adaptations to make an intervention more culturally sensitive are not necessary. Cultures may differ in daily family routines, factors that cause less positive parenting (i.e., culture-specific stressors), and ways of interpreting and implementing advice given in a context of an intervention, which may be related to the effectiveness of an intervention. Thus although the focus and aim of an intervention may be similar across cultures (e.g., promoting sensitive parenting), certain strategies or contexts in the intervention may be necessary to be culturally adapted to achieve this goal.<sup>466</sup>

For instance, Yagmur, Mesman, Malda, Bakermans-Kranenburg, and Ekmekci conducted an intervention study with Turkish minority Dutch mothers to improve sensitivity and sensitive discipline. In the study, certain toys and materials were adjusted to be more appropriate (e.g., mother's reading to the child was replaced by mother and child playing together with a tea set). All interveners had a Turkish background and were bilingual, which allowed them to adapt to the language that the mother preferred to speak.<sup>467</sup> Despite the need for such adaptations, from the work of Emmen and colleagues it was presumed that becoming more sensitive would be in line with mothers' values and a culturally appropriate form of parenting intervention.<sup>468</sup>

Reflecting on the work of Posada and colleagues, Yagmur and collaborators observed that parental beliefs about secure base and safe haven provision appear to be similar across cultural groups, whereas research to date on parental beliefs about discipline had revealed considerable variability.<sup>469</sup> Their study found that, following the intervention, Turkish minority Dutch mothers showed improved sensitivity but there was no change identified in disciplinary practices. Yagmur and colleagues reflected that this may be due to the cultural embeddedness of disciplinary practices.

Whilst in general caregiver sensitivity and less harsh disciplinary practices are clearly associated with one another, this could be contingent depending on circumstances, and

<sup>464</sup> Emmen, R. A. G., Malda, M., Mesman, J., Ekmekci, H., & Van IJzendoorn, M. H. (2012) Sensitive parenting as a cross-cultural ideal: Sensitivity beliefs of Dutch, Moroccan, and Turkish mothers in the Netherlands. *Attachment and Human Development*, 14, 601–619, p. 616.

<sup>465</sup> Mesman, J. (2021) Attachment theory's universality claims: Asking different questions. In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 245–251). New York: The Guilford Press.

<sup>466</sup> Emmen, R. (2014) Positive parenting in ethnic minority families. Challenges and outcomes. Unpublished doctoral thesis, Leiden University, p. 107, parentheses suppressed.

<sup>467</sup> Yagmur, S., Mesman, J., Malda, M., Bakermans-Kranenburg, M. J., & Ekmekci, H. (2014) Video-feedback intervention increases sensitive parenting in ethnic minority mothers: A randomized control trial. *Attachment & Human Development*, 16(4), 371–386.

<sup>468</sup> A similar position can be seen in Poulsen, B., Quinlan, D., Boris, N. W., & Coyne, J. (2024) Circle of security: Translating attachment science for diverse caregiving contexts. In J. D. Osofsky, H. E. Fitzgerald, M. Keren, & K. Puura (eds), *WAIMH Handbook of Infant and Early Childhood Mental Health: Cultural Context, Prevention, Intervention, and Treatment*, Vol. 2 (pp. 413–431). New York: Springer. For debate of this point, see Malda, M. & Mesman, J. (2017) Parental sensitivity and attachment in ethnic minority families. In N.-J. Cabrera & B. Leyendecker (eds), *Handbook on Positive Development of Minority Children and Youth*. Cham, Switzerland: Springer International Publishing; Keller, H. (2021) *The Myth of Attachment Theory: A Critical Understanding for Multicultural Societies*. London: Routledge, chapter 9.

<sup>469</sup> Yagmur, S., Mesman, J., Malda, M., Bakermans-Kranenburg, M. J., & Ekmekci, H. (2014) Video-feedback intervention increases sensitive parenting in ethnic minority mothers: A randomized control trial. *Attachment & Human Development*, 16(4), 371–386.

some caregivers might show high levels of sensitivity *together* with harsh discipline.<sup>470</sup> In another of the Leiden samples, for example, 17% of caregivers showed precisely this pattern.<sup>471</sup> Yagmur and colleagues cited evidence from Lansford and collaborators that showed that when physical discipline is a cultural norm, it is less associated with problematic child outcomes.<sup>472</sup> Lansford and collaborators suggest that cultural norms shared by parents and children may lead both to interpret some aspects of harsh discipline as independent from, or even potentially as a sign of, parental attention and availability.<sup>473</sup>

Though citing Lansford and colleagues' reflections, Yagmur and colleagues did not necessarily endorse them outright. Mesman would later offer explicit endorsement.<sup>474</sup> Van IJzendoorn and Bakermans-Kranenburg seem to have been more cautious.<sup>475</sup> Nonetheless, elsewhere they have acknowledged that context will profoundly shape how children interpret their parents' behaviour: for example, neglecting behaviours may be interpreted differently by children living in impoverished societies to children living in societies where there are more resources.<sup>476</sup>

Mesman and Van IJzendoorn led a further study, published in 2016, pooling data from research groups around 15 countries the world using the MBQS (N = 751).<sup>477</sup> Their findings converged with Posada and colleagues' earlier study, showing strong convergence between maternal beliefs about the ideal mother and the MBQS as an assessment of caregiver sensitivity: agreement within groups (mean 0.52, range 0.38–0.62) was similar

<sup>470</sup> See also Carlson, V. J., & Harwood, R. L. (2003) Attachment, culture, and the caregiving system: The cultural patterning of everyday experiences among Anglo and Puerto Rican mother–infant pairs. *Infant Mental Health Journal*, 24(1), 53–73.

<sup>471</sup> Alink, L. R., Mesman, J., Van Zeijl, J., Stolk, M. N., Juffer, F., Bakermans-Kranenburg, M. J., ... & Koot, H. M. (2009) Maternal sensitivity moderates the relation between negative discipline and aggression in early childhood. *Social Development*, 18(1), 99–120. See also Deater-Deckard, K., Lansford, J. E., Malone, P. S., Alampay, L. P., Sorbring, E., Bacchini, D., ... & Al-Hassan, S. M. (2011) The association between parental warmth and control in thirteen cultural groups. *Journal of Family Psychology*, 25(5), 790–794; Spinelli, M., Preti, E., Kassa, T. T., Asale, M. A., Goshu, M. A., Tsega, T. W., ... & Mesman, J. (2023) Cultural considerations in the assessment of sensitivity in low-income caregivers in Ethiopia. *Frontiers in Psychology*, 14, 1163773.

<sup>472</sup> Yaman, A., Mesman, J., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2010) Perceived family stress, parenting efficacy, and child externalizing behaviors in second-generation immigrant mothers. *Social Psychiatry and Psychiatric Epidemiology*, 45, 505–512; Lansford, J. E., Zelli, A., Chaudhary, N., Manke, B., Chang, L., Oburu, P., Palmérus, K., Pastorelli, C., Bombi, A. S., Tapanya, S., Deater-Deckard, K., & Quinn, N. (2005) Physical discipline and children's adjustment: Cultural normativeness as a moderator. *Child Development*, 76, 1234–1246.

<sup>473</sup> See also Kim, U., & Choi, S. H. (1994) Individualism, collectivism, and child development: A Korean perspective. In P. M. Greenfield & R. R. Cocking (eds), *Cross-Cultural Roots of Minority Development* (pp. 227–258) Hillsdale, NJ: Erlbaum; Grusec, J. E., Danyliuk, T., Kil, H., & O'Neill, D. (2017) Perspectives on parent discipline and child outcomes. *International Journal of Behavioral Development*, 41, 465–471.

<sup>474</sup> Mesman, J. & Emmen, R. A. G. (2021) Cultural perspectives on parenting. In V. A. Weekes-Shackelford & T. K. Shackelford (eds), *The Oxford Handbook of Evolutionary Psychology and Parenting* (pp. 97–114). Oxford: Oxford University Press.

<sup>475</sup> In a later study, Mbagaya, Oburu and Bakermans-Kranenburg would examine associations between self-reported physical abuse and mental health difficulties in Dutch, Zambian and Kenyan samples. Ambiguities about whether harsh discipline would be captured or not captured by self-report of physical abuse reduce the relevance of the findings to evaluation of Lansford and colleagues' proposals. However, the authors conclude that 'physical abuse and neglect are associated with psychopathology symptoms independently of country and cultural context' (95). This position may have reduced sympathy for claims that harsh discipline can be a positive for children depending on the cultural meaning assigned to the discipline. Mbagaya, C., Oburu, P., & Bakermans-Kranenburg, M. J. (2013) Child physical abuse and neglect in Kenya, Zambia and the Netherlands: A cross-cultural comparison of prevalence, psychopathological sequelae and mediation by PTSS. *International Journal of Psychology*, 48(2), 95–107. More generally, Van IJzendoorn and Bakermans-Kranenburg have taken it as axiomatic, following Main, that caregiver behaviour that may alarm a child is likely to contribute to disorganization rather than security.

<sup>476</sup> Mbagaya, C., Oburu, P., & Bakermans-Kranenburg, M. J. (2013) Child physical abuse and neglect in Kenya, Zambia and the Netherlands: A cross-cultural comparison of prevalence, psychopathological sequelae and mediation by PTSS. *International Journal of Psychology*, 48(2), 95–107.

<sup>477</sup> Mesman, J., Van IJzendoorn, M., Behrens, K., Carbonell, O. A., Cárcamo, R., Cohen-Paraira, I., ... & Zreik, G. (2016) Is the ideal mother a sensitive mother? Beliefs about early childhood parenting in mothers across the globe. *International Journal of Behavioral Development*, 40(5), 385–397.



to agreement between groups (mean 0.44, range 0.43–0.58). This was not a statistically significant difference.

Again, in line with Waters' expectations, item level analysis revealed that the items on which mothers agreed were regarding the value of secure base and safe haven provision, especially through physical touch. The items on which mothers disagreed were about aspects of insecurity, especially whether hostility, non-responsiveness or intrusiveness represented a problem. In the Zambian sample recruited by Pape, participants expressed less disapproval of behaviours that would be considered as physically intrusive on Ainsworth's scale for interference.<sup>478</sup> There was no difference for the other aspects of intrusiveness: Zambian participants had equivalent views to other samples in their evaluation of caregiver behaviour where interference would disrupt secure base or safe haven use. They likewise had the same evaluation as other samples for item 55: 'Respects child as an individual, i.e. able to accept child's behavior even if it is not consistent with her wishes.'

Rothbaum and Morelli praised Main and Hesse's FR system (Chapter 1) as less prone to unacknowledged ethnocentric bias than Ainsworth's sensitivity scale.<sup>479</sup> Yet in fact Mesman, Van IJzendoorn and colleagues' 2016 study found that there was considerably *more* agreement about what constituted good caregiving, than what constituted its opposite. Such findings offer support for the cross-cultural use of measures that tap secure base and safe haven provision, but in fact put pressure on the cross-cultural use of Main and Hesse's FR scale (Chapter 1) and Lyons-Ruth and colleagues' AMBIANCE (Chapter 2). As we shall see in Chapter 5, this is also an issue that concerns applied practitioners working with families from diverse cultures.

Whereas Posada and colleagues interpreted their findings of variation between the items endorsed by different samples as reflecting cultural differences, Mesman, Van IJzendoorn, and collaborators examined the respective contribution of socioeconomic status and cultural group membership. With inclusion of socioeconomic differences in the model, the variance explained by cultural group membership decreased from 29.7% to 10%. Such findings are consistent with meta-analytic research showing a higher distribution of insecure attachment relationships in samples facing more socioeconomic pressures compared to families living more comfortably (Chapter 5).

The Leiden researchers have been criticized by Keller and colleagues for giving a normative valuation of sensitivity, implied by the title of their 2016 paper: 'is the ideal mother a sensitive mother?'<sup>480</sup> This would suggest that mothers who have to prioritize socioeconomic demands, as do many, especially in the Global South, are behaving contrary to a universal moral norm. Mesman replied that caregivers have to juggle many considerations, of which secure base and safe haven provision is only one aspect. All the more for

<sup>478</sup> Pape, M. (2013) Sensitive parenting as universal ideal: Beliefs about sensitive parenting among mothers in Zambia and mothers from a minority and majority group in The Netherlands. Unpublished masters thesis, for example: Item 59: 'let the child carry on with appropriate activity without interruption'; and item 82: 'physical restriction of the child's movements while in proximity'. Pape reflected: 'These differences in maternal views regarding interfering parenting behavior might arise from culture-specific differences in the interaction patterns between mother and child. In Zambia, like in most African cultures, there is a great emphasis on physical contact between the mother and her infant or young child.'

<sup>479</sup> Rothbaum, F., & Morelli, G. (2005) Attachment and culture: Bridging relativism and universalism. In W. Friedlmeier, P. Chakkarath, & B. Schwarz (eds), *Culture and Human Development: The Importance of Cross-cultural Research to the Social Sciences*. Lisse: Swets & Zeitlinger, p. 110.

<sup>480</sup> Keller, H., Bard, K., Morelli, G., Chaudhary, N., Vicedo, M., Rosabal-Coto, M., ... & Gottlieb, A. (2018) The myth of universal sensitive responsiveness: Comment on Mesman et al. (2017) *Child Development*, 89(5), 1921–1928; Keller, H. (2021) *The Myth of Attachment Theory: A Critical Understanding for Multicultural Societies*. London: Routledge, chapter 5.

caregivers facing socioeconomic pressures, 'sensitive responsiveness cannot be equated to good parenting'.<sup>481</sup>

For Van IJzendoorn and Bakermans-Kranenburg, considering such debates, clarity is needed about the exact claims in play: too often attachment researchers, including Mesman, as well as the critics of attachment research, including Keller, have used the term 'sensitivity' in diverse ways, talking past one another and confusing the issues. Waters and Rothbaum likewise reflected that 'sensitivity' has been used at times by attachment researchers and by their critics to mean variously: positive aspects of caregiving; responsiveness to all and any child signals; or secure base and safe haven provision specifically.<sup>482</sup> Such confusion has no doubt been compounded by ambiguity around the meaning of the term 'attachment'.<sup>483</sup>

To give an example: Morelli has argued that attachment theory incorporates Western bias toward sensitive-responsive care where as 'in most of the world, controlling children is what good parents do'.<sup>484</sup> This criticism depends on assumptions about sensitivity, which would not necessarily apply to a claim that caregivers in general wish to offer a secure base and safe haven. Provision of a safe haven could most certainly entail controlling children at times, not least during toddlerhood.<sup>485</sup>

For Van IJzendoorn and Bakermans-Kranenburg, the heart of the matter appears to be a child's experience of secure base and safe haven provision from their caregiver. This is not identical with caregiver sensitivity: in fact, it should be noted that De Wolff and Van IJzendoorn were the first attachment researchers to empirically demonstrate the need to look beyond sensitivity, in their 1997 meta-analysis of associations between sensitivity and the Strange Situation.<sup>486</sup> Van IJzendoorn and Bakermans-Kranenburg have underlined the importance of other caregiver behaviours in their reflections on associations between the AAI and Strange Situation.<sup>487</sup> They have also reflected on this in considerations of parenting neurodiverse children.<sup>488</sup>

Van IJzendoorn and Bakermans-Kranenburg have argued that there is initial convergent evidence that, when socioeconomic pressures are not in conflict, mothers across cultures wish to provide a secure base and safe haven to their child or children.<sup>489</sup> Further inquiry

<sup>481</sup> Mesman, J. (2018) Sense and sensitivity: A response to the commentary by Keller et al. (2018) *Child Development*, 89(5), 1929–1931, p. 1929.

<sup>482</sup> Waters, E. & Rothbaum, F. (2002) Attachment theory—is it relevant universally? Symposium held at the International Society of Infant Studies, Toronto, Canada, Everett Waters personal archive.

<sup>483</sup> Duschinsky, R., Bakum, L., Mannes, J. M., Skinner, G. C., Turner, M., Mann, A., ... & Beckwith, H. (2021) Six attachment discourses: Convergence, divergence and relay. *Attachment & Human Development*, 23(4), 355–374.

<sup>484</sup> Morelli, G. A. (2015) The evolution of attachment theory and cultures of human attachment in infancy and early childhood. In L. A. Jensen (ed.) *The Oxford Handbook of Human Development and Culture* (ch. 10, pp. 149–164). Oxford: Oxford University Press, p. 155.

<sup>485</sup> Suma, K., Caughy, M. O., Bakeman, R., Washington, J., Murray, B. K., & Owen, M. T. (2024) Active direction: A new observational measure of African American parenting. *Infant Behavior and Development*, 76, 101955.

<sup>486</sup> De Wolff, M. S. & Van IJzendoorn, M. H. (1997) Sensitivity and attachment: A meta-analysis on parental antecedents of infant attachment. *Child Development*, 68(4), 571–591.

<sup>487</sup> Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2019) Bridges across the intergenerational transmission of attachment gap. *Current Opinion in Psychology*, 25, 31–36.

<sup>488</sup> For example Van IJzendoorn, M. H., Rutgers, A. H., Bakermans-Kranenburg, M. J., Swinkels, S. H., Van Daalen, E., Dietz, C., ... & Van Engeland, H. (2007) Parental sensitivity and attachment in children with autism spectrum disorder: Comparison with children with mental retardation, with language delays, and with typical development. *Child Development*, 78(2), 597–608: 'Our criteria for sensitive parenting may be inadequate for autism. Children with ASD may need much more explicit parental stimuli and a stronger emphasis on nonverbal input than children without ASD, and their parents may thus sometimes appear more physically intrusive' (605).

<sup>489</sup> Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, chapter 11.

is needed, and further replications, before this can be regarded as a robust and dependable body of knowledge. Nonetheless, it is suggestive that parallel results regarding the role of cultural group membership and socioeconomic factors were found by the Leiden group in studies of other aspects of caregiving behaviour in the 2010s.

Cárcamo, Vermeer, Van der Veer, and Van IJzendoorn published a study comparing child rearing between Mapuche and non-Mapuche families in Chile, using the Home Observation for Measurement of the Environment measure (HOME).<sup>490</sup> The Mapuche ethnic minority caregivers scored lower on this measure of quality of caregiving ( $r = 0.11$ ). So did families with low household income ( $r = 0.25$ ). Differences in income fully accounted for the apparent cultural differences between Mapuche and non-Mapuche families in HOME scores.

The authors conclude their paper with a notable point. As we saw in [Chapter 3](#), Belsky had argued that long hours of daycare for infants is associated with poorer socioemotional outcomes. The size of the effects identified were not large, but Belsky argued that they are meaningful at a population level. Well aware of Belsky's research, Cárcamo, Vermeer, Van der Veer, and Van IJzendoorn nonetheless expressed enthusiasm for the availability of free and universal coverage of childcare, which allows young mothers to participate in the labour market or continue their studies. It would appear that the authors felt that the potential risks from early or extensive use of childcare for children's development were outweighed by the potential for socioeconomic benefits, given the importance of socioeconomic pressure as a risk factor for caregiving.

A potential criticism of the study by Cárcamo and colleagues is that the HOME measures the quality of learning materials in the home, and whether the home seems physically well organized around the child, as well as interactional features such as whether the caregiver shows acceptance towards their child and seems involved with them. As we saw in [Chapter 3](#), assessing features like quality of learning materials may risk confounding quality of care with socioeconomic status. Indeed, in the NICHD study there was a considerable association between HOME scores and income-to-needs ratio ( $r = 0.31$ ).

Support for the role of socioeconomic factors by Cárcamo and colleagues comes another study. Alink, Euser, Van IJzendoorn, and Bakermans-Kranenburg conducted a major study drawing on: 1127 professionals' reports of any cases of maltreatment they saw over a three month period; child protection records over a year; and 1759 high school students' self-report of any experiences of maltreatment in the past year.<sup>491</sup> Across all three sources of information, children from families with a migrant history were at increased risk of maltreatment compared to native Dutch children. However, in the data from professionals' report and child protection records, this association disappeared after correction for educational level of the parents and family structure.

Once more, what appeared at first sight as a difference resulting from culture was a mask for differences resulting from socioeconomic factors and, here, also family factors. Nonetheless, the finding did not hold for families from countries where the majority of the immigrants had come to the Netherlands as refugees. Here correction for educational level of the parents and for step-parenthood did not attenuate associations with risk of child maltreatment. Alink and colleagues reflected that refugee parents may be facing challenges

<sup>490</sup> Cárcamo, R. A., Vermeer, H. J., van der Veer, R., & Van IJzendoorn, M. H. (2015) Childcare in Mapuche and non-Mapuche families in Chile: The importance of socio-economic inequality. *Journal of Child and Family Studies*, 24, 2668–2679.

<sup>491</sup> Alink, L. R., Euser, S., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2013) Is elevated risk of child maltreatment in immigrant families associated with socioeconomic status? Evidence from three sources. *International Journal of Psychology*, 48(2), 117–127.

around histories of trauma and increased stress from insecure citizenship, which in turn impact their caregiving behaviour.<sup>492</sup>

## Anthropology and Attachment Research

Anthropologists and cross-cultural psychologists have presented a number of criticisms of attachment research,<sup>493</sup> and especially of use of the Strange Situation.<sup>494</sup> Ogle and Cozza, and Waters and Eagle, have observed that these criticisms have achieved growing traction in the reception of attachment research.<sup>495</sup> Van IJzendoorn has often been situated in these critiques as an important antagonist due to his perceived role as an apologist for the attachment tradition and its aspirations to cross-cultural validity, especially on the basis of the Van IJzendoorn and Kroonenberg 1988 paper. Van IJzendoorn's commitment to meta-analysis has been situated as structurally opposed to the granularity, groundedness, and validity of ethnographic observation. Yet Van IJzendoorn and Bakermans-Kranenburg have by no means been unsympathetic to criticisms of attachment research. There are a number of criticisms that they have certainly sought to rebut. There are others that they have accepted. Consideration of these criticisms can help clarify their position.

One criticism of attachment theory and research from an anthropological perspective has been that it is used as a smokescreen for iniquitous forms of child welfare practice, with oppressed groups judged against the implicit parenting standards of dominant majorities.<sup>496</sup> For instance, Wright and colleagues have observed that attachment theory and research is drawn on in Australian child protection policy in ways that stigmatize Aboriginal families. They have argued that attachment theory and research gives practitioners inappropriate confidence in applying a limited model of normative family relationships,

<sup>492</sup> See also Barbot, B., Hein, S., Trentacosta, C., Beckmann, J. F., Bick, J., Crocetti, E., ... & Van IJzendoorn, M. H. (2020) Manifesto for new directions in developmental science. *New Directions for Child and Adolescent Development*, 2020(172), 135–149: 'we need, more than ever, to address the lack of knowledge about the multiple and interdependent individual, social, and cultural factors that can enhance the well-being of children growing up in highly vulnerable and rapidly changing contexts and situations. A good place to start may be by broadening the scope of research with migrant and refugee communities in order to explore how multiple personal and social assets influence developmental outcomes' (140).

<sup>493</sup> For example Burman, E. (2016) *Deconstructing Developmental Psychology*, 2nd ed. London: Routledge; Keller, H. (2021) *The Myth of Attachment Theory: A Critical Understanding for Multicultural Societies*. Routledge; Waters, S. F., Richardson, M., Mills, S. R., Marris, A., Harris, E., & Parker, M. (2024) Beyond attachment theory: Indigenous perspectives on the child–caregiver bond from a northwest tribal community. *Child Development*, early view.

<sup>494</sup> Reviewed in Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 2.

<sup>495</sup> Ogle, C. M. & Cozza, S. J. (2023) Contemporary applications of attachment theory: A review of the cultural nature of attachment: Contextualizing relationships and development, *Psychiatry*, 86(2), 91–97; Waters, E. & Eagle, M. (2023) Cross-cultural criticisms of attachment: A taxonomy and the method and advantages of charitable interpretation. Presentation to the Rapaport-Klein Study Group, <https://www.psychomedia.it/rapaport-klein/Waters-Slides-2023.pdf>.

<sup>496</sup> Rashid, S. P. (1996) Attachment viewed through a cultural lens. In D. Howe (ed.), *Attachment and Loss in Child and Family Social Work* (pp. 59–81), Brookfield, VT: Ash Company; Neckoway, R., Brownlee, K., & Castellan, B. (2007) Is attachment theory consistent with Aboriginal parenting realities? *First Peoples Child & Family Review*, 3(2), 65–74; Zanatta, F. (2018) Outside the dyad: An ethnographic journey beyond attachment, with African-Caribbean families in London, unpublished doctoral dissertation, University College London; Choate, P. W., CrazyBull, B., Lindstrom, D., & Lindstrom, G. (2020) Where do we go from here?: Ongoing colonialism from Attachment Theory. *Aotearoa New Zealand Social Work*, 32(1), 32–44; Raina, S. (2023) Culturally diverse parenting: Deconstructing attachment theory. *Perspectives of the ASHA Special Interest Groups*, 8(6), 1500–1508; Bailey, N., & Clark, Y. (2024) Exploring bonding and attachment in Aboriginal families. *Australian Journal of Psychology*, 76(1), 2356117.

such as priority to the infant–mother relationship, when assessing child safety.<sup>497</sup> Wright and colleagues characterize Van IJzendoorn and Sagi-Schwartz as having argued that ideas from attachment theory can serve as normative for families across the world, offering the façade of scientific credibility to child welfare practice that appraises minority families against majority expectations about caregiving.

In fact, Van IJzendoorn and Bakermans-Kranenburg have been in strong agreement with such criticism of the way attachment theory and research is often used in child welfare practice. The image of attachment theory and research held by practitioners can be ‘misleading and potentially damaging’, and far distant, in their view, from the one held by the research community.<sup>498</sup> Within this community, Van IJzendoorn, Bakermans-Kranenburg, and Sagi-Schwartz have been vocal in arguing that too much priority has been given to the infant–mother relationship at the expense of the network of sources of secure base and safe haven provision that may be available to a child. Partly through their advocacy, as well as anthropological and cross-cultural research,<sup>499</sup> in recent years this has become a consensus position within the attachment research community.<sup>500</sup> Bakermans-Kranenburg has given priority to research on fathers in her work, including research funded by her ERC Advanced Grant.<sup>501</sup> Schmidt, Keller, and Rosabal Coto have countered that, even if there has been some change, attachment researchers generally still tend to focus on child–mother relationships, and rarely examine multiple relationships or more-than-dyadic interactions.<sup>502</sup>

Van IJzendoorn was a leading contributor to an international consensus statement that I co-convened on child welfare practice, which argued that practitioners should take from attachment research three principles: the child’s need for familiar, non-abusive caregivers; the value of continuity of good-enough care; and the benefits of networks of attachment relationships.<sup>503</sup> Van IJzendoorn and Bakermans-Kranenburg regard these principles of safe, stable, and shared care as having ethical weight cross-culturally. In fact, these norms are a great deal closer to the prescriptions Wright and colleagues offer for *rectifying* child welfare practice in Australia than the image of attachment theory and research that they criticize.

<sup>497</sup> Wright, A., Gray, P., Selkirk, B., Hunt, C., & Wright, R. (2024) Attachment and the (mis) apprehension of Aboriginal children: Epistemic violence in child welfare interventions. *Psychiatry, Psychology and Law*, early view. See also Buchanan, F. (2013) A critical analysis of the use of attachment theory in cases of domestic violence. *Critical Social Work*, 14(2); Rosabal-Coto, M., Quinn, N., Keller, H., Vicedo, M., Chaudhary, N., Gottlieb, A., Scheidecker, G., Murray, M., Takada, A., & Morelli, G. A. (2017) Real-world applications of attachment theory. In H. Keller & K. A. Bard (eds), *The Cultural Nature of Attachment: Contextualizing Relationships and Development* (pp. 335–354), Cambridge, MA: MIT Press; Fleming, A. (2018) Ngā Tāpiritanga: Secure attachment from a Māori perspective *Ata: Journal of Psychotherapy Aotearoa New Zealand*, 22(1), 23–36.

<sup>498</sup> Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 151.

<sup>499</sup> For a review, see Chaudhary, N., Salali, G. D., & Swanepoel, A. (2024) Sensitive responsiveness and multiple caregiving networks among Mbendjele BaYaka hunter-gatherers: Potential implications for psychological development and well-being. *Developmental Psychology*, 60(3), 422–440.

<sup>500</sup> For example Steele, M., & Steele, H. (2021) A society that values it’s children should cherish their parents: A move to considering the attachment network. *New Directions for Child and Adolescent Development*, 2021(180), 141–147; Dagan, O., Schuengel, C., Verhage, M. L., Madigan, S., Roisman, G. I., Bernard, K., ... & Volling, B. L. (2024) Configurations of mother–child and father–child attachment relationships as predictors of child language competence: An individual participant data meta-analysis. *Child Development*, 95(1), 50–69.

<sup>501</sup> For example, Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2023) Sensitive responsiveness in expectant and new fathers. *Current Opinion in Psychology*, 50, 101580.

<sup>502</sup> Schmidt, W. J., Keller, H., & Rosabal Coto, M. (2021) Development in context: What we need to know to assess children’s attachment relationships. *Developmental Psychology*, 57(12), 2206–2219.

<sup>503</sup> Forslund, T., Granqvist, P., Van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M., ... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52.

Another criticism of attachment theory and research by anthropologists and cross-cultural researchers is that it is unjustifiably narrow in what kinds of knowledge it perceives as relevant to consideration of child attachment relationships. It has been argued that attachment researchers ignore, devalue or reject evidence from methodologies besides a limited number of authorized assessments.<sup>504</sup> Keller has specifically criticized the journal *Attachment & Human Development* and Mesman, Van IJzendoorn, and Sagi-Schwartz on this count.<sup>505</sup> There is truth to these criticisms of the attachment research community. As discussed in [Chapter 1](#), even as fierce an advocate as Waters has acknowledged that the complexity and esoteric nature of aspects of attachment theory and methodology mean that the circulation of knowledge into and out of the developmental tradition is generally a challenge. There have even been challenges in sustaining dialogue with research on trauma and dissociation, clearly cognate areas of inquiry, in the study of unresolved states of mind.<sup>506</sup> The attachment research community is likewise conventional within developmental science in regarding quantitative research as more credible and dependable.

Keller's criticism of Mesman, Van IJzendoorn, and Sagi-Schwartz relates especially to their chapter on cross-cultural research on attachment in the 2016 edition of the *Handbook of Attachment*. Keller treats this high-profile chapter as exemplifying the self-satisfaction and myopia of attachment researchers, in the authors' dismissal and exclusion of qualitative and anthropological research, and cross-cultural research adopting measures outside the primary measures used by attachment researchers. Comparison of the 1999, 2008, and 2016 editions of the chapter is interesting, though. The 1999 chapter by Van IJzendoorn and Sagi-Schwartz engaged very considerably with just this wider literature, and made a point of emphasizing its value for attachment research.<sup>507</sup> More space was given to research with the Strange Situation than other measures, and there is no dedicated section addressing learning from anthropological research, but in general the chapter did not reflect dismissal or exclusion of other approaches.

Van IJzendoorn and Sagi-Schwartz did not claim universality for all or most of the observations made by attachment researchers. In the first instance, they claimed only the universality of a propensity for children to form attachment relationships. In principle this should allow for cross-cultural investigation of attachment relationships, without implying the best way of pursuing such an investigation:

Because attachment processes have also been observed in nonhuman primates and other species, Bowlby suggested that the formation of an attachment relationship between infants and their protective caregivers is the outcome of evolution ... therefore, a core element of attachment theory is the idea of universality of this bias in infants to become attached, regardless of their specific cultural niche. From this universality thesis, however, it does not follow that the development of attachment is insensitive to culture-specific influences and idiosyncrasies. On the contrary, the evolutionary perspective leaves room

<sup>504</sup> Rothbaum, F., & Morelli, G. (2005) Attachment and culture: Bridging relativism and universalism. In W. Friedlmeier, P. Chkarakth, & B. Schwarz (eds), *Culture and Human Development: The Importance of Cross-cultural Research for the Social Sciences* (pp. 99–123). New York: Psychology Press.

<sup>505</sup> Keller, H. (2021) *The Myth of Attachment Theory: A Critical Understanding for Multicultural Societies*. London: Routledge, chapter 5.

<sup>506</sup> Bakum, L., Schuengel, C., Foster, S. L., Fearon, R. P., & Duschinsky, R. (2023) Trauma and loss in the Adult Attachment Interview: Situating the unresolved state of mind classification in disciplinary and social context. *History of the Human Sciences*, 36(3–4), 133–157.

<sup>507</sup> Van IJzendoorn, M. H., & Sagi, A. (1999) Cross-cultural patterns of attachment: Universal and contextual dimensions. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Application* (pp. 713–734). New York: Guilford Press.

for globally adaptive behavioural propensities that are realised in a specific way, depending on the cultural niche in which children have to survive. If a cultural niche requires the suppression of negative emotions, infants may develop an avoidant attachment pattern to meet this cultural demand. In such a culture, the avoidant attachment pattern may well be normative in the sense that it promotes inclusive fitness and general adaptation, and it may be observed in the majority of cases. That is, the universality thesis predicts only that attachment bonds will be established.<sup>508</sup>

Across almost all empirical studies using the Strange Situation, Van IJzendoorn and Sagi-Schwartz observed that the majority of infants were classified as securely attached, suggesting that security is a 'widespread and preferred phenomenon'.<sup>509</sup> Nonetheless, considerable numbers of infants in many studies were classified as insecurely attached. In the Bielefeld study, as we have seen, a majority were classified as avoidant. Yet the Grossmanns had documented that only those infants from dyads classified as avoidant who received insensitive care went on to show less effective regulation of negative emotions, social relationships, or cognitive development compared to infants in secure relationships.<sup>510</sup> The Grossmanns reflected that some children in their sample appeared to display avoidant behaviour in response to norms of caregiver behaviour that discouraged provision of comfort, rather than because they actually lacked confidence in the availability of their sensitive caregiver.

Accepting that anthropological research has raised potential challenges, and the need to be modest in claims about what exactly is and is not universal, the chapter by Van IJzendoorn and Sagi-Schwartz was nonetheless optimistic. The authors asserted that the available evidence by 1999 does not undermine the cross-cultural viability of research to examine attachment relationships. Though the empirical evidence remained relatively limited, they felt that findings so far from different countries had suggested that sensitive care is associated with secure attachment, and secure attachment is associated with better regulation of negative emotions, positive social relationships, and cognitive development. These patterns could be seen despite the fact that attachment security and insecurity may be expressed differently by infants in different cultures:

The conceptual similarity of attachment security across diverging cultures does not mean that exactly the same infant attachment behaviours are considered to be indicative of secure or insecure attachment. In some cultures, distal attachment behaviours may be stressed somewhat more than proximal behaviours, or vice versa. The secure-base phenomenon, however, is located at the level of behaviour patterns or behavioural organisation, at which separate behaviours play only a minor role (Waters, 1977). Gusii infants, for example, are accustomed to being greeted with a handshake instead of a hug by their mothers, as noted earlier. After separations the Gusii infants expect a handshake, whereas Western infants look forward to 'more intimate' physical contact. The patterning of attachment behaviours demonstrating the secure base remains the same, regardless of the specific behaviours. The secure Gusii infants studied by Kermorian and Leiderman (1986) would reach out to the adult with one arm, to receive the handshake enthusiastically, whereas the insecure infants would avoid the adult or would reach and then pull

<sup>508</sup> Ibid., 714, parentheses suppressed.

<sup>509</sup> Ibid., 728.

<sup>510</sup> Grossmann, K. E., Grossmann, K., & Schwan, A. (1986) Capturing the wider view of attachment: A reanalysis of Ainsworth's Strange Situation. In C. E. Izard & P. B. Read (eds), *Measuring Emotions in Infants and Children* (Vol. 2, pp. 124–171). New York: Cambridge University Press.

away as the adult approached. This is a powerful demonstration of the culture-specific behavioural markers of a universal and normative phenomenon.<sup>511</sup>

Overall, Van IJzendoorn and Sagi-Schwartz concluded that ‘taken as a whole, the studies are remarkably consistent with the theory. Until further notice, attachment theory may therefore claim cross-cultural validity.’<sup>512</sup>

The 2008 chapter by Van IJzendoorn and Sagi-Schwartz was not much changed in its narrative. Additional evidence using conventional attachment measures was added for the points made. The discussions of qualitative and anthropological research, and cross-cultural research adopting other measures, was not substantively updated. Overall, the chapter gives the impression that the authors added studies they knew, but did not conduct a new literature search to inform the chapter.

The 2016 chapter by Mesman, Van IJzendoorn, and Sagi-Schwartz was a more substantive update. Some of the original 1999 discussion of qualitative and anthropological research and alternate cross-cultural measures remained, but this was compressed to give space for a quite comprehensive overview of studies using conventional attachment measures. This was despite the outpouring of anthropological discussions of attachment in the early 2010s.<sup>513</sup> The chapter’s conclusion remained unchanged: ‘taken as a whole, the studies are remarkably consistent with the theory. Until further notice, attachment theory may therefore claim cross-cultural validity.’ This rings differently now. Since the studies that are ‘remarkably consistent’ are almost exclusively those by attachment researchers, it can be seen how Keller would regard this claim as reflecting the authors’ lack of interest in the work of other disciplines, and cross-cultural qualitative research in particular.

In fact, for Van IJzendoorn, the dividing line was not between qualitative and quantitative research, and methodologies outside of the authorized assessments are not ignored, devalued or rejected on that basis. Rather, the central issue was of replication. As we saw above, Van IJzendoorn has conducted and values qualitative research, so long as the methodology supports replication; the same is true of Bakermans-Kranenburg.<sup>514</sup> Van IJzendoorn has praised researchers who pursue a ‘combination of developmental and anthropological insights and methods.’<sup>515</sup> He and Bakermans-Kranenburg have acknowledged that ‘parenting evolves at various levels of functioning, from neurons and hormones

<sup>511</sup> Van IJzendoorn, M. H., & Sagi, A. (1999) Cross-cultural patterns of attachment: Universal and contextual dimensions. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Application* (pp. 713–734). New York: Guilford Press, p. 727, citing Waters, E. (1978) The reliability and stability of individual differences in infant–mother attachment. *Child Development*, 49(2), 483–494; Kermouan, R., & Leiderman, P. H. (1986) Infant attachment to mother and child caretaker in an East African community. *International Journal of Behavioral Development*, 9(4), 455–469.

<sup>512</sup> Van IJzendoorn, M. H., & Sagi, A. (1999) Cross-cultural patterns of attachment: Universal and contextual dimensions. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Application* (pp. 713–734). New York: Guilford Press, p. 731.

<sup>513</sup> For example, Keller H. (2013) Attachment and culture. *Journal of Cross-Cultural Psychology*, 44, 175–194; Quinn, N. & Mageo, J. (eds) (2013) *Attachment Reconsidered: Cultural Perspectives on a Western Theory*, London: Palgrave; Otto, H., & Keller, H. (eds), (2014) *Different Faces of Attachment: Cultural Variations on a Universal Human Need*. Cambridge: Cambridge University Press; Morelli, G. (2015) The evolution of attachment theory and cultures of human attachment in infancy and early childhood. In L. E. Jensen (ed.), *The Oxford Handbook of Human Development and Culture: An Interdisciplinary Perspective* (pp. 149–164). Oxford: Oxford University Press.

<sup>514</sup> For example, Starreveld, K. M., Overbeek, M. M., Willems, A. M., & Bakermans-Kranenburg, M. J. (2024) Adapting a video-feedback intervention to support teacher–child interaction and behavior regulation of young children at school: A qualitative pilot study. *School Psychology International*, 45(1), 16–35.

<sup>515</sup> Cover endorsement by M. H. Van IJzendoorn for R. L. Harwood, J. G. Miller, N. L. Irizarry (1997) *Culture and Attachment: Perceptions of the Child in Context*. New York: Guilford Press.



to socio-economic, cultural, and religious contexts. Therefore, parenting can only be studied fruitfully from a wide range of disciplines.<sup>516</sup> For instance, 'expectations of fathers on the sociocultural level may influence their bonding and involvement in caregiving behaviors, which may in turn influence but may also be influenced by hormonal and neural processes'<sup>517</sup> Van IJzendoorn has evidently followed anthropological discussions of attachment research, and has cited these books and papers elsewhere in his work, though generally without deep discussion.<sup>518</sup>

An exception has been that Van IJzendoorn and Bakermans-Kranenburg have engaged in a sustained way with research on multiple caregiving arrangements. This has included frequent reflections on Meehan and Hawks' work on multiple caregiving among the Central African Aka hunter-gatherers.<sup>519</sup> Van IJzendoorn and Bakermans-Kranenburg have accepted as a dependable, replicated finding of anthropological and cross-cultural research that infants generally receive care not just from their mother but from a set of core caregivers. More generally, they have acknowledged that 'the meaning and context of specific parental behaviors, as well as the value placed on specific developmental outcomes, may vary between different cultural groups and across different ecological niches'.<sup>520</sup>

For Van IJzendoorn and Bakermans-Kranenburg, there are some epistemic obstacles to dialogue with anthropological research. One problem they perceived with the anthropological literature is that it has sometimes tended to be focused on criticizing an outdated, rather caricatured version of attachment theory, drawn from selected statements by Bowlby.<sup>521</sup> Van IJzendoorn and Bakermans-Kranenburg have urged critics to engage with the current state of inquiry, its questions and dilemmas, rather than with prevailing or outdated simplifications of attachment theory and research.

Van IJzendoorn and Bakermans-Kranenburg believe that anthropological and cross-cultural researchers have underestimated the need for work in the context of justification in the production of dependable knowledge. Where anthropologists have criticized attachment research on the basis that not much information is transmitted from content to coding, Van IJzendoorn and Bakermans-Kranenburg have been more concerned that not much content can be reliably coded. Exploratory and interpretive research, such as ethnographic studies, may offer valuable insight for generating hypotheses. Regardless, for Van IJzendoorn and Bakermans-Kranenburg, they are not yet dependable knowledge.

With these limitations in mind, Van IJzendoorn and Bakermans-Kranenburg nonetheless hold that there is much that developmental psychology could learn from anthropological and cross-cultural research. Addressing an issue close to their hearts, dialogue could support generation of hypotheses about the functioning of the attachment network.<sup>522</sup>

<sup>516</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2017) Editorial overview: Multidisciplinary and interdisciplinary perspectives on parenting. *Current Opinion in Psychology*, 15, iv–vii, p.vii.

<sup>517</sup> Bakermans-Kranenburg, M. J., Lotz, A., Alyousefi-van Dijk, K., & Van IJzendoorn, M. (2019) Birth of a father: Fathering in the first 1,000 days. *Child Development Perspectives*, 13(4), 247–253.

<sup>518</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, chapter 11.

<sup>519</sup> Meehan, C. L. & Hawks, S. (2013) Cooperative breeding and attachment among Aka foragers. In N. Quinn & J. M. Mageo (eds), *Attachment Reconsidered: Cultural Perspectives on a Western Theory* (pp. 85–114), London: Palgrave-Macmillan.

<sup>520</sup> Ellis, B. J., Boyce, W. T., Belsky, J., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2011) Differential susceptibility to the environment: An evolutionary–neurodevelopmental theory. *Development and Psychopathology*, 23(1), 7–28, p. 21.

<sup>521</sup> Duschinsky, R., Van IJzendoorn, M., Foster, S., Reijman, S., & Lionetti, F. (2020) Attachment histories and futures: Reply to Vicedo's 'Putting attachment in its place'. *European Journal of Developmental Psychology*, 17(1), 138–146.

<sup>522</sup> For recent work in this direction see for example Schmidt, W. J. (2023) Cultural attachment theory: How children form relationships in three cultural contexts in Costa Rica, unpublished doctoral dissertation,

It could also shed light on ecological factors that shape secure base and safe haven availability, such as buffering the effects of socioeconomic challenges on caregivers' coping, or altering the priorities of parents, grandparents, or other sources of social support.<sup>523</sup>

Van IJzendoorn and Bakermans-Kranenburg have dreamt of consortia to study phenomena such as the complementarity of attachment relationships in a network, and how and when a child integrates these various attachments in their experience of themselves and the world.<sup>524</sup> They have been delighted by research led by Or Dagan examining the implications of the attachment network for child development using pooled data to undertake an individual participant data meta-analysis.<sup>525</sup> The problem is that meta-analytic research on such questions can only scratch the surface because the necessary data is missing: these questions remain under-researched using assessments that can be harmonized across studies. Furthermore, new large collaborative studies are badly needed as the potential of harmonized existing datasets is going to be exhausted before long.

The perception of a thin evidence-base appears to have made Van IJzendoorn and Bakermans-Kranenburg especially reticent regarding developing theoretical proposals regarding how or why culture may impact the development of individual differences in attachment. Other attachment researchers have faced a similar predicament, though some such as Thompson and Bureau have drawn from anthropological and cross-cultural research to develop initial proposals.<sup>526</sup> In turn, the limited development of theory has hindered hypothesis-testing research that might examine the effects of culture, for example predictors of the variation that was shown in mothers' values in studies using Q-Sorts. This has contributed to a tendency at times for unmoored post-hoc theorizing among attachment researchers, including Van IJzendoorn and Bakermans-Kranenburg, when differences have been identified between national or cultural groups.<sup>527</sup>

The basic problem is that the support and motivation for a conversation across disciplines has been weak. This has hindered cooperation and contributed to bad feeling and distrust.<sup>528</sup> What attachment researchers most want from cross-cultural researchers are

Universität Osnabrück; Schmidt, W. J., Keller, H., & Coto, M. R. (2023) The cultural specificity of parent-infant interaction: Perspectives of urban middle-class and rural indigenous families in Costa Rica. *Infant Behavior and Development*, 70, 101796.

<sup>523</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, chapter 11. See also Mooya, H., Sichimba, F., & Bakermans-Kranenburg, M. (2016) Infant-mother and infant-sibling attachment in Zambia. *Attachment & Human Development*, 18(6), 618–635; Riem, M. M., Bakermans-Kranenburg, M. J., Cima, M., & Van IJzendoorn, M. H. (2023) Grandparental support and maternal postpartum mental health: A review and meta-analysis. *Human Nature*, 34(1), 25–45; Spinelli, M., Preti, E., Kassa, T. T., Asale, M. A., Goshu, M. A., Tsega, T. W., ... & Mesman, J. (2023) Cultural considerations in the assessment of sensitivity in low-income caregivers in Ethiopia. *Frontiers in Psychology*, 14, 1163773.

<sup>524</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, Table 3.1.

<sup>525</sup> For example, Dagan, O., Schuengel, C., Verhage, M. L., Van IJzendoorn, M. H., Sagi-Schwartz, A., Madigan, S., ... & Collaboration on Attachment to Multiple Parents and Outcomes Synthesis. (2021) Configurations of mother-child and father-child attachment as predictors of internalizing and externalizing behavioral problems: An individual participant data (IPD) meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 67–94.

<sup>526</sup> For example Thompson, R. A. (2021) Eyes to see and ears to hear: Sensitivity in research on attachment and culture. *Attachment & Human Development*, 23(2), 222–230; Broesch, T., von Rueden, C., Yurkowski, K., Quinn, H., Alami, S., Davis, H. E., ... & Bureau, J. F. (2023) Fatherhood and child-father attachment in two small-scale societies. *Journal of Cross-Cultural Psychology*, 54(5), 591–609.

<sup>527</sup> For example Cassibba, R., Sette, G., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2013) Attachment the Italian way. *European Psychologist*, 18(1), 47–58: 'We may speculate that the underrepresentation of unresolved attachments is a consequence of the high diffusion of Catholic values among the Italian population' (53).

<sup>528</sup> Keller, H. (2021) *The Myth of Attachment Theory: A Critical Understanding for Multicultural Societies*. London: Routledge; Waters, E. & Eagle, M. (2023) Cross-cultural criticisms of attachment: A taxonomy and the

studies to help shed light on the moderators that shape when and how kinds of caregiving influence child attachment and later development.<sup>529</sup> This also reflects a growing focus on moderation within developmental science. However, there is little funding for such work within either discipline. Furthermore, such questions would be at most incidental to the primary goals of most anthropological and cross-cultural researchers, since they are only marginally aligned with the aim of anthropology to understand cultural practices.<sup>530</sup>

In turn, anthropologists and cross-cultural researchers have observed that attachment researchers have focused research on parental care, parental mental health, attachment representations, and parents' attitudes towards their child. Sometimes they have attended to caregivers' experiences by addressing parenting stress, social support, and life events; one thread in attachment theory has been to conceptualize the caregiver's own supports as the secure base for their parenting.<sup>531</sup> However, rarely do they collect information on caregivers' ecology, resources, parental ethno-theories, parenting beliefs and values, exposure to forms of violence and oppression, and household, social, and caregiving practices.<sup>532</sup> This has been an obstacle to addressing the role of diverse family forms in shaping attachment relationships.<sup>533</sup> Stern and colleagues have added that experiences of racism and other forms of discrimination should likewise be routinely collected by researchers.<sup>534</sup>

Lyons-Ruth has identified the relative paucity of such information, which she recognizes as important, as a limitation to her longitudinal study (Chapter 2). Keller has specifically criticized this issue in the case of the work by Posada and colleagues and the Leiden group:

These studies are not based on a conception of culture; instead they equate country with culture or ethnic group without assessing information about cultural orientations/attitudes/beliefs of the respective samples. Moreover, the samples often are composed by participants differing in their ethnic and social characteristics, which may mask different conceptions of attachment.<sup>535</sup>

Furthermore, as we saw in Belsky's Penn State studies (Chapter 3), when attachment researchers do sometimes collect such information, it is used in limited ways. To give a

method and advantages of charitable interpretation. Presentation to the Rapaport-Klein Study Group, <https://www.psychomedia.it/rapaport-klein/Waters-Slides-2023.pdf>.

<sup>529</sup> Grossmann, K. E., Grossmann, K., & Keppler, A. (2005) Universal and culturally specific aspects of human behavior: The case of attachment. In W. Friedlmeier, P. Chakkarath, & B. Schwarz (eds), *Culture and Human Development: The Importance of Cross-cultural Research to the Social Sciences* (pp. 75–97). Howe, GB: Psychology Press.

<sup>530</sup> Friedlmeier, W. (2005) Emotional development and culture: Reciprocal contributions of cross-cultural research and developmental psychology. In W. Friedlmeier, P. Chakkarath, & B. Schwarz (eds), *The Importance of Cross-cultural Research for the Social Sciences* (pp. 125–152). Hove, England: Psychology Press.

<sup>531</sup> For example, Sroufe, L. A., Egeland, B., Carlson, E. A., & Collins, W. A. (2005) *The Development of the Person*. New York: Guilford

<sup>532</sup> Weisner, T. S. (2005) Attachment as a cultural and ecological problem with pluralistic solutions. *Human Development*, 48(1/2), 89–94; Harkness, S. (2015) The Strange Situation of attachment research: A review of three books. *Reviews in Anthropology*, 44(3), 178–197; Gaskins, S., Beeghly, M., Bard, K. Gernhardt, A. Liu, C. Teti, D. Thompson, R. Weisner, T., & Yovsi, R. (2017) Meaning and methods in the study and assessment of attachment. In H. Keller & K. Bard (eds), *The Cultural Nature of Attachment: Contextualizing Relationships and Development Nature of Relationships and Development* (pp. 195–229). Cambridge, MA: MIT Press; Selcuk, E., Ascigil, E., & Gunaydin, G. (2024) A theoretical analysis and empirical agenda for understanding the socioecology of adult attachment. *European Review of Social Psychology*, early view.

<sup>533</sup> Golombok, S. (2015) *Modern Families: Parents and Children in New Family Forms*. Cambridge: Cambridge University Press.

<sup>534</sup> Stern, J. A., Barbarin, O., & Cassidy, J. (2022) Attachment perspectives on race, prejudice, and anti-racism: Introduction to the Special Issue. *Attachment & Human Development*, 24(3), 253–259.

<sup>535</sup> Keller, H. (2021) *The Myth of Attachment Theory: A Critical Understanding for Multicultural Societies*. London: Routledge, p. 45.

specific example, Belsky collected information about women's experience of gender stereotypes, but then did not examine the correlates of these experiences. Generally, in the late 1970s and early 1980s, under the influence of Bronfenbrenner, Belsky advocated for the irreducible importance of caregivers' ecology, resources, parental ethno-theories, parenting beliefs, and household, social, and caregiving practices.<sup>536</sup> This no doubt contributed to his desire to collect relevant data in the Penn State longitudinal studies. However, by the late 1980s, concern with these factors had begun to drop out of view, though they continued to be acknowledged in principle. Belsky's focus turned towards what he regarded as more proximal factors, regarded as more practically and politically amenable to intervention.

Barbot, Van IJzendoorn, and collaborators have acknowledged that 'the measurement and modeling of the "environome" should include more factors, from physical to ethnic and cultural influences, that are often missing from current developmental models.'<sup>537</sup> Yet for Van IJzendoorn and Bakermans-Kranenburg, a key limitation is that there is no consensus set of priorities or consensus set of measures for assessing such ecological aspects of caregiving, resulting in a diffuse and limited basis for knowledge. An illustration, discussed in [Chapter 3](#), is the heterogeneous literature on the role of social support. Waters and Eagle have agreed that collaboration between attachment researchers and cross-cultural colleagues would be a huge asset in the development of a consensus set of measures.<sup>538</sup>

Regarding methodologies outside of the 'gold standard' attachment assessments, again the issue hinges on replication. Van IJzendoorn and Bakermans-Kranenburg have argued for the value of use of a convergent set of assessments as the basis of cumulative research.<sup>539</sup> When sufficient evidence has accumulated with a new measure, whether the AQS or AMBIANCE, they have contributed to or led meta-analytic research to confirm what findings survive across replications. In the case of AMBIANCE, this was despite disapproval from their friends Main and Hesse, who perceived the meta-analysis as serving to legitimize a rival to their own measure of frightening/frightened (FR) caregiving behaviour ([Chapter 1](#)).

Anthropologists and cross-cultural critics have argued that the study of attachment has been static and unbreathing, unresponsive to time or criticism or others' perspectives,

<sup>536</sup> Belsky, J., & Steinberg, L. D. (1978) The effects of day care: A critical review. *Child Development*, 929–949: 'Future researches should also examine potentially differential influences of center-based care, family day care, and home rearing on peer interaction, friendship formation, and interpersonal competence. Investigations of the consequences of day care at the level of the exosystem, defined as "those formal and informal structures that do not themselves contain the child, but impinge upon and encompass the immediate settings in which he is contained" (Bronfenbrenner 1977, p. 515), are also conspicuous in their absence. We cannot hope to understand fully the impact of the day-care experience until we begin to examine its effects on the marital relationship, the world of work, and the structure and functioning of the neighborhood. Thus, questions that we might pose in this regard are, How is the institution of marriage affected by day care? Does day care affect a family's income, the career advancement of women, or absenteeism from work? How does day care affect the development, function, and maintenance of social networks? Finally, and perhaps most profoundly, we know almost nothing about the ways in which day care affects the patterns of culture and sub-culture that serve as carriers of information, ideology, and custom. Such effects at the level of the macrosystem might be studied through analyses of the impact of day care upon societal attitudes toward the care of children, the function of the family, and the role of women in our culture. One might also question, for example, how alternative child-care arrangements influence the entrance of women into the labor force, as well as the effect that this may have on the rates of teenage unemployment, the welfare system, and other broad economic indicators' (946).

<sup>537</sup> Barbot, B., Hein, S., Trentacosta, C., Beckmann, J. F., Bick, J., Crocetti, E., ... & Van IJzendoorn, M. H. (2020) Manifesto for new directions in developmental science. *New Directions for Child and Adolescent Development*, 2020(172), 135–149.

<sup>538</sup> Waters, E. & Eagle, M. (2023) Cross-cultural criticisms of attachment: A taxonomy and the method and advantages of charitable interpretation. Presentation to the Rapaport-Klein Study Group, <https://www.psychomedia.it/rapaport-klein/Waters-Slides-2023.pdf>.

<sup>539</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2021) Replication crisis lost in translation? On translational caution and premature applications of attachment theory. *Attachment & Human Development*, 23(4), 422–437.

partly due to a lack of methodological pluralism.<sup>540</sup> It is true, there is a kind of methodological conservatism in the priority given by Van IJzendoorn and Bakermans-Kranenburg to established methods, such as the Strange Situation, judged as well positioned to contribute to future meta-analytic inquiry. This stems directly from their philosophy of science, and the emphasis placed on the need for inquiry in the context of justification. This priority has left even relatively established measures—such as alarming caregiving behaviour (FR or AMBIANCE) or caregiver reflective functioning—out in the cold, without research on their cross-cultural validity.<sup>541</sup>

Van IJzendoorn and Bakermans-Kranenburg have similarly undertaken little work on whether the antecedents of avoidance, resistance, and disorganization are the same cross-culturally.<sup>542</sup> Not that they regard such research as uninteresting or unimportant—quite the opposite. Nonetheless, for them priority needs to be given to the most established methods, and the basic question of secure base and safe haven provision, in order that science can gain a foothold.

Beyond the need to give priority to established measures, Van IJzendoorn and Bakermans-Kranenburg have otherwise agreed with criticisms of attachment research as being slow to learn from other disciplines. They have been especially impatient with the traditional oppositions, established in the early years of attachment research especially by Sroufe, between forms of explanation that appeal to attachment and those that appeal to biology, temperament, or social learning.<sup>543</sup>

They have also been passionate about supporting research on secure base and safe haven provision using the ‘gold standard’ measures around the world, observing that ‘the current cross-cultural database is almost absurdly small.’<sup>544</sup> Almost three-quarters of studies have been conducted in North America, and a fifth in Europe. Furthermore, within these

<sup>540</sup> Morelli, G. A. & Henry, P. I. (2013) Afterword: Cross-cultural challenges to attachment theory. In N. Quinn & J. M. Mageo (eds), *Attachment Reconsidered: Cultural Perspectives on a Western Theory* (pp. 241–249). New York: Palgrave Macmillan US; Weisner, T. (2014) The socialization of trust: Plural caregiving and diverse pathways in human development across cultures. In H. Otto & H. Keller (eds), *Different Faces of Attachment* (pp. 263–277). Cambridge: Cambridge University Press; Keller, H. (2021) Attachment theory: Fact or fancy? In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The fundamental questions*, ch. 28 (pp. 229–236). New York: Guilford.

<sup>541</sup> An exception is an emerging body of research using the Parental Reflective Functioning Questionnaire for example Sümer, N., Lubiewska, K., Aran, Ö., Głogowska, K., & Żegleń, M. (2024) Maternal reflective functioning and intergenerational transmission of attachment orientations in Poland, the Netherlands, and Turkey. *Journal of Child and Family Studies*, 33(1), 288–303; Lee, Y., Meins, E., & Larkin, F. (2023) Parental mentalization across cultures: Mind-mindedness and parental reflective functioning in British and South Korean Mothers, <https://osf.io/preprints/psyarxiv/qx9mh/>. For a survey of cross-cultural applications of the AAI, see Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A. & Van IJzendoorn, M. H. (2024) Celebrating more than 26,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status. *Attachment & Human Development*, forthcoming: ‘Large parts of the world are not represented in the corpus of AAI studies. Not a single study from the African continent is available. In addition, only one study from South America and three studies from Australia’ though ‘we happily note the substantial increase of AAIs in non-English languages, and the rather similar distributions found for these AAIs’.

<sup>542</sup> For example, Mooya, H., Sichimba, F., & Bakermans-Kranenburg, M. (2016) Infant–mother and infant–sibling attachment in Zambia. *Attachment & Human Development*, 18(6), 618–635. For a review of this literature and new empirical report, see True, M. M. (2021) New correlates of disorganization from a West-African dataset, and shared rhythmic touch as a hidden pathway to infant attachment security. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 240–259). New York: Wiley.

<sup>543</sup> Bosmans, G., Bakermans-Kranenburg, M. J., Vervliet, B., Verhees, M. W., & Van IJzendoorn, M. H. (2020) A learning theory of attachment: Unraveling the black box of attachment development. *Neuroscience & Biobehavioral Reviews*, 113, 287–298.

<sup>544</sup> Mesman, J., Van IJzendoorn, M. H., & Sagi-Schwartz, A. (2016) Cross-cultural patterns of attachment. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (pp. 852–877). New York: Guilford, p. 809.

samples, over 60% reported no ethnic minority representation.<sup>545</sup> Van IJzendoorn and Bakermans-Kranenburg have sought to rectify such imbalances, with particular focus on caregiving contexts.

Van IJzendoorn's 1990 paper argued that attachment theory and research would be validated, not by distributions of classifications in the Strange Situation, but by evidence of theoretically expectable antecedents and sequelae. It is notable, then, that their efforts have focused almost exclusively on supporting cross-cultural research on antecedents. This may reflect Van IJzendoorn's growing perception that the effects of secure base/safe haven provision by caregivers on child development are not, as Bowlby anticipated, largely mediated by children's expectations regarding their caregivers (e.g., as measured by the Strange Situation).

In the mid-2000s, Van IJzendoorn was given a sizeable personal bonus by Leiden University for winning the Spinoza Prize. He put this money towards the founding the Lolle Nauta Foundation, to support the graduate studies of a dozen African researchers at the University of Zambia, several co-supervised by Leiden researchers.<sup>546</sup> The Foundation also received funds from Van IJzendoorn, Bus, and Bakermans-Kranenburg's fees for writing, talks and editorial work.<sup>547</sup> They invested considerable amount of their time in mentoring graduate students from Zambia and Kenya. Studies funded by the Lolle Nauta Foundation included research by Francis Sichimba of the role of grandparental care and sensitivity,<sup>548</sup> and a study by Haatembo Mooya of infant-sibling attachment in the Strange Situation.<sup>549</sup> As a matter of principle, to counterbalance the usual neo-colonial approach of excluding African researchers from being (co-)authors, Van IJzendoorn refrained from being co-author when these studies were published.<sup>550</sup> For the same reason, except Mbagaya, all PhD dissertations were defended at African universities.

In addition to the Lolle Nauta Foundation, Van IJzendoorn, and Bakermans-Kranenburg have supported researchers and conducted training in other countries to pursue empirical research on attachment, including Chile and China.<sup>551</sup> Often this research has addressed questions off the beaten track for conventional attachment research, addressing questions arising as important within the specific national context. Van IJzendoorn has also offered teaching for students in Kyiv and Lviv, and helped support research

<sup>545</sup> Ly, A., Deneault, A.-A., Duschinsky, R., Schuengel, C. & Madigan, S. (2024) The Child Attachment Studies Catalogue and Data Exchange (CASCADE) dataset, a repository of all child-parent attachment studies conducted using observational measures. Poster presented at the International Attachment Conference, Rouen, France, July 2024. See also Fourment, K., Espinoza, C., Ribeiro, A. C. L., & Mesman, J. (2022) Latin American Attachment studies: A narrative review. *Infant Mental Health Journal*, 43(4), 653–676; Prag, A., Donald, K. A., Weldon, E., Halligan, S. L., Stein, D. J., & Malcolm-Smith, S. (2024) Has maternal sensitivity been comprehensively investigated in sub-Saharan Africa? A narrative scoping review. *Acta Neuropsychiatrica*, early view.

<sup>546</sup> <https://lollenautafoundation.eu/about-the-foundation>.

<sup>547</sup> For example, Van IJzendoorn, M. H., & de Frankrijker, H. (2005) *Pedagogiek in Beeld: Een inleiding in de pedagogische studie van opvoeding, onderwijs en hulpverlener*. 2nd ed. Bohn Stafleu van Loghum.

<sup>548</sup> Sichimba, F., Mooya, H., & Mesman, J. (2017) Predicting Zambian grandmothers' sensitivity toward their grandchildren. *The International Journal of Aging and Human Development*, 85(2), 185–203.

<sup>549</sup> Mooya, H., Sichimba, F., & Bakermans-Kranenburg, M. (2016) Infant-mother and infant-sibling attachment in Zambia. *Attachment & Human Development*, 18(6), 618–635.

<sup>550</sup> Mooya, H. (2024) Parenting and attachment without borders. Keynote address to the International Attachment Conference, Rouen, France, July 2024.

<sup>551</sup> For example, Cárcamo, R. A., Vermeer, H. J., van der Veer, R., & Van IJzendoorn, M. H. (2016) Early full-time day care, mother-child attachment, and quality of the home environment in Chile: Preliminary findings. *Early Education and Development*, 27(4), 457–477; Liang, X., Lin, Y., Van IJzendoorn, M. H., & Wang, Z. (2021) Grandmothers are part of the parenting network, too! A longitudinal study on coparenting, maternal sensitivity, child attachment and behavior problems in a Chinese sample. *New Directions for Child and Adolescent Development*, 2021(180), 95–116.

in war-stricken Ukraine.<sup>552</sup> This has included collaborative research on the impact of the war on the mental health of Ukrainian children and caregivers who have been internally displaced from their homes.<sup>553</sup>

On the one hand, Van IJzendoorn and Bakermans-Kranenburg have been concerned to expand the research base of theory and practice on attachment, over-reliant on studies in a limited number of countries and ensuing risk of cultural bias. On the other, as a matter of equity, they have sought to ensure access to attachment research for those who wish to contribute to the field. They have capitalized on cross-national differences in context and policy to study specific challenges with broader theoretical or practical stakes.<sup>554</sup> Several such examples can be seen in their collaborations with Sagi-Schwartz, including studies of children raised collectively on kibbutzim,<sup>555</sup> and of the states of mind regarding attachment of Holocaust survivors and their children.<sup>556</sup> Another example is Van IJzendoorn's collaboration with Jing Guo, examining experiences of Covid-19 among Chinese adolescents—underway before the virus was even officially acknowledged by governments to be present in Europe.<sup>557</sup> Van IJzendoorn and Bakermans-Kranenburg have also pursued a sustained research agenda examining the attachment and development of children raised in institutions rather than by families, which has been especially common in eastern and southern Europe. This will be the focus of the next section.

## Institutional Care

### Growing Concern

One of the important bases for Bowlby's development of attachment theory was his studies of children without access to a familiar caregiver. This included: his case review of 44 juvenile thieves, many of whom had unstable caregiving arrangements; his review for the World Health Organisation of research on children receiving institutional care; and the empirical research conducted by his research group on the experience of children in long-term hospital care without much contact with their parents.<sup>558</sup> Attachment theory was founded on the premise that experience of a familiar caregiver is very important to a child's socioemotional development. Bowlby argued that not every child without access to a familiar caregiver would experience mental disturbance but anticipated that this would be a common developmental pathway.

<sup>552</sup> Пресцентр НМУ (2023) Почесний професор Лондонського університету прочитав лекції у НМУ. <https://nmuofficial.com/news/pochesnyj-profesor-londonskogo-universytetu-prochytav-lektsiyi-u-nmu/>.

<sup>553</sup> Tsyhanyk, L., Van IJzendoorn, M., Chemerys, N., & Nehrych, T. (2024) The dramatic impact of Russian aggression on the mental health of Ukrainian children and returning war veterans. International Attachment Conference, Rouen, France, July 2024.

<sup>554</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2008) Earlier is better: A meta-analysis of 70 years of intervention improving cognitive development in institutionalized children. *Monographs of the Society for Research in Child Development*, 73(3) p. 279.

<sup>555</sup> Sagi, A., Van IJzendoorn, M. H., Aviezer, O., Donnell, F., Koren-Karie, N., Joels, T., & Harl, Y. (1995) Attachments in a multiple-caregiver and multiple-infant environment: The case of the Israeli kibbutzim. *Monographs of the Society for Research in Child Development*, 60(2–3), 71–91.

<sup>556</sup> Sagi, A., Van IJzendoorn, M. H., Joels, T., & Scharf, M. (2002) Disorganized reasoning in Holocaust survivors. *American Journal of Orthopsychiatry*, 72(2), 194–203.

<sup>557</sup> Guo, J., Fu, M., Liu, D., Zhang, B., Wang, X., & Van IJzendoorn, M. H. (2020) Is the psychological impact of exposure to COVID-19 stronger in adolescents with pre-pandemic maltreatment experiences? A survey of rural Chinese adolescents. *Child Abuse & Neglect*, 110, 104667.

<sup>558</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 1.



With Ainsworth's introduction of the Strange Situation, empirical research on attachment generally left aside the question of children without access to a familiar caregiver. The primary exception was Charles Zeanah and collaborators.<sup>559</sup> However, the topic was one that particularly interested Van IJzendoorn. As we saw above, from early in his career he seems to have been particularly mindful of the potential powerlessness of children, especially those without a familiar person to understand and advocate for their needs. From his first writings about attachment theory, he identified this as a central theoretical issue: if children with no access to a familiar caregiver generally showed minimal effects, this would be fatal to attachment theory.<sup>560</sup> He also perceived children without access to a familiar caregiver as a pressing societal issue. Whilst Bowlby's work had reduced the frequency of long-term hospital care for children without access to their parents, many children still experienced unstable caregiving arrangements or resided in institutional care, in the Netherlands and around the world.

The topic was further addressed by empirical work undertaken by Van IJzendoorn and colleagues in the mid-1990s. Bakermans-Kranenburg's doctoral thesis had established the psychometric and discriminant credibility of the AAI in a community sample. A next step would be to establish whether the measure could adequately differentiate community and clinical or forensic populations. Bowlby had proposed that disruptions in attachment relationship would predispose criminal behaviour and mental illness. Following this lead, Van IJzendoorn and collaborators undertook a study with 40 individuals subject to *Ter Beschikking Stelling*, a sanction that can be given in the Netherlands following conviction of a severe crime (e.g., rape, child sexual abuse, homicide) where the offence is judged to have been caused by a mental illness.<sup>561</sup>

Only two of the participants were identified as secure/autonomous on the AAI. The transcripts of all the others were identified as showing distortions or lack of coherence in their accounts of their childhood and care. These findings agreed with a meta-analysis Van IJzendoorn and Bakermans-Kranenburg were conducting at the same time of research with the AAI to date, which identified an overrepresentation of insecure states of mind regarding attachment in clinical and forensic samples.<sup>562</sup> Van IJzendoorn and colleagues regarded the tiny proportion of secure/autonomous classifications in the offender sample as commensurate with the high level of psychological disturbance among their sample.

Examining the transcripts, Van IJzendoorn and the team were struck that as many as 55% of the offender sample had grown up in institutional care or had major and repeated discontinuities in their caregiving arrangements. The researchers also found many more markers of insecurity among the participants with these experiences than participants with more stable backgrounds who were raised in families. Within the sample of 40, a quarter of participants had transcripts that departed too much from the classifications described by the Berkeley group, and were judged 'cannot classify'. All but one of these 10 participants had grown up in institutional care.

<sup>559</sup> For example, Zeanah C. H., Mammen O., & Lieberman, A. (1993) Disorders of attachment. In C. H. Zeanah (ed.) *Handbook of Infant Mental Health* (pp. 332–349). New York, Guilford.

<sup>560</sup> Van IJzendoorn, M. H., Tavecchio, L. W. C., Goossens, F. A. & Vergeer, M. M. (1982) *Opvoeden in geborgenheid: Een kritische analyse van Bowlby's attachmenttheorie*, Amsterdam: Van Loghum Slaterus

<sup>561</sup> Van IJzendoorn, M. H., Feldbrugge, J. T. T. M., Derks, F. C. H., De Ruiter, C., Verhagen, M. F. M., Philipse, M. W. G., ... & Riksen-Walraven, J. M. A. (1997) Attachment representations of personality disordered criminal offenders. *American Journal of Orthopsychiatry*, 67, 449–459.

<sup>562</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (1996) Attachment representations in mothers, fathers, adolescents, and clinical groups: A meta-analytic search for normative data. *Journal of Consulting and Clinical Psychology*, 64(1), 8–21.



## Studies of Institutionalized Children

In 1999 the Nuffield Foundation in the UK funded a study of attachment relationships among children in Greek institutional care, led by Panayiota Vorria, Judy Dunn, Howard Steele, and Van IJzendoorn.<sup>563</sup> This was the first study to use the Strange Situation with infants in residential care, seen with their most familiar residential caregiver. Comparisons were made between 86 infants reared in group care and 41 matched infants raised in families and attending local daycare.

The researchers found the Strange Situations exceptionally difficult to classify, with only 62% agreement between coders. Of the children in institutional care, 66% ultimately received a disorganized classification. A quarter were classified as secure. In the comparison group, 25% received a disorganized classification, and 41% were classified as secure. No significant association with attachment classification was found for various infant characteristics such as health factors, temperament, or cognitive development. Vorria and colleagues reflected that disorganized attachment behaviour may, on the one hand, reflect experience of alarming caregiver behaviour, as in family-raised samples: 'because the institution is understaffed the caregivers often employed disciplining behaviour which could be frightening to the infants'. On the other hand, or additionally, the high rates of disorganized attachment may reflect aspects of institutional care itself, such as staff turnover, which may undermine infants' confidence in their ability to turn to staff as familiar figures in times of need.

These findings were supported by a 2005 paper by Zeanah and colleagues, reporting first results from the Bucharest Early Intervention Project, the first and only randomized controlled trial of foster care as an alternative to institutional care for orphaned children.<sup>564</sup> These children were compared with home-reared Romanian children. Using data only for children aged 11–31 months without an intellectual disability, the study reported findings for 95 children in the institutionalized group, with 50 home-reared Romanian children recruited as a point of comparison. The children were seen in the Strange Situation with their most familiar caregiver. The Strange Situations were coded by Carlson and Sroufe from the Minnesota group using the familiar four-category system, and also with a scale, developed by Elizabeth Carlson, for classifying the degree to which children appeared attached to their caregiver. The caregiver completed the Disturbances of Attachment Interview to assess for inhibited attachment disorder and indiscriminate friendliness (Chapter 2). The caregiver completed a questionnaire about child social competence and behavioural problems. Children's cognitive abilities were assessed with the Bayley Scales of Infant Development. The quality of children's care was measured using an adaptation of the NICHD HOME scale (Chapter 3).

Zeanah and colleagues found that the children in institutional care showed considerably more inhibited attachment behaviour and indiscriminate friendliness. There was no association with the length of institutionalization. All the family-reared children showed clear-cut attachment behaviour in the Strange Situation, orienting towards the caregiver on reunion and playing more when they were present. Whilst many of the institutionalized children showed some attachment behaviour towards their caregiver, only for three

<sup>563</sup> Vorria, P., Papaligoura, Z., Dunn, J., Van IJzendoorn, M. H., Steele, H., Kontopoulou, A., & Sarafidou, Y. (2003) Early experiences and attachment relationships of Greek infants raised in residential group care. *Journal of Child Psychology and Psychiatry*, 44(8), 1208–1220.

<sup>564</sup> For an overview, see Zeanah, C. H., Fox, N. A., & Nelson, C. A. (2016) Attachment at the extremes: Lesson from the Bucharest Early Intervention Project. In *Attachment Across Clinical and Cultural Perspectives* (pp. 162–182). London: Routledge.

was this clear-cut. A fifth of the institutionalized children could not be classified. Of the others, 65% received a disorganized classification, in large part because their attachment behaviour appeared 'anomalous or incompletely developed'.<sup>565</sup> Of the 18 institutionalized infants classified as securely attached, these classifications were tentative as almost all received a low score on Carlson's measure of whether an attachment relationship seemed present at all. The researchers suspected that 'the meaning of secure and disorganized classifications of attachment in the community and institutionalized groups are different'.<sup>566</sup>

For the home-reared children, 74% received a secure classification. The association between the Strange Situation classifications and caregiver report of indiscriminate friendliness was non-significant, suggesting that these are relatively independent. For the institutionalized children, but not the home-reared children, quality of care as measured by the NICHD scale was associated with less disorganization and less inhibited attachment behaviour. The researchers did not examine whether disrupted attachment relationships predicted child outcomes over and above the effects of institutional care.

Influenced by the studies by Vorria and Zeanah and colleagues, in 2008, the St Petersburg–USA Orphanage Research Team published a further study, an evaluation of two interventions with orphanages in St Petersburg. The children in these orphanages received adequate medical care, nutrition, and toys and equipment. Besides this, 'caregivers performed routine duties in a perfunctory, business-like manner with minimum interaction with children. In addition, children had 9–12 caregivers per week, as many as 60–100 different care givers over the first 2 years of life'.<sup>567</sup> In one condition (N = 54), the orphanage staff were trained in the importance of providing consistent, sensitive care. In a second condition (N = 52), as well as implementing this training, the group size for children was reduced from 12 to 6, and two primary caregivers were assigned to each group so that one could be available every day. The caregivers spent at least two hours a day of dedicated time with the six children in their 'family-style' group. In a third orphanage, no intervention was made to care as usual (N = 64).

The interventions led to improved quality of care (assessed with the HOME), with greater improvements in the second condition. There was a dose–response relationship identified, with stronger effects after 9+ months than after 4–9 months. The interventions also led to improvements in children's physical growth (height, weight, chest circumference—though not head circumference), suggesting that the improved socioemotional care received by the children had an impact on their physical development. Additionally, the St Petersburg interventions saw improvements in cognitive and behavioural, again with greater improvements in the second condition.

In the Strange Situation, the St Petersburg children in the second, 'family-style', condition were observed to show more positive emotions towards their familiar caregiver during free play and on reunions, especially after nine+ months of the intervention. They showed considerably more proximity seeking and contact maintaining behaviour with their caregiver, and less avoidant behaviour. They were also 2.7 times less likely to be classified as disorganized. For children in the orphanage providing care as usual or just

<sup>565</sup> Zeanah, C. H., Smyke, A. T., Koga, S. F., Carlson, E., & Bucharest Early Intervention Project Core Group (2005) Attachment in institutionalized and community children in Romania. *Child Development*, 76(5), 1015–1028, p. 1024.

<sup>566</sup> Ibid.

<sup>567</sup> St Petersburg–USA Orphanage Research Team (2008) The effects of early social-emotional and relationship experience on the development of young orphanage children. *Monographs of the Society for Research in Child Development*, 73: vii–295, p. vii.

training, around 85% were classified as disorganized, compared to 62% in the condition with structural changes to provide more consistent care.

The children in the 'family-style' continued to show considerable physical, cognitive, and socioemotional benefits from the intervention 6 and 10 years later.<sup>568</sup> The intervention was eventually integrated into official national policy for all orphanages in Russia, and implemented in institutions elsewhere in the world.<sup>569</sup> Though Van IJzendoorn and Bakermans-Kranenburg have questioned whether these policies represent mere propaganda or are actually reflected in reality.<sup>570</sup> Again no attempt was made to examine whether disrupted attachment relationships predicted child outcomes over and above the effects of institutional care.

Bakermans-Kranenburg, Van IJzendoorn, and Juffer offered a commentary on the St Petersburg study.<sup>571</sup> They stressed that improvement in institutional care nonetheless still left children at serious risk of poor outcomes. So even with the formation of 'family-style' groups, with contact with familiar caregivers for two hours a day, rates of disorganized attachment were still extremely high, and similar to the 65% rate for disorganization reported by Zeanah and colleagues in their study of Romanian orphanages.<sup>572</sup> Other outcomes, while improved, were likewise considerably below the means for studies of family-reared children even facing other adversities. Bakermans-Kranenburg and colleagues argued that 'institutional rearing, because of its regimented nature, high child-to-caregiver ratio, multiple shifts and frequent change of caregivers, almost inevitably deprive children of reciprocal interactions with stable caregivers. In this respect, institutional care implies structural neglect.'<sup>573</sup>

Van IJzendoorn's Spinoza Prize in 2004 allowed him to fund research with a considerable degree of freedom. One such project, funded by the Prize, was a study of 37 children aged 13–80 months in an orphanage in India. Juffer and colleagues documented severe deficits in physical and cognitive development; these findings were then replicated in a second cohort. To further understand the nature of structural neglect, they also had observers step into the room the child was in every 10 minutes during a five-hour window,

<sup>568</sup> McCall, R. B., Groark, C. J., Fish, L., Muhamedrahimov, R. J., Palmov, O. I., & Nikiforova, N. V. (2013) Maintaining a social-emotional intervention and its benefits for institutionalized children. *Child Development*, 84(5), 1734–1749; McCall, R. B., Groark, C. J., Hawk, B. N., Julian, M. M., Merz, E. C., Rosas, J. M., ... & Nikiforova, N. V. (2019) Early caregiver–child interaction and children's development: Lessons from the St. Petersburg–USA Orphanage intervention research project. *Clinical Child and Family Psychology Review*, 22, 208–224.

<sup>569</sup> Solodunova, M., Palmov, O., & Muhamedrahimov, R. J. (2017) Family environment in institutions for young children in Russia: Mental health and development vs. medical care. In A. V. Rus, S. R. Parris, & E. Stativa (eds), *Child Maltreatment in Residential Care: History, Research, and Current Practice* (pp. 199–218). New York: Springer. See also Groark, C. J., McCall, R. B., McCarthy, S. K., Eichner, J. C., Warner, H. A., Salaway, J., ... & Lopez, M. E. (2013) The effects of a social-emotional intervention on caregivers and children with disabilities in two Central American institutions. *Infants & Young Children*, 26, 286–305; Wang, W. C., McCall, R. B., Li, J., Groark, C. J., Zeng, F., & Hu, X. (2017) Chinese collective foster-care model: Description and evaluation. *International Social Work*, 60, 435–451.

<sup>570</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2024) Monitoring change from residential housing care to family-based care for children. *Lancet Child and Adolescent Health*, 8(8), 549–550.

<sup>571</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2008) Earlier is better: A meta-analysis of 70 years of intervention improving cognitive development in institutionalized children. *Monographs of the Society for Research in Child Development*, 73(3) p. 279. See also Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. (2021) 'Tear down your institutions'. Empirical and evolutionary perspectives on institutional care in SOS Children's Villages. <https://osf.io/preprints/psyarxiv/ye7jh>.

<sup>572</sup> Zeanah, C. H., Smyke, A. T., Koga, S. F., Carlson, E., & Bucharest Early Intervention Project Core Group (2005) Attachment in institutionalized and community children in Romania. *Child Development*, 76(5), 1015–1028.

<sup>573</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2008) Earlier is better: A meta-analysis of 70 years of intervention improving cognitive development in institutionalized children. *Monographs of the Society for Research in Child Development*, 73(3), 279.

and make video recordings which were coded afterwards. The results were bleak: 80% of the time the child was not interacting with anyone; 14% of the time they were interacting with another child; and only 6% of the time were they interacting with a caregiver, and of this only 1% involved vocal interaction. Around half the time, the child sat or lay passively, not engaged in any activity. Following orphanage policy, the children were in the same room day and night. Toys were available for the child 10% of the time. The children were silent 92% of the time. Juffer and colleagues reflected that ‘the observations in the current study indeed point to experiences of structural neglect and sustained traumatization within a highly regimented child-unfriendly structure of child care. A larger contrast to sensitive care ... is hardly conceivable.’<sup>574</sup>

Another study of institutional care funded by the Spinoza Prize was a doctoral study by Dobrova-Krol, supervised by Bakermans-Kranenburg, Van IJzendoorn, and Juffer, which reported results from a further study of institutional care in 2010. The research team compared 29 institution-reared children in Ukraine and 35 family-raised matched children. Around half of each sample were positive for HIV. Both HIV infection and institutional care were associated reduced physical and cognitive development, but institutional care was considerably more consequential than HIV infection.<sup>575</sup>

The children were seen in the Strange Situation. Use of the Carlson scale revealed that only 24% of the institution-reared children had clearly developed attachment patterns. Of these, the most frequent classification was disorganized.<sup>576</sup> Dobrova-Krol and colleagues also used an interview to ask caregivers whether the children showed indiscriminate friendliness. As in Lyons-Ruth’s work (Chapter 2), some indiscriminate friendliness was identified among home-reared children. However, it was considerably more common among the institution-reared children.

Genotyping of the children permitted the research team to examine the potential for differential susceptibility, examining functional polymorphisms in the serotonin transporter gene (5HTT) (Chapter 3). Children with the ss or sl 5HTT genotype, generally linked to greater susceptibility, showed significantly more attachment disorganization and less security when they grew up in an institution compared to children reared by their family. Children in institutional care who had the long allele of 5HTT, generally a marker for less susceptibility, were significantly less likely to show disorganization.

This work inspired a study by Drury and colleagues using data from the Bucharest Early Intervention Project. Drury and colleagues undertook a further analysis, considering interaction between polymorphisms in 5HTT and whether children had been adopted into foster care in predicting indiscriminate friendliness. Children with the ss 5TT genotype showed the lowest levels of indiscriminate friendliness when randomized to foster care but the highest levels when randomized to institutional care. By comparison, children with the long allele showed no difference in levels of indiscriminate behaviours whether

<sup>574</sup> Juffer, F., Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2017) Structural neglect in orphanages: Physical growth, cognition and daily life of young institutionalised children in India. In A. V. Rus, S. R. Parris, & E. Stativa (eds), *Child Maltreatment in Residential Care: History, Research and Current Practice* (pp. 301–322). New York: Springer, p. 317.

<sup>575</sup> Dobrova-Krol, N. A., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Juffer, F. (2010) Effects of perinatal HIV infection and early institutional rearing on physical and cognitive development of children in Ukraine. *Child Development*, 81(1), 237–251.

<sup>576</sup> Dobrova-Krol, N. A., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2010) The importance of quality of care: Effects of perinatal HIV infection and early institutional rearing on preschoolers’ attachment and indiscriminate friendliness. *Journal of Child Psychology and Psychiatry*, 51(12), 1368–1376.

they were in foster care or institutional care.<sup>577</sup> Together with the findings from the Leiden group, Drury and colleagues interpreted their results as suggesting that a reason that some children are less affected by institutional care than others may be differential susceptibility.

The Bucharest Early Intervention Project has received criticism as inhumane, since the researchers could have anticipated that foster care was going to be superior to institutional care.<sup>578</sup> For their part, Van IJzendoorn and Bakermans-Kranenburg have praised and defended the Bucharest Early Intervention Project in the strongest of terms.<sup>579</sup> The children randomized to foster care would have otherwise received institutional care, so the research did not do harm.<sup>580</sup> Furthermore, strong evidence was required to make convincing claims for change in policy and practice, for the sake of future institutionalized children.

At the same time as their Ukraine study, Van IJzendoorn, Bakermans-Kranenburg, and collaborators were undertaking a related project, with parallels to the Bucharest Early Intervention Project.<sup>581</sup> One such study emerged from a collaboration between Van IJzendoorn, Bakermans-Kranenburg, and colleagues at the Great Ape Nursery at Yerkes. Over the decades there have been some attempts to use animal models to ask questions relevant to attachment.<sup>582</sup> Nonetheless, this remains an underelaborated area of potential synthesis and opportunity.<sup>583</sup> In the Great Ape Nursery, 46 chimpanzee infants were being reared by humans, mostly on account of being rejected by or receiving unsafe care from their mothers. In response to worries about the conventional deprived regime these chimpanzee infants received, the Yerkes facility experimented with adapting their procedure to

<sup>577</sup> Drury, S. S., Gleason, M. M., Theall, K. P., Smyke, A. T., Nelson, C. A., Fox, N. A., & Zeanah, C. H. (2012) Genetic sensitivity to the caregiving context: The influence of 5httlpr and BDNF val66met on indiscriminate social behavior. *Physiology and Behavior*, 106, 728–735.

<sup>578</sup> Fins, J. J. (2013) Romanian orphans: A reconsideration of the ethics of the Bucharest Early Intervention Project. Hastings Centre, <https://www.thehastingscenter.org/romanian-orphans-a-reconsideration-of-the-ethics-of-the-bucharest-early-intervention-project/>.

<sup>579</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Duschinsky, R., Fox, N. A., Goldman, P. S., Gunnar, M. R., ... & Sonuga-Barke, E. J. (2020) Institutionalisation and deinstitutionalisation of children 1: A systematic and integrative review of evidence regarding effects on development. *The Lancet Psychiatry*, 7(8), 703–720, Online Supplement: ‘Because foster care did not really exist in Bucharest at the start of the study, the investigators needed to create their own foster care program. And, because of a variety of social-cultural biases that existed in Romania in the late 1990s and early 2000s, it was very difficult to create such a program. In the end, after extensive advertising and screening, only 58 families could be identified, and 68 children were placed in those 58 families by keeping siblings together. Thus, the BEIP did not withhold “treatment” (i.e., the intervention) from one group or another; rather, treatment was limited to those 68 children.’

<sup>580</sup> The Bucharest Early Intervention Project also made no objection if the institutionalized children were subsequently fostered or adopted, which happened to many of the children, despite reducing the sharpness of the contrast between the children randomized to foster care and those left in the institution. See also Zeanah, C. H., Fox, N. A., & Nelson, C. A. (2012) The Bucharest Early Intervention Project: Case study in the ethics of mental health research. *The Journal of Nervous and Mental Disease*, 200(3), 243–247.

<sup>581</sup> Van IJzendoorn, M. H., Bard, K. A., Bakermans-Kranenburg, M. J., & Ivan, K. (2009) Enhancement of attachment and cognitive development of young nursery-reared chimpanzees in responsive versus standard care. *Developmental Psychobiology: The Journal of the International Society for Developmental Psychobiology*, 51(2), 173–185.

<sup>582</sup> For example, Hinde, R. A. & McGinnis, L. (1977) Some factors influencing the effects of temporary mother–infant separation: Some experiments with rhesus monkeys. *Psychological Medicine*, 7(2), 197–212; Kondo-Ikemura, K. & Waters, E. (1995) Maternal behavior and infant security in old world monkeys: Conceptual issues and a methodological bridge between human and nonhuman primate research. In E. Waters, B. E. Vaughn, G. Posada, & K. Kondo-Ikemura (eds), *Caregiving, Cultural, and Cognitive Perspectives on Secure-Base Behavior and Working Models: New Growing Points of Attachment Theory and Research* (pp. 97–110). Chicago: The University of Chicago Press; Sproul Bassett, A. M., Wood, E. K., Lindell, S. G., Schwandt, M. L., Barr, C. S., Suomi, S. J., & Higley, J. D. (2020) Intergenerational effects of mother’s early rearing experience on offspring treatment and socioemotional development. *Developmental Psychobiology*, 62(7), 920–931.

<sup>583</sup> Suomi, S. (2016) Attachment in Rhesus monkeys. In J. Cassidy & P. Shaver (eds), *Handbook of Attachment* (3rd ed., pp. 133–154). New York: Guilford.

offer more nurturing and stimulating care. Essentially what resulted was a natural experiment, with the chimpanzee infants to one of two conditions. In the first, humans provided essential health-related care, but otherwise the infants were largely left to interact with one another. This was standard procedure at the Great Ape Nursery. In the second condition, human caregivers offered an additional four hours of interaction, five days a week, with human caregivers who were trained in chimpanzee socioemotional and communicative development.

Taking advantage of the natural experiment, at 12 months the chimpanzees were assessed with their human caregivers in the Strange Situation, the first time the Strange Situation had been used with non-humans.<sup>584</sup> Van IJzendoorn and Bakermans-Kranenburg coded the recording independently and reported 95% agreement: despite cross-species application of the procedure, the researchers reported that the Strange Situation coding system could readily be applied. As for human infants, in episodes without the caregiver present, there was more crying; when the caregiver was present, there was more exploration; and the chimpanzees sought contact with their familiar caregiver on reunion. They also showed more physical touch towards their caregiver than towards the stranger, and this difference was greater in reunion episodes.

When the two conditions of care were compared, there were clear differences. For the chimpanzees who received standard care, 28% were classified as securely attached and 72% classified as disorganized. The chimpanzees classified as disorganized spent much of their time in the reunion episodes clutching a towel and rocking back and forth, suggesting distress without being able to make use of the caregiver for comfort. For the chimpanzees who received enriched care, 41% were classified as secure, 6% avoidant, 12% resistant, and 41% disorganized. The use of a towel for comfort instead of a caregiver was rare for these chimpanzees. On a behavioural measure of cognitive development, the Mental Development Index, there was a marked difference, with the chimpanzees who experienced enriched care scoring not only considerably more highly than those in standard care, but also scoring higher than the average for humans at the same age. Van IJzendoorn and colleagues observed that these findings converged with research with human infants, offering support for the idea that access to interactions with a familiar caregiver are beneficial for socioemotional and cognitive development, as anticipated by attachment theory.<sup>585</sup>

As we saw in [Chapter 2](#), building from Bowlby, Lyons-Ruth, and colleagues had observed that when a caregiver routinely withdraws from interaction by being unresponsive to infant signals of distress, the infant is left alone with their distress since they are unable to use the caregiver to help them regulate. Likewise developing ideas from Bowlby, Van IJzendoorn, and colleagues suggested that the high rates of disorganization among institutionalized children may likewise represent routine experiences of distress without access to a familiar caregiver to provide comfort. The same could be seen for the chimpanzees who received standard care. Even the enriched care was only five hours a day, which would account for the extent of disorganization in that condition too. Nonetheless, Van IJzendoorn and colleagues did not rule out that some of what was coded as disorganization might stem

<sup>584</sup> An earlier study had used the Attachment Q-Sort. Kondo-Ikemura, K., & Waters, E. (1995) Maternal behavior and infant security in old world monkeys: Conceptual issues and a methodological bridge between human and nonhuman primate research. *Monographs of the Society for Research in Child Development*, 60 (2/3), 97–110.

<sup>585</sup> For convergent findings from a later follow-up with this sample, see Clay, A. W., Bloomsmith, M. A., Bard, K. A., Maple, T. L., & Marr, M. J. (2015) Long-term effects of infant attachment organization on adult behavior and health in nursery-reared, captive chimpanzees (Pan troglodytes). *Journal of Comparative Psychology*, 129(2), 145–159.

from other sources, such as differences in the emotion regulation capacities of chimpanzees compared to humans.<sup>586</sup>

### Likelihood of Abuse

As we have seen, Van IJzendoorn and Bakermans-Kranenburg argued that the lack of interaction with a consistent, familiar caregiver within institutional care represented a form of structural neglect, anticipated to disrupt children's development across a range of fronts. This conclusion was supported by the study with chimpanzees. Additionally, Van IJzendoorn and Bakermans-Kranenburg were concerned by evidence that human children without a familiar adult to advocate for and protect them were more vulnerable to abuse.

A doctoral study by Saskia Euser, supervised by Alink, Van IJzendoorn, and Bakermans-Kranenburg, asked 264 professionals working in Dutch residential or foster care to report on child abuse for the children they worked with. The researchers also asked 329 adolescents in residential or foster care on their own experiences of abuse. Whereas rates for children in foster care were the same as the general population, there was a much higher prevalence of abuse according to both sources for children in residential care.<sup>587</sup> According to the professional report, rates of sexual abuse by adults were nine times higher for children in residential care than the general population. Rates were still higher for children with intellectual disabilities in residential care.<sup>588</sup>

Euser and colleagues also reported that a quarter of all adolescents in residential care reported physical abuse by adults.<sup>589</sup> In 71% of cases, the perpetrator was an employee at the residential care facility. Euser and colleagues noted that residential care is often justified as more safe for abused children than remaining at home. However, their findings made clear that residential care was extremely unsafe for many children. Van IJzendoorn considered that 'the numbers are shocking'.<sup>590</sup>

A consensus statement on group care, led by Dozier, of which Van IJzendoorn was a part, set out that the absence of an adult personally committed to and invested in a young person's wellbeing renders them vulnerable in a number of ways. Adults usually also offer a variety of supports to adolescents including 'monitoring the adolescent's activities, providing structure and supervision, negotiating increased adolescent autonomy, encouraging engagement in school, and planning for the future'.<sup>591</sup> Where an adult is not in place to play this role, Dozier and colleagues reflected that young people will be vulnerable to exploitation by peers. They cited a large-scale study by Ryan and collaborators comparing

<sup>586</sup> Cf. Bernier, A., & Meins, E. (2008) A threshold approach to understanding the origins of attachment disorganization. *Developmental Psychology*, 44(4), 969–982; Serván, I. (2023) *Desorganización del apego: Clínica y psicoterapia con adultos*. Bilbao: Desclee de Brouwer.

<sup>587</sup> Euser, S., Alink, L. R., Tharner, A., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2013) The prevalence of child sexual abuse in out-of-home care: A comparison between abuse in residential and in foster care. *Child Maltreatment*, 18(4), 221–231.

<sup>588</sup> Euser, S., Alink, L. R., Tharner, A., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2016) The prevalence of child sexual abuse in out-of-home care: Increased risk for children with a mild intellectual disability. *Journal of Applied Research in Intellectual Disabilities*, 29(1), 83–92.

<sup>589</sup> Euser, S., Alink, L. R., Tharner, A., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2014) Out of home placement to promote safety? The prevalence of physical abuse in residential and foster care. *Children and Youth Services Review*, 37, 64–70.

<sup>590</sup> Van IJzendoorn, M. H. (2013) Opvoeding bestuderen van molecuul tot maatschappelijke context. *NVO Bulletin*, 5, jaargang 14, 4–8, p. 5.

<sup>591</sup> Dozier, M., Kaufman, J., Kobak, R., O'Connor, T. G., Sagi-Schwartz, A., Scott, S., ... & Zeanah, C. H. (2014) Consensus statement on group care for children and adolescents: A statement of policy of the American Orthopsychiatric Association. *American Journal of Orthopsychiatry*, 84(3), 219–215.



foster care with institutional care, with samples matched on race, sex, abuse and placement history, presence of behaviour problems, and history of running away.<sup>592</sup> The researchers found that young people in institutional care were two and a half times more likely to have subsequent criminal justice involvement. Such findings point to the ramifications of the absence of an adult personally committed to and invested in a young person's wellbeing to support safe exploration and development.

### The Lancet Meta-analyses

The studies conducted with involvement from Van IJzendoorn and Bakermans-Kranenburg clearly indicated that institutional care has serious and pervasive negative implications for children. For all that, Van IJzendoorn and Bakermans-Kranenburg have nonetheless faced criticism from other developmental scientists, who have been able to point to other studies reporting more modest effects. Baptista, Belsky, and colleagues conducted a study with 50 Portuguese children in residential care. They found that when institutional caregivers were asked to rate internalizing and externalizing difficulties, there was no main effect of time spent in institutional care. Internalizing and externalizing difficulties were, however, predicted by an interaction between time spent in institutional care and extent of maltreatment before entering the institution.

The authors argued that these findings fit with Belsky's ideas about cumulative risk (especially represented in Table 1 of his process model paper) 'by showing that more important than the effect of any single adversity, is the interactive combination of early adversities.'<sup>593</sup> They extrapolated from their findings to suggest that time in institutional care may not be regarded as harmful in and of itself. Baptista, Belsky, and colleagues also considered that the Portuguese residential institutions were higher quality than those studied by most other researchers, including Van IJzendoorn and Bakermans-Kranenburg. Having argued that the effects of daycare on child behavioural problems are through quantity rather than quality of care (Chapter 3), Belsky here advocated that the effects of institutional care on child behavioural problems seen in other studies may be dependent on poor quality care. The researchers did not raise the possibility that the results may stem from their reliance on institutional carer report. It could well be that institutional caregivers are so used to high levels of internalizing and externalizing behaviour that this has calibrated their expectations.

As we have seen, Van IJzendoorn and Bakermans-Kranenburg have argued that researchers and their audiences can be misdirected when too much weight is placed on individual studies, especially small studies, which will be vulnerable to false positive and false negative results. All the more when individual studies are dependent on self-report measures. To secure claims about the effects of institutional care, they pursued a number of meta-analyses.<sup>594</sup> Culminating this work, in 2020, Van IJzendoorn, Bakermans-Kranenburg, and collaborators (including myself) published a set of meta-analyses integrating data from 308 studies, with over 100,000 participants, across 68 countries, addressing a variety of outcomes. The researchers sought to examine the correlates of institutional

<sup>592</sup> Ryan, J. P., Marshall, J., Herz, D., & Hernandez, P. (2008) Juvenile delinquency in child welfare: Investigating group home effects. *Children and Youth Services Review*, 30, 1088–1099.

<sup>593</sup> Baptista, J., Belsky, J., Marques, S., Silva, J. R., Oliveira, P., Mesquita, A., ... & Soares, I. (2014) The interactive effect of maltreatment in the family and unstable institutional caregiving in predicting behavior problems in toddlers. *Child Abuse & Neglect*, 38(12), 2072–2079, p. 2077.

<sup>594</sup> For example Van IJzendoorn, M. H., Luijk, M. P., & Juffer, F. (2008) IQ of children growing up in children's homes: A meta-analysis on IQ delays in orphanages. *Merrill-Palmer Quarterly*, 54(3), 341–366.



care; the effects of length of time in institutional care; and the consequences when children left institutional care to be reared by families.

For these questions, to support causal inferences, the results of the meta-analysis were compared with the findings of the Bucharest Early Intervention Project, as the only randomized controlled trial that controlled for confounders such as potential selection differences institutionalized and non-institutionalized children. In general, the findings were highly convergent between the meta-analysis and the Bucharest Early Intervention Project, with overlapping confidence intervals. The exception was that Bucharest Early Intervention Project reported greater cognitive delays associated with institutional care than the meta-analytic results.

The meta-analysis found that the greatest differences between institutionalized and family-reared children were in terms of physical growth (height and weight for age) and brain and cognitive development. In these domains at least 80% of the institutionalized children were below the average of the comparison family-reared children. Effects were largest in infancy and early childhood. This was different to attention problems, which the research team found tended to increase with age, perhaps because such problems are difficult to detect in early childhood.

The findings for physical health were more modest than for physical growth or brain and cognitive development. However, there were a number of confounds. These included that in many of the studies, the assessments of health were completed months or years after the children had left the institution. Dental health was included as part of the measurement of physical health in some of the studies, and this was sometimes better for institutionalized children. A moderation effect was also identified, with girls showing more problems with physical health following institutional care than boys.

The results for socioemotional development were more modest. Again, Van IJzendoorn, Bakermans-Kranenburg, and colleagues pointed to limitations with the available data. In particular, they expressed concern regarding the widespread use of standardized caregiver questionnaires not adapted to children living in institutions. Furthermore, it was suspected that 'the smaller effects on socioemotional development might also reflect children in institutions having learnt not to express emotion because of the oppressive and neglectful regimes under which these children often live.'<sup>595</sup> A moderation effect was also identified, with boys with experiences of institutional care showing more socioemotional problems than girls.

In 11 studies, including 471 children, attachment classifications had been assessed by researchers. The proportion of securely attached children in institutions was 24%, considerably lower than the international average for family-reared children (52%). The proportion of disorganized or unclassifiable children in institutions was 57%, considerably higher than the average for family-reared children (24%).<sup>596</sup>

Van IJzendoorn and colleagues reported a synthesis of 89 studies that charted the longitudinal relationship between duration of children's stay in institutions and developmental outcomes (see Figures 4.4, 4.5 and 4.6). A dose-response relationship was identified, with longer stays in the institution predicting larger developmental delays. The strongest effect

<sup>595</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Duschinsky, R., Fox, N. A., Goldman, P. S., Gunnar, M. R., Johnson, D. E., Nelson, C. A., Reijman, S., Skinner, G. C. M., Zeanah, C. H., & Sonuga-Barke, E. J. S. (2020) Institutionalisation and deinstitutionalisation of children 1: A systematic and integrative review of evidence regarding effects on development. *The Lancet Psychiatry*, 7(8), 703–720, p. 710.

<sup>596</sup> Distributions for secure and disorganised attachment have been updated since the Lancet Psychiatry paper by a 2023 meta-analysis. I have reported the updated figures here. Madigan, S., Fearon, R. M., Van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J., ... & Verhage, M. L. (2023) The first 20,000 Strange Situation procedures: A meta-analytic review. *Psychological Bulletin*, 149(1–2), 99.

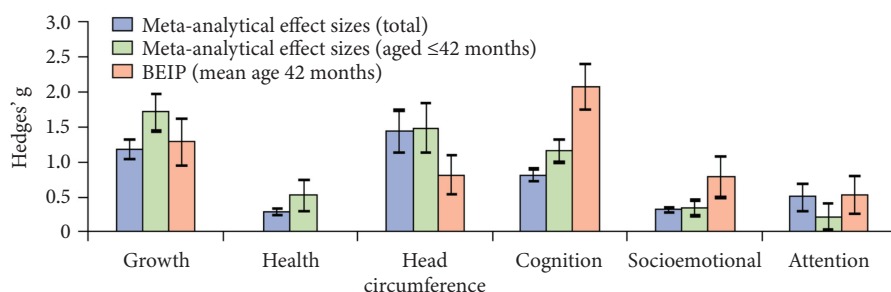


**Figure 4.4** Associations between institutional care and children's physical, cognitive, and socioemotional development, with comparison between meta-analytic effect sizes and the BEIP.

Source: From Van IJzendoorn et al. (2020).

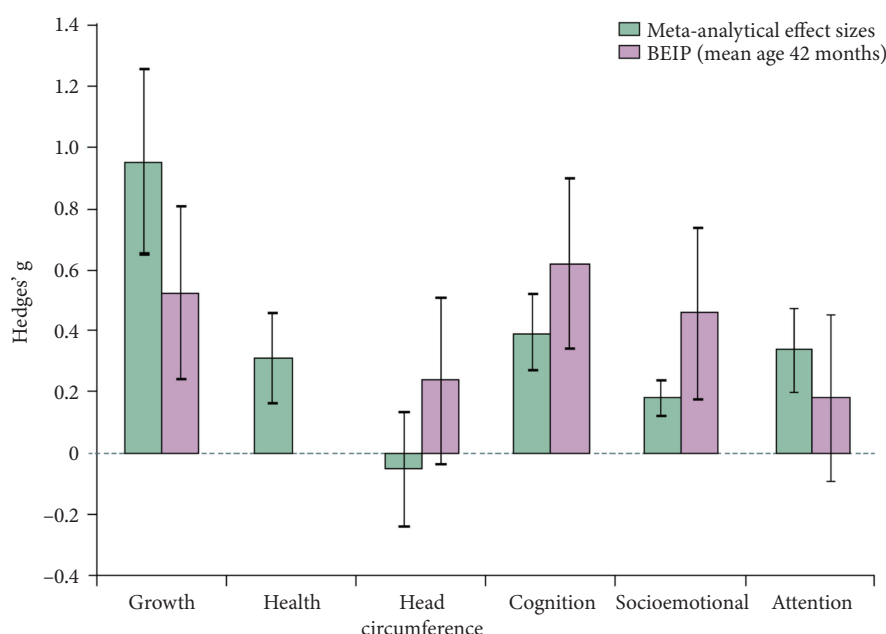


**Figure 4.5** Meta-analytic associations between duration of institutionalization and child physical, cognitive, and socioemotional development.

Source: From Van IJzendoorn et al. (2020).

was for physical growth. From a heterogeneous group of studies, Van IJzendoorn and colleagues tentatively concluded that 'age 6–24 months constitutes an especially sensitive period for the effects of institutional care', with the implication that children might be best set to recover from the effects of institutional care if removed in infancy.<sup>597</sup>

Examining studies that reported on change after a move to family-based care, physical growth, brain growth and cognition again showed the strongest effects. In each case the meta-analytic results were in the same direction but yielded stronger effects than

<sup>597</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Duschinsky, R., Fox, N. A., Goldman, P. S., Gunnar, M. R., Johnson, D. E., Nelson, C. A., Reijman, S., Skinner, G. C. M., Zeanah, C. H., & Sonuga-Barke, E. J. S. (2020) Institutionalisation and deinstitutionalisation of children 1: A systematic and integrative review of evidence regarding effects on development. *The Lancet Psychiatry*, 7(8), 703–720, p. 714.

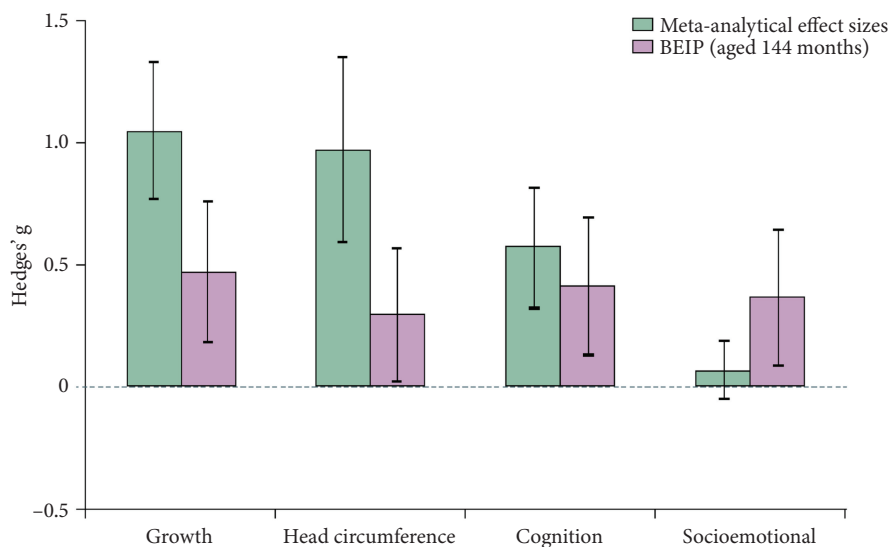


**Figure 4.6** Extent of catch-up for formerly institutionalised children across different domains.

Source: From Van IJzendoorn et al. (2020).

the Bucharest Early Intervention Project. This may reflect the statistical procedures used by the Bucharest Early Intervention Project: their intention-to-treat analysis will likely have dampened the strength of the reported effect sizes. Alternatively, the discrepancy may suggest a role of selection effects in which children were adopted or fostered, elevating the meta-analytic results. If the meta-analytic results are trusted, they appear to suggest that in these three domains children's recovery puts them back into the normal range. Even with the somewhat smaller effect sizes from the Bucharest Early Intervention Project, it is striking that adoption and fostering of institutionalized children appear to represent some of the most powerful interventions ever documented in the behavioural sciences.

Too few studies reported child health or attention to attempt a quantitative synthesis. There was little evidence of socioemotional recovery following a move to family-based care in the meta-analysis; the effect appeared stronger in the Bucharest Early Intervention Project, though confidence intervals were overlapping. Two studies examined Strange Situation classifications of adopted or fostered children with experiences of institutional care. In the Bucharest Early Intervention Project, 49% were classified as secure,<sup>598</sup> and in the English and Romanian Adoptees study 60% were classified as secure,<sup>599</sup> suggesting that adoption and fostering may well offer children an opportunity to develop confidence in the availability of a familiar caregiver as secure base and safe haven, even after experiences of institutional care.

A number of outstanding questions nonetheless remain. One is the mechanisms linking institutional care to negative outcomes. In a roundtable at the Society for Research on

<sup>598</sup> Smyke, A. T., Zeanah, C. H., Fox, N. A., Nelson, C. A., & Guthrie, D. (2010) Placement in foster care enhances quality of attachment among young institutionalized children. *Child Development*, 81, 212–223.

<sup>599</sup> Kreppner, J., Rutter, M., Marvin, R., O'Connor, T. G., & Sonuga-Barke, E. (2011) Assessing the concept of the 'insecure-other' category in the Cassidy/Marvin scheme: Changes between 4 and 6 years in the English and Romanian adoptee study. *Social Development*, 20, 1–16.

Child Development biennial conference in 2023, Van IJzendoorn offered further reflections on this question.<sup>600</sup> He observed that institutional care has various elements that disrupt attachment relationships, such as staff turnover and lack of consistency between day and night staff. Stressed and overwhelmed staff may also display alarming behaviour towards the children in their care. However, Van IJzendoorn proposed that the critical and underlying problem with institutional care for the development of attachment relationships is, in his view, that each moment of the day is organized according to the needs of the institution, so that children's individual needs and signals are not noticed or, if noticed, disregarded. For Van IJzendoorn, the capacity of a caregiver to notice and respond to needs and signals is a predicate of children experiencing a relationship as a potential source of secure base and safe haven provision. When such experiences become available through adoption or fostering, the child starts to recover.

Van IJzendoorn's proposals depend on the assumption that institutional care contributes to negative outcomes in large part through disturbance of the attachment system. Whilst plausible, this remains to be tested. As we saw above, studies have documented strong associations between institutional care and disorganized attachment, between institutional care and negative outcomes, and between adoption or fostering and recovery. Despite this, no study has examined whether attachment plays a mediating role. More than this, only one study has examined whether individual differences in attachment among institutionalized and post-institutionalized children predict child outcomes; individual differences in attachment generally have been treated, resolutely, as a dependent variable, the effect of institutional care rather than the potential cause of anything.<sup>601</sup> Given other evidence of psychosocial disruptions, there is reason to believe that the high rates of disorganization index relational disturbance, but that does not mean they mediate the effects of institutional care on later outcomes.

Another point is that it is uncertain, as Bakermans-Kranenburg, Van IJzendoorn, and colleagues have acknowledged, whether disorganized and secure attachment coded in institutionalized samples has the same correlates as in family-reared samples. Additionally, the predicament of home-reared but neglected children is unclear: it is not known whether they will resemble other home-reared children, institutionalized children, or have characteristics of both.<sup>602</sup>

A further matter is that few proposals have been made by attachment researchers as to how or why a proportion of institutionalized children are classified as secure with their caregiver, with whom they have minimal familiarity. Van IJzendoorn and colleagues

<sup>600</sup> Van IJzendoorn, M. H. (25 March 2023) How can we increase and improve research on institutionalization and deinstitutionalization? Roundtable on Children Need Families: Connecting Deinstitutionalization Research to Practice and Policy (chair: Nicole Gilbertson Wilke) at the Biennial conference of the Society for Research on Child Development, Salt Lake City, USA.

<sup>601</sup> The English and Romanian Adoptees study contrasted children with one of the traditional four Strange Situation classifications with children who seemed not to have developed selective attachment behaviour. They had too few children with the traditional four Strange Situations to examine their correlates. Sonuga-Barke, E., Kennedy, M., Golm, D., Knights, N., Kovshoff, H., Kreppner, J., ... & Schlotz, W. (2020) Adoptees' responses to separation from, and reunion with, their adoptive parent at age 4 years is associated with long-term persistence of autism symptoms following early severe institutional deprivation. *Development & Psychopathology*, 32(2), 631–640.

<sup>602</sup> Bakermans-Kranenburg, M. J., Steele, H., Zeanah, C. H., Muhamedrahimov, R. J., Vorria, P., Dobrova-Krol, N. A., ... & Gunnar, M. R. (2011) Attachment and emotional development in institutional care: Characteristics and catch up. *Monographs of the Society for Research in Child Development*, 76(4), 62–91: 'The question that these results raise extends beyond studies of institutionalized children to all circumstances where care is intermittent, chaotic, and otherwise radically different from the average expectable environment. That is, do some very high-risk home-reared children (for example, neglected children) have attachments that also are incompletely developed?' (69).

have considered that child temperament, length of institutional care, favouritism, and the sensitivity of the institutional caregiver could be investigated as possible explanations.<sup>603</sup>

It could also be argued that the proportion of institutionalized children classified as secure fits with Main's theory, in which approaching adults for protection when alarmed is the 'default' response for children, which may be overlayed by the conditional strategies and disrupted by disorganization. Certainly, there is evidence that, when infants are over-stressed, conditional strategies can break down, and panicked approach behaviour may be displayed. When Ainsworth repeated the Strange Situation with her sample two weeks later, Main was acting as research assistant and recalled that 'the babies were simply too frightened not to approach their mother ... it was a coup for John Bowlby, since he expected approach under high stress or fear.'<sup>604</sup> The behaviour of institutionalized children classified as 'secure' may reflect an inability to muster another response, rather than confidence in the caregiver's availability.

Such remaining questions can be pursued to refine some fundamental conclusions, established by the Lancet meta-analyses and convergent findings from the Bucharest Early Intervention Project. The findings provided clear indication that children should not be exposed to institutional care if at all possible. Bakermans-Kranenburg and Van IJzendoorn have spoken about these results to government agencies around the world, including Greece, Belarus, and Bulgaria, pointing to the decisiveness of the evidence of the harms of institutional care.

Anthropologist critics of attachment research have argued that children can be attached to institutions and communities, not just caregivers.<sup>605</sup> The boundaries of what counts as an attachment relationship remain under discussion among attachment researchers in the developmental tradition.<sup>606</sup> Be that as it may, the Lancet meta-analyses show that access to belonging to an institution is not sufficient for children's health and development: they need access to a family.<sup>607</sup>

The team working on the Lancet meta-analyses argued that the meta-analytic research showed that kinship care, adoption, and stable foster-family care should be supported the furthest extent to reduce the need for institutional care of children.<sup>608</sup> In *Matters of Significance*, Van IJzendoorn and Bakermans-Kranenburg observed that 70 years ago, 'Bowlby advocated adoption as the preferred alternative to institutional care, but he acknowledged the lack of empirical evidence supporting the effectiveness of this intervention. We closed that gap.'<sup>609</sup>

<sup>603</sup> Van IJzendoorn, M. H., Palacios, J., Sonuga-Barke, E. J. S., Gunnar M. R., Vorria, Y., McCall, R., LeMare, L., Bakermans-Kranenburg, M. J., Dobrova-Krol, N., & Juffer F. (2011) Children in institutional care: Delayed development and resilience. *Monographs of the Society for Research of Child Development*, 76, 8–30.

<sup>604</sup> M. Main, personal communication, March 5, 2013.

<sup>605</sup> For example, Morelli, G. A. & Henry, P. (2013) Afterwards: Cross-cultural challenges to attachment theory. In N. Quinn & J. M. Mageo (eds), *Attachment Reconsidered: Cultural Perspectives on a Western Theory* (pp. 241–150) New York: Palgrave-Macmillan; Jedynak, D. (2024) The intersection between attachment and community: An exploration of belonging in the West. Unpublished graduate thesis, Pacifica Graduate Institute.

<sup>606</sup> Granqvist, P. (2021) The God, the blood, and the fuzzy: Reflections on Cornerstones and two target articles. *Attachment & Human Development*, 23(4), 412–421.

<sup>607</sup> See also Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2024) Family matters: Growing up in family-based care makes a world of a difference. Proceedings of the Shevchenko Scientific Society. *Medical Sciences*, 73(1).

<sup>608</sup> Goldman, P. S., Bakermans-Kranenburg, M. J., Bradford, B., Christopoulos, A., Ken, P. L. A., Cuthbert, C., ... & Sonuga-Barke, E. J. (2020) Institutionalisation and deinstitutionalisation of children 2: Policy and practice recommendations for global, national, and local actors. *The Lancet Child & Adolescent Health*, 4(8), 606–633.

<sup>609</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 181.

## Adoption

Van IJzendoorn's positive stance on adoption in the Lancet meta-analyses stemmed from many decades of work on the topic, galvanized especially by collaboration with Femmie Juffer. In 1990, Van IJzendoorn won a Pioneer grant from the Nederlandse Organisatie voor Wetenschappelijk Onderzoek. This required matched funding from Leiden, which came in the form of a full-time post within Van IJzendoorn's research group. In the event this post was split into two part-time posts, for Bakermans-Kranenburg, who had just finished her PhD with Van IJzendoorn, and Juffer, who had also recently finished a PhD at Utrecht University. Juffer's PhD had been an intervention study to support caregiver sensitivity among parents who had undertaken international adoption with infants.<sup>610</sup>

The Spinoza Prize gave the research group the freedom to pursue a programme of work exploring the development of adopted children compared to peers. There was considerable debate on this topic at the time, with many arguing that adoption would be associated with developmental and attachment problems. In fact, the Leiden group reported a much more positive picture, findings that generated considerable international media interest.

The first study funded by the Spinoza Prize was a 2005 meta-analysis of adoption and cognitive development.<sup>611</sup> Van IJzendoorn and Juffer synthesized 62 studies. Comparing children who were adopted to siblings who remained with their birth families, Van IJzendoorn and Juffer found that adoption enhanced children's IQ and school performance, with enormous effect sizes ( $d = 1.17$  for IQ;  $d = 0.55$  for school performance). Comparing children who were adopted to their adoptive siblings and peers, the researchers found similar IQ scores, though school performance lagged behind somewhat if adoption occurred after infancy. Van IJzendoorn and Juffer speculated that, in the context of loss of an attachment figure or attachment figures, 'the burden of grief may hamper or slow down their progress through school.'<sup>612</sup> Despite this burden of grief, Van IJzendoorn and Juffer were very upbeat about the benefits of adoption, describing it in the title of their paper as 'a successful natural intervention.'

A further meta-analysis by Juffer and Van IJzendoorn, published in 2007, addressed the self-esteem of adopted children and their peers. Across 88 studies, no differences were identified. The researchers concluded that it appears that 'in general the majority of adoptees receive sufficient compensation from the social environment—including the adoptive family context—to feel valued.'<sup>613</sup> Across three studies, adoptees were found to have higher self-esteem than institutionalized children ( $d = 0.50$ ).

<sup>610</sup> Juffer, F. (1993) *Verbonden door adoptie. Een experimenteel onderzoek naar hechting en competentie in gezinnen met een adoptiebaby*. Amersfoort, the Netherlands: Academische Uitgeverij; Juffer, F., Rosenboom, L. G., Hoksbergen, R. A. C., Riksen-Walraven, J. M. A., & Kohnstamm, G. A. (1997) Attachment and intervention in adoptive families with and without biological children. In W. Koops, J. B. Hoeksma, & D. C. Boom (eds), *Development of Interaction and Attachment: Traditional and Non-traditional Approaches* (pp. 93–108), Amsterdam/Oxford: North-Holland.

<sup>611</sup> Van IJzendoorn, M. H. & Juffer, F. (2005) Adoption is a successful natural intervention enhancing adopted children's IQ and school performance. *Current Directions in Psychological Science*, 14(6), 326–330.

<sup>612</sup> *Ibid.*, 328. See also Van IJzendoorn, M. H., Juffer, F., & Poelhuis, C. W. K. (2005) Adoption and cognitive development: A meta-analytic comparison of adopted and nonadopted children's IQ and school performance. *Psychological Bulletin*, 131(2), 301–316.

<sup>613</sup> Juffer, F. & Van IJzendoorn, M. H. (2007) Adoptees do not lack self-esteem: A meta-analysis of studies on self-esteem of transracial, international, and domestic adoptees. *Psychological Bulletin*, 133(6), 1067–1083, p. 1078.

In 2009 the Leiden group published another meta-analysis, this time addressing the security of attachment among children with experience of adoption or fostering.<sup>614</sup> Children who were adopted or long-term fostered in infancy were found to have equivalent frequency of secure attachment as their non-adopted peers. Children adopted or fostered after infancy showed considerably less attachment security than peers ( $d = 0.80$ , CI 0.49–1.12), and higher rates of disorganized attachment ( $d = 0.36$ , CI 0.04–0.68). Still, rates of disorganization were only 31%, greatly lower than in institutionalized samples. Given that children who are adopted or fostered have often experienced considerable adversity before their change of caregiver, the researchers felt that ‘adopted children show an impressive although incomplete catch-up after their placement.’<sup>615</sup>

The findings about age of adoption/long-term fostering are interesting: ‘children who are placed before their first birthday may have experienced deprivation for shorter periods of time than later placed adoptees, resulting in a more normative development of attachment relationships. Alternatively, it may be easier for early placed children to become securely attached because they are placed with new parents and receive sensitive care in a stage when attachment is still developing. It may be easier to prevent insecure attachment than to change insecure attachment.’<sup>616</sup>

In 2009, Van IJzendoorn, Bakermans-Kranenburg, and colleagues reported on risk of maltreatment in adoptive and non-adoptive families, drawing on an analysis of all Dutch child protection records from one year where maltreatment had been documented by professionals.<sup>617</sup> The family composition of the maltreated children was compared to a large national representative sample (the Netherlands Kinship Panel Study).

Rates were higher for families with a stepparent (RR 1.71, CI 1.47–1.98). The rates of maltreatment for children in large families with a stepparent were especially high. Adoptive families, however, had considerably less recorded child maltreatment (RR 0.12, CI 0.07–0.22), around eight times lower than would be expected on the basis of their representation in the national population. Evolutionary social psychologists had predicted more maltreatment by stepparents and adoptive parents as they would have less investment in the survival of unrelated offspring. The finding that adoptive parents were so much less likely to maltreat their children was not a good fit with this prediction. Van IJzendoorn, Bakermans-Kranenburg, and colleagues considered that an alternative explanation may be that the presence of a stepparent in a family is ‘often associated with other risk conditions such as the stressful experience of a past divorce, sometimes resulting in a negative change of the socioeconomic conditions.’<sup>618</sup>

The Leiden group were also interested in understanding adoptees’ states of mind regarding attachment on the AAI. They undertook a longitudinal follow-up with the sample of internationally adopted children Juffer had researched for her doctoral study, together

<sup>614</sup> Van den Dries, L., Juffer, F., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2009) Fostering security? A meta-analysis of attachment in adopted children. *Children and Youth Services Review*, 31(3), 410–421.

<sup>615</sup> Ibid., 417.

<sup>616</sup> Ibid., 418, parentheses suppressed.

<sup>617</sup> Van IJzendoorn, M. H., Euser, E. M., Prinzie, P., Juffer, F., & Bakermans-Kranenburg, M. J. (2009) Elevated risk of child maltreatment in families with stepparents but not with adoptive parents. *Child Maltreatment*, 14(4), 369–375.

<sup>618</sup> Ibid., 373.

with a parallel doctoral study from Utrecht with adoptees by Rosenboom.<sup>619</sup> When participants were 14 they completed the AAI.<sup>620</sup> Of the 152 adopted adolescents, 33% were classified as secure, 37.5% dismissing, 12.5% preoccupied, and 17% unresolved. Compared to data on distributions in nonclinical adolescent samples, all the insecure classifications were overrepresented. The mean IQ of the sample was no different to distributions in nonclinical adolescent samples. The authors reflected that ‘the adopted adolescents experienced the loss of their birth parents and possibly other attachment figures, even when they do not explicitly remember them. In addition, their adoptive status may be an issue in particular during adolescence because of the process of identity formation in this stage of life.’<sup>621</sup>

To assess the potential that the findings were specific to adolescence, Van IJzendoorn and Bakermans-Kranenburg collaborated with colleagues at the University of Iowa, who had undertaken a follow-up of participants from five adoption studies originating between 1975 and 1989, in all cases with adoptees placed with their birth families in infancy.<sup>622</sup> The AAI was conducted with 129 adoptees, now with a mean age of 39. The distribution of AAI classifications was considerably more in line with nonclinical norms in this sample. Unresolved classifications remained only a little overrepresented (24%) compared to national norms (18%).

Bakermans-Kranenburg and colleagues reflected that adoptees may still have some awareness of loss of their birth parents, even if they do not remember them, or some sense of dislocation. These feelings may slightly predispose an unresolved response to subsequent losses or traumas.<sup>623</sup> Nonetheless, the high rates of insecure states of mind from the Dutch adolescent follow-up of the Juffer and Rosenboom was not replicated in the US adult sample, suggesting that, by adulthood, adoptees have had time to integrate the meaning of their adoption for their self-concept and reduce distortion in recall of attachment-relevant information in the AAI. This conclusion was supported by a later follow-up of the Dutch adoptees at age 23, where their scores on the secure-base script measure applied to the AAI were equivalent to international non-clinical adult norms.<sup>624</sup>

These findings fit with the general impression of the literature by Bakermans-Kranenburg, Van IJzendoorn, and colleagues that, even following inadequate care, children who experience positive relationships through adoption or long-term fostering can develop security in their attachment relationships.<sup>625</sup> Yet there may be some delay.

<sup>619</sup> Rosenboom, L. G. (1994) *Gemengde gezinnen, gemengde gevoelens? Hechting en competentie van adoptiebaby's in gezinnen met biologisch eigen kinderen*. Unpublished doctoral dissertation, Utrecht University. See also Juffer, F., & Rosenboom, L. G. (1997) Infant-mother attachment of internationally adopted children in the Netherlands. *International Journal of Behavioral Development*, 20(1), 93–107.

<sup>620</sup> Beijersbergen, M. D., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2008) Stress regulation in adolescents: Physiological reactivity during the adult attachment interview and conflict interaction. *Child Development*, 79(6), 1707–1720.

<sup>621</sup> *Ibid.*, 1718.

<sup>622</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Caspers, K., & Philibert, R. (2011) DRD4 genotype moderates the impact of parental problems on unresolved loss or trauma. *Attachment & Human Development*, 13(3), 253–269.

<sup>623</sup> Cf. Dalton, N., McLaughlin, M., & Cassidy, T. (2023) Trauma in mid-life adoptees: A qualitative analysis of Adult Attachment Interview narratives. <https://osf.io/preprints/psyarxiv/ac8s7>.

<sup>624</sup> Schoenmaker, C., Juffer, F., Van IJzendoorn, M. H., Linting, M., van der Voort, A., & Bakermans-Kranenburg, M. J. (2015) From maternal sensitivity in infancy to adult attachment representations: A longitudinal adoption study with secure base scripts. *Attachment & Human Development*, 17(3), 241–256.

<sup>625</sup> Dozier, M., Kaufman, J., Kobak, R., O'Connor, T. G., Sagi-Schwartz, A., Scott, S., ... & Zeanah, C. H. (2014) Consensus statement on group care for children and adolescents: A statement of policy of the American Orthopsychiatric Association. *American Journal of Orthopsychiatry*, 84(3), 219–225.



This was illustrated by a study of 92 children by the Leiden group adopted by caregivers in the Netherlands from China, mostly after their first birthday. Half the children had experienced institutional care before adoption. The children with experiences of institutional care had lower rates of security in the Strange Situation at two and six months post-adoption than non-adopted children. Even so, by nine years after adoption, they demonstrated equivalent levels of secure base script knowledge to their non-adopted peers and adoptees without experience of institutional care.<sup>626</sup> These findings were parallel to results for cognitive development, with catch-up by nine years after adoption.<sup>627</sup> Children showed more security and greater cognitive development by nine years post-adoption when their caregivers were observed to display more sensitive care, with this effect particularly notable for the children with experience of institutionalization.

Globally, international adoption has been in steep decline since 2005. The Dutch context has become especially hostile to international adoption, with critics arguing that it represents an ongoing form of colonialism and exploitation. A blanket ban was introduced in May 2024. Van IJzendoorn and Bakermans-Kranenburg have been outspoken against this position, which they feel often misrepresents the empirical evidence. Contrary to the critics of international adoption, they have argued that ‘there is no sound scientific evidence to support the proposition that intercountry adoption would promote the growth of the number of orphanages or disadvantage youth care in the countries of origin.’<sup>628</sup>

Van IJzendoorn and Bakermans-Kranenburg have drawn on the Kantian political philosopher John Rawls,<sup>629</sup> in developing a thought experiment: imagine you do not know whether you are an adopted child, an adoptive parent, or a birth parent, and need to decide whether to permit international adoption. Following Rawls, Van IJzendoorn, and Bakermans-Kranenburg argued that it is rational to ensure that ‘the rights and life chances of the weakest party should be given special consideration. No rational decision maker would want to end up in the position of a maltreated or neglected child whose parents had to relinquish or abandon them, without the opportunity for adoption.’<sup>630</sup> As long as millions of children are still subject to institutional care as the primary alternative available to maltreatment or neglect in their country of origin, intercountry adoption into families is a rational last resort and should be considered a child protection measure. International adoption should only be banned after de-institutionalization of children is complete.<sup>631</sup>

<sup>626</sup> Van den Dries, L., Juffer, F., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Alink, L. R. A. (2012) Infants’ responsiveness, attachment, and indiscriminate friendliness after international adoption from institutions or foster care in China: Application of emotional availability scales to adoptive families. *Development and Psychopathology*, 24(1), 49–64; Finet, C., Waters, T. E., Vermeer, H. J., Juffer, F., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Bosmans, G. (2021) Attachment development in children adopted from China: The role of pre-adoption care and sensitive adoptive parenting. *Attachment & Human Development*, 23(5), 587–607.

<sup>627</sup> Finet, C., Vermeer, H. J., Juffer, F., Bijttebier, P., & Bosmans, G. (2019) Remarkable cognitive catch-up in Chinese adoptees nine years after adoption. *Journal of Applied Developmental Psychology*, 65, 101071; Finet, C., Waters, T. E., Vermeer, H. J., Juffer, F., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Bosmans, G. (2021) Attachment development in children adopted from China: The role of pre-adoption care and sensitive adoptive parenting. *Attachment & Human Development*, 23(5), 587–607.

<sup>628</sup> Van IJzendoorn, M. H. (2016) ‘Is een kind uit het buitenland halen nog van deze tijd?’, <http://www.opvoeding-wetenschap.nl/2016/11/03/is-kind-buitenland-halen-nog-tijd/>,

<sup>629</sup> Rawls, J. (2001) *Justice as Fairness: A Restatement*. Cambridge, MA: Harvard University Press.

<sup>630</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 178.

<sup>631</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2022) Intercountry adoption is a child protection measure: Some comments on ‘Investigating Historical Abuses’ by Balk, Frerks and De Graaf (2022) *Journal of*

## Video-Feedback Intervention to Promote Positive Parenting and Sensitive Discipline

### Towards Video-Feedback

Bowlby's account of interventions to improve child–caregiver attachment security focused on changing caregivers' internal working models, helping them reflect on past events to allow them to respond to their child and the child's needs. This largely followed a model of psychodynamic psychotherapy, though with a family systems orientation.<sup>632</sup> Bowlby's approach was picked up and developed by several clinician-researchers from the 1980s onwards, such as by Ainsworth's former student Alicia Lieberman.<sup>633</sup>

Representing an alternate position, other researchers argued that the principles of attachment theory implied that interventions to improve caregiving and child–caregiver security must be holistic, not targeted on a specific aspect of caregiver psychology or behaviour.<sup>634</sup> One voice in favour of this position was Lyons-Ruth (Chapter 2). It was also a position advocated by Sroufe, Egeland, and colleagues in the Minnesota group. For them attachment is 'the core, around which all other experience is structured, whatever impact it may have', holding a 'central place in the hierarchy of development'.<sup>635</sup> They argued that 'interventions should be designed as comprehensive programs that enhance as many aspects of family life as possible'.<sup>636</sup>

This principle informed the design of Project STEEP by Erickson and Egeland, a preventive intervention program for high-risk parents of young children, begun in 1986–1987 with funding from the National Institute of Mental Health. STEEP stood for 'Steps Toward Effective, Enjoyable Parenting'. The programme 'was comprehensive and intensive and had a number of goals'.<sup>637</sup> Korfmacher, a graduate student involved in the intervention, later recalled that 'STEEP had a "kitchen sink" approach: families were offered support across almost all the areas that they wanted or needed help'.<sup>638</sup> The effect of the programme were anticipated by Erickson and Egeland to be holistic, irreducible to its components: 'our belief is that it would be fruitless to try to attribute effects to one particular aspect of the program, and, in fact, we believe that the different components of the program all may be necessary, working together in a way that creates a whole greater than the sum of its parts'.<sup>639</sup>

Belsky was another advocate of the need for holistic interventions, following from the logic of his process model (Chapter 3). He felt that interventions would be best located as

*Applied History*, 5(1), 75–84; Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2024) Monitoring change from residential housing care to family-based care for children. *The Lancet Child & Adolescent Health*, early view.

<sup>632</sup> Bowlby, J. (1949) The study and reduction of group tensions in the family. *Human Relations*, 2(2), 123–128; Bowlby, J. (1988) *Secure Base*. London: Routledge.

<sup>633</sup> Lieberman, A. F., Weston, D. R., & Pawl, J. H. (1991) Preventive intervention and outcome with anxiously attached dyads. *Child Development*, 62, 199–209.

<sup>634</sup> For example, Beckwith, L. (1988) Intervention with disadvantaged parents of sick preterm infants. *Psychiatry*, 51, 242–247.

<sup>635</sup> Sroufe, L. A. (2005) Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*, 7(4), 349–367, p. 353.

<sup>636</sup> Appleyard, K., Egeland, B., Dulmen, M. H., & Sroufe, L. A. (2005) When more is not better: The role of cumulative risk in child behavior outcomes. *Journal of Child Psychology and Psychiatry*, 46(3), 235–245, pp. 242–243.

<sup>637</sup> Egeland, B., Carlson, E., & Sroufe, L. A. (1993) Resilience as process. *Development & Psychopathology*, 5(4), 517–528, p. 526.

<sup>638</sup> Korfmacher, J. (2001) *Harder than You Think: Determining What Works, for Whom, and Why in Early Childhood Interventions*. Chicago, IL: Herr Research Center, Erikson Institute, p. 6.

<sup>639</sup> Erickson, M. F., Korfmacher, J., & Egeland, B. R. (1992) Attachments past and present: Implications for therapeutic intervention with mother-infant dyads. *Development & Psychopathology*, 4(4), 495–507, p. 501.

forms of support embedded within routine public services and integrated into the natural flow of community life. In his view, ‘to the extent that any intervention requires additional cadres of helpers, we view it as fatally flawed ... strategies of intervention must be amenable to service delivery systems that are already in place.’<sup>640</sup> For instance, routine antenatal care could provide a springboard for interventions to ensure family coping across various domains, such as housing, parental interactions, parent expectations about their child, and social support.<sup>641</sup>

Van IJzendoorn, Juffer, and Bakermans-Kranenburg were respectful of psychodynamic psychotherapy, which they regarded as possessing valuable techniques for supporting caregivers. They were appreciative of the fact that holistic interventions were attempting to respond to very real, multifaceted challenges that families faced. That said, they felt that both psychodynamic psychotherapy and holistic interventions, when used to improve child–caregiver attachment, lacked fundamental clarity about mechanism, with relatively weak ties to the ideas about attachment they ostensibly invoked.

In line with Popper, Van IJzendoorn, Juffer, and Bakermans-Kranenburg preferred the prospect of a targeted intervention that could be examined by researchers for its anticipated mechanism and effects.<sup>642</sup> Such targeted interventions could, if needed, be combined with additional forms of support for families, ideally grounded in empirical evidence. For example, a targeted parenting intervention, supported by empirical research, could be combined with a targeted, evidence-based poverty-reduction intervention. Both might be expected to have benefits for the child–caregiver relationship, given meta-analytic research by Cyr, Euser, Bakermans-Kranenburg, and Van IJzendoorn documenting associations between socioeconomic pressures and insecure and disorganized attachment relationships.<sup>643</sup> Though it should be acknowledged that associations here may, or may not, translate into direct causal relationships (see [Chapter 5](#)).

For Van IJzendoorn, Juffer, and Bakermans-Kranenburg, without a theoretical basis and specific target, both psychodynamic psychotherapy and holistic interventions risked flying blind with families when trying to improve child–caregiver relationships and child outcomes. Not only was it unclear on what criteria such interventions should be evaluated, but it was unclear how they might be improved. Van IJzendoorn, Bakermans-Kranenburg, and colleagues were also mindful that evaluation of interventions offered profound opportunities to contribute to attachment theory and research through testing potential causal mechanisms: ‘Theory-based parenting interventions are the litmus test of causality and of

<sup>640</sup> Belsky, J., & Benn, J. (1982) Beyond bonding: A family approach to the enhancement of parent–infant relations in the newborn period. In L. Bond & J. Joffe (eds), *Facilitating Infant and Early Childhood Development* (pp. 281–308) Hanover, NH: New England University Press, p. 300.

<sup>641</sup> Belsky, J. (1993) Etiology of child maltreatment: A developmental-ecological analysis. *Psychological Bulletin*, 114(3), 413–434, p. 428.

<sup>642</sup> Popper, K. ([1944] 1957) *The Poverty of Historicism*. London: Routledge, Part III; Popper, K. (1948) Utopia and violence. *The Hibbert Journal*, 16: 109–116; Jacobs, S. & Tregenza, I. (2014) Rationalism and tradition: The Popper–Oakeshott conversation. *European Journal of Political Theory*, 13(1), 3–24.

<sup>643</sup> Cyr, C., Euser, E. M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2010) Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, 22(1), 87–108: ‘Results of our meta-analyses suggest that preventive efforts to reduce child maltreatment may not only be oriented toward reinforcing sensitive parenting behaviour but also try to alleviate less immediate contextual issues such as parenting stress, social support, home safety, and job placement’ (104). That said, the use of discrete targeted interventions may also risk causing confusion for already-struggling families. In a process evaluation of another attachment-based video-feedback intervention by Bagwell-Gray and colleagues, ‘families indicated multiple needs, yet they also indicated experiencing confusion amongst providers due to the multiple providers coming to their home’. The researchers suggested a more holistic approach might be more acceptable to the families in their study. Bagwell-Gray, M. E., Grube, W., Mendenhall, A., Jen, S., Olaleye, O., & Sattler, P. (2023) A qualitative exploration of caregivers’ experiences with the Attachment and Biobehavioral Catch-up (ABC) parenting program. *Infant Mental Health Journal*, 44(3), 406–421, p. 418.

the translational value of theories about parenting.<sup>644</sup> Neither psychodynamic psychotherapy nor holistic interventions were well positioned to capitalize on such opportunities, as neither tended to have clearly articulated and testable accounts of potential causal processes. By contrast, a narrow focus on a specific intervention target, such as caregiver sensitivity, could test one of the core causal hypotheses in attachment theory, namely that enhanced sensitivity would cause greater attachment security. This critical link between theory and applied work with families would be impossible with Project STEEP or other multifaceted parenting interventions.

If a parent had experienced trauma, they might well benefit from psychotherapy and improve the quality of their caregiving. If a parent was overwhelmed by socioeconomic stressors, they might well benefit from advocacy to ensure access to welfare and charity support, and again quality of caregiving might be expected to benefit. For Van IJzendoorn, the issue is that neither of these claims ultimately require attachment theory. Van IJzendoorn, Sagi-Schwartz, and a number of other researchers argued in the 1980s that attachment research since Ainsworth had pointed especially to the role of caregiver sensitivity as contributing to secure attachment and, through this, positive developmental outcomes.<sup>645</sup> Sensitivity therefore seemed a strong candidate for an intervention target.

Van IJzendoorn supervised a doctoral study by Mirjam Lambermon, funded by the Foundation for Preventive Studies (Praeventiefonds), which investigated two potential mechanisms for improving caregiver sensitivity. Lambermon and Van IJzendoorn randomized a small sample of 35 mother–infant dyads, drawn from a lower-middle class community sample, to either receive written information about how to provide sensitive care, or an instructional video with this content. Lambermon and Van IJzendoorn expected the instructional video would be more lively and engaging, and therefore more successful. This was not the case. In fact, the written materials had a significantly greater effect on caregiver sensitivity ( $d = 0.77$ ) than the instructional video ( $d = 0.58$ ). Qualitative interviews with participants revealed that mothers who received the instructional video were distracted from the content, as they found themselves making comparisons between themselves and the illustrations in the video.<sup>646</sup>

In a 1998 paper, Bakermans-Kranenburg, Juffer, and Van IJzendoorn compared two forms of intervention in a sample of 30 mothers.<sup>647</sup> In the first, mothers received written information about how to provide sensitive care plus video-feedback on their own caregiving behaviour to encourage sensitivity. The video-feedback focused on helping the caregiver learn about: (a) the baby's contact-seeking and exploration behavior, (b) the accurate perception of the baby's more subtle signals and expressions, (c) the relevance of adequate and prompt reactions to the baby's cues, and (d) affective attunement and sharing of emotions.<sup>648</sup> In the second arm of the intervention, the mothers also received a brief intervention of talking therapy, with intervenors asking about mothers' experiences

<sup>644</sup> Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256, p. 241.

<sup>645</sup> For example, Bustan, D., & Sagi, A. (1984) Effects of early hospital-based intervention on mothers and their preterm infants. *Journal of Applied Developmental Psychology*, 5, 305–317.

<sup>646</sup> Lambermon, M. W. & Van IJzendoorn, M. H. (1989) Influencing mother–infant interaction through videotaped or written instruction: Evaluation of a parent education program. *Early Childhood Research Quarterly*, 4(4), 449–458.

<sup>647</sup> Bakermans-Kranenburg, M. J., Juffer, F., & Van IJzendoorn, M. H. (1998) Interventions with video feedback and attachment discussions: Does type of maternal insecurity make a difference? *Infant Mental Health Journal*, 19(2), 202–219.

<sup>648</sup> *Ibid.*, 213.

and expectations about attachment relationships, and drawing links to their parenting behaviour. Following the pilot intervention, both groups showed more sensitivity than a control group. However, no difference was found between the two intervention arms: both were equally effective ( $d = 0.87$ ). This was interpreted by Bakermans-Kranenburg and colleagues as suggesting that the talking therapy focused on internal working models had not made an additional difference, though they acknowledged that the intervention had been brief and the results preliminary.

Whereas Lambermon and Van IJzendoorn had found videotaped instructions (without individualized feedback) less effective when the illustrations were of another caregiver and child, Bakermans-Kranenburg and colleagues concluded that video-feedback was more effective when the illustrations were clips from the caregiver's own interactions with their child. It appeared that when caregivers saw clips of themselves, the obstructive feelings evoked by comparison could be circumvented, and caregivers could see with greater clarity their own infant's signals and communications. The technical affordances of film, specifically the capacity to see oneself from the outside during interactive sequences, offered caregivers a heightened mode of perception of themselves and their child. Conversations with participants suggested that they did not feel patronized, but empowered, because it was *their own* expertise that was being built upon with this approach. Caregivers could take insight and delight from the precise particularity of their own relationship, not the familiar idea and its judgements.

In the 1980s, Shames described Van IJzendoorn's work, influenced by Habermas, as a 'psychology of emancipation'.<sup>649</sup> A line of continuity can be traced to Van IJzendoorn's interest in video-feedback. In video-feedback with caregivers, central roles are assigned to reviewing the evidence; consideration of differences between expectations and observable reality; and the use of a visible, objective touchstone to permit new intersubjective consensus. At an epistemic level, immediate experience is distrusted in favour of mediated reflection, underpinned by opportunity for individuals to agree or disagree with an independent person about what they are both seeing.

Clearly, first and foremost video-feedback represented a form of intervention focused on improving sensitive caregiving and the child-caregiver attachment relationship. Additionally, it resonated for Van IJzendoorn as a means of facilitating caregiver enlightenment from their own unreasoned behaviours and assumptions about themselves and their child.<sup>650</sup> It is interesting that Gaudreau and colleagues, observing child-caregiver interactions following a randomized trial of another attachment-based intervention utilizing video-feedback, found that the intervention contributed to a higher proportion of child-led and restatement questions, and a lower proportion of parent-led and pedagogical questions, compared to the control. Additionally, the higher proportion of child-led questions were related to higher parental sensitivity scores. The psychology of enlightenment offered by the intervenor to the caregiver may be a skill that then becomes a part of the child-caregiver relationship.<sup>651</sup>

<sup>649</sup> Shames, C. (1988) Toward a psychology of emancipation. *New Ideas in Psychology*, 6(1), 127–135.

<sup>650</sup> Kant called on individuals to use reason to evaluate their assumptions and behaviour, a process he characterised with the metaphor of reflection, as if in a mirror. Vujošević, M. (2014) The judge in the mirror: Kant on conscience. *Kantian Review*, 19(3), 449–474. This was echoed in the title of Bakermans-Kranenburg, M. J., Juffer, F., & Van IJzendoorn, M. H. (2018) Reflections on the mirror: On video feedback to promote positive parenting. In C. H. Zeanah (ed.), *Handbook of Infant Mental Health* (4th ed., pp. 527–542). New York: The Guilford Press.

<sup>651</sup> Gaudreau, C., Delgado, A., Confair-Jones, R., Flambaum, S., Hirsh-Pasek, K., Raby, K. L., Dozier, M., & Golinkoff, R. M. (2024) The unanticipated side effects of an attachment intervention: Parents ask higher quality questions. *Developmental Psychology*, 60(3), 456–466.

## Less Is More

In 2003, Bakermans-Kranenburg, Van IJzendoorn, and Juffer published a meta-analysis of interventions evaluated for their effects on caregiver sensitivity and/or child attachment. Data from 70 studies were synthesized. The findings were explosive. Bakermans-Kranenburg and colleagues found that interventions that took as their target improvements in caregiver's internal working models were less effective at increasing caregiver sensitivity and attachment security than those that took caregiver behaviour as their target. Bakermans-Kranenburg and colleagues highlighted that interventions were effective at improving caregiver sensitivity if they utilized video-feedback with parents, showing them clips of their own interaction with their child, and using these as the basis for discussion. They did not discuss a finding, reported in Table 6 of their paper, that interventions without video-feedback were more effective ( $d = 0.25$ ) than interventions with video-feedback ( $d = 0.07$ ) at improving child-caregiver security; this result has been left unnoticed or undiscussed by subsequent researchers.

Completely contrary to the position of advocates for holistic interventions, Bakermans-Kranenburg and colleagues found that interventions to date that attempted to make a comprehensive and holistic intervention in the lives of families generally either had no effect on patterns of attachment or, actually, increased insecurity. Further pointing to the potential disadvantages of a holistic intervention, in two of the three studies that included fathers in the intervention, mothers barely improved their sensitivity or became less sensitive. Contrary to predictions by the Minnesota group that 'more is better',<sup>652</sup> Bakermans-Kranenburg and colleagues also found that interventions with a moderate number of sessions tended to be significantly more effective at increasing attachment security than longer interventions. Bakermans-Kranenburg and colleagues ultimately described holistic interventions like STEEP as 'well-intended' but 'counterproductive'.<sup>653</sup> As the Minnesota team themselves acknowledged, the findings from their evaluation were that the STEEP intervention did not have the expected effect.

Something of an oddity in the 'less is more' meta-analysis are findings regarding four studies (with 696 dyads), all with experimental designs, that sought to improve caregiver sensitivity without an in-person intervention, merely offering written instructional materials. As we saw above, Lambermon and Van IJzendoorn found that written materials had a very considerable effect on caregiver sensitivity ( $d = 0.77$ ). Bakermans-Kranenburg found that the standardized effect size of these four interventions was  $d = 0.62$  (CI 0.08, 1.17), compared to  $d = 0.32$  (CI 0.12, 0.51) for a non-professional and  $d = 0.44$  (CI 0.35, 0.54) for interventions led by a professional.<sup>654</sup> Bakermans-Kranenburg did not comment on these findings, perhaps as a result of the small number of studies and very broad confidence interval.

Fifteen years later, the second-generation Stony Brook group conducted a meta-analysis looking only at interventions with outcome data for disorganized attachment.<sup>655</sup> The researchers found that the duration of the intervention did not significantly moderate

<sup>652</sup> Egeland, B., Weinfield, N., Bosquet, M., & Cheng, V. (2000) Remembering, repeating, and working through: Lessons from attachment-based interventions. In J. Osofsky (ed.), *WHIMH Handbook of Infant Mental Health*, Vol. 4, (pp. 35–89). New York: Wiley, p. 79.

<sup>653</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2003) Less is more: Meta-analyses of sensitivity and attachment interventions in early childhood. *Psychological Bulletin*, 129(2), 195–215, p. 210.

<sup>654</sup> *Ibid.*, Table 3.

<sup>655</sup> Facompré, C. R., Bernard, K., & Waters, T. E. (2018) Effectiveness of interventions in preventing disorganized attachment: A meta-analysis. *Development & Psychopathology*, 30(1), 1–11, Table 2.

effectiveness at reducing *disorganization*,<sup>656</sup> in contrast to the findings of Bakermans-Kranenburg and colleagues for *security* but in line with what they had found for disorganized attachment.<sup>657</sup> Interventions targeting sensitive behaviour were not more effective than those addressing internal working models or with a holistic focus. Indeed, some studies suggest that the effectiveness of interventions aimed at reducing disorganized attachment may be moderated by caregiver trauma symptoms, implying the potential value of addressing caregiver trauma models for other components of an intervention to be successful.<sup>658</sup> Findings for whether attachment-based interventions are moderated by caregivers' AAI classifications have been very mixed, perhaps reflecting heterogeneity within the AAI unresolved classification, which captures both trauma and loss (Chapter 1).<sup>659</sup>

A meta-analysis by Euser, Alink, Stoltenborgh, Bakermans-Kranenburg, and Van IJzendoorn of parenting interventions aiming to prevent or reduce child maltreatment generally found that interventions with a moderate duration (6–12 months) or a moderate number of sessions (16–30) had significantly greater effects than interventions either with fewer or with more sessions.<sup>660</sup> A subsequent meta-analysis by Wright, Fearon, and colleagues looked at randomized-control trials and semi-randomized trials of interventions to improve child–caregiver attachment. They found that video-feedback interventions were not more effective.<sup>661</sup> As we saw above, this actually agrees with Table 6 of the 'less is more' meta-analysis, if not the predominant narrative of the paper in favour of video-feedback interventions.<sup>662</sup>

Bakermans-Kranenburg and colleagues' 2003 'less is more' paper has not been updated, so its claims could certainly still hold, though there is still some debate between advocates of holistic and targeted interventions about its conclusion that *less* may be *more*.<sup>663</sup> At the time, however, the meta-analysis by Bakermans-Kranenburg and colleagues represented

<sup>656</sup> These findings agreed with Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2005) Disorganized infant attachment and preventive interventions: A review and meta-analysis. *Infant Mental Health Journal: Official Publication of the World Association for Infant Mental Health*, 26(3), 191–216.

<sup>657</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2005) Disorganized infant attachment and preventive interventions: A review and meta-analysis. *Infant Mental Health Journal*, 26, 191–216.

<sup>658</sup> For example, Van der Asdonk, S., Cyr, C., & Alink, L. (2021) Improving parent–child interactions in maltreating families with the Attachment Video-feedback Intervention: Parental childhood trauma as a moderator of treatment effects. *Attachment & Human Development*, 23(6), 876–896.

<sup>659</sup> Moran, G., Pederson, D. R., & Krupka, A. (2005) Maternal unresolved attachment status impedes the effectiveness of interventions with adolescent mothers. *Infant Mental Health Journal*, 26, 231–249; Cassibba, R., Castoro, G., Costantino, E., Sette, G., & Van IJzendoorn, M. H. (2015) Enhancing maternal sensitivity and infant attachment security with video feedback: An exploratory study in Italy. *Infant Mental Health Journal*, 36, 53–61; Ramsauer, B., Mühlhan, C., Lotzin, A., Achtergarde, S., Mueller, J., Krink, S., ... & Romer, G. (2020) Randomized controlled trial of the Circle of Security-Intensive intervention for mothers with postpartum depression: Maternal unresolved attachment moderates changes in sensitivity. *Attachment & Human Development*, 22(6), 705–726; Labella, M. H., Raby, K. L., Bourne, S. V., Trahan, A. C., Katz, D., & Dozier, M. (2024) Is Attachment and biobehavioral catch-up effective for parents with insecure attachment states of mind? *Child Development*, 95(2), 648–655.

<sup>660</sup> Euser, S., Alink, L. R., Stoltenborgh, M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) A gloomy picture: A meta-analysis of randomized controlled trials reveals disappointing effectiveness of programs aiming at preventing child maltreatment. *BMC Public Health*, 15(1), 1068.

<sup>661</sup> Wright, B., Fearon, P., Garside, M., Tsappis, E., Amoah, E., Glaser, D., ... & McHale, M. (2023) Routinely used interventions to improve attachment in infants and young children: A national survey and two systematic reviews. *Health Technology Assessment (Winchester, England)*, 27(2), 1.

<sup>662</sup> It should be noted that the meta-analysis by Wright, Fearon, and colleagues, despite its apparently broader scope, appears to be potentially incomplete: it includes a lower number of trials compared to a meta-analysis of just the VIPP-SD intervention by Van IJzendoorn and colleagues. Bakermans-Kranenburg and Van IJzendoorn have therefore asked for the data, and plan to attempt to reproduce the study by Wright, Fearon, and colleagues. M. Van IJzendoorn, personal communication, August 20, 2024.

<sup>663</sup> For example, Steele, H., Murphy, A., Bonuck, K., Meissner, P., & Steele, M. (2019) Randomized control trial report on the effectiveness of Group Attachment-Based Intervention (GABI®): Improvements in the parent–child relationship not seen in the control group. *Development and Psychopathology*, 31(1), 203–217; Firk, C., Dahmen, B., Dempfle, A., Niessen, A., Baumann, C., Schwarte, R., ... & Herpertz-Dahlmann, B. (2021)



a fundamental intervention. It has been widely cited in research, as well as in policy.<sup>664</sup> The meta-analysis established a general consensus among attachment researchers that ‘the most effective attachment interventions target maternal sensitivity’,<sup>665</sup> and directed the development of attachment-based interventions towards relatively brief, video-feedback interventions seeking to improve the sensitivity of the behaviour of one caregiver. It was anticipated that other targeted interventions could help with other aspects of caregiver difficulties, provided when the moment was right for a family, and avoiding the risks of overwhelming caregivers or diffused effects attendant on holistic interventions.<sup>666</sup>

### The VIPP Intervention

Building from Juffer’s doctoral research, Juffer, Bakermans-Kranenburg, and Van IJzendoorn developed a targeted parenting intervention: Video-feedback Intervention to promote Positive Parenting and Sensitive Discipline (VIPP-SD). The manual for VIPP-SD sets out six sessions of video-feedback with parents at home, each lasting 90 minutes.<sup>667</sup> The child is first filmed alone during ordinary play, then with their caregiver. There are no structured interactions to activate the attachment motivational system, as in the Strange Situation. The focus is resolutely on those aspects relevant to attachment within ordinary interaction. The recordings are also screened for suitable moments involving secure base or safe haven behaviour, to connect the themes of the individual sessions to the video. The resulting script is connected to the time codes on the video and serves as a guide for the video feedback in the intervention session, with all material recorded in the previous home visit reviewed with the parent (not just the fragments selected for feedback).

Each session has a theme. The core themes are:

1. Distinguishing exploration and attachment-related child behaviour (comprehending secure base/safe haven dynamics)
2. Speaking for the child
3. Chains of sensitivity: responding to the child’s cues and noticing their response
4. Sharing of emotions.<sup>668</sup>

In two further sessions, meant as booster sessions, these themes are repeated and integrated.

When VIPP is delivered with children at least 12 months of age, it generally includes a module on sensitive discipline. It is then called VIPP-Sensitive Discipline (VIPP-SD).

A mother–child intervention program for adolescent mothers: Results from a randomized controlled trial (the TeeMo study). *Development and Psychopathology*, 33(3), 992–1005.

<sup>664</sup> For example Public Safety Canada (2006) Better to build a child than fix an adult: A report on the predictors of risk for youth who proceed to the adult justice system and the programs that work to reduce that likelihood. Ottawa, Ontario: Public Safety Canada.

<sup>665</sup> Beckwith, H., Van IJzendoorn, M., Freeston, M., Woolgar, M., Stenner, P., & Duschinsky, R. (2022) A ‘transmission gap’ between research and practice? A Q-methodology study of perceptions of the application of attachment theory among clinicians working with children and among attachment researchers. *Attachment & Human Development*, 24(6), 661–689, p. 677.

<sup>666</sup> Van IJzendoorn, M. H. & Beckwith, H. (2018) Attachment Interview Part 1 with M. Van IJzendoorn. YouTube, <https://www.youtube.com/watch?v=jdmyvrZOdX0&t=14s>.

<sup>667</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) *Manual video-feedback intervention to promote positive parenting and sensitive discipline (VIPP-SD)(version 3.0)*, Leiden: Leiden University, Centre for Child and Family Studies.

<sup>668</sup> Ibid.



Bakermans-Kranenburg, Juffer, and Van IJzendoorn felt that the available attachment-based interventions did not have enough to offer to parents struggling with child non-compliance during toddlerhood ('the terrible two's') and afterwards. The sensitive discipline module was inspired by Patterson's coercion theory, a social learning approach that seeks to avoid cycles in which children get their way through tantrums.<sup>669</sup> Patterson's idea was that children may be conditioned to show increasingly demanding behaviour to achieve their immediate goals when caregivers offer inconsistent reinforcement or respond with inconsistent punishment to these demanding behaviours. Essentially it is an operant conditioning model. The module adds the following themes:

1. Non-coercive discipline
2. Positive reinforcement
3. De-escalation of tantrums through a sensitive pause
4. Empathy for the child and consistent limit-setting

The caregiver's partner (the manual assumes a husband) is welcome to attend the booster sessions 5 and 6, after the core themes have been addressed in sessions 1–4. Though the focus remains on the target caregiver.<sup>670</sup> A few implementations of VIPP-SD have adapted this guidance to include fathers more substantively.<sup>671</sup>

This is by no means to imply that Juffer, Bakermans-Kranenburg, and Van IJzendoorn regarded fathers and partners as lacking importance; quite the opposite.<sup>672</sup> They have been collaborators on research documenting that the contribution of fathers is often as important as that of mothers to child development (Chapter 5), and that the sensitivity of one caregiver affects the sensitivity of another.<sup>673</sup> Van IJzendoorn and international collaborators in Australia and the UK have also given attention to the potential contribution of grandparents as potential allies in parenting interventions.<sup>674</sup> Rather than disrupt or dilute the encounter of a caregiver with an image of their own caregiving in video feedback, they have instead preferred to work on dedicated interventions for fathers using VIPP.<sup>675</sup>

<sup>669</sup> Patterson, G. R. (1982) *Coercive Family Process*. Eugene, OR: Castilia.

<sup>670</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) *Manual video-feedback intervention to promote positive parenting and sensitive discipline (VIPP-SD)(version 3.0)*, Leiden: Leiden University, Centre for Child and Family Studies.

<sup>671</sup> For example, Williams, O. (2017) *Healthy Start, Happy Start: Fathers' experiences and engagement in an attachment-based parenting intervention*. Doctoral thesis (D.Clin.Psy), UCL (University College London); Iles, J. E., Rosan, C., Wilkinson, E., & Ramchandani, P. G. (2017) Adapting and developing a video-feedback intervention for co-parents of infants at risk of externalising behaviour problems (VIPP-Co): A feasibility study. *Clinical Child Psychology and Psychiatry*, 22(3), 483–499. Cf. Berthelot, N., Larouche, K., Garon-Bissonnette, J., Deschênes, K., Drouin-Maziade, C., & Lemieux, R. (2024) Spillover effects on the relationship with the partner of a mentalization-based intervention for pregnant women. *Infant Mental Health Journal*, early view.

<sup>672</sup> Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2023) Sensitive responsiveness in expectant and new fathers. *Current Opinion in Psychology*, 50, 101580.

<sup>673</sup> Hallers-Haalboom, E. T., Groeneveld, M. G., van Berkel, S. R., Endendijk, J. J., van der Pol, L. D., Linting, M., ... & Mesman, J. (2017) Mothers' and fathers' sensitivity with their two children: A longitudinal study from infancy to early childhood. *Developmental Psychology*, 53(5), 860.

<sup>674</sup> Riem, M., Hasselman, F., Psyllou, C., Van Harmelen, A. L., Pearce, A., Minnis, H., & Cima, M. (2023) More than just treats? Effects of grandparental support for children growing up in adversity. *OSF*, <https://osf.io/preprints/psyarxiv/743gs>; Riem, M. M., Perrykkad, K., Watson, S. J., Wynter, K., Van IJzendoorn, M. H., & Galbally, M. (2024) The role of lack of grandparental support in perinatal depression. *Journal of Affective Disorders*, 360, 198–205.

<sup>675</sup> Buisman, R. S., Alyousefi-van Dijk, K., de Waal, N., Kesarlal, A. R., Verhees, M. W., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2023) Fathers' sensitive parenting enhanced by prenatal video-feedback: A randomized controlled trial using ultrasound imaging. *Pediatric Research*, 93(4), 1024–1030; De Waal, N., Alyousefi-van Dijk, K., Buisman, R. S. M., Verhees, M. W. F. T., & Bakermans-Kranenburg, M. J. (2022) The prenatal video-feedback intervention to promote positive parenting for expectant fathers (VIPP-PRE): Two case studies. *Infant Mental Health Journal*, 43 (5), 730–743; Witte, A. M., de Moor, M. H. M., Verhees, M. W. F. T., Lotz,

In preparing VIPP sessions, the intervener carefully reviews the recording of the previous visit and makes a profile of the parent-child interaction using a list of behavioural items (e.g., adequately reacting to positive signals of the child, such as smiling and acknowledging the child's actions; adjusting their pace to that of the child) as an outline of what the parent is already doing well (to be emphasized in the next visit), and what could be worked on as opportunities for change.

During VIPP sessions, the intervener will show the recording and use it to illustrate the information each session seeks to convey, which is based on the theme of the session and the specific profile of the parent-child interaction. As clips are shown, the intervener will tentatively describe the child's behaviour and expressions from the viewpoint of the child, as if providing subtitles to their nonverbal behaviour to convey the child's apparent motivations and mood. This technique was drawn from earlier psychodynamic psychotherapy interventions, delivered to infants and mothers together.<sup>676</sup> Acknowledging the parent as the expert on their child, the intervener asks whether the parent agrees with the interpretation of the child's behaviour. As sessions progress, the intervener will ask the caregiver questions when clips play, to help the caregiver start to generate their own subtitles and interpretations.

Viewing and discussing the clips together is used to help the caregiver learn to identify their child's signals of pleasure and distress or frustration. On this basis, caregivers can then learn to follow their child's lead, whether the child's need is for exploration or for comfort and support. The clips are used to help the caregiver see what responses might prolong happy interaction, avoid provoking distress or frustration, and provide verbal or physical reassurance or comfort. Reviewing the clips can help caregivers reflect on how to pace their responses to align with their child and facilitate effective back-and-forth exchanges. Discussions may also address the repertoire of responses caregivers tend to use, and whether these could be diversified, to be most effective and adapted to different situations.

The intervener's tone must never be judgemental, but always constructive and kind, drawing attention to caregivers' strengths as well as things to improve in the last four sessions. Positive film fragments are emphasized: the intervention builds precisely on parent's *own* expertise, with the caregiver serving as a reinforcing role model for themselves:

Focusing on positive interactions serves the goal of showing the mother that she is able to act as a sensitive, competent parent: she should feel empowered by positive feedback rather than incompetent due to negative feedback.... In case of insensitive parental behaviour, the parent is encouraged to use more sensitive behaviours, preferably behaviours she displayed at other moments on the videotape, so that she is her own model of competent parenting. These 'corrective messages' are, however, postponed to the third or later intervention sessions.<sup>677</sup>

Interveners are advised to create a good atmosphere by making positive remarks about the child ('she's already talking a lot!', 'so cute, listen to her babbling on', 'he's playing so nicely', 'hasn't she got lovely shoes!', etc.). This is intended to stimulate the parent's positive

A. M., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (in press) Effects of a baby carrier intervention on fathers' sensitivity, involvement, and hormonal levels: Follow-up of a randomized controlled study. *Parenting*.

<sup>676</sup> Carter, S. L., Osofsky, J. D., & Hann, D. M. (1991) Speaking for the baby: A therapeutic intervention with adolescent mothers and their infants. *Infant Mental Health Journal*, 12(4), 291–301. See also Slade, A. (2023) Looking back to light the path forward: Ghosts in the Nursery revisited. *Infant Mental Health Journal*, 44(6), 857–868.

<sup>677</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2014) Attachment-based interventions: Sensitive parenting is the key to positive parent-child relationships. In P. Holmes & S. Farnfield (eds), *The Routledge Handbook of Attachment: Implications and Interventions* (pp. 83–103). London: Routledge, p. 90.

feelings towards their child. It is also advised to end the recording at a quiet moment and on a positive note.<sup>678</sup>

Illustrating the approach, Juffer and Bakermans-Kranenburg have provided an example of VIPP in action in a published case study:

Using the recordings, she [the intervener] pointed out how happy and proud Ava reacted to Noah's compliments and how they were peacefully playing together afterward. The intervener explained that research has shown that it works much better to praise your child and give compliments when she does things well than to punish her when things go wrong. Sometimes it is even better to ignore naughty or difficult behavior because that way your child is not receiving attention for that type of behavior. The intervener summarized this message by saying: 'Because you are so important for Ava, she really loves to have your attention and compliments, and that is why it works so well to praise Ava when you want her to listen to you or be compliant.'<sup>679</sup>

Qualitative process evaluations have found that practitioners find the manual easy to follow and helpful; though sometimes families did not find all the themes directly relevant to them, and more experienced practitioners might feel constrained by the manualized approach.<sup>680</sup>

VIPP-SD has been adapted for various target groups. In one adaptation, Schoemaker and Leiden colleagues adapted VIPP-SD for use with carers of foster children.<sup>681</sup> Many of the children in their target group had experience of abuse from previous caregivers. Schoemaker and colleagues therefore made a number of adjustments to VIPP-SD to respond to the needs and experiences of these children. For instance, tasks that depend on physical touch in the manual were adjusted, as maltreated children may be anxious about physical contact.<sup>682</sup>

The VIPP-SD manual builds on Ainsworth's concept of sensitivity to children's signals, giving a prominent place especially to signals of secure base and safe haven availability. This was reflected in the first published account of VIPP by Juffer and colleagues which situated it as an intervention focused on secure base and safe haven provision specifically.<sup>683</sup> Ainsworth's concept, and the VIPP-SD manual, assume that children's needs can

<sup>678</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) *Manual Video-Feedback Intervention to Promote Positive Parenting and Sensitive Discipline (VIPP-SD)(version 3.0)*, Leiden: Leiden University, Centre for Child and Family Studies.

<sup>679</sup> Juffer, F., & Bakermans-Kranenburg, M. J. (2018) Working with video-feedback intervention to promote positive parenting and sensitive discipline (VIPP-SD): A case study. *Journal of Clinical Psychology*, 74(8), 1346–1357, p. 1352.

<sup>680</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (eds) (2012) *Promoting Positive Parenting: An Attachment-Based Intervention*. London: Taylor & Francis; Comyn, J. (2019) Exploring stakeholders' perceptions of the impact, acceptability and feasibility of a video-feedback intervention to promote positive parenting in foster care (VIPP-FC), unpublished doctoral dissertation, University College London.

<sup>681</sup> Schoemaker, N. K., Jagersma, G., Stoltenborgh, M., Maras, A., Vermeer, H. J., Juffer, F., & Alink, L. R. (2018) The effectiveness of video-feedback intervention to promote positive parenting for foster care (VIPP-FC): Study protocol for a randomized controlled trial. *BMC Psychology*, 6, 1–11; Schoemaker, N. K., Juffer, F., Rippe, R. C., Vermeer, H. J., Stoltenborgh, M., Jagersma, G. J., ... & Alink, L. R. (2020) Positive parenting in foster care: Testing the effectiveness of a video-feedback intervention program on foster parents' behavior and attitudes. *Children and Youth Services Review*, 110, 104779.

<sup>682</sup> See also Oliveira, P., Stevens, E., Barge, L., Comyn, J., Langley, K., Ramchandani, P., ... & Fearon, P. (2022) A modified video-feedback intervention for carers of foster children aged 6 years and under with reactive attachment disorder: A feasibility study and pilot RCT. *Health Technology Assessment*, 26(35), 1–106.

<sup>683</sup> Juffer, F., Hoksbergen, R. A., Riksen-Walraven, J. M., & Kohnstamm, G. A. (1997) Early intervention in adoptive families: Supporting maternal sensitive responsiveness, infant–mother attachment, and infant competence. *Journal of Child Psychology and Psychiatry*, 38(8), 1039–1050.

be inferred from their signals, but these signals may be subtle or even distorted, dependent on the child's experiences.<sup>684</sup> As we saw in [Chapter 1](#), a proportion of children in the Berkeley sample with a classification of disorganized attachment in infancy did not display markers of disorganization at age six, but rather controlling-caregiver or controlling-punitive strategies. Schoemaker and colleagues adapted VIPP-SD to inform foster parents that children may display false positive affect or not ask for help when distressed.

VIPP-SD was also adapted to respond to the Covid-19 pandemic and associated lockdowns, during which there was considerable additional pressure on families. At the same time, there were additional obstacles to provision of interventions or support for families. Among other researchers, Sari, Van IJzendoorn, and colleagues documented that caregivers' levels of sensitivity tended to decline, and rates of harsh parenting increased, as caregivers experienced competing demands and challenges to their coping.<sup>685</sup> Responding to this context, Van IJzendoorn, Stevens, and Bakermans-Kranenburg developed an adaptation of VIPP that could be delivered virtually.<sup>686</sup> They took heart from a meta-analysis by Batastini and colleagues, of 57 studies that found that psychosocial interventions delivered virtually have equivalent outcomes to those delivered in person.<sup>687</sup>

In Virtual-VIPP, the intervener records interaction through a video call, trying to keep the activity within the screen frame. During feedback, the intervener shares their screen with the caregiver to play back video clips and provide feedback and opportunities for reflection. A difference with VIPP-SD is that in Virtual-VIPP making new recordings and giving video feedback is split over separate sessions, given the additional demands and reduced rewards of virtual interaction. Separating recording sessions (providing the video footage) from feedback sessions (where the fragments are reviewed and feedback is provided) leads to more and shorter sessions instead of fewer and longer sessions.

## Early Trials

The first evaluation of the effects of a preliminary version of VIPP was reported in 2005 by Juffer, Bakermans-Kranenburg, and Van IJzendoorn.<sup>688</sup> This intervention comprised only three sessions. It was implemented with around half of the pooled sample of 130 internationally adopted children from the doctoral studies by Juffer and Rosenboom, mentioned earlier. The evaluation incorporated data from Juffer's 1997 report from 90 of these cases.

<sup>684</sup> Runze, J., Van IJzendoorn, M. H., Vrijhof, C. I., & Bakermans-Kranenburg, M. J. (2022) Replicating a randomized trial with video-feedback to promote positive parenting in parents of school-aged twins. *Journal of Family Psychology*, 36(4), 490–501; Starreveld, K. M., Overbeek, M. M., Willemsen, A. M., & Bakermans-Kranenburg, M. J. (2024) Adapting a video-feedback intervention to support teacher–child interaction and behavior regulation of young children at school: A qualitative pilot study. *School Psychology International*, 45(1), 16–35.

<sup>685</sup> For example Sari, N. P., Van IJzendoorn, M. H., Jansen, P., Bakermans-Kranenburg, M., & Riem, M. M. (2022) Higher levels of harsh parenting during the COVID-19 lockdown in the Netherlands. *Child Maltreatment*, 27(2), 156–162. Such effects appear to be moderated by pre-pandemic functioning: Lindblom, J., Korja, R., Karlsson, H., Karlsson, L., Karukivi, M., Pajulo, M., & Nölvi, S. (2024) Prepandemic to early COVID-19: Changes in couple functioning and links with harsh parenting. *Journal of Family Psychology*, 38(4), 536–547.

<sup>686</sup> Van IJzendoorn, M. H., Stevens, E., & Bakermans-Kranenburg, M. J. (2023) Development of the virtual-VIPP and a systematic review of online support for families during the COVID-19 pandemic. *Attachment & Human Development*, 25(2), 223–239.

<sup>687</sup> Batastini, A. B., Paprzycki, P., Jones, A. C. T., & MacLean, N. (2021) Are videoconferenced mental and behavioral health services just as good as in-person? A meta-analysis of a fast-growing practice. *Clinical Psychology Review*, 83, 101944.

<sup>688</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2005) The importance of parenting in the development of disorganized attachment: Evidence from a preventive intervention study in adoptive families. *Journal of Child Psychology and Psychiatry*, 46(3), 263–274.

The intervention was well-regarded by mothers: 81% characterized it as informative; 76% as useful. It proved highly effective at increasing caregiver sensitivity ( $d = 0.65$ ).

An earlier meta-analysis by Van IJzendoorn, Schuengel, and Bakermans-Kranenburg had documented only a modest association between insensitivity and disorganization ( $r = -0.10$ ).<sup>689</sup> As such, an unexpected finding was that VIPP did not increase attachment security in the adoption sample, but did decrease the extent of disorganized attachment behaviours compared to the control sample ( $d = 0.62$ ). These results impressed national policy-makers. On the basis of the findings, and the enthusiasm of adoption professionals and adoptive parents about the relevance of attachment theory for adoption, a national and government-subsidized adoption aftercare service was started, in which adoptive caregivers can receive VIPP-SD.<sup>690</sup> With growing evidence for VIPP-SD over the subsequent years, the municipalities of Amsterdam and Rotterdam have recently started to offer the intervention as a free service to caregivers who want help.<sup>691</sup>

Some caution is needed in interpreting the results of the paper by Juffer and colleagues. They presented their 2005 study as a *randomized trial* of VIPP. Yet most of the data was drawn from Juffer's 1997 study, where—if this paper is consulted—four participants of a book-only control group were not randomized. This was affirmed in a letter from Juffer to Van IJzendoorn and Bakermans-Kranenburg in 2018.<sup>692</sup> Van IJzendoorn, Bakermans-Kranenburg, and collaborators acknowledged that this had inflated the effect size reported in 2005: the effect size reported by Juffer and colleagues in 2005 ( $d = 0.65$ ) is considerably larger than the corrected effect size, excluding that specific control group, for the study tabulated in the meta-analysis by Van IJzendoorn, Schuengel, Wang, and Bakermans-Kranenburg in 2023, reported as  $r = 0.16$ .<sup>693</sup> Conversions of Cohen's  $d$  to a Pearson's correlation might have  $d = 0.65$  resulting in an  $r$  of around 0.3. The difference is accounted for by the fact that the meta-analysis reports the effect size only for randomized groups.

A second study was conducted as part of a doctoral study by Klein Velderman, supervised by Van IJzendoorn, Juffer, and Bakermans-Kranenburg.<sup>694</sup> (This study was already mentioned in Chapter 3, as the first experimental evidence for differential susceptibility theory. Here the focus will remain on main effects, rather than temperament as a moderator.) New mothers were screened for insecure states of mind regarding attachment on the AAI ( $N = 262$ ). Participants were randomized to one of three groups: a third were controls, a third received VIPP, and a third received VIPP plus brief talking therapy aiming to facilitate change in internal working models. As in the 1998 paper by Bakermans-Kranenburg and colleagues, there was no greater advantage to the brief talking therapy. Instead, both

<sup>689</sup> Van IJzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999) Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, 11(2), 225–250.

<sup>690</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2014) Attachment-based interventions: Sensitive parenting is the key to positive parent–child relationships. In P. Holmes & S. Farnfield (eds), *The Routledge Handbook of Attachment: Implications and Interventions* (pp. 83–103). London: Routledge. Though on poor uptake in the UK, see Wright, B., Fearon, P., Garside, M., Tsappis, E., Amoah, E., Glaser, D., ... & McHale, M. (2023) Routinely used interventions to improve attachment in infants and young children: A national survey and two systematic reviews. *Health Technology Assessment* (Winchester, England), 27(2), 1–226.

<sup>691</sup> <https://www.indigowest.nl/cursussen/cursus/-/ouder-peuter-interventie-vipp-sd->.

<sup>692</sup> Juffer, F. (2018) Letter to Guy Skinner, Marinus Van IJzendoorn and Marian Bakermans-Kranenburg, 3 September, 2018, archived: <https://osf.io/pwg7v>.

<sup>693</sup> Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256.

<sup>694</sup> Klein Velderman, M., Bakermans-Kranenburg, M. J., Juffer, F., & Van IJzendoorn, M. H. (2006) Effects of attachment-based interventions on maternal sensitivity and infant attachment: Differential susceptibility of highly reactive infants. *Journal of Family Psychology*, 20, 266–274.

arms in which VIPP were delivered resulted in improvements in caregiver sensitivity ( $d = 0.46$ ) observed at 11 months. Though less clear than changes in caregiver sensitivity, there was some change in child–caregiver security assessed in the Strange Situation as well: 67% of the infants in the intervention groups developed a secure attachment to their mothers, compared to 56% of the infants in the control group. Although coded, no findings in relation to disorganized attachment were presented in either in the doctoral thesis or the published paper.

In a later follow-up at 40 months, significantly fewer children scored in the clinical range for behavioural problems if their caregivers had received VIPP ( $\chi^2 = 7.12$ ), but not VIPP plus talking therapy. Klein Velderman and colleagues reflected that ‘Less satisfaction with the representational part of the intervention, and possibly more tension caused by the attachment discussions in this intervention, might have led to less intervention profits for VIPP-R mothers compared to VIPP mothers. Alternatively, the representational part of the intervention might have taken so much emotional attention that the targeting on positive parenting behavior was jeopardized.’<sup>695</sup> By 40 months, there was no significant effect of the intervention on either observed caregiver sensitivity or on child–caregiver attachment measured with the AQS.

The third trial of VIPP was the first to incorporate the sensitive discipline module. In a report by Van Zeijl and colleagues, VIPP-SD was delivered to a randomized half of a set of 237 families screened for maternal-report of high levels of child externalizing behaviour.<sup>696</sup> The intervention generally had no significant effect on maternal-reported child externalizing difficulties ( $r = 0.03$ , CI  $-0.10$ – $0.15$ ).<sup>697</sup>

### Further Investigations of VIPP

Over subsequent years, VIPP has been trialled across different locations and with varied populations. One line of inquiry has been research with samples of parents with clinical needs. In 2006, Stein and colleagues at Oxford University published results from a trial of VIPP compared to talking therapy as an intervention with 80 new mothers with eating disorders.<sup>698</sup> When child–caregiver interaction was observed during meal-times, episodes of marked or severe conflict at post-test were identified for 24% of the dyads in the VIPP group and 54% of dyads where mothers received talking therapy. Maternal intrusive behaviour was reduced in both groups compared to baseline.

Another line of inquiry has been to undertake research with VIPP in additional countries and contexts. In 2009, Kalinauskiene published results from her doctoral study,

<sup>695</sup> Klein Velderman, M., Bakermans-Kranenburg, M. J., Juffer, F., Van Ijzendoorn, M. H., Mangelsdorf, S. C., & Zevalkink, J. (2006) Preventing preschool externalizing behavior problems through video-feedback intervention in infancy. *Infant Mental Health Journal*, 27(5), 466–493, p. 486.

<sup>696</sup> Van Zeijl, J., Mesman, J., Van Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., ... & Alink, L. R. (2006) Attachment-based intervention for enhancing sensitive discipline in mothers of 1-to 3-year-old children at risk for externalizing behavior problems: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74(6), 994–1005.

<sup>697</sup> There was a significant decrease in child externalising difficulties in families where mothers reported more marital discord and daily hassles. Van Zeijl and colleagues offered no speculation as to why this might have been. Although mothers who received VIPP-SD displayed more positive discipline after the intervention, there was no average increase in caregiver sensitivity. Van Zeijl and colleagues proposed that caregivers may have been too frustrated and preoccupied with their children’s externalising behaviour to implement sensitive caregiving in nonconflict situations.

<sup>698</sup> Stein, A., Woolley, H., Senior, R., Hertzmann, L., Lovel, M., Lee, J., Fairburn, C. G. (2006) Treating disturbances in the relationship between mothers with bulimic eating disorders and their infants: A randomized, controlled trial of video feedback. *American Journal of Psychiatry*, 163(5), 899–906.

supervised by Van IJzendoorn, Juffer, Čekuolienė, and Bakermans-Kranenburg.<sup>699</sup> The researchers examined the effects of VIPP with a sample of 54 Lithuanian mothers recruited on the basis of observations of low sensitivity. Kalinauskiene and colleagues found that VIPP was associated with considerable improvements in observed caregiver sensitivity ( $d = 0.78$ ).

A trial of VIPP with 40 families in Turkey by Alsancak-Akbulut and colleagues also reported marked improvements in observed caregiver sensitivity ( $d = 0.51$ ).<sup>700</sup> Post hoc analysis revealed a distinction between caregiver responsiveness and absence of intrusiveness. Alsancak-Akbulut and colleagues found that VIPP was associated with a significant change in intrusiveness, not in responsiveness.<sup>701</sup>

A published analysis from the Lithuanian study and an unpublished analysis from the Turkish study examined whether the effectiveness of VIPP was moderated by maternal report of infant emotionality.<sup>702</sup> This followed initial findings by Klein Velderman—discussed in [Chapter 3](#)—showing that highly reactive infants were more susceptible to their mother's increase in sensitive caregiving following the intervention, with their relationships more often classified as secure in the Strange Situation. Yet this finding did not replicate in either the Lithuanian or Turkish study, or in a subsequent large Dutch sample.<sup>703</sup> As mentioned in [Chapter 3](#), maternal report of child emotional reactivity has not functioned consistently as an indicator of differential susceptibility.

The meta-analytic results of the randomized VIPP and VIPP-SD studies support the effectiveness of the intervention. That said, in terms of the critique of attachment research by anthropologists and cross-cultural researchers mentioned earlier,<sup>704</sup> cross-national research with VIPP to date remains limited. None of the studies outside the Netherlands or UK have pursued process evaluation, asking caregivers what they made of the intervention or whether they liked it.<sup>705</sup> In their book *Matters of Significance*, Van IJzendoorn and Bakermans-Kranenburg argued that their study on the ideal parenting using the MBQS in 26 different sociocultural settings (discussed earlier) is one piece of ethical grounding of the acceptability of the goals of VIPP-SD for parents internationally.<sup>706</sup> Furthermore, Turkish minority mothers in the Netherlands expressed their support for the intervention in general and for its specific aspects, including the use of video-feedback and the themes

<sup>699</sup> Kalinauskiene, L., Cekuoliene, D., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., & Kusakovskaja, I. (2009) Supporting insensitive mothers: The Vilnius randomized control trial of video-feedback intervention to promote maternal sensitivity and infant attachment security. *Child Care Health & Development*, 35(5), 613–623.

<sup>700</sup> Alsancak-Akbulut, C., Sahin-Acar, B., & Sumer, N. (2021) Effect of video-feedback intervention on Turkish mothers' sensitivity and physical intrusiveness: A randomized control trial. *Attachment & Human Development*, 23(6), 795–813.

<sup>701</sup> Metin Orta, İ. (2015) Early parenting support: Application of an intervention program to enhance maternal sensitivity in Turkey. Unpublished doctoral thesis, Middle East Technical University.

<sup>702</sup> Kalinauskiene, L., Cekuoliene, D., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., & Kusakovskaja, I. (2009) Supporting insensitive mothers: The Vilnius randomized control trial of video-feedback intervention to promote maternal sensitivity and infant attachment security. *Child Care Health & Development*, 35(5), 613–623; Metin Orta, İ. (2015) Early parenting support: Application of an intervention program to enhance maternal sensitivity in Turkey. Unpublished doctoral thesis, Middle East Technical University.

<sup>703</sup> Runze, J., Van IJzendoorn, M. H., Vrijhof, C. I., & Bakermans-Kranenburg, M. J. (2022) Replicating a randomized trial with video-feedback to promote positive parenting in parents of school-aged twins. *Journal of Family Psychology*, 36(4), 490–501.

<sup>704</sup> See also Scheidecker, G., Chaudhary, N., Keller, H., Mezzenzana, F., & Lancy, D. F. (2023) 'Poor brain development' in the global South? Challenging the science of early childhood interventions. *Ethos*, 51(1), 3–26.

<sup>705</sup> Unpublished analysis by the Turkish team showed that it was not associated with reduction in maternal stress. Metin Orta, İ. (2015) Early parenting support: Application of an intervention program to enhance maternal sensitivity in Turkey. Unpublished doctoral thesis, Middle East Technical University.

<sup>706</sup> Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 83.



discussed during the interventions. As one of the mothers in the intervention study noted: 'I really enjoyed it a lot, and I can't wait to see the whole DVD again', and another mother wrote 'I have definitely used the advice that I received and still do. They have given me more insight into the behavior of my child that is fitting for his age and how I can deal with it, both his difficult and good behavior.'<sup>707</sup>

Studies in the Netherlands, Australia, the UK, Italy, Portugal, and Canada have shown that VIPP-SD contributes to positive child outcomes.<sup>708</sup> Outside of OECD countries, in Kalinauskienė's unpublished doctoral thesis no association was found between receiving VIPP-SD and maternal-report of child behavioural problems two years later.<sup>709</sup> This unpublished finding was not included in Van IJzendoorn, Bakermans-Kranenburg, and colleagues' later meta-analyses of the effects of VIPP-SD on externalizing behaviour.<sup>710</sup> Given the comparatively small sample, and the fact that the meta-analytic effect sizes for externalizing difficulties were not statistically significant, inclusion of Kalinauskienė's findings would not have materially altered the meta-analytic results in any case.

Research with VIPP-SD has also considered effectiveness of the intervention for families monitored by child welfare services. In particular, there has been considerable interest in the use of VIPP-style interventions in child welfare contexts from Canadian attachment researchers, who in general have been early adopters of new developments in attachment research with clinical relevance (Chapters 2 and 5). In a 2011 paper, Moss and colleagues reported a study with a sample of 67 mothers and their children monitored by child protective or community services in Quebec for potential child maltreatment. Participants were randomized to a video-feedback intervention largely following the VIPP-SD model. The intervention incorporated an additional focus on reducing alarming caregiving behaviours, regarded as an important cause of disorganized attachment (Chapter 1).<sup>711</sup>

Moss and colleagues found that the intervention improved caregiver sensitivity ( $r = 0.28$ ), child attachment security ( $r = 0.38$ ), and reduced disorganized attachment ( $r = 0.37$ ). No direct effect was identified on maternal-report of child externalizing behaviour. Similar findings were reported when VIPP-SD was trialled in a Portuguese sample of 43 families living in poverty, where concerns had been raised by professional services about the adequacy of the care of their infant.<sup>712</sup>

<sup>707</sup> Yagmur, S., Mesman, J., Malda, M., Bakermans-Kranenburg, M. J., & Ekmekci, H. (2014) Video-feedback intervention increases sensitive parenting in ethnic minority mothers: A randomized control trial. *Attachment & Human Development*, 16(4), 371–386, p. 381.

<sup>708</sup> Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256.

<sup>709</sup> Kalinauskienė, L. (2010) Motinos ir kūdikio prierašumo santykių korekcijos galimybės, unpublished doctoral thesis, Vilniaus University.

<sup>710</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2018) Video-feedback intervention to promote positive parenting and sensitive discipline: Development and meta-analytic evidence for its effectiveness. In H. Steele & M. Steele (eds), *Handbook of Attachment-Based Interventions* (pp. 1–26). New York: Guilford Publications; Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256, Figure 5.

<sup>711</sup> Moss, E., Tarabulsky, G. M., Dubois-Comtois, K., Cyr, C., Bernier, A., & St Laurent, D. (2018) The attachment video-feedback intervention program. Development and validation. In H. Steele & M. Steele (eds), *Handbook of Attachment-Based Interventions* (pp. 318–339). New York: Guilford Press.

<sup>712</sup> Negrão, M., Pereira, M., Soares, I., & Mesman, J. (2014) Enhancing positive; parent-child interactions and family functioning in a poverty sample: A randomized control trial. *Attachment & Human Development*, 16(4), 315–328; Pereira, M., Negro, M., Soares, I., & Mesman, J. (2014) Decreasing harsh discipline in mothers at risk for maltreatment: A randomized control trial. *Infant Mental Health Journal*, 35(6), 604–613.



VIPP-SD has also been implemented with families with neurodiverse children. Neurodiversity has been a longstanding interest of Van IJzendoorn's.<sup>713</sup> The topic seems to have had a special resonance for him: he has been interested as to whether or not 'autism challenges the validity of attachment theory'.<sup>714</sup> Autism is defined by certain challenges making sense of other minds, and attachment theory assumes that caregiving experiences impact our expectations of others' intentions to provide support or help. Furthermore, autism may challenge conventional attachment measures. Markers for autism may overlap with markers for trauma and for insecure and disorganized attachment, requiring the need for thoughtful adjustments to coding systems.<sup>715</sup>

An additional spur for Van IJzendoorn's interest in autism was Niko Tinbergen. Tinbergen is widely understood as proposing that caregiving responsiveness can cure autism.<sup>716</sup> Van IJzendoorn distanced himself from this position. Still, he was interested in the idea, which could be glimpsed in Tinbergen, that caregiver sensitivity to the signals of children with autism, which can be different from neurotypical children, may help them reach their developmental potential earlier and better. Van IJzendoorn also anticipated that parents of children with autism might benefit from greater insight into their child's signals, helping them feel more competent and less stressed.

In the mid-2010s, a version of VIPP was developed by the Leiden group and collaborators targeted to caregivers of children with autism (VIPP-AUTI). Rather than the 'sensitive discipline' module, the focus on caregiver sensitivity was supplemented with guidance around supporting joint attention, establishing helpful routines, and understanding and sharing emotions.<sup>717</sup> In a first trial of this adaptation, in 2015, 78 families with a child with autism were randomized to VIPP-AUTI or a control condition of five home visits of approximately 90 minutes each in which interveners provide caregivers with information and advice. VIPP-AUTI was not found to be associated with an increase in caregiver

<sup>713</sup> Naber, F. B., Swinkels, S. H., Buitelaar, J. K., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Dietz, C., ... & van Engeland, H. (2007) Attachment in toddlers with autism and other developmental disorders. *Journal of Autism and Developmental Disorders*, 37(6), 1123–1138; Rutgers, A. H., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Swinkels, S. H. (2007) Autism and attachment: The attachment Q-sort. *Autism*, 11(2), 187–200.

<sup>714</sup> Van IJzendoorn, M. H., Rutgers, A. H., Bakermans-Kranenburg, M. J., Swinkels, S. H., Van Daalen, E., Dietz, C., ... & Van Engeland, H. (2007) Parental sensitivity and attachment in children with autism spectrum disorder: Comparison with children with mental retardation, with language delays, and with typical development. *Child Development*, 78(2), 597–608, p. 597. See also Slade, A. (2009) Mentalizing the unmentalizable: Parenting children on the spectrum. *Journal of Infant, Child, and Adolescent Psychotherapy*, 8(1), 7–21; Perasso, G., Sifton, N. R., & De Angelis, J. (2020) Parenting in dyads with an ASD-child: An overview of the challenges and intervention perspectives through attachment theoretical framework. In N. R. Sifton (ed.), *Exploring Best Child Development Practices in Contemporary Society* (pp. 191–221). New York: Medical Information Science Reference.

<sup>715</sup> Willemsen-Swinkels, S. H. N., Bakermans-Kranenburg, M. J., Buitelaar, J. K., Van IJzendoorn, M. H., & van Engeland, H. (2000) Insecure and disorganised attachment in children with a pervasive developmental disorder: Relationship with social interaction and heart rate. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41, 759–767; Coughlan, B., Van IJzendoorn, M. H., Woolgar, M., Weisblatt, E. J., & Duschinsky, R. (2022) Differentiating 'attachment difficulties' from autism spectrum disorders and attention deficit hyperactivity disorder: Qualitative interviews with experienced health care professionals. *Frontiers in Psychology*, 12, 780128; Coughlan, B., Woolgar, M., Van IJzendoorn, M. H., & Duschinsky, R. (2023) Socioemotional profiles of autism spectrum disorders, attention deficit hyperactivity disorder, and disinhibited and reactive attachment disorders: A symptom comparison and network approach. *Development and Psychopathology*, 35(3), 1026–1035. See also Coughlan, B., Marshall-Andon, T., Anderson, J., Reijman, S., & Duschinsky, R. (2019) Attachment and autism spectrum conditions: Exploring Mary Main's coding notes. *Developmental Child Welfare*, 1(1), 76–93.

<sup>716</sup> Tinbergen, N. & Tinbergen, E. A. (1983) *Autistic Children: New Hope for a Cure*. London: Allen & Unwin. See also Silverman, C. (2010) 'Birdwatching and baby-watching': Niko and Elisabeth Tinbergen's ethological approach to autism. *History of Psychiatry*, 21(2), 176–189; Vicedo, M. (2018) Ethopathology and civilization diseases: Niko and Elisabeth Tinbergen on autism. *Canadian Bulletin of Medical History*, 35(1), 1–31.

<sup>717</sup> Poslowsky, I. E., Naber, F. B., Bakermans-Kranenburg, M. J., De Jonge, M. V., Van Engeland, H., & Van IJzendoorn, M. H. (2014) Development of a video-feedback intervention to promote positive parenting for children with autism (VIPP-AUTI) *Attachment & Human Development*, 16(4), 343–355.

sensitivity, changes in child interactive behaviours, or a measure of the elaboration of the child's play. However, VIPP-AUTI was associated with an increase in caregiver feelings of self-efficacy ( $d = 0.61$ ), and a reduction in caregiver intrusiveness ( $d = 0.49$ ).<sup>718</sup>

A decade earlier, Van IJzendoorn had observed that 'our criteria for sensitive parenting may be inadequate for autism. Children with ASD may need much more explicit parental stimuli and a stronger emphasis on nonverbal input than children without ASD, and their parents may thus sometimes appear more physically intrusive.'<sup>719</sup> Having learnt from experiences on the VIPP-AUTI trial, Poslawsky, Van IJzendoorn, and colleagues felt that the reduction in intrusiveness might reflect a successful intervention: 'the VIPP-AUTI program supported parents to understand the ASD characteristics of their child, and focused on the child's competences and needs. This empathic understanding may have offered parents room to step back in order to guide the child in its own pace, in other words, to become less intrusive.'<sup>720</sup>

A similar adaptation of VIPP was undertaken by Green and colleagues in the UK, and implemented with the younger infant siblings of children with autism, with 54 families randomized to the intervention or a control condition in which no service was provided. The research team were interested as to whether sensitive caregiving could reduce the likelihood of these siblings developing autism. The intervention was regarded as highly successful in reducing infant behaviours suggestive of the development of autism ( $d = 0.50$ ), increasing infant attentiveness to their parent ( $d = 0.29$ ), and reduced intrusive caregiving behaviours ( $d = 0.81$ ).<sup>721</sup>

In a subsequent study in Australia, VIPP was delivered to families with infants identified by paediatricians as showing early signs of autism. A total of 89 families were randomized to VIPP or a control condition. Families were followed up over three years. This study reported similar findings to that of Green and colleagues, with VIPP associated with reduced clinical markers of autism and increased observed caregiver responsiveness.<sup>722</sup> The researchers calculated that for every seven families provided with VIPP, one infant was diverted from a trajectory towards autism. Green has argued that this diversion will benefit the child and reduce strain on families.<sup>723</sup> Furthermore, economic modelling undertaken

<sup>718</sup> Poslawsky, I. E., Naber, F. B., Bakermans-Kranenburg, M. J., Van Daalen, E., Van Engeland, H., & Van IJzendoorn, M. H. (2015) Video-feedback intervention to promote positive parenting adapted to autism (VIPP-AUTI): A randomized controlled trial. *Autism*, 19(5), 588–603.

<sup>719</sup> Van IJzendoorn, M. H., Rutgers, A. H., Bakermans-Kranenburg, M. J., Swinkels, S. H., Van Daalen, E., Dietz, C., ... & Van Engeland, H. (2007) Parental sensitivity and attachment in children with autism spectrum disorder: Comparison with children with mental retardation, with language delays, and with typical development. *Child Development*, 78(2), 597–608, p. 605.

<sup>720</sup> Poslawsky, I. E., Naber, F. B., Bakermans-Kranenburg, M. J., Van Daalen, E., Van Engeland, H., & Van IJzendoorn, M. H. (2015) Video-feedback intervention to promote positive parenting adapted to autism (VIPP-AUTI): A randomized controlled trial. *Autism*, 19(5), 588–603, p. 597.

<sup>721</sup> Green, J., Charman, T., Pickles, A., Wan, M. W., Elsabbagh, M., Slonims, V., ... & Johnson, M. H. (2015) Parent-mediated intervention versus no intervention for infants at high risk of autism: A parallel, single-blind, randomised trial. *The Lancet Psychiatry*, 2(2), 133–140.

<sup>722</sup> Whitehouse, A. J., Varcin, K. J., Pillar, S., Billingham, W., Alvares, G. A., Barbaro, J., ... & Hudry, K. (2021) Effect of preemptive intervention on developmental outcomes among infants showing early signs of autism: A randomized clinical trial of outcomes to diagnosis. *JAMA Pediatrics*, 175(11), e213298–e213298.

<sup>723</sup> Green, J. (2023) Debate: Neurodiversity, autism and healthcare. *Child and Adolescent Mental Health*, 28(3), 438–442. See also Crowell, J. A., Keluskar, J., & Gorecki, A. (2019) Parenting behavior and the development of children with autism spectrum disorder. *Comprehensive Psychiatry*, 90, 21–29; Frolli, A., Bosco, A., Di Carmine, F., Cavallaro, A., Lombardi, A., Sergi, L., ... & Ricci, M. C. (2021) Parent training and therapy in children with autism. *Pediatric Reports*, 13(2), 216–226; Giannotti, M., Venuti, P., & De Falco, S. (2023) Child attachment representations and parenting stress in mothers and fathers of school-age children with a diagnosis of autism spectrum disorder: A pilot cross-sectional study. *Children*, 10(10), 1633.

by Segal and Green suggested that this diversion will save public services \$7519 (in US dollars) per child on a trajectory towards autism, by the age of 12, in reduced need for services and support.<sup>724</sup>

For their part, Van IJzendoorn and Bakermans-Kranenburg have cited this research favourably as evidence of the diversity of research with VIPP. The potential for VIPP to have impact across different areas also fits with their more general critique of diagnosis-focused thinking.<sup>725</sup> However, they have refrained from celebration or criticism of the use of the intervention to divert children from a trajectory towards autism, treated as an illness.<sup>726</sup> From their remarks elsewhere, they appear sympathetic to the strain that the behavioural profile associated with autism may place on families.<sup>727</sup> For all that, they seem hesitant to regard the reduction of autism symptoms as an expectable outcome of a sensitivity-based intervention, as if these symptoms represented aspects of an insecure child–caregiver relationship. The position may risk veering too close to comfort to discredited ‘refrigerator mother’ theories of the development of autism.<sup>728</sup>

A final domain of applications of VIPP to draw out is work adapting the intervention to take account of disability by Schuengel and colleagues at VU Amsterdam. The group adapted VIPP-SD for delivery with parents with mild intellectual disability. This was trialled with a sample of 85 Dutch mothers, compared to usual state provision for these caregivers. The intervention led to a steeper decline in stress over time among participants who received the intervention ( $d = 0.46$ ).<sup>729</sup> The intervention increased the harmoniousness of child–caregiver interaction for caregivers who were struggling to cope pre-intervention (low adaptive functioning), but not for caregivers who were coping well.<sup>730</sup> There was no effect for sensitive discipline. Part of the reason appeared to be that mothers with mild intellectual disability generally showed moderate levels of harmonious interaction and sensitive discipline before the intervention. So there seemed to be a ceiling effect. This would also explain the moderation by whether caregivers report generally coping at pretest.

<sup>724</sup> Segal, L., Green, J., Twizeyemariya, A., Hudry, K., Wan, M. W., Barbaro, J., ... & Whitehouse, A. J. (2023) Estimated therapy costs and downstream cost consequences of iBASIS–video interaction to promote positive parenting intervention vs usual care among children displaying early behavioral signs of autism in Australia. *JAMA Network Open*, 6(4), e235847–e235847.

<sup>725</sup> Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256: ‘The potential generic impact of VIPP-SD across a variety of psychological problems may converge with evidence for the existence of a general psychopathology factor’ (242).

<sup>726</sup> Van IJzendoorn, M. H., Stevens, E., & Bakermans-Kranenburg, M. J. (2023) Development of the virtual-VIPP and a systematic review of online support for families during the COVID-19 pandemic. *Attachment & Human Development*, 25(2), 223–239.

<sup>727</sup> For example, Poslawsky, I. E., Naber, F. B., Bakermans-Kranenburg, M. J., Van Daalen, E., Van Engeland, H., & Van IJzendoorn, M. H. (2015) Video-feedback intervention to promote positive parenting adapted to autism (VIPP-AUTI): A randomized controlled trial. *Autism*, 19(5), 588–603, p. 589.

<sup>728</sup> Rutter and colleagues warned Van IJzendoorn and Bakermans-Kranenburg on this point in Rutter, M., Kreppner, J., & Sonuga-Barke, E. (2009) Emanuel Miller Lecture: Attachment insecurity, disinhibited attachment, and attachment disorders: Where do research findings leave the concepts? *Journal of Child Psychology and Psychiatry*, 50(5), 529–543. See also Bennett, M., Webster, A. A., Goodall, E., Rowland, S., Bennett, M., Webster, A. A., ... & Rowland, S. (2018) Establishing contexts for support: Undoing the legacy of the ‘refrigerator mother’ myth. In *Life on the Autism Spectrum: Translating Myths and Misconceptions into Positive Futures* (pp. 61–80). New York: Springer.

<sup>729</sup> Hodes, M. W., Meppelder, M., de Moor, M., Kef, S., & Schuengel, C. (2017) Alleviating parenting stress in parents with intellectual disabilities: A randomized controlled trial of a video-feedback intervention to promote positive parenting. *Journal of Applied Research in Intellectual Disabilities*, 30(3), 423–432.

<sup>730</sup> Harmonious quality was indexed by 10 rating scales: parents’ supportive presence, respect for autonomy, stimulation of cognitive development, hostility, and confidence, as well as children’s enthusiasm, persistence, negativity, affection towards the parent, and the dyadic scale affective mutuality.

Something to hold in mind when interpreting these discrepant findings for sensitivity and sensitive discipline is the measure of sensitive discipline used. There have been two in circulation in trials of VIPP, and they look quite different. A first was used in the Van Zeijl and colleagues study of families with children showing high levels of externalizing behaviour. Here sensitive discipline was coded as the *presence of positive discipline* (distraction, explaining, and display of empathy and understanding) and the *absence of negative discipline* (prohibition, physical obstruction, or giving in).<sup>731</sup>

In the same period, Verschueren and colleagues at the Catholic University Leuven collaborated with Bakermans-Kranenburg to develop an alternative approach. Here sensitive discipline was coded as the *absence of physical discipline, harsh discipline, verbally harsh discipline, and laxness*. These are unquestionably important behaviours, and it is understandable that researchers wanted to bring them into greater focus. From the perspective of Lyons-Ruth (Chapter 2), these are all behaviours that would be central to the coding of alarming caregiver behaviour and feature strongly within AMBIANCE. In these terms, the Leuven scale, lacking any measure of positive discipline, is conceptually closer to a measure of alarming caregiving.

By comparison, the positive discipline scale used by Van Zeijl and colleagues is closer to caregiver sensitivity: at baseline before the intervention, caregiver sensitivity was unrelated to negative discipline, whereas the association with positive discipline was  $r = 0.25$ .<sup>732</sup> Indeed, across the trials of VIPP in which the Leuven scale has been used, no study has demonstrated improvement in negative discipline.<sup>733</sup> Schuengel and colleagues used the Leuven scale, and so their findings need to be interpreted in this light: the intervention did not result in observable change in alarming caregiver behaviours specifically, and effects on the positive aspects of sensitive discipline were not measured.

The VU Amsterdam group undertook a further trial of VIPP, with families with a child with a visual or visual-and-intellectual disability. A sample of 77 Dutch families were randomized to VIPP or a control condition without additional support beyond what was usually provided by the state. There was no direct effect of VIPP on observed caregiving behaviour (measured using the NICHD scales; referred to as sensitivity\* in Chapter 3 given the differences from Ainsworth's construct) or parent-child interaction quality, but there was an increase in parents' perceived self-efficacy. In turn, self-efficacy contributed to improved parent-child interaction quality. As in the study of parents with mild intellectual disability, the parents in this sample again had a relatively high baseline level of sensitivity\* and quality in parent-child interaction.

As we saw above, Van IJzendoorn and colleagues anticipate that the priority given to sensitivity by caregivers is reduced when families are under acute stress. When adversities accumulate and ramify, Cyr and Leiden colleagues had shown that disorganized attachment relationships become more common, which they have interpreted as reflecting the

<sup>731</sup> Van Zeijl, J., Mesman, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., ... & Alink, L. R. (2006) Attachment-based intervention for enhancing sensitive discipline in mothers of 1-to 3-year-old children at risk for externalizing behavior problems: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74(6), 994–1005.

<sup>732</sup> Ibid., Table 3.

<sup>733</sup> For example, Yagmur, S., Mesman, J., Malda, M., Bakermans-Kranenburg, M. J., & Ekmekci, H. (2014) Video-feedback intervention increases sensitive parenting in ethnic minority mothers: A randomized control trial. *Attachment & Human Development*, 16(4), 371–386; Schoemaker, N. K., Juffer, F., Rippe, R. C., Vermeer, H. J., Stollenborgh, M., Jagersma, G. J., ... & Alink, L. R. (2020) Positive parenting in foster care: Testing the effectiveness of a video-feedback intervention program on foster parents' behavior and attitudes. *Children and Youth Services Review*, 110, 104779.

fact that caregivers can become chronically overwhelmed.<sup>734</sup> Schuengel and colleagues considered that a parent's experience of mild intellectual disability and a child's visual or visual-and-intellectual disability do not seem to trigger this state: measures cognate to sensitivity in both samples studied by the VU Amsterdam group were moderate already at pre-test. This may have contributed to ceiling effects for some outcome measures. Nonetheless, gains in parenting self-efficacy may still be highly valued by caregivers and appear to have contributed to improved parent-child interaction.

The report of gains in parenting self-efficacy among caregivers who started already with moderate levels of sensitivity is reassuring. After all, as we saw earlier, Kok, Linting, Bakermans-Kranenburg, and colleagues had documented that maternal sensitivity during infancy was *positively* correlated in two large samples with maternal-report of child internalizing difficulties by the preschool years. Kok and colleagues had theorized that the very highest levels of sensitivity may reflect anxiety by the caregiver. In principle VIPP-SD could trigger this effect as it increases caregiver sensitivity. However, if VIPP-SD is associated with caregivers feeling more confident and less anxious in their role, this offers encouraging evidence that no such iatrogenic effect is occurring as a result of the VIPP-SD intervention. Offering further confidence on this point, O'Farrelly and colleagues recently reported from a large UK trial that VIPP-SD was associated with a prospective decrease in child internalizing difficulties ( $d = 0.15$ , CI  $-0.01-0.32$ ).<sup>735</sup>

Summing up and drawing together randomized trials of VIPP-SD to date, a meta-analysis was reported by Van IJzendoorn, Schuengel, Wang, and Bakermans-Kranenburg in 2023, incorporating data from 25 studies.<sup>736</sup> The researchers systematically evaluated the quality of the randomized trials of VIPP-SD to date, calculated overall effect sizes, and examined potential moderators to understand variation between studies. In presenting this evidence, the researchers were by no means unmindful of the limitations of trials, which they addressed in their quality assessment. In particular, few of the 25 studies were evaluating an intervention embedded within routine services, though these few were high quality.<sup>737</sup> Wright and colleagues and Comyn have reflected that this will be an important step for bridging research and practice.<sup>738</sup> Nonetheless, compared to a narrative analysis, a meta-analysis of trials offers valuable signal regarding relationships between parental sensitivity and child attachment security, a foundation for understanding what attachment theory and research so far can tell us.

The meta-analysis documented effects of the intervention on a composite of parenting sensitivity and sensitive discipline ( $r = 0.18$ , CI  $0.12-0.23$ ), though there was evidence of

<sup>734</sup> Cyr, C., Euser, E. M., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2010) Attachment security and disorganization in maltreating and high-risk families: A series of meta-analyses. *Development and Psychopathology*, 22(1), 87–108.

<sup>735</sup> O'Farrelly, C., Barker, B., Watt, H., Babalis, D., Bakermans-Kranenburg, M., Byford, S., ... & Ramchandani, P. (2021) A video-feedback parenting intervention to prevent enduring behaviour problems in at-risk children aged 12–36 months: The Healthy Start, Happy Start RCT. *Health Technology Assessment* (Winchester, England), 25(29), 1.

<sup>736</sup> Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256.

<sup>737</sup> O'Farrelly, C., Watt, H., Babalis, D., Bakermans-Kranenburg, M. J., Barker, B., Byford, S., ... & Ramchandani, P. G. (2021) A brief home-based parenting intervention to reduce behavior problems in young children: A pragmatic randomized clinical trial. *JAMA Pediatrics*, 175(6), 567–576.

<sup>738</sup> Comyn, J. (2019) Exploring stakeholders' perceptions of the impact, acceptability and feasibility of a video-feedback intervention to promote positive parenting in foster care (VIPP-FC), unpublished doctoral dissertation, University College London; Wright, B., Fearon, P., Garside, M., Tsappis, E., Amoah, E., Glaser, D., ... & McHale, M. (2023) Routinely used interventions to improve attachment in infants and young children: A national survey and two systematic reviews. *Health Technology Assessment* (Winchester, England), 27(2), 1–226

publication bias. Using trim-and-fill compensation for potential publication bias resulted in eight added effect sizes to reach symmetry and a corrected combined effect size of  $r = 0.11$ .<sup>739</sup> When effect sizes for parenting sensitivity and sensitive discipline were separated, and compared, there was no significant difference found in the extent to which they were impacted by VIPP. Against Schuengel's earlier hypothesis that the intervention would be more effective for higher-risk groups, there was no significant moderation by risk.

Effects of VIPP-SD on child-caregiver attachment were assessed in 11 trials. This was assessed in a variety of ways. Some studies used the Strange Situation or the AQS. Some used the Emotional Availability Scales which assess children's responsiveness and involvement with their caregiver.<sup>740</sup> A study by Cyr and colleagues measured cooperative and unconflicted child-caregiver dyadic interaction, rather than specifically child behaviour towards their caregiver.<sup>741</sup> The combined effect size across these different studies amounted to  $r = 0.23$  (CI 0.11–0.34). Again, there was no significant difference in effect between high and low-risk samples. There was also no significant difference identified between effects of VIPP-SD on behaviour measured with the Strange Situation, AQS, and alternative assessments of child-caregiver attachment.

Whereas early studies using VIPP-SD had shown material effects on maternal-report child externalizing difficulties,<sup>742</sup> in the 2023 meta-analysis the effect was only  $r = 0.07$  (CI –0.04–0.19). Yet the meta-analysis was not able to incorporate concurrent findings from a doctoral study by Jana Runze, supervised by Bakermans-Kranenburg. VIPP-SD was implemented with a randomized study of two samples of families with twins ( $N = 445$ ) and found that it did reduce children's hair cortisol concentrations as well as externalizing behaviour, the latter measured with a composite of both parents' reports.<sup>743</sup>

The study by Runze, as with most of the studies in the meta-analysis, depended on caregiver-report of externalizing difficulties. As we have seen, Van IJzendoorn has been sceptical of self-report measures without converging evidence from other sources. Fearon and colleagues had likewise found that the association between early attachment and externalizing difficulties was far stronger when assessed with researcher-report rather than caregiver-report. Yet new data from Ramchandani and colleagues of a trial of VIPP-SD with 300 families documented effects on externalizing behaviour even six years post-intervention, assessed by researchers using a structured clinical interview ( $d = 0.11$ ).<sup>744</sup> Overall, it is noteworthy that meta-analytic effects of VIPP-SD on parenting behaviour

<sup>739</sup> Attitudes towards sensitivity and sensitive discipline were also assessed in nine trials. The pooled effect size was  $r = 0.16$  (CI 0.09, 0.23).

<sup>740</sup> For example Barone, L., Barone, V., Dellagiulia, A., & Lionetti, F. (2018) Testing an attachment-based parenting intervention-VIPP-FC/A in adoptive families with post-institutionalized children: Do maternal sensitivity and genetic markers count? *Frontiers in Psychology*, 9, 156.

<sup>741</sup> Cyr, C., Dubois-Comtois, K., Paquette, D., Lopez, L., & Bigras, M. (2022) An attachment-based parental capacity assessment to orient decision-making in child protection cases: A randomized control trial. *Child Maltreatment*, 27(1), 66–77.

<sup>742</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2018) Video-feedback intervention to promote positive parenting and sensitive discipline: Development and meta-analytic evidence for its effectiveness. In H. Steele & M. Steele (eds), *Handbook of Attachment-Based Interventions* (pp. 1–26). New York: Guilford Publications.

<sup>743</sup> Runze, J., Pappa, I., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J. (2022) Conduct problems and hair cortisol concentrations decrease in school-aged children after VIPP-SD: A randomized controlled trial in two twin cohorts. *International Journal of Environmental Research and Public Health*, 19, 15026.

<sup>744</sup> Ramchandani, P., Elkes, J., Cornelius, V., Barker, B., Stevens, E., O'Farrelly, C & HSHS team (2024) But does it work in the long-run? Findings from a 6 year follow up of a video-feedback parenting programme (VIPP-SD) Paper presented at the International Attachment Conference, Rouen, France, July 2024.

and child attachment, which are both rated by observers who not aware whether they rate an intervention or a control dyad, outperform effects on child externalizing behaviour, that are in most studies reported by parents who are not blind to whether they were in the intervention or control condition.

### Proposed Mechanisms

Van IJzendoorn and Bakermans-Kranenburg have argued for the importance of replicable research and discussion of the causal mechanisms underpinning parenting interventions. In conjunction with cost-benefit analysis and ethical deliberations,<sup>745</sup> these form a critical basis for dialogue between research and practice, to understanding the scope of applicability of interventions, how they might best be adapted for different populations, and how the interventions may be refined.<sup>746</sup>

In terms of mechanism, VIPP has from the start been presented as an intervention targeting 'caregiver sensitivity', in line with the findings of the 'less is more' meta-analysis. In the 2000s, any effects on the child-caregiver relationship or child outcomes were anticipated to be mediated by improvements in caregiver sensitivity:

The medium of video and the use of video fragments enable the intervener to highlight children's signals, thus directing and focusing the parent's attention to the child's actual behavior (see below), and coaching parents to observe their child's behavior in a more accurate way (the first part of Ainsworth et al.'s (1978) definition of sensitive responsiveness). Moreover, by showing and repeating video fragments of the parent's sensitive behaviors the intervener is enabled to reinforce and encourage adequate and prompt responding to the child's signals (the second part of the definition of sensitive responsiveness).<sup>747</sup>

With the addition of the sensitive discipline module (VIPP-SD), the intervention was coupled with social learning theory. In explaining this decision, Van Zeijl and colleagues said merely that 'the traditional emphasis of attachment theory on parental sensitivity is derived from research on infants (Ainsworth et al., 1978), but parents also need to

<sup>745</sup> Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, chapters 7 and 8.

<sup>746</sup> Hamaker, E. L., Mulder, J. D., & Van IJzendoorn, M. H. (2020) Description, prediction and causation: Methodological challenges of studying child and adolescent development. *Developmental Cognitive Neuroscience*, 46, 100867: 'a number of assumptions need to hold in order to draw causal conclusions (Hernán & Robins, 2020; Rosenbaum & Rubin, 1983) Three key assumptions are: 1) exchangeability, which means that receiving the treatment or control condition depends only on the measured covariates (i.e., there are no unobserved confounders); 2) positivity, that is, for each combination of the covariates that are needed to ensure exchangeability, the probability of being assigned to treatment or no treatment needs to be larger than zero; and 3) consistency, that is, the treatment values under investigation should correspond unambiguously with a well-defined intervention. When focusing on this third assumption, we can see this actually has major consequences for our thinking about causality. It implies that if we are interested in the effect of stress on well-being, it is not enough to distinguish between stressed and non-stressed conditions; instead, we have to be very specific about what kind of stress we are considering, because being stressed about an upcoming test may have a different effect on well-being than the stress due to having a conflict with one's parents, going on a first date, or being bullied at school. When there are different ways in which we can lift the treatment score from zero to one, this implies there are multiple versions of treatment, which in turn means that there is not a single treatment effect and it becomes unclear what causal effect we are trying to study.' This is the issue that concerned Van IJzendoorn and Bakermans-Kranenburg regarding holistic attachment-based interventions such as STEEP.

<sup>747</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2005) The importance of parenting in the development of disorganized attachment: Evidence from a preventive intervention study in adoptive families. *Journal of Child Psychology and Psychiatry*, 46(3), 263–274, p. 271.

manage their older children's exploration of behavioral limits.<sup>748</sup> The implication was that a social learning approach needed to be added because attachment theory had not focused on dimensions of parenting that become especially relevant beyond infancy, and many parents were seen struggling with the challenging behaviour of their 2–5-year-olds. The Leiden researchers later added that caregiver sensitivity and sensitive discipline, when each were assessed at age two and three, had some correlation but certainly covary, generally reporting associations of around  $r = 0.28$ .<sup>749</sup> Such findings provided support for the need to consider both caregiver sensitivity and sensitive discipline in the intervention.

It is important to note that there was an implicit context to the framing of the integration of social learning theory within an intervention stated to target sensitivity. Van IJzendoorn, Bakermans-Kranenburg, and colleagues were frustrated at inadequacies in Bowlby's account of aggression, which was largely limited to consideration of frustration in response to unmet comfort-seeking behaviour.<sup>750</sup> They felt they needed to supplement attachment theory with another approach in their intervention. Bowlby himself was enthusiastic about social learning theory and its compatibility with attachment theory, both in correspondence<sup>751</sup> and in print.<sup>752</sup> However, social learning theorists had been vehement critics of Ainsworth's early work, who in turn had offered no concessions, with the result that social learning theory had become an ancestral enemy of attachment research in the developmental tradition.<sup>753</sup>

Social learning critics argued that avoidance in the Strange Situation represented children socialized to be independent, and resistance just children socialized to be clingy. Fundamental to the early work of the Minnesota group in establishing attachment research within developmental psychology was establishing that avoidance in the Strange Situation was associated with less caregiver sensitivity at home, and less independence in children's behaviour at school.<sup>754</sup> Where many social learning theorists argued that children's care-seeking behaviours should be held in check to improve independence and confidence,

<sup>748</sup> Van Zeijl, J., Mesman, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., ... & Alink, L. R. (2006) Attachment-based intervention for enhancing sensitive discipline in mothers of 1-to 3-year-old children at risk for externalizing behavior problems: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74(6), 994–1005, p. 995.

<sup>749</sup> For example Alink, L. R., Mesman, J., Van Zeijl, J., Stolk, M. N., Juffer, F., Bakermans-Kranenburg, M. J., ... & Koot, H. M. (2009) Maternal sensitivity moderates the relation between negative discipline and aggression in early childhood. *Social Development*, 18(1), 99–120.

<sup>750</sup> See the discussion of the aggression behavioural system in Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 1. Other researchers have agreed that Bowlby's account of aggression has considerable limitations, for example Shaver, P. R., Segev, M., & Mikulincer, M. (2011) A behavioral systems perspective on power and aggression. In P. R. Shaver & M. Mikulincer (eds), *Human Aggression and Violence: Causes, Manifestations, and Consequences* (pp. 71–87), Washington, DC: American Psychological Association.

<sup>751</sup> For example Bowlby, J. (1973) Letter to Scott Henderson, 30 July 1973, PP/Bow/J.9/98: 'I strongly suspect that the particular form of atypical care-eliciting behaviour selected by a patient is greatly influenced by modelling, the term introduced by Bandura, and roughly equivalent to identification, to describe adopting the same behaviour that one has observed engaged in by others.... More and more in work with parents I have been struck by the extent to which they have adopted the same disciplinary procedures towards their children as they themselves were subjected to—often despite their wish to behave quite otherwise.'

<sup>752</sup> Melges, F. T. & Bowlby, J. (1969) Types of hopelessness in psychopathological process. *Archives of General Psychiatry*, 20(6), 690–699; Bowlby, J. (1973) *Separation*, London: Penguin, p. 132.

<sup>753</sup> For example, Cairns, R. B. (1972) Attachment and dependency: A psychobiological and social learning synthesis. In J. L. Gewirtz (ed.), *Attachment and Dependency* (pp. 29–80) Washington DC: Winston; Gewirtz, J. (1972) On the selection and use of attachment and dependence indices. In J. L. Gewirtz (ed.), *Attachment and Dependency* (pp. 179–215), Washington, DC: Winston.

<sup>754</sup> Sroufe, L. A. (1989) Relationships, self, and individual adaptation. In A. J. Sameroff & R. N. Emde (eds), *Relationship Disturbances in Early Childhood: A Developmental Approach* (pp. 70–94). New York: Basic Books.



Ainsworth argued that independence and confidence would be achieved precisely through responsiveness to care-seeking behaviours.

The idea of integrating attachment theory and social learning theory was a controversial one among attachment researchers, especially given Minnesota's influence in the early 2000s. Even as late as 2022, Huber would criticize the Leiden group for contaminating their sensitivity-focused intervention with 'antithetical' principles from social learning theory.<sup>755</sup> In the period that VIPP-SD was being introduced, Van IJzendoorn, Bakermans-Kranenburg, and colleagues were unusual in perceiving an alignment between attachment theory and social learning theory, where—with exceptions such as Kochanska—most researchers in developmental science in the period saw only opposition.<sup>756</sup> Specifically, Van IJzendoorn, Bakermans-Kranenburg, and colleagues perceived that supporting caregivers to avoid coercive cycles was compatible with caregiver sensitivity in handling the wilfulness of toddlers. This was reflected in the term 'sensitive discipline'.<sup>757</sup>

As discussed earlier, Van IJzendoorn and Hubbard's early research on crying had drawn a distinction between infant distress and care-seeking. This conceptual distinction helped Van IJzendoorn thread the debate between Ainsworth and her social learning theory critics, and find their points of alignment. Sensitive caregiving did not imply acquiescence to a child's signals. The sensitive caregiver, Ainsworth proposed, 'acknowledges the baby's wishes even though she does not unconditionally accede to them', since much of what is 'for the baby's own good is done contrary to his wishes'.<sup>758</sup> For toddlers, Bakermans-Kranenburg, Juffer, and Van IJzendoorn argued that sensitive caregiving requires giving messages that acknowledge the child's distress, deescalate tantrums, signal consistent limits, and keep child-caregiver communication open. This acknowledgement, support for regulation, consistency in limits, and communicative openness are part of what being a secure base and safe haven means for toddlers, and were anticipated by the Leiden team to contribute to attachment security, and fewer tantrums.<sup>759</sup>

Acquiescence to a toddler's tantrum might align with their immediate wishes, but risked contributing to insecurity, especially if accompanied by expressions of frustration with the child or attempts by the caregiver to use coercion to reassert control. Insecurity will also make a contribution to future tantrums. These ideas can be seen implicitly from the introduction of VIPP-SD in the 2000s in discussions of 'sensitive discipline'. They can likewise be seen implicitly, in the same period, in Van IJzendoorn and Bakermans-Kranenburg's explanations of how avoidant and resistant attachment actually occur: with avoidant attachment conceptualized as prompted and sustained when care-seeking

<sup>755</sup> Huber, A. T. (2022) Effectiveness of the circle of security intervention in an Australian community-based clinical population: A consecutive cohort study. Unpublished doctoral dissertation, Macquarie University, p. 44.

<sup>756</sup> For example, Kochanska, G. (1995) Children's temperament, mothers' discipline, and security of attachment: Multiple pathways to emerging internalization. *Child Development*, 66(3), 597–615. More recently, see Kochanska, G., & An, D. (2024) The parent's and the child's internal working models of each other moderate cascades from child difficulty to socialization outcomes: Preliminary evidence for dual moderation? *Development and Psychopathology*, 36(2), 504–517.

<sup>757</sup> Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Pijlman, F. T., Mesman, J., & Juffer, F. (2008) Experimental evidence for differential susceptibility: Dopamine D4 receptor polymorphism (DRD4 VNTR) moderates intervention effects on toddlers' externalizing behavior in a randomized controlled trial. *Developmental Psychology*, 44(1), 293–300.

<sup>758</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) Appendix: Maternal caregiving and interaction scales. In *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press.

<sup>759</sup> Bakermans-Kranenburg, M. J., Juffer, F., & Van IJzendoorn, M. H. (2018) Reflections on the mirror: On video-feedback to promote positive parenting and infant mental health. In C. Zeanah (ed.), *Handbook of Infant Mental Health* (4th ed.). New York: Guilford Press, p. 531.

behaviour backfires for the child, and resistant attachment prompted and sustained when coercive cycles keep the caregiver's attention and availability.<sup>760</sup>

In 2020 the integration of attachment and social learning theory would see explicit and sophisticated elaboration in an article in collaboration with colleagues including Guy Bosmans (Leuven) and Ainsworth's former student Roger Kobak.<sup>761</sup> Here Bosmans and colleagues argued that VIPP-SD seeks to improve child-caregiver attachment through increasing caregiver sensitivity, in part through social learning mechanisms where these are compatible with sensitivity. One of the anticipated mechanisms through which this can be achieved is the amplification of sensitive moments in videotaped caregiver-child interaction:

To prevent the onset of insecure cycles between the coach and the parents, the coach does not act as a teacher who knows better. Instead, the coach enables the parents to explore their interactions with the child and experience the reinforcing effects of some of their more successful reactions to misbehavior of the child. In the first two sessions only positive interaction sequences are emphasized and the parents are affirmed in their role as having expert knowledge of their own child. The coach always maintains a non-judgmental attitude and acts as an empathic guide for the parents to reflect on specific rewarding parts of the videotape. Through video-feedback, already available parental skills that serve VIPP-SD's goals are identified, shared with parents, and amplified so they can be used more in future interactions that threaten to elicit coercive cycles or in future ongoing coercive cycles. VIPP-SD considers the role of the coach of crucial importance because the interactions and relationships of the coach with the parents function as a model for the way in which the parents interact with their child.<sup>762</sup>

Without staking out a confrontation with Juffer, Bakermans-Kranenburg, and Van IJzendoorn, the importance of social learning mechanisms and parenting self-efficacy have been given rather more weight than sensitivity by Schuengel and VU Amsterdam colleagues.<sup>763</sup> Informed by insights from their work in intellectual disability, the VU Amsterdam group have tended to characterize sensitivity as less important in itself than for its association with *caregiver-child coregulation*, facilitated by social learning from positive interactions.<sup>764</sup>

<sup>760</sup> For example Fearon, R. M. P., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2010) Jealousy and attachment: The case of twins. In S. L. Hart & M. Legerstee (eds), *Handbook of Jealousy. Theory, Research, and Multidisciplinary Approaches* (pp. 362–386), Chichester, UK: John Wiley.

<sup>761</sup> Bosmans, G., Bakermans-Kranenburg, M. J., Vervliet, B., Verhees, M., & Van IJzendoorn, M. H. (2020) A learning theory of attachment: Unraveling the black box of attachment development. *Neuroscience and Biobehavioral Reviews*, 113, 287–298.

<sup>762</sup> Bosmans, G., Van Vlierberghe, L., Bakermans-Kranenburg, M. J., Kobak, R., Hermans, D., & Van IJzendoorn, M. H. (2022) A learning theory approach to attachment theory: Exploring clinical applications. *Clinical Child and Family Psychology Review*, 25(3), 591–612, p. 603. See also Van Vlierberghe, L., Diamond, G., & Bosmans, G. (2023) Middle childhood attachment-based family therapy: Theory and model description. *Family Process*, 62(3), 1040–1054.

<sup>763</sup> Schuengel, C. & Oosterman, M. (2019) Parenting self-efficacy. In Bornstein M. H. (ed.), *Handbook of Parenting: Being and Becoming a Parent* (654–680). London: Routledge/Taylor & Francis Group.

<sup>764</sup> For example, van den Broek, E. G., van Eijden, A. J., Overbeek, M. M., Kef, S., Sterkenburg, P. S., & Schuengel, C. (2017) A systematic review of the literature on parenting of young children with visual impairments and the adaptations for video-feedback intervention to promote positive parenting (VIPP). *Journal of Developmental and Physical Disabilities*, 29, 503–545; Platje, E., Sterkenburg, P., Overbeek, M., Kef, S., & Schuengel, C. (2018) The efficacy of VIPP-V parenting training for parents of young children with a visual or visual-and-intellectual disability: A randomized controlled trial. *Attachment & Human Development*, 20(5), 455–472; Doodeman, T. W., Schuengel, C., & Sterkenburg, P. S. (2023) Effects of the Attune & Stimulate-checklist for caregivers of people with severe and profound intellectual disabilities: A randomised controlled trial. *Journal of Applied Research in Intellectual Disabilities*, 36(5), 1136–1149.

Besides sensitivity and social learning, a third mechanism in play in VIPP-SD may also be caregiver mentalizing. As established by the work of Fonagy and colleagues, mentalizing may be defined as the capacity to conceive of, and make available for reconsideration, the thoughts and feelings implicated in motivations and intentions of oneself and others.<sup>765</sup> Fonagy, Steele, and Steele drew a strong contrast between mentalizing and sensitivity. They argued that caregiver sensitivity was largely a by-product of mentalizing, and that it was the latter that was largely the basis for infant secure attachment. What was captured by Ainsworth's sensitivity scale, Fonagy and colleagues proposed, was the extent to which the caregiver was attentive to the mental states of the child, could interpret these accurately, and respond to them promptly and in an undistorted way.<sup>766</sup> This perspective has been influential for clinicians and intervention research focused on improving caregiver mentalizing, including through video-feedback.<sup>767</sup>

VIPP-SD is anticipated by Juffer and colleagues to help caregivers become more aware of motivations and intentions implicit in the subtle behaviour of their infants, to perceive the infant's experience of the world in the intricacy of their actions and expressions. It is also anticipated to help caregivers reflect on their own caregiving behaviour and its meaning to themselves and their child: 'For example, in a video-feedback intervention project with eating-disordered mothers and their babies, the video stills and the (repeated) watching of particular episodes proved to be turning points in the reframing of the mothers' perceptions of themselves as having a potential positive influence on their child.'<sup>768</sup> The contrast drawn between sensitivity and mentalizing by Fonagy raised the possibility that the effects of VIPP on child-caregiver attachment are in fact via mentalizing. Indeed some commentators have incorrectly assumed that VIPP was developed precisely to achieve change through effects on mentalizing.<sup>769</sup> Van IJzendoorn, Bakermans-Kranenburg, and colleagues have accepted that mentalizing may be enhanced by VIPP-SD themes such as speaking for the child and emotion sharing, which may stimulate changes in parenting behavior that in turn mediate the effects of VIPP-SD on attachment.<sup>770</sup> However, in their

<sup>765</sup> Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press, chapter 4.

<sup>766</sup> Fonagy, P. Steele, H., Steele, M. & Holder, J. (1997) Attachment and theory of mind: Overlapping constructs? *Association for Child Psychology and Psychiatry Occasional Papers*, 14, 31–40. See also Zeegeers, M. A., Colonnese, C., Stams, G. J. J., & Meins, E. (2017) Mind matters: A meta-analysis on parental mentalization and sensitivity as predictors of infant-parent attachment. *Psychological Bulletin*, 143(12), 1245–1272.

<sup>767</sup> For example, Steele, M., Steele, H., Bate, J., Knafo, H., Kinsey, M., Bonuck, K., ... & Murphy, A. (2014) Looking from the outside in: The use of video in attachment-based interventions. *Attachment & Human Development*, 16(4), 402–415; Olhaver, M. (2024) From dyad to triad in early childhood: Mentalization-informed interventions developed in Chile. *Journal of Infant, Child, and Adolescent Psychotherapy*, 23(1), 20–33.

<sup>768</sup> Juffer, F. & Steele, M. (2014) What words cannot say: The telling story of video in attachment-based interventions. *Attachment & Human Development*, 16(4), 307–314, p. 311, discussing Woolley, H., Hertzmann, L., & Stein, A. (2008) Video-feedback intervention with mothers with postnatal eating disorders and their infants. In F. Juffer, M. J. Bakermans-Kranenburg, & M. H. Van IJzendoorn (eds), *Promoting Positive Parenting: An Attachment-Based Intervention* (pp. 111–138). New York: Taylor & Francis.

<sup>769</sup> For example, Shemmings, D., Shemmings, Y., & Cook, A. (2012) Gaining the trust of 'highly resistant' families: Insights from attachment theory and research. *Child & Family Social Work*, 17(2), 130–137, p. 134.

<sup>770</sup> Poslawsky, I. E., Naber, F. B., Bakermans-Kranenburg, M. J., Van Daalen, E., Van Engeland, H., & Van IJzendoorn, M. H. (2015) Video-feedback Intervention to promote positive parenting adapted to autism (VIPP-AUTI): A randomized controlled trial. *Autism*, 19(5), 588–603: 'VIPP-AUTI might have enhanced maternal insightfulness of their children as the video-feedback stimulates parental reflection on the interactions with the child. Videofeedback functions as a mirror for mentalizing dyadic interactions. In future studies with VIPP-AUTI, the potential mediating role of mind-mindedness and insightfulness in changing children's developmental outcome should be examined' (599); Kolijn, L., van den Bulk, B. G., Euser, S., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Huffmeijer, R. (2022) Does neural face processing explain effects of an attachment-based intervention on maternal sensitivity? A randomized controlled study including pre- and postintervention measures. *Brain and Behavior*, 12(1), e01972: 'The VIPP-SD themes "speaking for the child" and "sharing emotions"

view, mentalizing cannot influence the child directly but only via observable parenting that, in turn, affect child attachment.

The first empirical study to address the mechanism of VIPP was Juffer and colleagues' original 2005 report on VIPP, which reported that the intervention improved caregiver sensitivity and reduced attachment disorganization.<sup>771</sup> They found that caregiver sensitivity did not mediate the effects of VIPP on attachment disorganization in the Strange Situation. As the intervention did not significantly increase security in the Strange Situation in this sample, no test was conducted as to whether sensitivity mediated the effects of the intervention on security. At the time, Juffer and colleagues assumed that the intervention was effective in increasing caregiver sensitivity, but that the declines in disorganized attachment occurred via a different mechanism.

A doctoral study by Dorothee Out, supervised by Bakermans-Kranenburg and Van IJzendoorn, documented that disconnected caregiver behaviour is associated with disorganized attachment.<sup>772</sup> It could be that VIPP-SD reduces disconnected caregiving behaviour by making child behaviour more intelligible and interesting to the parent. As mentioned earlier: one subgroup in Juffer's study was not randomized and the effect size for sensitivity diminished considerably when that subgroup was excluded, but the effect on disorganized attachment remained intact.<sup>773</sup> The only other study to document an association between VIPP and reduction in disorganization was work by Moss and colleagues, where VIPP was supplemented with a module focused on reducing alarming caregiver behaviours.<sup>774</sup> There could be, then, that VIPP decreases the likelihood of disorganized attachment, but further evidence would be needed to establish this relationship.

A second study to investigate mediation was the 2006 paper by Van Zeijl and colleagues, reporting findings from the first implementation of VIPP-SD. This study found that VIPP-SD reduced maternal report of child externalizing behaviour. Once again this effect was not found to be significantly mediated by caregiver sensitivity.<sup>775</sup> Also in 2006, Klein Velderman, Bakermans-Kranenburg, and colleagues reported findings from a study using VIPP with a sample of 77 first-time mothers oversampled for insecurity on the AAI. The intervention was successful in reducing maternal report of child mental health difficulties. Once more, there was no evidence of mediation by caregiver sensitivity. The empirical signal appeared to be clear: it was not sensitive caregiving that was diminishing child mental health difficulties.

At the time the Leiden researchers accepted the repeated lack of evidence for mediation at face value, acceding to a mentalization-based interpretation: 'we hypothesize that it was

could increase cognitive processes that are involved in perspective taking/mentalizing and internal verbalization that in turn could promote maternal sensitivity on a behavioral level.'

<sup>771</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2005) The importance of parenting in the development of disorganized attachment: Evidence from a preventive intervention study in adoptive families. *Journal of Child Psychology and Psychiatry*, 46(3), 263–274.

<sup>772</sup> Out, D., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2009) The role of disconnected and extremely insensitive parenting in the development of disorganized attachment: Validation of a new measure. *Attachment & Human Development*, 11(5), 419–443.

<sup>773</sup> Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256.

<sup>774</sup> Moss, E., Dubois-Comtois, K., Cyr, C., Tarabulsy, G. M., St-Laurent, D., & Bernier, A. (2011) Efficacy of a home-visiting intervention aimed at improving maternal sensitivity, child attachment, and behavioral outcomes for maltreated children: A randomized control trial. *Development and Psychopathology*, 23(1), 195–210.

<sup>775</sup> Van Zeijl, J., Mesman, J., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., Stolk, M. N., ... & Alink, L. R. (2006) Attachment-based intervention for enhancing sensitive discipline in mothers of 1-to 3-year-old children at risk for externalizing behavior problems: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, 74(6), 994–1005.

the broader behavioral effect on caregiving, including the mothers' increased capability to see things from their child's point of view, which resulted in a lower rate of clinical behavior problems in the VIPP group.<sup>776</sup> Though this would still leave open the question of what behaviours mediated the effects of improved caregiver mentalizing. However, across the three studies, the Baron and Kenny procedure was used to assess sensitivity as a mediator, and is not regarded as dependable by contemporary statistics (Chapter 1). Bakermans-Kranenburg and Van IJzendoorn have also argued that meta-analyses of randomized trials are crucial for tracing causality, instead of the analysis of mediation of variables in single studies or with correlational designs.<sup>777</sup>

Lyons-Ruth and colleagues observed in 2014 that there remains a lack of clarity about the processes involved in the effects of VIPP-SD, and that there may be a number of mechanisms rattling around inside such interventions despite their apparent focus on change in caregiver sensitivity.<sup>778</sup> Subsequently, the Leiden group have returned to an account of VIPP-SD as effected through caregiver sensitivity, though tentatively. In 2017, the Leiden researchers accepted that, while VIPP-SD has proven effective, 'the underlying mechanisms accounting for the observed change in parenting behavior remain largely unknown.'<sup>779</sup> They considered that VIPP-SD may contribute to change in child-caregiver relationships through four mechanisms:<sup>780</sup>

1. Increasing caregiver recognition of child behaviour and signals.
2. Increasing caregiver awareness of the mental states implicit in child behaviour.
3. Displaying and reinforcing positive moments of parent-child interaction.
4. Increasing caregiver reflection on their own behaviour.

More recently, Van IJzendoorn and Bakermans-Kranenburg have added two further anticipated mechanisms:

5. Increasing caregiver empathy for the child's wishes and needs.
6. Enhancing caregiver feelings of competence.<sup>781</sup>

In support of these proposals, two UK-based qualitative interview studies have documented that caregivers report benefiting in all six ways.<sup>782</sup>

<sup>776</sup> Klein Velderman, M., Bakermans-Kranenburg, M. J., Juffer, F., Van IJzendoorn, M. H., Mangelsdorf, S. C., & Zevalkink, J. (2006) Preventing preschool externalizing behavior problems through video-feedback intervention in infancy. *Infant Mental Health Journal*, 27(5), 466–493, p. 487.

<sup>777</sup> Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology*, 66(1), 381–409.

<sup>778</sup> Lyons-Ruth, K., Zeanah, C. H., Benoit, D., Madigan, S., & Mills-Koonce, W. R. (2014) Disorder and risk for disorder during infancy and toddlerhood. In E. J. Mash & R. A. Barkley (eds), *Child Psychopathology* (3rd ed., pp. 673–736). New York: Guilford Press, p. 717.

<sup>779</sup> Kolijn, L., Euser, S., van den Bulk, B. G., Huffmeijer, R., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2017) Which neural mechanisms mediate the effects of a parenting intervention program on parenting behavior: Design of a randomized controlled trial. *BMC Psychology*, 5, 1–10, p. 1.

<sup>780</sup> Juffer, F., & Steele, M. (2014) What words cannot say: The telling story of video in attachment-based interventions. *Attachment & Human Development*, 16(4), 307–314; Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2017) Pairing attachment theory and social learning theory in video-feedback intervention to promote positive parenting. *Current Opinion in Psychology*, 15, 189–194.

<sup>781</sup> Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, Figure 4.1.

<sup>782</sup> Oliveira, P., Stevens, E., Barge, L., Comyn, J., Langley, K., Ramchandani, P., ... & Fearon, P. (2022) A qualitative study of foster carers' experiences of a video-feedback intervention to promote sensitive caregiving. In a

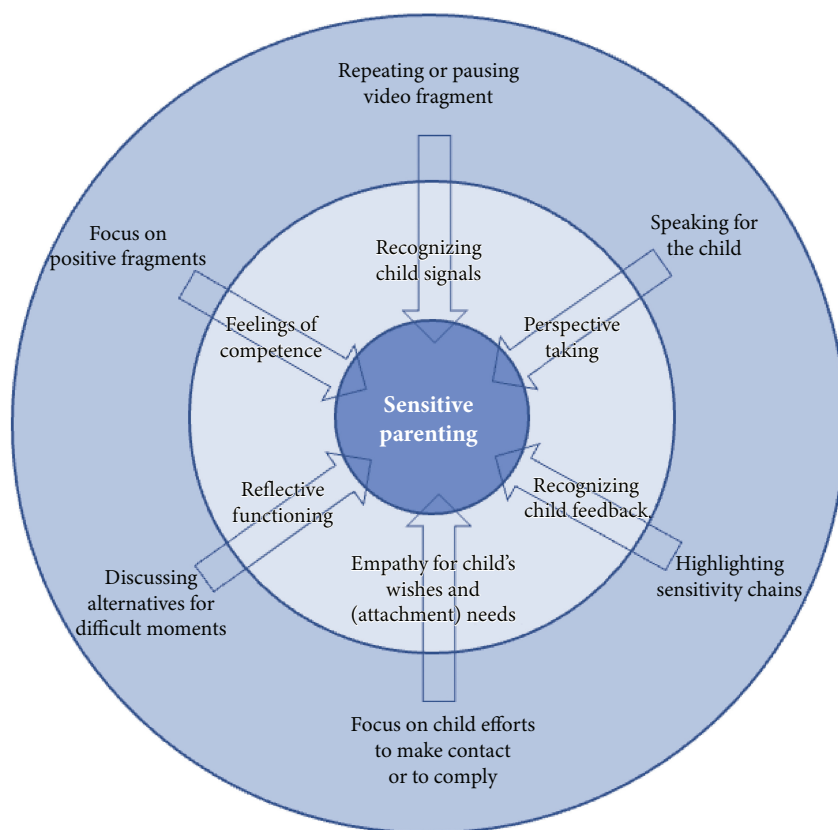


**Figure 4.7** Components of sensitive care facilitated by VIPP.

*Source:* From Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024). *Matters of Significance: Replication, translation and academic freedom in developmental science*. London: UCL Press, [Figure 4.1](#).

VIPP could in these terms be regarded as a kind of ‘combination therapy’ that achieves benefits for the child–caregiver relationships and child outcomes through social learning theory, mentalization, and sensitivity mechanisms. However, this is not how Juffer, Bakermans-Kranenburg, and Van IJzendoorn have framed VIPP-SD in their discussions of its underpinning processes (see [Figure 4.7](#)).

Where critics of the concept of sensitivity within attachment research have drawn oppositions (e.g., with social learning, or with mentalizing), Juffer and colleagues have argued for overlap and convergence. Some sensitive care may be facilitated by social learning; some by mentalization. Nonetheless, the potential for direct effects from social learning or mentalizing to child–caregiver attachment have been downplayed compared to the central role assigned to sensitivity.

Van IJzendoorn, Bakermans-Kranenburg, and colleagues found an association of  $r = 0.50$  between changes in sensitivity and changes in child attachment behaviour in trials of VIPP, suggesting the importance of sensitivity as a potential mediator, though without

denying additional processes may be in play.<sup>783</sup> This is the first well-powered meta-analytic evidence of a causal connection between sensitivity and attachment. Commenting on this finding, Dozier and Bernard have acknowledged that it represents an essential foundation, upon which future studies will build, including perhaps attempts to disaggregate sensitivity into more fine-grained components or identify other relevant mechanisms.<sup>784</sup>

Juffer and colleagues hold that VIPP increases caregiver recognition and responsiveness to infant signals, which then is reinforced by infants' happy responses. Repetition of such interaction then slowly changes caregivers' cognition, including mentalizing of themselves and their child, which in turn reinforces continued recognition and responsiveness to infant signals. So social learning and mentalizing play a role. But an intervention focused primarily on either would be anticipated to be less effective, as it is through responsiveness to infant signals that social learning and mentalizing are activated and become relevant. Juffer and colleagues suspect that VIPP is effective at reducing disorganized attachment not in the first instance through caregiver mentalizing, but through parental attention focused on chains of cue and response, holding back intrusive thoughts of unresolved losses or traumas.<sup>785</sup>

Where psychodynamic interventions assumed that caregiver internal working models should be the intervention target, and behaviour will follow, in VIPP caregiver cognitions are assumed to change due to reflection on the implications of change in cues and responses. And where holistic interventions assumed that caregiver behaviour could only ever be improved if wider difficulties were addressed, Juffer, Bakermans-Kranenburg, and Van IJzendoorn have seen that the force of mirrored images of real interactions can gather their own momentum: 'The persuasiveness of video material cannot be overestimated.'<sup>786</sup> Reflections of the child's positive responses on the videotape reinforce parental change in interactive behaviour, and subsequently parental attitudes, feelings of efficacy, and perhaps mentalization. A participant in a process evaluation by Comyn reported: 'when you watch it back on video you can't escape those positive moments, especially with the way that VIPP really highlights them.'<sup>787</sup>

A final point about mechanism has been raised by Everett Waters (Chapter 1), regarding whether the concept of 'sensitivity' is unhelpfully broad and might better be refined to secure base and safe haven provision. Indeed, as we have seen, this was stated to be the original focus of Juffer in her pilot study using video feedback as a parenting intervention, and is the central focus of session one of VIPP-SD.<sup>788</sup> Such questions have been asked directly of the work of the Leiden group by McElwain and Booth-LaForce, who argued

<sup>783</sup> Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256.

<sup>784</sup> Dozier, M., & Bernard, K. (2023) Intervening early: Socioemotional interventions targeting the parent–infant relationship. *Annual Review of Developmental Psychology*, 5(1), 115–135.

<sup>785</sup> Juffer, F., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2005) The importance of parenting in the development of disorganized attachment: Evidence from a preventive intervention study in adoptive families. *Journal of Child Psychology and Psychiatry*, 46(3), 263–274.

<sup>786</sup> Van IJzendoorn, M. H., Schuengel, C., Wang, Q., & Bakermans-Kranenburg, M. J. (2023) Improving parenting, child attachment, and externalizing behaviors: Meta-analysis of the first 25 randomized controlled trials on the effects of video-feedback intervention to promote positive parenting and sensitive discipline. *Development and Psychopathology*, 35(1), 241–256, p. 252.

<sup>787</sup> Comyn, J. (2019) Exploring stakeholders' perceptions of the impact, acceptability and feasibility of a video-feedback intervention to promote positive parenting in foster care (VIPP-FC), unpublished doctoral dissertation, University College London, p. 101.

<sup>788</sup> Juffer, F., Hoksbergen, R. A., Riksen-Walraven, J. M., & Kohnstamm, G. A. (1997) Early intervention in adoptive families: Supporting maternal sensitive responsiveness, infant–mother attachment, and infant competence. *Journal of Child Psychology and Psychiatry*, 38(8), 1039–1050.

that a greater focus on secure base and safe haven provision specifically could represent a 'direction for further refinement'.<sup>789</sup> Dozier and Bernard have likewise criticized interventions that focus on caregiver sensitivity, such as VIPP, as poorly adapted to children who, for whatever reason, 'may fail to signal their needs for nurturance clearly'.<sup>790</sup>

If adapted along these lines, Van IJzendoorn and Bakermans-Kranenburg's six mechanisms would be respecified as:

1. Increasing caregiver recognition of child secure base and safe haven needs and communications.
2. Increasing caregiver awareness of mental states about secure base and safe haven expectations implicit in child behaviour.
3. Displaying and reinforcing positive moments of parent–child interaction in provision of a secure base or safe haven.
4. Increasing caregiver reflection on their own behaviour when providing or not providing a secure base and safe haven to their child.
5. Increasing caregiver empathy for the child's needs for a secure base and safe haven.
6. Enhancing caregiver feelings of competence in secure base and safe haven provision.

McElwain and Booth-LaForce, and Dozier and Bernard, no doubt based their criticisms on the assumption that VIPP-SD is focused on sensitivity to children's signals generally. In fairness, in public presentations of VIPP-SD, as we have seen, Juffer, Van IJzendoorn, and Bakermans-Kranenburg have repeatedly described the intervention as *targeting sensitivity*, and defined this in Ainsworth's classic sense of responsiveness to children's signals. However, the manual indicates the significant place given by VIPP-SD to secure base/safe haven dynamics: these are the exclusive focus of session 1 (distinguishing exploration and attachment-related child behaviour), and a primary focus of session 2 (speaking for the child).

Session 3 supports caregivers to respond to children's cues and notice their response, which reflects the idea of responsiveness to children's signals. VIPP interveners discuss with caregivers that child signals may be subtle or even distorted, dependent on the child's experiences.<sup>791</sup> Caregivers are supported to develop their skills in the interpretive work of identifying the child's signals and needs, developed in the previous sessions. Session 4 helps caregivers reflect on sharing emotions with their child, which moves away from a focus on secure base/safe haven dynamics. The intervention also addresses 'adjusting the pace of the parent to that of the child', 'good communication', 'eye contact', and 'warmth in the parent's voice and facial expression', which are not necessarily part of the secure base/safe haven dynamic. Nonetheless, a considerable part of the intervention already implements precisely the recommendations made by McElwain and Booth-LaForce, and Dozier and Bernard. As such, it should be recognized that VIPP-SD does target

<sup>789</sup> McElwain, N. L. & Booth-LaForce, C. (2006) Maternal sensitivity to infant distress and nondistress as predictors of infant–mother attachment security. *Journal of Family Psychology*, 20(2), 247–255, p. 253.

<sup>790</sup> Dozier, M. & Bernard, K. (2017) Attachment and biobehavioral catch-up: Addressing the needs of infants and toddlers exposed to inadequate or problematic caregiving. *Current Opinion in Psychology*, 15, 111–117.

<sup>791</sup> Schoemaker, N. K., Jagersma, G., Stoltenborgh, M., Maras, A., Vermeer, H. J., Juffer, F., & Alink, L. R. (2018). The effectiveness of Video-feedback Intervention to promote Positive Parenting for Foster Care (VIPP-FC): study protocol for a randomized controlled trial. *BMC psychology*, 6, 1–11; Starreveld, K. M., Overbeek, M. M., Willemsen, A. M., Carl, B., & Bakermans-Kranenburg, M. J. (in press) Video-feedback intervention to promote positive parenting and sensitive discipline in early elementary education (VIPP-School): A randomized controlled trial. *Attachment and Human Development*.



secure base/safe haven dynamics, as well as issues related to synchronization, affect, communication, and eye contact.

The value of secure base/safe haven dynamics as a target for intervention has been supported by a 2021 study by Raby, Theo Waters, and colleagues. They followed up a sample of children who received the Attachment Biobehavioral Catch-Up intervention in early childhood. This intervention has considerable similarities to VIPP-SD. There are two differences relevant in this context. A first is that interveners also explicitly seek to reduce alarming caregiver behaviours. A second is that interveners give ‘in the moment’ feedback at a high rate on current caregiver behaviour, compared to feedback during reviewing of video recordings in VIPP-SD.<sup>792</sup> Raby, Waters, and colleagues found that the intervention led to an increase in secure base script knowledge among caregivers, which in turn predicted more caregiver sensitivity when the children were eight years old.<sup>793</sup> Raby, Waters, and colleagues argued that these findings suggest that changes in secure base script knowledge were driving the effects of the intervention.

The idea that caregivers’ secure base knowledge specifically, rather than sensitivity generally, might shape the effects of VIPP-SD was tested in a recent study by Witte, Runze, Van IJzendoorn, and Bakermans-Kranenburg.<sup>794</sup> In this large study, 445 families with pre- and school-aged twin children were randomized to receive VIPP-SD or telephone calls. This study found no significant effect on caregiver sensitivity or sensitive discipline; likewise, there was no significant effect on caregivers’ secure base script knowledge. So, the study was not well positioned to examine whether secure base script knowledge mediated the effectiveness of the intervention. However, the researchers were able to report that parents with lower secure base script knowledge benefited most from the VIPP-SD in terms of strongest improvements in sensitive discipline behaviour and positive attitudes towards sensitive discipline behaviour. Witte and colleagues reflected that VIPP-SD does not explicitly target secure base script knowledge, and that a clearer examination of the role of this factor may be supported by evaluation of an adaptation of VIPP-SD that gives this greater prominence.

In sum, while some questions remain about mechanism, the major contribution of VIPP-SD to attachment research over the past two decades should be highlighted. As the most focused attachment-based intervention it provides unique evidence interrogating the causal link between caregiving behaviour and attachment security. It represents an important rapprochement between attachment theory and social learning theory, historically regarding as opposing and incompatible perspectives. In turn, VIPP-SD has inspired further theoretical and fine-grained empirical advances in the role of conditioning in attachment development by Bosmans and colleagues.<sup>795</sup>

<sup>792</sup> Dozier, M. & Bernard, K. (2019) *Coaching Parents of Vulnerable Infants: The Attachment and Biobehavioral Catch-up Approach*. New York: Guilford.

<sup>793</sup> Raby, K. L., Waters, T. E., Tabachnick, A. R., Zajac, L., & Dozier, M. (2021) Increasing secure base script knowledge among parents with attachment and biobehavioral catch-up. *Development and Psychopathology*, 33(2), 554–564.

<sup>794</sup> Witte, A. M., Runze, J., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2024) Secure base script knowledge and video-feedback intervention to promote positive parenting-sensitive discipline. *Journal of Applied Developmental Psychology*, 92, 101651.

<sup>795</sup> For example, Bosmans, G., Waters, T. E., Finet, C., De Winter, S., & Hermans, D. (2019) Trust development as an expectancy-learning process: Testing contingency effects. *PloS One*, 14(12), e0225934; Bosmans, G., Bakermans-Kranenburg, M. J., Vervliet, B., Verhees, M. W., & Van IJzendoorn, M. H. (2020) A learning theory of attachment: Unraveling the black box of attachment development. *Neuroscience & Biobehavioral Reviews*, 113, 287–298. For discussion of possible clinical implications, Bosmans, G., Van Vlierberghe, L., Bakermans-Kranenburg, M. J., Kobak, R., Hermans, D., & Van IJzendoorn, M. H. (2022) A learning theory approach to attachment theory: Exploring clinical applications. *Clinical Child and Family Psychology Review*, 25(3), 591–612; Hutchings, J., Williams, M. E., & Leijten, P. (2023) Attachment, behavior problems and interventions. *Frontiers in Child and Adolescent Psychiatry*, 2, 1156407

VIPP-SD is, to date, the best evidenced attachment-based intervention. A review by the US Home Visiting Evidence of Effectiveness concluded that thorough evidence exists for the effectiveness of VIPP-SD, based on well-designed research.<sup>796</sup> The intervention is used across many contexts, and is freely available to families in the two largest municipalities in the Netherlands. Technical aspects of the approach, such as setting the caregiver's positive behaviour as an example to themselves, are acceptable to caregivers, regarded positively by practitioners, and contribute to an intervention with considerable evidence of effectiveness. There is also emerging evidence of the cost effectiveness of the intervention.<sup>797</sup>

Schuengel and colleagues have observed a shift in focus of attachment research away from concern with the AAI and Strange Situation, and towards attachment-based interventions, which may in part be inspired by the findings of studies using VIPP.<sup>798</sup> Though VIPP has received the most research attention of any attachment-based intervention and remarkable progress has been made, it is still early days, with many decades of research and discovery clearly ahead. But according to Bakermans-Kranenburg and Van IJzendoorn more than three decades have been sufficient for proving translatability of VIPP-SD. In their view, it meets the three criteria for translation: replicated evidence of causal effects, ethical arguments for the acceptability for caregivers of increased sensitivity, and a positive balance between costs and benefits for applications of the intervention.<sup>799</sup>

## Neurobiological Attachment Research

### The Urgency of Neurobiological Research

In the late 1990s, Van IJzendoorn observed biological measures starting to pour into developmental science, as if someone had knocked over the jug. Growing precedence was being given to these measures, which were—explicitly or implicitly—often treated as more true or real than messy observational research. This posed a threat to the kind of science Van IJzendoorn prized, and to attachment research in particular.<sup>800</sup> With a few exceptions such as Spangler,<sup>801</sup> attachment research was also proving slow in adopting biomedical measures.<sup>802</sup> In part, this reflected a commitment to observation, in part the opportunity cost

<sup>796</sup> Home Visiting Evidence of Effectiveness (2023) *Video-Feedback Intervention to Promote Positive Parenting-Sensitive Discipline* (VIPP-SD), <https://homvee.acf.hhs.gov/effectiveness/Video-Feedback%20Intervention%20to%20promote%20Positive%20Parenting%E2%80%9393Sensitive%20Discipline%C2%AE%2028VIPP%E2%80%9393SD%29>.

<sup>797</sup> Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2020) Problematic cost–utility analysis of interventions for behavior problems in children and adolescents. *New Directions for Child and Adolescent Development*, 2020(172), 89–102; Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, chapter 8. See also Bachmann, C. J., Beecham, J., O'Connor, T. G., Briskman, J., & Scott, S. (2022) A good investment: Longer-term cost savings of sensitive parenting in childhood. *Journal of Child Psychology and Psychiatry*, 63(1), 78–87.

<sup>798</sup> Schuengel, C., Verhage, M. L., & Duschinsky, R. (2021) Prospecting the attachment research field: A move to the level of engagement. *Attachment & Human Development*, 23(4), 375–395.

<sup>799</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, chapter 8.

<sup>800</sup> *Ibid.*, chapter 9.

<sup>801</sup> Spangler, G. & Grossmann, K. E. (1993) Biobehavioral organization in securely and insecurely attached infants. *Child Development*, 64(5), 1439–1450.

<sup>802</sup> This is despite an early important paper in which cardiac measures were used to validate the difference between security and insecurity in the Strange Situation. Sroufe, L. A. & Waters, E. (1977) Attachment as an organizational construct. *Child Development*, 48, 1184–1199.

of the resource and time required by observational measures, and in part a disdain for such measures in some quarters.

For instance, Sroufe's account of attachment theory was framed by an opposition between psychosocial attachment research and biological explanations. The use of biomedical measures in the Minnesota sample could only begin after his retirement, with Roisman assuming leadership.<sup>803</sup> The use of biomedical measures in the NICHD sample again came very late, and again partly at Roisman's urging. Prominent critics of attachment research, such as Plomin, were characterizing attachment research as outdated, superseded by biomedical developmental science.<sup>804</sup> The accusation levelled at attachment research was that the importance ascribed to child experiences of care had been overstated, when in fact child development was more a consequence of genetic or other constitutional factors. Attachment research needed to muster a response.

This prompted studies by Van IJzendoorn and Bakermans-Kranenburg examining the respective contribution of genetic markers and caregiving to Strange Situation classifications. A first study, published in 2000, examined the similarity of siblings' attachment to the same caregiver, a question that perhaps stirred Bakermans-Kranenburg's interest because by this point she had three children.<sup>805</sup> With Fearon, Van IJzendoorn, and Bakermans-Kranenburg also undertook a behavioural genetic study to examine the respective contribution of environment and genetics to child attachment in twins, documenting a minimal role for genetics in child-caregiver attachment assessed in the Strange Situation.<sup>806</sup> Genetics may play a larger role later in development in shaping older children and adolescents' expectations about attachment relationships, perhaps due to the greater active role older children can play in shaping their relationships than younger children.<sup>807</sup>

As we saw in [Chapter 3](#), in 2000 Lakatos and colleagues reported an association between DRD4 polymorphism and disorganized attachment. However, Van IJzendoorn and Bakermans-Kranenburg were able to show with their Leiden samples that this finding did not replicate.<sup>808</sup> Instead, DRD4 polymorphism moderated associations between caregiver sensitivity and externalizing behaviour,<sup>809</sup> and between caregiver unresolved loss

<sup>803</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 4.

<sup>804</sup> For example, Plomin, R. (1994) Nature, nurture, and social development. *Social Development*, 3(1), 37–53.

<sup>805</sup> Van IJzendoorn, M. H., Moran, G., Belsky, J., Pederson, D., Bakermans-Kranenburg, M. J., & Kneppers, K. (2000) The similarity of siblings' attachments to their mother. *Child Development*, 71, 1084–1096.

<sup>806</sup> Bokhorst, C. L., Bakermans-Kranenburg, M. J., Pasco Fearon, R. M., Van IJzendoorn, M. H., Fonagy, P., & Schuengel, C. (2003) The importance of shared environment in mother–infant attachment security: A behavioral genetic study. *Child Development*, 74(6), 1769–1782; Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Bokhorst, C. L., & Schuengel, C. (2004) The importance of shared environment in infant–father attachment: A behavioral genetic study of the attachment q-sort. *Journal of Family Psychology*, 18(3), 545–549; Fearon, R. M., Van IJzendoorn, M. H., Fonagy, P., Bakermans-Kranenburg, M. J., Schuengel, C., & Bokhorst, C. L. (2006) In search of shared and nonshared environmental factors in security of attachment: A behavior-genetic study of the association between sensitivity and attachment security. *Developmental Psychology*, 42(6), 1026–1040. Though see also Fearon, P., Shmueli-Goetz, Y., Viding, E., Fonagy, P., & Plomin, R. (2014) Genetic and environmental influences on adolescent attachment. *Journal of Child Psychology and Psychiatry*, 55(9), 1033–1041; Runze, J., Witte, A., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. (2023) Heritability of children's attachment representations in middle childhood. *OSF*, <https://osf.io/va2p7>.

<sup>807</sup> Fearon, P., Shmueli-Goetz, Y., Viding, E., Fonagy, P., & Plomin, R. (2014) Genetic and environmental influences on adolescent attachment. *Journal of Child Psychology and Psychiatry*, 55(9), 1033–1041; Runze, J., Witte, A. M., van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2024). Heritability of children's Secure Base Script Knowledge in middle childhood: a twin study with the Attachment Script Assessment. *Journal of Child Psychology and Psychiatry*. Early View

<sup>808</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2004) No association of the dopamine D4 receptor (DRD4) and -521 C/T promoter polymorphisms with infant attachment disorganization. *Attachment & human development*, 6(3), 211–218.

<sup>809</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2006) Gene-environment interaction of the Dopamine D4 receptor (DRD4) and observed maternal insensitivity predicting externalizing behavior in preschoolers. *Developmental Psychobiology*, 48, 406–409.

and infant disorganized attachment.<sup>810</sup> These findings offered first evidence of genetic differential susceptibility. Even Sroufe, not generally positive about the use of biological measures within attachment research, acknowledged that he was impressed by these findings, describing the research as ‘outstanding’ and ‘sophisticated’.<sup>811</sup>

At the same time as perceiving a potential threat to observational attachment research from the growing ascendance of biomedical measures, Van IJzendoorn and Bakermans-Kranenburg were excited by the opportunities they offered. The discovery of genetic differential susceptibility offered a good illustration of how environmental and biological factors could in fact be brought together in fruitful ways.<sup>812</sup>

Van IJzendoorn’s distrust in self-report measures contributed to his particular interest in physiological measures that bypass subjectivity. Beyond this, for Van IJzendoorn, Bowlby’s attachment theory had from the start been about biological predispositions (Chapter 1). Bowlby had been enthusiastic about Hofer’s proposals about biological processes as a hidden regulators within attachment relationships but had not known how to integrate these into his work. As a consequence, this was not followed up. Hofer was invited to contribute to the 1999 *Handbook of Attachment*, but bibliometric analysis indicates that it was not well integrated with the other contributions.<sup>813</sup> Only the VU Amsterdam group made Hofer’s work a central touchstone; caregiver–child co-regulation was of critical relevance for their attention to intellectual disabilities and to the issue of establishing attachment relationships with foster and other non-parental caregivers.<sup>814</sup>

Biomedical measures offered the prospect of picking up this loose thread regarding biological processes. Where Bowlby had written pages and pages of notes, trying to understand with the limited science of his day how attachment might relate to biological homeostasis,<sup>815</sup> new tools from biomedical research promised insight into the interplay of psychological, neurological, endocrinal, physiological, and genetic processes shaping and shaped by attachment relationships.<sup>816</sup>

Inspired by the early neurobiological attachment research of Spangler on adrenocortical responses of infants to the Strange Situation,<sup>817</sup> Van IJzendoorn decided to learn more by spending his sabbatical in Berkeley in 2000 attending courses on neuroimaging

<sup>810</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M.J. (2006) DRD4 7-repeat polymorphism moderates the association between maternal unresolved loss or trauma and infant disorganization. *Attachment & Human Development*, 8, 291–307.

<sup>811</sup> Sroufe, L.A. (2016) Midterm evaluation: Institute of Education and Child Studies. Marinus van IJzendoorn personal archive.

<sup>812</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2007) Research review: Genetic vulnerability or differential susceptibility in child development: The case of attachment. *Journal of Child Psychology and Psychiatry*, 48(12), 1160–1173; Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2012) Integrating temperament and attachment. In M. Zentner & R. L. Shiner (eds), *Handbook of Temperament* (pp. 403–424). New York: Guilford Press.

<sup>813</sup> Kroonenberg, P. M., & Stoltenborgh, M. (2023) Handbooks as a means of mapping a discipline: An exploration of the world of attachment. In A. Okada, K. Shigemasu, R. Yoshino, & S. Yokoyama (eds), *Facets of Behaviorometrics: The 50th Anniversary of the Behaviorometric Society* (pp. 123–143). New York: Springer.

<sup>814</sup> See for example Oosterman, M. & Schuengel, C. (2008) Attachment in foster children associated with caregivers’ sensitivity and behavioral problems. *Infant Mental Health Journal*, 29(6), 609–623; Schuengel, C., Oosterman, M., & Sterkenburg, P. S. (2009) Children with disrupted attachment histories: Interventions and psychophysiological indices of effects. *Child and Adolescent Psychiatry and Mental Health*, 3, 1–10.

<sup>815</sup> For example Bowlby, J. ([1969] 2021) Anxiety, stress and homeostasis. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 34–45). New York: Wiley.

<sup>816</sup> See also White, L., Kungl, M., & Vrticka, P. (2023) Charting the social neuroscience of human attachment (SoNeAt). *Attachment & Human Development*, 25(1), 1–18.

<sup>817</sup> Spangler, G. (1998) Emotional and adrenocortical responses of infants to the strange situation: The differential function of emotional expression. *International Journal of Behavioral Development*, 22(4), 681–706; Spangler, G. & Zimmermann, P. (1999) Attachment representation and emotion regulation in adolescents: A psychobiological perspective on internal working models. *Attachment & Human Development*, 1(3), 270–290.

(Mark d'Esposito) and on neurophysiology (Arthur Shimamura). He also studied Allan Schore's neurobiological perspective on attachment theory.<sup>818</sup> With the freedom of funds from the Spinoza Prize, from the mid-2000s Van IJzendoorn and Bakermans-Kranenburg could implement neurobiological components rather quickly in ongoing studies. Large samples were needed to catch the small amount of explained variance from most biomedical measures and were increasingly an essential mark of credibility in the scientific community. Doctoral students supervised by Van IJzendoorn and Bakermans-Kranenburg conducted studies with much larger samples than other attachment research groups, because they collaborated in groups on the same project (e.g., Jantien van Zeijl, Mirjam Stolk, and Lenneke Alink collaborated on a study with of 237 child-caregiver dyads). This approach could grant sufficient statistical power for meaningful inquiry using biological measures.

### Oxytocin

Capitalizing on new biological tools for developmental research, Bakermans-Kranenburg and Van IJzendoorn began a programme of research on oxytocin as a potential biological contributor to caregiver sensitivity.<sup>819</sup> Oxytocin had been touted as the 'cuddle hormone'. In the early 2010s there was a growing consensus that more of the hormone in the brain or bloodstream would be linked to activation of the caregiving motivational system in humans, and thereby support child-caregiver attachment.<sup>820</sup> There was growing interest within the wing to the attachment research community excited by biological measures, such as Dozier.<sup>821</sup>

The first study in this area by Van IJzendoorn and Bakermans-Kranenburg's group considered the oxytocin receptor gene. They found that caregivers with the possibly less efficient variants of the oxytonergic system genes showed lower levels of sensitive responsiveness to their toddlers. The paper was accompanied by an enthusiastic introduction from the editor.<sup>822</sup> In fact, in a later meta-analysis Bakermans-Kranenburg and Van IJzendoorn identified their early finding as a false positive, and as an example of the so-called

<sup>818</sup> Karen, R. (2024) *Becoming Attached*, 2nd ed. Oxford: Oxford University Press, pp. 531–533.

<sup>819</sup> Naber, F., Van IJzendoorn, M. H., Deschamps, P., van Engeland, H., & Bakermans-Kranenburg, M. J. (2010) Intranasal oxytocin increases fathers' observed responsiveness during play with their children: A double-blind within-subject experiment. *Psychoneuroendocrinology*, 35(10), 1583–1586. A few studies examined heart rate reactivity as a measure of stress response when examining responses to attachment-related cues For example Bimmel, N., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Juffer, F., & De Geus, E. J. (2008) Problem behavior and heart rate reactivity in adopted adolescents: Longitudinal and concurrent relations. *Journal of Research on Adolescence*, 18(2), 201–214; Gilissen, R., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & van der Veer, R. (2008) Parent-child relationship, temperament, and physiological reactions to fear-inducing film clips: Further evidence for differential susceptibility. *Journal of Experimental Child Psychology*, 99(3), 182–195.

<sup>820</sup> Feldman, R. (2012) Oxytocin and social affiliation in humans. *Hormones and Behavior*, 61(3), 380–391.

<sup>821</sup> For example, Bick, J. & Dozier, M. (2009) Mothers' concentrations of oxytocin following close, physical interactions with biological and nonbiological children. *Developmental Psychobiology*, 1(52), 100–107.

<sup>822</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2008) Oxytocin receptor (OXTR) and serotonin transporter (5-HTT) genes associated with observed parenting. *Social, Cognitive and Affective Neuroscience*, 3: 128–134. The editor's Introduction to the issue notes: 'A professor from whom I took a course in graduate school asserted that journals could serve one of two functions: An archival function for articles that nailed down the details of an often paradigm-specific effect or a heuristic function, in which all the details of the findings were not yet nailed down, but the work could serve as an inspiration to others. He was squarely on the side of the heuristic function. A similar point may be made about journal articles. Some address all the details of a modest question, whereas others are sufficiently exciting, despite leaving questions unanswered, as to have an energizing effect on the field. Such is the case with the Bakermans-Kranenburg and Van IJzendoorn article, "Oxytocin Receptor (OXTR) and Serotonin Transporter (5-HTT) Genes Associated with Observed Parenting".

'winners curse': early studies on rather small samples may overestimate the true effect.<sup>823</sup> Van IJzendoorn and Bakermans-Kranenburg shifted their attention away from the oxytocin receptor gene to oxytocin as a hormone and neurotransmitter, where their first studies had already produced promising results.

Some researchers proposed that oxytocin could be delivered to patients as an adjunct to clinical intervention.<sup>824</sup> This could improve clinical engagement and effectiveness. For instance, alongside a psychosocial intervention, oxytocin could be given to caregivers struggling to provide quality care for their children to increase caregivers' engagement and responsiveness to the intervention and to their child.

Admittedly, much of the research underpinning these ideas at the time was drawn from rodent studies. Bakermans-Kranenburg and Van IJzendoorn were interested in the role of oxytocin in regulating caregiving motivations, but from the start were sceptical of how quickly consensus had grown up about the meaning of oxytocin without adequate studies in humans.<sup>825</sup> In a 2011 paper, researchers at the University of Columbia proposed that the primary role of oxytocin may be to increase the salience of emotional information, and as such could have quite different implications depending on a person's past experiences and present situation.<sup>826</sup> Van IJzendoorn and Bakermans-Kranenburg were of the same view, and undertook several small studies in the 2010s.<sup>827</sup>

Their first wave of experimental studies of oxytocin administration in humans targeted fathers, given that research on fathers is not complicated by cycle-related fluctuations in endogenous maternal oxytocin. A first study by the Leiden group was a randomized controlled within-subject study conducted with 17 fathers with toddlers, observed in two play sessions of 15 minutes a week apart.<sup>828</sup> Around half received an intranasal administration of oxytocin before the first session, and the others before the second session; on the other occasion a placebo was received. Following intranasal administration of oxytocin, the fathers were found to offer significantly more secure base provision for their child's exploration, and to show less hostility towards their toddler. There was no effect for overall sensitivity in this small sample.<sup>829</sup> Essentially identical findings were reported when the same procedure was implemented in fathers and a typically developing toddler (N = 18), and fathers of toddlers diagnosed with autism (N = 14).<sup>830</sup>

Yet the contribution of oxytocin to responsive care was found to be attenuated in a clinical sample. The same procedure as with the father and toddlers was used with a

.... in the best tradition of heuristically based pieces, without nailing down every loose end, this research team has succeeded in stirring interest, guiding future thinking and providing a model for testing these and other exciting questions regarding genetic bases of social behavior'.

<sup>823</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2014) A sociability gene? Meta-analysis of oxytocin receptor (OXTR) genotype effects in humans. *Psychiatric Genetics*, 24(2), 45–51.

<sup>824</sup> Liu, J. C. J., McErlean, R., & Dadds, M. (2012) Are we there yet? The clinical potential of intranasal oxytocin in psychiatry. *Current Psychiatry Reviews*, 8(1), 37–48.

<sup>825</sup> Mileva-Seitz, V. R., Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2016) Genetic mechanisms of parenting. *Hormones and Behavior*, 77, 211–223, p. 216.

<sup>826</sup> Bartz, J. A., Zaki, J., Bolger, N., & Ochsner, K. N. (2011) Social effects of oxytocin in humans: Context and person matter. *Trends in Cognitive Sciences*, 15(7), 301–309.

<sup>827</sup> Huffmeijer, R., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2012) Ageing and oxytocin: A call for extending human oxytocin research to ageing populations—a mini-review. *Gerontology*, 59(1), 32–39.

<sup>828</sup> Naber, F., Van IJzendoorn, M. H., Deschamps, P., van Engeland, H., & Bakermans-Kranenburg, M. J. (2010) Intranasal oxytocin increases fathers' observed responsiveness during play with their children: A double-blind within-subject experiment. *Psychoneuroendocrinology*, 35(10), 1583–1586.

<sup>829</sup> Veening, J. G. & Olivier, B. (2013) Intranasal administration of oxytocin: Behavioral and clinical effects, a review. *Neuroscience & Biobehavioral Reviews*, 37(8), 1445–1465.

<sup>830</sup> Naber, F. B., Poslawsky, I. E., Van IJzendoorn, M. H., Van Engeland, H., & Bakermans-Kranenburg, M. J. (2013) Brief report: oxytocin enhances paternal sensitivity to a child with autism: A double-blind within-subject experiment with intranasally administered oxytocin. *Journal of Autism and Developmental Disorders*, 43, 224–229.

sample of 25 mothers and their infants, recruited on the basis of mothers' diagnosis of postnatal depression.<sup>831</sup> As well as in free play, mothers' response was observed when a stranger was overly intrusive with the infant. Additionally, caregivers were asked to listen to different pre-recorded infant cries and report their sense of how urgent the cry was, and what they might do to respond.<sup>832</sup>

The researchers did not replicate the earlier finding from the study with fathers and their toddlers, where the fathers were more likely to serve as a secure base and show less hostility.<sup>833</sup> However, they did find that mothers with postnatal depression were more likely to intervene when the stranger was intrusive with their infant when they had received intranasal oxytocin.<sup>834</sup> Furthermore, they found that, in the intranasal oxytocin condition, mothers with symptoms of postnatal depression were more likely to rate an infant cry as urgent, and to indicate that they would choose a harsh caregiving strategy in response.<sup>835</sup> The findings suggest that oxytocin may have particular relevance to protection.<sup>836</sup> They likewise agree with the idea that oxytocin increases the salience of social information, rather than simply increasing positive feeling and cuddliness in caregivers' responses.

In the oxytocin condition, the mothers reported being sadder. Furthermore, they described their babies as more difficult but reported that the quality of their relationship with their infant was more positive. For this sample already facing symptoms of postnatal depression, oxytocin administration appeared to intensify these symptoms, increase their feelings of struggling to cope with their infant but also increase the intensity of their positive feelings about the relationship.<sup>837</sup>

This configuration of findings, with both positives and negatives increased by randomized allocation of oxytocin, appears an excellent fit with the theory that oxytocin heightens saliency of emotional information. Additionally, the results suggested that if oxytocin were implemented as an adjunct to clinical interventions with caregivers, it may backfire, increasing caregivers' clinical difficulties and difficulties coping with their child. Or at least, oxytocin could be used to intensify the salience of emotional information, and support would be needed for patients in how to interpret that information.<sup>838</sup> A meta-analysis by Bakermans-Kranenburg and Van IJzendoorn documented that intranasal oxytocin had

<sup>831</sup> Mah, B. L., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Smith, R. (2015) Oxytocin promotes protective behavior in depressed mothers: A pilot study with the enthusiastic stranger paradigm. *Depression and Anxiety*, 32(2), 76–81.

<sup>832</sup> The approach, and the recordings, were drawn from Ashley Groh's doctoral study: Groh, A. M. & Roisman, G. I. (2009) Adults' autonomic and subjective emotional responses to infant vocalizations: The role of secure base script knowledge. *Developmental Psychology*, 45(3), 889–893.

<sup>833</sup> For concerns about the replicability of much research utilizing intranasal administration of oxytocin, see Mierop, A., Mikolajczak, M., Stahl, C., Béna, J., Luminet, O., Lane, A., & Corneille, O. (2020) How can intranasal oxytocin research be trusted? A systematic review of the interactive effects of intranasal oxytocin on psychosocial outcomes. *Perspectives on Psychological Science*, 15(5), 1228–1242.

<sup>834</sup> Mah, B. L., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Smith, R. (2015) Oxytocin promotes protective behavior in depressed mothers: a pilot study with the enthusiastic stranger paradigm. *Depression and Anxiety*, 32(2), 76–81.

<sup>835</sup> Mah, B. L., Van IJzendoorn, M. H., Out, D., Smith, R., & Bakermans-Kranenburg, M. J. (2017) The effects of intranasal oxytocin administration on sensitive caregiving in mothers with postnatal depression. *Child Psychiatry & Human Development*, 48, 308–315.

<sup>836</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2018) Oxytocin and human sensitive and protective parenting. *Current Topics in Behavioral Neurosciences*, 35, 421–448.

<sup>837</sup> Mah, B. L., Van IJzendoorn, M. H., Smith, R., & Bakermans-Kranenburg, M. J. (2013) Oxytocin in postnatally depressed mothers: Its influence on mood and expressed emotion. *Progress in Neuro-Psychopharmacology and Biological Psychiatry*, 40, 267–272.

<sup>838</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2016) The role of oxytocin in parenting and as augmentative pharmacotherapy: Critical issues and bold conjectures. *Journal of Neuroendocrinology*, 28(8); Verhees, M. W., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Ceulemans, E., de Winter, S., Santens, T., ... & Bosmans, G. (2020) Combining oxytocin and cognitive bias modification training in a randomized controlled trial: Effects on trust in maternal support. *Journal of Behavior Therapy and Experimental Psychiatry*, 66, 101514.

fewer or no positive effects in clinical samples.<sup>839</sup> Bakermans-Kranenburg and Van IJzendoorn reflected that this may reflect the role of negative mood in the present, negative perceptions of the world as an 'outgroup' not to be trusted (feelings that might be increased through oxytocin administration), or differential methylation of the oxytocin receptor gene as a result of early childhood experiences.

As such, Bakermans-Kranenburg and colleagues were interested as to whether people's past experiences in attachment relationships might shape the impact of oxytocin in the present. In one study, they asked 57 undergraduate students to take part in a study. Participants were randomized to an intranasal administration of oxytocin or a placebo, then given the chance to make a charitable donation. A self-report measure was used of love withdrawal behaviours by caregivers, asking for relative endorsement of items such as: 'my mother is a person who will not talk to me when I displease her'; 'will avoid looking at me when I have disappointed her'; 'when I displease her, tells me how little she feels for me.'<sup>840</sup> Despite Van IJzendoorn's antipathy to self-report measures, for this small proof-of-concept study, the measure served as a placeholder for Bowlby's concern with maternal deprivation and unavailability.

Van IJzendoorn, Bakermans-Kranenburg, and colleagues found that oxytocin significantly increased participants' willingness to donate to charity, but only for participants who reported little in the way of love withdrawal behaviour from their caregivers. There was no effect for participants who reported high levels of love withdrawal behaviour from their caregivers. When memories of the caregiver are more positive, administration of oxytocin may make these positive feelings more salient and contribute to altruism. Similar findings emerged in their study using the prosocial cyberball paradigm with a different sample.<sup>841</sup> A later meta-analysis by Ellis, Van IJzendoorn, Bakermans-Kranenburg, and colleagues of 13 samples confirmed that intranasal administration of oxytocin is associated with more positive outcomes among adults who report lower levels of childhood adversity ( $r = 0.12$ ).<sup>842</sup>

The studies of oxytocin using small samples by Van IJzendoorn, Bakermans-Kranenburg, and colleagues offered interesting proof of concept, and a picture of the role of oxytocin in caregiving was beginning to come into focus. The findings from these studies converged with research in other groups showing that oxytocin may influence each of the moments of sensitivity: noticing child signals, interpreting these signals, and responding appropriately and promptly.<sup>843</sup> The studies of oxytocin at Leiden were almost entirely funded by the Spinoza Prize, keeping resources constrained, not least since the

<sup>839</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2013) Sniffing around oxytocin: review and meta-analyses of trials in healthy and clinical groups with implications for pharmacotherapy. *Translational Psychiatry*, 3(5), 258–258.

<sup>840</sup> Van IJzendoorn, M. H., Huffmeijer, R., Alink, L. R., Bakermans-Kranenburg, M. J., & Tops, M. (2011) The impact of oxytocin administration on charitable donating is moderated by experiences of parental love-withdrawal. *Frontiers in Psychology*, 2, 258.

<sup>841</sup> Riem, M. M. E., Bakermans-Kranenburg, M. J., Huffmeijer, R., Van IJzendoorn, M. H. (2013) Does intranasal oxytocin promote prosocial behavior to an excluded fellow player? A randomized controlled trial with Cyberball. *Psychoneuroendocrinology*, 38, 1418–1425. For a review of related studies, see Mikulincer, M. & Shaver, P. R. (2017) An attachment perspective on compassion and altruism. In Paul Gilbert (ed.), *Compassion* (pp. 187–202). London: Routledge; Zhang, K., Fan, Y., Yu, R., Tian, Y., Liu, J., & Gong, P. (2021) Intranasal oxytocin administration but not peripheral oxytocin regulates behaviors of attachment insecurity: A meta-analysis. *Psychoneuroendocrinology*, 132, 105369.

<sup>842</sup> Ellis, B. J., Horn, A. J., Carter, C. S., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2021) Developmental programming of oxytocin through variation in early-life stress: Four meta-analyses and a theoretical reinterpretation. *Clinical Psychology Review*, 86, 101985.

<sup>843</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2018) Oxytocin and human sensitive and protective parenting. *Current Topics in Behavioral Neurosciences*, 35, 421–448.



award was called on to also fund many other aspects of the group's research programmes. Yet the proof-of-concept studies provided the basis for a successful grant application by Bakermans-Kranenburg, who won an Advanced Grant in 2015 from the European Research Council (2.5m Euros), the most competitive and prestigious award in Europe. The grant was entitled 'Father Trials: Hormonal and behavioral experiments on prenatal and postnatal parenting' and included a series of randomized trials on men in the transition to parenthood. Work on the grant started in Leiden, and later moved with Bakermans-Kranenburg to VU Amsterdam.

In a 2022 paper from this research, Witte and colleagues investigated the effects of intranasal administration of two hormones, oxytocin and vasopressin, on neural reactivity to infant cry sounds in 70 first-time fathers in the first year of fatherhood.<sup>844</sup> Both hormones had been associated in previous studies with pair bonding and parental caregiving. Vasopressin has been proposed to have an especially important role for men, as vasopressin synthesis is modulated by testosterone. Witte and colleagues examined fathers' neural reactivity to infant cry sounds using fMRI, and participants were asked to complete self-report measures of experience of harsh discipline and love withdrawal in their own childhood. Witte and colleagues found decreased amygdala activation in response to the cry sounds in both the oxytocin and vasopressin conditions, suggesting reduced anxiety or aversion to the infant cry, which might pave the way for a sensitive response.<sup>845</sup> Importantly, participants' self-report of their perception of the cry sounds, in terms of urgency and sadness, did not show significant effects for oxytocin or vasopressin.<sup>846</sup>

With such studies, the early work of Bakermans-Kranenburg and collaborators on oxytocin has entered a new chapter, with access to larger samples and extending to other related hormones. Other recent work by Bakermans-Kranenburg has begun to examine the interaction between different hormones and effects on caregiving behaviour.<sup>847</sup> Part of the interest in this work is the possibility of unpicking some of the neuroendocrinal factors that are involved in sensitive care, attentive to the ways that individuals' past and present situation may moderate these effects.<sup>848</sup> An important working hypothesis, emerging from these studies of men in the transition to parenthood, is that whereas for mothers neurobiological changes during pregnancy precede caregiving behaviour, for fathers the order seems to be reverse: taking care of the infant and time spent with the child may induce hormonal and neural changes.<sup>849</sup> In line with Gettler's work on testosterone levels in fathers, Bakermans-Kranenburg concluded that it does not matter whether you *are* a father, but

<sup>844</sup> Witte, A. M., Riem, M. M., Van der Knaap, N., de Moor, M. H., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2022) The effects of oxytocin and vasopressin administration on fathers' neural responses to infant crying: A randomized controlled within-subject study. *Psychoneuroendocrinology*, 140, 105731.

<sup>845</sup> See also Riem, M. M., Bakermans-Kranenburg, M. J., Pieper, S., Tops, M., Boksem, M. A., Vermeiren, R. R., ... & Rombouts, S. A. (2011) Oxytocin modulates amygdala, insula, and inferior frontal gyrus responses to infant crying: A randomized controlled trial. *Biological Psychiatry*, 70(3), 291–297.

<sup>846</sup> Mothers' electrophysiological, subjective, and observed responding to infant crying were not significantly associated also in Groh, A. M., Roisman, G. I., Haydon, K. C., Bost, K., McElwain, N., Garcia, L., & Hester, C. (2015) Mothers' electrophysiological, subjective, and observed emotional responding to infant crying: The role of secure base script knowledge. *Development and Psychopathology*, 27(4.1), 1237–1250.

<sup>847</sup> Lotz, A. M., Buisman, R. S. M., Alyousefi-van Dijk, K., Witte, A. M., Bakermans-Kranenburg, M. J., & Verhees, M. W. F. T. (2022) Exploring the role of endocrine factors in sensitive parenting in men. *Hormones and Behavior*, 140, 105118.

<sup>848</sup> Feldman, R. & Bakermans-Kranenburg, M. J. (2017) Oxytocin: A parenting hormone. *Current Opinion in Psychology*, 15, 13–18.

<sup>849</sup> Horstman, L. I., Riem, M. M., Alyousefi-van Dijk, K., Lotz, A. M., & Bakermans-Kranenburg, M. J. (2021) Fathers' involvement in early childcare is associated with amygdala resting-state connectivity. *Social Cognitive and Affective Neuroscience*, 17, 198–205.

what you *do* as a father.<sup>850</sup> To date, results from her work paint an intriguing picture of the role of hormones, but already clearly signal the fruitfulness of the research agenda.

## Generation R

Until Bakermans-Kranenburg's ERC grant, much of the research on oxytocin by the Leiden group was with small samples. The within-subject experimental designs offered some mitigation. However, 'most of these studies—and this is true for studies on oxytocin more general—include a small to modest number of subjects and thus are seriously underpowered, which implies a high risk for publication bias and nonreplicability'.<sup>851</sup> This was often the case for research using biomedical measures by attachment researchers, as for instance with the use of such measures with Lyons-Ruth's Harvard sample (Chapter 2).

As well as the scientific risk of false positive and false negative results, there was a major reputational problem. The addition of biomedical measures to existing samples from attachment research, or the use of new small samples, ran the risk of leaving the attachment community on the outside, as a backwater, with difficulty finding the scientific credibility and funding to sustain itself. A solution was to include of observational attachment measures in a subsample of a larger biomedical cohort study. This approach was adopted by Van IJzendoorn, who, together with Bakermans-Kranenburg, contributed to the setting up of a major new cohort study, Generation R.

Nearly 10,000 Rotterdam families were enrolled in the study, which focused on disease and physical health, but with secondary interests in behavioural and cognitive development. A focus sample of around 800 families was seen in the Strange Situation with their mothers at 14 months, and maternal and paternal sensitivity coded at 14 months and 3 years. Mothers in the focus sample reported on their mental health, and experiences of maltreatment in their own childhood.<sup>852</sup> Over 4,000 mothers were also asked to complete a survey about harsh parenting behaviours at three years.<sup>853</sup> Generation R sits within the EAGLE consortium of 20 population-based cohorts with extensive and often convergent biomedical measures (in total around 38,500 participants).<sup>854</sup>

In genre terms, this was akin to a heist. The interest and resource attracted by biomedicine were raided by Van IJzendoorn for the supplies to give attachment research a chance to show the scientific community its right to survive, demonstrating its distinct

<sup>850</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn M. H. (2022) Fathers' brains: Ready to jump into fatherhood? Paper presented at Parental Brain 2022, the 7th International Meeting on the Neuroscience of Parenting, St. Malo, France (16–18 May). See also Gettler, L. T., McDade, T. W., Feranil, A. B., & Kuzawa, C. W. (2011) Longitudinal evidence that fatherhood decreases testosterone in human males. *Proceedings of the National Academy of Sciences of the United States of America*, 108(39), 16,194–16,199.

<sup>851</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2018) Oxytocin and human sensitive and protective parenting. *Current Topics in Behavioral Neurosciences*, 35, 421–448, p. 445.

<sup>852</sup> Bravo, P., Van IJzendoorn, M., & Jansen, P. (2024) Longitudinal association of Maternal childhood maltreatment and offspring emotional and behavioral problems in childhood: Are infant attachment and family components the linking mechanisms? Poster presented at the International Attachment Conference, Rouen, France, July 2024. Bravo and colleagues reported that mothers with a history of maltreatment had more mental health problems and were more likely to be part of avoidant child–caregiver dyads. Effects on child internalizing and externalizing difficulties, and family functioning, were mediated by maternal mental health.

<sup>853</sup> Sari, N. P., Van IJzendoorn, M. H., Jansen, P., Bakermans-Kranenburg, M., & Riem, M. M. (2022) Higher levels of harsh parenting during the COVID-19 lockdown in the Netherlands. *Child Maltreatment*, 27(2), 156–162.

<sup>854</sup> Neumann, A., Nolte, I. M., Pappa, I., Ahluwalia, T. S., Pettersson, E., Rodriguez, A., ... & Tiemeier, H. (2022) A genome-wide association study of total child psychiatric problems scores. *PloS One*, 17(8), e0273116.

value and relevance in a sample with an astounding array of biomedical measures. A good illustration is the 2022 paper ‘Maternal psychological problems during pregnancy and child externalizing problems’ by Luo, Pappa, Cecil, Jansen, Van IJzendoorn, and Kok.<sup>855</sup> The study showed that maternal psychological problems influence child behavioural problems in part through children’s difficulties with self-regulation. A polygenic risk score for aggression made an independent contribution to child behavioural problems, with no interaction with self-regulation difficulties. This was, to the letter, Sroufe’s argument in his 1996 book *Emotional Development*.<sup>856</sup> However, Sroufe would never have been in a position to evidence this argument: it required a larger sample than the Minnesota longitudinal sample, and extensive genetic information on mothers and children that he had no wish to collect. His book on *Emotional Development* had seen declining citation and interest.

The integration of attachment research within a wider biomedical cohort study also allowed Van IJzendoorn to influence able younger researchers working on the study. For instance, Irene Pappa, one of the authors of the 2022 paper, originally studied biology and medicine in Athens. In 2011, she came to Rotterdam for a PhD using the Generation R data. Her doctoral supervisors were Tiemeier, Van IJzendoorn, and Bakermans-Kranenburg. In the closing paragraph of her 2015 doctoral thesis, she reflected:

René Descartes (1596–1650) wrote: ‘Archimedes used to demand just one firm and immovable point, in order to shift the entire earth, so I too can hope for great things if I manage to find just one thing, however slight, that is certain and unshakable.’ With somehow similar thoughts, I began the research leading to this PhD thesis, considering that genes could be this ‘firm and immovable point’ on which we can base our understanding of both normal behavior and psychopathology. Now that my PhD thesis is completed, I clearly see that indubitable knowledge does not exist, or has not been found yet. Genes are indeed a starting point, but not enough to explain complex behaviors. Environmental variables should be taken into account.<sup>857</sup>

In turn, the availability of biomedical measures could offer new contributions to attachment research. Van IJzendoorn, Bakermans-Kranenburg, and colleagues have used this data to pursue now classic questions about the possibility of genetic contributions to security in the Strange Situation, capitalizing on the size of the Generation R sample.<sup>858</sup> The dataset has also permitted further inquiry into the physiological correlates of the Strange Situation classifications. A doctoral study by Maartje Luijk examined associations between the Strange Situation classification and infant cortisol stress reactivity and diurnal rhythm at 14 months. Infants from dyads with a resistant classification showed the largest increase in cortisol levels from pre- to post-Strange Situation, suggesting that they experienced the most distress and emotional dysregulation. Whereas most studies of physiological correlates of the Strange Situation in the history of attachment research have had too few

<sup>855</sup> Luo, M., Pappa, I., Cecil, C. A., Jansen, P., Van IJzendoorn, M. H., & Kok, R. (2022) Maternal psychological problems during pregnancy and child externalizing problems: Moderated mediation model with child self-regulated compliance and polygenic risk scores for aggression. *Child Psychiatry & Human Development*, 53(4), 654–666.

<sup>856</sup> Sroufe, L. A. (1996) *Emotional Development*. Cambridge: Cambridge University Press.

<sup>857</sup> Pappa, I. (2015) *Genetica en epigenetica van gedragsproblemen bij kinderen*, unpublished doctoral thesis, Erasmus University Rotterdam, p. 207.

<sup>858</sup> Luijk, M. P., Roisman, G. I., Haltigan, J. D., Tiemeier, H., Booth-LaForce, C., Van IJzendoorn, M. H., ... & Bakermans-Kranenburg, M. J. (2011) Dopaminergic, serotonergic, and oxytonergic candidate genes associated with infant attachment security and disorganization? In search of main and interaction effects. *Journal of Child Psychology and Psychiatry*, 52(12), 1295–1307.

resistant dyads to report confident findings, the large focus subsample of Generation R was of sufficient size to examine this group separately, and document effects convergent with expectations from attachment theory regarding this pattern.

Infants from dyads with a disorganized attachment classification showed a more flattened diurnal cortisol pattern compared to nondisorganized children. A flattened diurnal cortisol pattern is associated with chronic stress experiences (Chapter 2). Van IJzendoorn, Bakermans-Kranenburg, and colleagues proposed that the findings support Main and Hesse's theory that an important pathway to disorganized attachment may be repeated experiences of alarming caregiving. Though they could equally be convergent with Lyons-Ruth's expanded account, in which withdrawal, neglect or other experiences of lack of support for regulation would be associated with disorganized attachment. Luijk and colleagues also found the association between disorganized attachment and flattened diurnal cortisol pattern was limited to those dyads with an alternate insecure classification. Leveraging the large sample, this is one of the few studies to date to report correlates of the different subtypes of disorganized attachment (Chapter 2).

The study by Luijk and colleagues has predominantly interested and been cited by attachment researchers. An example of a study using measures from attachment research in the Generation R data to speak to the wider scientific community is a doctoral study by Jana Runze, supervised by Bakermans-Kranenburg, with additional supervision from Van IJzendoorn and Pappa. Runze and colleagues used data regarding genetic markers associated by previous research with educational outcomes. These markers are thought to be linked to cognitive problem-solving abilities, planning skills, task persistence, and stress regulatory abilities. A previous study by Wertz and colleagues (including Daniel Belsky, son of Jay Belsky; Chapter 3), had documented that these genetic markers were associated in the Dunedin study with a composite observational measure of caregiver cognitive stimulation; warmth and sensitivity; household orderliness chaos; and household safety and tidiness.<sup>859</sup>

In the Generation R sample, Runze and colleagues used a wider set of genetic markers associated by previous studies with both educational and cognitive outcomes. They found associations between these markers and observed caregiver sensitivity at 14 months ( $b = 0.12$ ) and 3 years ( $b = 0.16$ ), controlling for potential covariates such as child sex.<sup>860</sup> The genetic markers generally predictive of educational and income outcomes were found to be more relevant than genetic markers for IQ. These associations held when controlling for (phenotypical measures of) maternal educational level, IQ, and income, suggesting that what was supporting sensitivity was not socioeconomic status, but the *genetic basis for cognitive problem-solving abilities, planning skills, task persistence, and stress regulatory abilities* that contributed to both socioeconomic status and parenting. Following Belsky's process model (Chapter 3), Runze also examined the contribution of these markers in the child to mothers' sensitivity, on the assumption that children with these traits may make sensitive care easier for caregivers. There was no significant effect on mothers' sensitivity of child polygenic markers during infancy (14 months), but such an effect was present during early childhood (3–4 years). It was concluded that: 'child temperament might only begin to exert effects on maternal sensitivity after toddlerhood.'<sup>861</sup>

<sup>859</sup> Wertz, J., Moffitt, T. E., Agnew-Blais, J., Arseneault, L., Belsky, D. W., Corcoran, D. L., ... & Caspi, A. (2020) Using DNA from mothers and children to study parental investment in children's educational attainment. *Child Development*, 91(5), 1745–1761.

<sup>860</sup> Reported by the researchers as a standardized beta.

<sup>861</sup> Runze, J., Bakermans-Kranenburg, M. J., Cecil, C. A., Van IJzendoorn, M. H., & Pappa, I. (2023) The polygenic and reactive nature of observed parenting. *Genes, Brain and Behavior*, 22(6), e12874.

At first sight, these findings might seem to indicate a direct genetic influence on sensitivity. And a conventional set of behavioural genetics researchers might well have come to this conclusion. In their interpretation of the findings, Runze and colleagues hypothesized that the influence of the genetic markers is not direct, but indirect via cognitive problem-solving abilities, planning skills, task persistence, and stress regulatory abilities. This would need to be tested but suggests another set of potential psychosocial factors that impact caregiver sensitivity.

Meta-analytic research has shown that caregiver sensitivity is lower for families facing socioeconomic adversities (Chapter 5). It may be that this association reflects the interference and challenges of socioeconomic pressures to problem-solving abilities, planning skills, task persistence, and stress regulatory abilities in the context of parenting. Furthermore, Runze and colleagues stressed that research with VIPP has demonstrated that ‘interventions can improve parenting behavior without altering genes, by changing the traits, circumstances or behaviors that mediate genetic influences on parenting’. Indeed, some of the effect of VIPP-SD could be mediated via skills such as stress regulatory abilities in the context of parenting interactions.

### Neurological Structure

One of the primary lines of inquiry by Van IJzendoorn, Bakermans-Kranenburg, and colleagues, using the Generation R study, has been to examine the neurological correlates of child-caregiver attachment and caregiver sensitivity. Part of the urgency of this work is that claims about the impact of attachment on the developing brain have received truly considerable hype, especially in popular science books but also in parenting education materials and social policy discourse.<sup>862</sup> Van IJzendoorn and Bakermans-Kranenburg have observed, with some exasperation and humour, that ‘neuroscientific research using EEG or fMRI is tremendously popular with funding agencies, journals, newspapers, and the wider public. This is probably because of the attractively coloured pictures of the brains that seem to disclose the colourful secrets of your inner mental life.’<sup>863</sup>

Yet in fact the number of neuroscientific studies to have used validated observational measures of attachment or caregiving has been modest.<sup>864</sup> Furthermore, studies have

<sup>862</sup> For example Gerhardt, S. (2004) *Why Love Matters: How Affection Shapes a Baby's Brain*. London: Routledge. For discussions see Thornton, D. J. (2011) Neuroscience, affect, and the entrepreneurialization of motherhood. *Communication and Critical/Cultural Studies*, 8(4), 399–424; Edwards, R., Gillies, V., & Horsley, N. (2015) Brain science and early years policy: Hopeful ethos or ‘cruel optimism’? *Critical Social Policy*, 35(2), 167–187; Wall, G. (2018) ‘Love builds brains’: Representations of attachment and children’s brain development in parenting education material. *Sociology of Health & Illness*, 40(3), 395–409; Macvarish, J. (2023) Babies’ brains and parenting policy: The insensitive mother. In E. Lee, J. Bristow, C. Faircloth, & J. Macvarish (eds), *Parenting Culture Studies* (pp. 215–239). New York: Springer.

<sup>863</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 11.

<sup>864</sup> To date, more studies have been conducted using social psychological measures of attachment than measures from the developmental tradition such as the Strange Situation or Adult Attachment Interview. A meta-analysis of the first 12 fMRI studies reported theoretically coherent associations with self-reported attachment styles. An avoidant attachment style was associated with reduced activation of left inferior frontal gyrus when participants were presented with an emotional stimulus. This suggests some inhibition of processing of the emotional stimuli. By contrast, an anxious attachment style was associated with greater activation of the left side of the amygdala, which may suggest greater concern with the emotional stimuli. These findings align with the wider literature using social psychological measures and an assessment of neurological activity, which offers a convergent picture: anxious attachment is associated with neurological activation around vigilance and threat, whereas avoidant attachment is associated with suppression of distress and of social reactivity. Long, M., Verbeke, W.,

often been of populations, such as institutionalized children, who have had very different experiences to children brought up by families, even in maltreating homes.<sup>865</sup> For Van IJzendoorn and Bakermans-Kranenburg, research on attachment, caregiving, and neurological development with the Generation R sample was important for bringing actual empirical evidence to bear against unqualified claims about attachment and the brain. It was also important for drawing attachment research into the high-profile scientific conversation about the brain, and to stake a claim for the value of examining the potential role of psychosocial developmental factors against the current of biomedical neglect of such factors.

Oliveira and Fearon have praised this research agenda as of great value for the study of attachment. Citing work with the Generation R study, they observed: ‘The complexity of the attachment behavioural system means that it would be impossible to locate a single, dedicated attachment circuit—“a bit like trying to find the real artichoke by peeling away all its leaves” (Coan, 2008: 3). Rather, neuroimaging techniques allow us to study the mechanisms involved in the operation of this complex behavioural system. Important progress has been made in this field.’<sup>866</sup>

Doctoral studies by Rianne Kok and Sandra Thijssen, supervised by Van IJzendoorn, Bakermans-Kranenburg, Verhulst, and Tiemeier, examined associations between caregiving and neurological development.<sup>867</sup> Head circumference was assessed at six weeks and brain structure assessed using fMRI measurements at eight years. As mentioned above, maternal and paternal sensitivity were assessed at 14 months and three years.

Kok and colleagues found that higher levels of parental sensitivity in early childhood were significantly associated with larger total brain volume ( $b = 0.15$ ) and grey matter volume ( $b = 0.16$ ) at eight years, controlling for infant head size, gender and child age.<sup>868</sup> Fathers’ sensitivity was no less predictive than mothers’ sensitivity. No significant associations were found between caregiver sensitivity and white matter, amygdala or hippocampal volumes. That is to say, the researchers found no greater specific effect on some subcortical structures than others: the effect was general. This aligned well with findings that have linked caregiver sensitivity to various aspects of development, including cognitive, behavioural, and social development (Chapters 3 and 5).

The results were a huge coup for Van IJzendoorn and Bakermans-Kranenburg. They offered clear evidence that observational measures of child–caregiver interaction could offer impressive prediction of no less a privileged biomedical metric than the total size of children’s brains. It was important validation for the inclusion of such observational measures within the Generation R study. The findings also offered support and qualification for claims about caregiving and the brain: on the one hand, the findings showed that such effects could be seen from both maternal and paternal care; on the other hand, the effects were hardly as strong or specific as boasted by popular science claims about attachment and the brain.

Ein-Dor, T., & Vrtička, P. (2020) A functional neuro-anatomical model of human attachment (NAMA): Insights from first- and second-person social neuroscience. *Cortex*, 126, 281–321.

<sup>865</sup> Sheridan, M. A., Fox, N. A., Zeanah, C. H., McLaughlin, K. A., & Nelson, C. A. (2012) Variation in neural development as a result of exposure to institutionalization early in childhood. *Proceedings of the National Academy of Sciences*, 109(32), 12927–12932.

<sup>866</sup> Oliveira, P. & Fearon, P. (2019) The biological bases of attachment. *Adoption & Fostering*, 43(3), 274–293, citing Coan, J. A. (2008) Toward a neuroscience of attachment. In Cassidy, J. & Shaver, P. R. (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications*. New York: Guilford Press, pp. 241–265.

<sup>867</sup> Kok, R., Thijssen, S., Bakermans-Kranenburg, M. J., Jaddoe, V. W., Verhulst, F. C., White, T., ... & Tiemeier, H. (2015) Normal variation in early parental sensitivity predicts child structural brain development. *Journal of the American Academy of Child & Adolescent Psychiatry*, 54(10), 824–831.

<sup>868</sup> Reported by the researchers as a standardized beta.

While caregiver sensitivity was not associated with the structure or size of the amygdala, it did appear to alter the connection between the amygdala and the medial pre-frontal cortex. The amygdala is understood to be involved in emotional states such as feeling alarmed or anxious; the medial pre-frontal cortex plays a role in the use of cognition in regulating emotions. The researchers found that lower combined parental sensitivity and especially lower maternal sensitivity predicted accelerated connectivity between these two structures.<sup>869</sup>

Thijssen and colleagues reflected that life history theory (Chapter 3) predicts that children facing adversity may prepare for adverse future environments by adopting a ‘fast’ life strategy. Low levels of parental sensitivity may terminate the immature period of the amygdala–medial prefrontal cortex circuit comparatively early, resulting in the capacity to muster strategies for regulation in the context of their attachment relationship, but at the price of long-term self-regulatory potential.<sup>870</sup> In Main’s terms (Chapter 1), children who experience insensitive care may need to develop a conditional strategy, which entails minimizing (avoidance) or intensifying (resistance) attention to attachment-relevant information. Accelerated connectivity between the amygdala and the medial pre-frontal cortex may be part of the neurological architecture facilitating these strategies.

A further doctoral study was undertaken by Andrea Cortes Hidalgo, supervised by Tiemeier, Van IJzendoorn, and Bakermans-Kranenburg.<sup>871</sup> The researchers used both the Generation R study and the Mannheim Study of Children at Risk (N = 179). In both samples, a cumulative measure of childhood adversity<sup>872</sup> was related to smaller cortical grey matter, cerebral white matter, and cerebellar volumes in children. Hidalgo were interested as to whether caregiver sensitivity buffered these effects but found no significant interaction between protective factors and adversity. In fact, after correction for the number of statistical tests, the association was not reduced by any of the potential protective factors measured: temperament, cognition, self-esteem, or friendship quality. Though this latter test may have been underpowered.

Having examined associations between sensitivity and neurological structure, Hidalgo and colleagues looked at associations with Strange Situation classifications.<sup>873</sup> In fact, they found that children with avoidant or resistant attachment patterns did not significantly differ from those who were securely attached in *any* brain outcome. This was an important finding in the context of over-strong claims that have circulated about the relevance of secure attachment for brain development. It is also notable given that, as mentioned earlier, considerable differences were observed in neurological development associated with caregiver sensitivity.

<sup>869</sup> Thijssen, S., Muetzel, R. L., Bakermans-Kranenburg, M. J., Jaddoe, V. W., Tiemeier, H., Verhulst, F. C., ... & Van IJzendoorn, M. H. (2017) Insensitive parenting may accelerate the development of the amygdala–medial prefrontal cortex circuit. *Development & Psychopathology*, 29(2), 505–518.

<sup>870</sup> See also Manning, L. G., Davies, P. T., & Cicchetti, D. (2014) Interparental violence and childhood adjustment: How and why maternal sensitivity is a protective factor. *Child Development*, 85, 2263–2278.

<sup>871</sup> Hidalgo, A. P. C., Tiemeier, H., Metcalf, S. A., Monninger, M., Meyer-Lindenberg, A., Aggensteiner, P. M., ... & Holz, N. E. (2022) No robust evidence for an interaction between early-life adversity and protective factors on global and regional brain volumes. *Developmental Cognitive Neuroscience*, 58, 101166.

<sup>872</sup> Twelve items: early parenthood, one-parent family at child birth, unwanted pregnancy, parental psychopathology, poverty, parent’s death, family relationship problems, parental divorce/separation, unemployment, physical abuse, psychological abuse, and sexual abuse.

<sup>873</sup> Hidalgo, A. P. C., Muetzel, R., Luijk, M. P., Bakermans-Kranenburg, M. J., El Marroun, H., Vernooij, M. W., ... & Tiemeier, H. (2019) Observed infant–parent attachment and brain morphology in middle childhood—A population-based study. *Developmental Cognitive Neuroscience*, 40, 100724.



For children classified as showing disorganized attachment in infancy, by age 10 participants showed significantly larger hippocampal volume, on both the left and right side. This finding remained robust when controlling for the child's IQ and emotional and behavioural problems. There were no other associations for disorganized attachment with specific or global brain measures. The reasons why disorganized attachment and childhood trauma would be associated with a larger, rather than a smaller, hippocampus remain a current concern (see also [Chapter 2](#)). Again, Van IJzendoorn, Bakermans-Kranenburg, and colleagues have pointed out that life history theory would suggest that adverse experiences promote an accelerated development of the hippocampus, which would develop more gradually, and effectively, in typically developing children.

This might suggest that childhood adversity contributes to initial hippocampal growth, but smaller size in the long-term. Evidence for such a conclusion comes from a study by Van IJzendoorn and collaborators from a study with 21 adolescents with trauma symptoms related to childhood sexual abuse, 28 adolescents with anxiety and/or depression, and 25 nonclinical adolescents.<sup>874</sup> The AAI and an fMRI were conducted with these adolescents.<sup>875</sup> There was a considerable association between unresolved states of mind on the AAI and smaller left hippocampal volume ( $r = 0.48$ ).<sup>876</sup> In another sample of 44 women, unresolved states of mind was not associated with hippocampal volume.<sup>877</sup> With the small samples, and discrepant findings, further research will be needed to be able to see the pattern.

Overall, research with the Generation R sample has provided important evidence regarding the relevance of the child-caregiver attachment relationship for neurological development. Against the low prestige of observational measures within the biomedical science community, the work by Van IJzendoorn, Bakermans-Kranenburg, and collaborators with the Generation R sample has shown that infant disorganized attachment and caregiver sensitivity have considerable relevance and predictive power. In the context of overblown popular science claims about attachment and the brain, they have also reported that caregiver sensitivity does not significantly buffer associations between adversity and neurological development; and that infant insecure attachment does not significantly predict later neurological development. The Generation R sample is now in late adolescence, and data collection remains ongoing. No doubt there will be more to learn about human development from the embedded measures of attachment and caregiving in this major biomedical cohort study.

<sup>874</sup> Van Hoof, M. J., Van Lang, N. D. J., Speekenbrink, S., Van IJzendoorn, M. H., & Vermeiren, R. R. J. M. (2015) Adult Attachment Interview differentiates adolescents with childhood sexual abuse from those with clinical depression and non-clinical controls. *Attachment & Human Development*, 17, 354–375.

<sup>875</sup> Van Hoof, M. J., Riem, M., Garrett, A., Pannekoek, N., van der Wee, N., Van IJzendoorn, M., & Vermeiren, R. (2019) Unresolved-disorganized attachment is associated with smaller hippocampus and increased functional connectivity beyond psychopathology. *Journal of Traumatic Stress*, 32(5), 742–752.

<sup>876</sup> Other changes included: a higher level of functional connectivity between the hippocampus and the middle temporal gyrus and lateral occipital cortex, higher functional connectivity between the left amygdala and the left lateral occipital cortex, precuneus, and superior parietal lobule; and reduced left amygdala-medial frontal cortex connectivity. Van Hoof, M. J., Riem, M. M., Garrett, A. S., van der Wee, N. J., Van IJzendoorn, M. H., & Vermeiren, R. R. M. (2019) Unresolved-disorganized attachment adjusted for a general psychopathology factor associated with atypical amygdala resting-state functional connectivity. *European Journal of Psychotraumatology*, 10(1), 1583525.

<sup>877</sup> Riem, M. M., Alink, L. R., Out, D., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2015) Beating the brain about abuse: Empirical and meta-analytic studies of the association between maltreatment and hippocampal volume across childhood and adolescence. *Development and Psychopathology*, 27(2), 507–520.



## Scientific Progress

### Attachment Research 2.0

In a 2021 article and a chapter of their 2024 book *Matters of Significance*, Van IJzendoorn and Bakermans-Kranenburg offered an account of the state of attachment research, revisiting and updating Van IJzendoorn's 1987 account in *Attachment in Social Networks* of attachment research as a Lakatosian research programme.<sup>878</sup> Van IJzendoorn and Bakermans-Kranenburg observed that upheaval was again on the horizon for the study of attachment. Attachment research could choose a path to exhaustion, continuing as it had. Or it could embrace a transformation, one that Van IJzendoorn and Bakermans-Kranenburg, in their own work, had attempted to pursue. They termed this Attachment Research 2.0.

In 1987, Van IJzendoorn had felt that the work of Mary Main offered the prospect of rejuvenating attachment research and saving it from exhaustion. In 1987, Van IJzendoorn was writing as something of an outsider to the US-centric attachment research community, even offering criticism of the tendency of this community to maintain consensus through exclusion of critics such as Michael Lamb. In the 2020s, Van IJzendoorn and Bakermans-Kranenburg were writing following decades of care and advocacy for attachment research, having played a critical role in the life of the paradigm in the Netherlands and internationally.

Fonagy and Campbell, in a 2015 article, had also prophesized that attachment research was becoming exhausted.<sup>879</sup> By this point, Fonagy and colleagues had generally moved on from attachment research as a primary concern; attachment was one part of their work, but not central to their academic identities. By contrast, part of the significance and valence of Van IJzendoorn and Bakermans-Kranenburg's claims comes from their staunch and prominent public identification of themselves as attachment researchers.

Moreover, Van IJzendoorn and Bakermans-Kranenburg have served as caretakers for attachment theory, alert to signals regarding its needs, and proactive in attempting to respond to these signals. Though this caretaking has perhaps been more in the role of safe haven than secure base, given their acute awareness of what will happen to a research paradigm when it starts stumbling about, drunk on research in the context of discovery, without access to replication and synthesis of dependable knowledge.<sup>880</sup> They have conducted trainings in attachment measures to increase their accessibility to global researchers, and contributed to the research of many other groups internationally by coding their Strange Situations, Adult Attachment Interviews, and observations of caregiver sensitivity. When criticism has been offered of attachment research generally, and Main's theory or methods in particular, Van IJzendoorn has repeatedly jumped to the defence (e.g., in the debate with Fox, discussed earlier). As such, when Van IJzendoorn and Bakermans-Kranenburg considered whether attachment research had a future, and if so in what form, these were questions of deep personal significance.

<sup>878</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2021) Replication crisis lost in translation? On translational caution and premature applications of attachment theory. *Attachment & Human Development*, 23(4), 422–437.

<sup>879</sup> For example, Fonagy, P., & Campbell, C. (2015) Bad blood revisited: Attachment and psychoanalysis, 2015. *British Journal of Psychotherapy*, 31(2), 229–250.

<sup>880</sup> On caregiving behaviour directed towards theories, see Higgins, E. T. (2004) Making a theory useful: Lessons handed down. *Personality and Social Psychology Review*, 8(2), 138–145: 'Neither spoil nor abuse the theory; neither neglect nor abandon it; support and nurture the theory; don't overprotect it but do defend it; be patient with the theory—don't push it too hard or too fast; and finally, don't forget to love and enjoy it' (138).

In their 2021 article and 2024 chapter, they considered four domains: the *content of the study of attachment*, the *methodology* used, the characteristic modes of *communication*, and the *relationship between research and practice*. They traced the study of attachment across each of these four domains, from the origins of the study of attachment, to the future. Yet in both 2021 and 2024 the argument is very compressed. Whilst the reason for this compression is not fully clear, it may perhaps reflect both ambivalence and loyalty: a sense of wanting to make the points quietly, to avoid implied criticism of colleagues and downplay what might otherwise be regarded as the sweeping and controversial stakes of their claims. Nonetheless, these texts are helpful to consider: Van IJzendoorn and Bakermans-Kranenburg's reflections on possible futures for attachment research offer insight into the motivations and priorities that have guided their research. Their proposals have also begun to gain traction: advocacy for Attachment Research 2.0 formed the main thrust of Susana Tereno's keynote address to the International Attachment Conference in July 2024.<sup>881</sup>

In terms of the *content of study of attachment*, Van IJzendoorn and Bakermans-Kranenburg acknowledged the origins of this content in Bowlby's initial theory. Some aspects of this theory have stood the test of repeated empirical studies, such as the importance of safe haven availability for child development and mental health, and that perceptions of this availability are shaped by experiences of care. However, even these ideas have been qualified. For instance, research on differential susceptibility has suggested that perceptions of the availability of caregivers may be impacted by factors, including the contribution of genetics, that shape how experiences are interpreted. Other aspects of Bowlby's theory have been superseded. Among the latter category might be included Bowlby's control systems theory, his focus on the mother as attachment figure at the expense of attachment networks, and vague concept of internal working models to which Bowlby also assigned too much causal influence.

As in Van IJzendoorn's 1987 chapter, Van IJzendoorn and Bakermans-Kranenburg characterized attachment research as having become an empirical paradigm with Ainsworth's contributions. Yet they described these contributions as having 'diminishing returns'.<sup>882</sup> While Van IJzendoorn has from the start been open about strengths and limitations of Ainsworth's work, this is his most forthright public statement to date signalling that it may be that Ainsworth's theory and methods may have less to teach us now. For Van IJzendoorn and Bakermans-Kranenburg, their lessons should be incorporated into new theoretical and methodological proposals, especially perhaps where these might be integrated into experimental designs.<sup>883</sup>

Evidence of the contemporary exhaustion of attachment research, Van IJzendoorn and Bakermans-Kranenburg suggested, could be seen in the 'cumulation of anomalies' in the

<sup>881</sup> Tereno, S. (2024) Attachment theory and research: Some ideas to face challenges in the new century. Keynote address to the International Attachment Conference, Rouen, France, July 2024.

<sup>882</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2021) Replication crisis lost in translation? On translational caution and premature applications of attachment theory. *Attachment & Human Development*, 23(4), 422–437, Figure 3.

<sup>883</sup> An example of such methodological innovation might be the Leiden Infant Simulator Sensitivity Assessment. See for example Voorthuis, A., Out, D., van der Veen, R., Bhandari, R., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2013) One doll fits all: validation of the Leiden Infant Simulator Sensitivity Assessment (LISSA). *Attachment & Human Development*, 15(5–6), 603–617; Kaźmierczak, M., Pawlicka, P., Anikiej-Wiczenbach, P., Łada-Maśko, A., Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2024) Couples' empathy and sensitive responsiveness to a crying baby simulator. *Journal of Social and Personal Relationships*, 02654075241240078.

course of replication studies.<sup>884</sup> The example they provided for this exhaustion is quite a shock: Verhage and colleagues' 2016 meta-analysis on the transmission gap, on which Van IJzendoorn and Bakermans-Kranenburg were co-authors. The paper reflects the maturity of attachment research in affirming associations between the AAI and Strange Situation, as anticipated by Main, and the basic generativity and validity of connections between these measures. It replicated in a much larger set of studies the existence of a transmission gap as proposed in Van IJzendoorn's 1995 meta-analysis, but also made new contributions in showing that associations were moderated by risk status of the sample, biological relatedness of child-caregiver dyads, and age of the children.

Verhage and colleagues' 2016 meta-analysis represents an impressive culmination of the research agenda prompted by Main's work and Van IJzendoorn's quantification of a 'transmission gap'. However, for Van IJzendoorn and Bakermans-Kranenburg, it also signalled that this agenda might be reaching diminishing marginal returns. Of course, some value could come from continued inquiry using the AAI and Strange Situation, looking at their association and mediating mechanisms. For example, Van IJzendoorn and Bakermans-Kranenburg have made available the protocol for a new study looking at IQ as a possible contributor to this association.<sup>885</sup> Still, it seems that Van IJzendoorn and Bakermans-Kranenburg do not anticipate major new discoveries from such work. It might be of interest to attachment researchers but perhaps of limited interest to the wider scientific community.

Going beyond the current state-of-the-art would mean developing new designs and new data collection methods (across labs and countries) instead of continuing to exhaust pooled data or meta-analysis of existing published research. Such work may continue to provide new findings and insights. But according to Van IJzendoorn and Bakermans-Kranenburg, the attachment research community should make plans looking forward for going beyond this charted territory into new domains. In their view, such work would adopt a more causal and mechanistic approach, such as experiments and Mendelian randomization studies.<sup>886</sup>

Van IJzendoorn and Bakermans-Kranenburg call for 'Attachment Research 2.0'. In this, concern with attachment would take its place within a broader interdisciplinary framework. Attachment research would lose its tendencies towards parochialism, insularity, and vague, untestable, plausible claims. It would no longer be acceptable for researchers to use the AAI without a reasonable sense of what was being measured, or how to bring this into dialogue with developments in other areas of science; perhaps this stance can be seen in Van IJzendoorn and Bakermans-Kranenburg's growing focus on the secure base script approach. Methodological, theoretical, and statistical innovations from other areas of science would not be drawn upon occasionally, but routinely and pervasively. Research on attachment relationships would abandon populism and overclaiming the implications of single studies, with premature translation into practice. Instead, it would refocus on translation of knowledge secured by careful replication. Old enmities, for instance, against biomedical measures, research on temperament, or social learning theory, would be accepted as outdated and a hinderance.

<sup>884</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2021) Replication crisis lost in translation? On translational caution and premature applications of attachment theory. *Attachment & Human Development*, 23(4), 422–437, Figure 3.

<sup>885</sup> Bakermans-Kranenburg, M.J., Van IJzendoorn, M.H., Pappa, I., Runze, J., & Witte, A. M. (2023) Intergenerational transmission of attachment: The role of intelligence. *OSF*, <https://osf.io/etb47> This research has been in response to a provocation by Del Giudice, M., & Haltigan, J. D. (2023). A new look at the relations between attachment and intelligence. *Developmental Review*, 67, 101054.

<sup>886</sup> For example, Warrier, V., Kwong, A. S., Luo, M., Dalvie, S., Croft, J., Sallis, H. M., ... & Cecil, C. A. (2021) Gene-environment correlations and causal effects of childhood maltreatment on physical and mental health: A genetically informed approach. *The Lancet Psychiatry*, 8(5), 373–386.

Van IJzendoorn and Bakermans-Kranenburg also traced the history of the *methodology of attachment research*. They start here with work by the Minnesota group establishing correlates of the Strange Situation classifications, initiating the first longitudinal study of the implications of early attachment relationships. The methodology of attachment research was rejuvenated by the contributions of Main and Berkeley colleagues. Interestingly, in the 2021 paper, the example they give of the methodology of attachment research achieving maturity is Roisman and colleagues' study using an experimental design to investigate the mechanisms underpinning the AAI categories, and specifically potential differences between secure/autonomous speakers who report generally positive or generally negative childhoods.<sup>887</sup> Hesse disapproved of this research, which seemed to him to question the AAI.<sup>888</sup> With quite a different evaluation, for Van IJzendoorn and Bakermans-Kranenburg, the empirical work of Roisman and colleagues was exemplary, illustrating the important attention that can be given to questions of mechanism once methods have reached a threshold of validation.

All the same, Van IJzendoorn and Bakermans-Kranenburg reflected that the methodology of attachment research, like its content, risks exhaustion. In the 2021 paper, an example they give is a 2014 article by Padrón, Carlson, and Sroufe, recommending that researchers distinguish within the disorganized classification between behaviours that are confused or conflicted, and those that reflect apprehension towards the caregiver.<sup>889</sup> As we saw in [Chapter 1](#), the coding system for infant disorganized attachment remains a sketch. It is feasible but difficult to use, and—globally—there are few reliable coders. Little psychometric research has ever been conducted on the disorganized attachment category. Lyons-Ruth and Jacobvitz argued that the disorganized attachment classification should be revalidated to include just those elements that predict developmental risk ([Chapter 2](#)).

For Van IJzendoorn and Bakermans-Kranenburg, dependable knowledge requires continuity or commensurability of measures used by researchers. In their view, dissatisfaction with the current state of the disorganized classification, if this is felt, should be expressed in ways that do not hinder the capacity for meta-analytic synthesis. It is also not the pressing issue. More pressing problems are that there are few reliable coders (the category could simply 'run out of gasoline' if there are no coders); no evidence that coders can reliably distinguish conflict/confusion from apprehension; and 'too many unsettled theoretical and empirical questions' such that attempts to refine the category, ultimately, risk diminishing marginal returns.<sup>890</sup> Furthermore, the adequacy of the disorganized attachment classification has an 'auxiliary' status: the ultimate contribution of the ideas of attachment theory do not stand or fall on how questions of how to measure disorganization.<sup>891</sup>

<sup>887</sup> Roisman, G. I., Fortuna, K., & Holland, A. (2006) An experimental manipulation of retrospectively defined earned and continuous attachment security. *Child Development*, 77(1), 59–71.

<sup>888</sup> Hesse, E. (2016) The Adult Attachment Interview: Protocol, method of analysis, and selected empirical studies: 1985–2015. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications*, (3rd ed., pp. 553–597). New York: Guilford.

<sup>889</sup> Padrón, E., Carlson, E. A., & Sroufe, L. A. (2014) Frightened versus not frightened disorganized infant attachment: Newborn characteristics and maternal caregiving. *American Journal of Orthopsychiatry*, 84(2), 201–208.

<sup>890</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2019) Finding order in disorder? SEAS SRCD Pre-conference Symposium on Partners in Attachment Research Baltimore, 20 March 2019: 'If we run out of gasoline: additional questions keeping me awake. How to set up robust training for D? How to create a feasible and valid D reliability test? What are neurobiological markers of D? Why is the D classification emphasized instead of the D rating scale?'

<sup>891</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2021) Replication crisis lost in translation? On translational caution and premature applications of attachment theory. *Attachment & Human Development*, 23(4), 422–437, p. 424.

Rather than attempt to fine-tune existing methods, Van IJzendoorn and Bakermans-Kranenburg suggested that Attachment Research 2.0 would transition to a profoundly different approach. The methodology for the study of attachment would move away from individual laboratories producing papers based on small studies about how children's care influences their attachment behaviour or their attachment behaviour influences their outcomes, with little new knowledge entering or exiting this area of study. Instead, attachment theory would be absorbed as a valued component within a broader interdisciplinary framework. Van IJzendoorn and Bakermans-Kranenburg envisaged international consortia, with pooled data, with sufficient statistical power to understand both the contextual moderators of how child-caregiver relationships function and their underpinning mechanisms within this interdisciplinary framework.<sup>892</sup> This approach would permit study of secure base/safe haven networks in their diversity and contextual embeddedness, something not possible for meta-analytic research synthesizing existing attachment research.<sup>893</sup> Though Van IJzendoorn and Bakermans-Kranenburg are mindful that the incentives and career structures of contemporary academia, where individual ownership and the appearance of sovereignty are rewarded, may unfortunately direct researchers away from such collaborative consortia and collective forms of inquiry.

Or to take another example: over the past 15 years, Bakermans-Kranenburg and Van IJzendoorn have given attention to protective parenting or its absence, leaving aside research on alarming caregiver behaviours. They have taken inspiration from Bowlby's definition of attachment as the inborn bias of human infants to seek proximity to a protective caregiver in times of stress, distress, illness, and other physical or psychological discomfort.<sup>894</sup> Thompson and Goldberg had argued that confidence in caregiver protection represented the central dimension of care relevant to child-caregiver attachment.<sup>895</sup> Additionally, Bakermans-Kranenburg and Van IJzendoorn appear to regard protective parenting as a construct that more readily opens out to a wider scientific conversation, perhaps especially with the ethological and animal behaviour literature that first made possible the development of attachment theory.<sup>896</sup> Their concern with protective parenting exceeds

<sup>892</sup> Cf. Frank, M. C., Bergelson, E., Bergmann, C., Cristia, A., Floccia, C., Gervain, J., ... & Lew-Williams, C. (2017) A collaborative approach to infant research: Promoting reproducibility, best practices, and theory-building. *Infancy*, 22, 421–435; Uhlmann, E. L., Ebersole, C. R., Chartier, C. R., Errington, T. M., Kidwell, M. C., Lai, C. K., ... & Nosek, B. A. (2019) Scientific utopia III: Crowdsourcing science. *Perspectives on Psychological Science*, 14, 711–733.

<sup>893</sup> Bakermans-Kranenburg, M. J. (2021) The limits of the attachment network. *New Directions for Child and Adolescent Development*, 2021(180), 117–124. On the possibilities and limits of meta-analysis of existing research for the study of attachment networks, see Dagan, O. & Sagi-Schwartz, A. (2021) Early attachment networks to multiple caregivers: History, assessment models, and future research recommendations. *New Directions for Child and Adolescent Development*, 2021(180), 9–19; Dagan, O., Schuengel, C., Verhage, M. L., Van IJzendoorn, M. H., Sagi-Schwartz, A., Madigan, S., ... & Collaboration on Attachment to Multiple Parents and Outcomes Synthesis. (2021) Configurations of mother-child and father-child attachment as predictors of internalizing and externalizing behavioral problems: An individual participant data (IPD) meta-analysis. *New Directions for Child and Adolescent Development*, 2021(180), 67–94.

<sup>894</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2018) Oxytocin and human sensitive and protective parenting. In R. Hurlmann & V. Grinevich (eds), *Behavioral Pharmacology of Neuropeptides: Oxytocin*. *Current Topics in Behavioral Neurosciences*, vol. 35, 421–448.

<sup>895</sup> Thompson, R. A. (1997) Sensitivity and security: New questions to ponder. *Child Development*, 68 (4), 595–597; Goldberg, S., Grusec, J. E., & Jenkins, J. M. (1999) Confidence in protection: Arguments for a narrow definition of attachment. *Journal of Family Psychology*, 13(4), 475–483. See for example Mah, B. L., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Smith, R. (2015) Oxytocin promotes protective behavior in depressed mothers: A pilot study with the enthusiastic stranger paradigm. *Depression and Anxiety*, 32(2), 76–81; Riem, M. M. E., Witte, A., Lotz, A. M., Cima, M., H. Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2023) Parental protection in fathers with negative caregiving experiences: Heightened amygdala reactivity to infant threatening situations. *Journal of Neuroendocrinology*, 35, 7, 13230.

<sup>896</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2017) Protective parenting: Neurobiological and behavioral dimensions. *Current Opinion in Psychology*, 15, 45–49; Bakermans-Kranenburg, M. J. & Van

the 'grid of specification' laid down by the Strange Situation categories (Chapter 1), and no attempt has been made by Bakermans-Kranenburg and Van IJzendoorn to retether it by examining associations with alarming caregiving or the Strange Situation. It is one instance in which the grid of specification established following Main's work seems to be slipping within attachment research, even for some of her closest allies.

For decades, Van IJzendoorn and Bakermans-Kranenburg have been prominent advocates for Main's work, and argued against adaptations to her methods in the absence of material evidence of incremental validity.<sup>897</sup> However, in their characterization of Attachment Research 2.0, they appear to be proposing that methods like the Strange Situation and the AAI may have served their function, and that priority should now be given to pursuing the insights they have offered using other research tools, better able to sustain a dialogue between the study of attachment and the study of other problems in the sciences. Or at least validate automatized coding algorithms to reduce the resource they require and improve their usability. As things stand, work with attachment measures faces a considerable risk of 'fading into a small niche in an ever more expansive domain of large-scale basic and applied developmental psychopathology research'.<sup>898</sup>

Just as clinical diagnostic categories may be superseded by the development of a more incisive and underpinning 'general psychopathology factor',<sup>899</sup> Van IJzendoorn and Bakermans-Kranenburg have wondered whether attachment research could benefit from concern with a 'general parenting factor'. Martini and colleagues have suggested that this general factor is, in fact, sensitivity.<sup>900</sup> Attention to different forms of insecurity would then be reserved only when specific hypotheses warrant this level of granularity and when the reliability of such granular measurements has been established.<sup>901</sup>

Rather than remain caught in a leg-trap by their traditional methodologies, attachment researchers should seek to supersede the Strange Situation:

We anticipate that further investigation, including the use of machine learning approaches and/or wearable technologies, validated through comparison with existing approaches, may eventually allow us to pick out these mechanisms more sharply, strengthening continuous attachment ratings, pruning the coding systems and permitting their automation. In turn, this sharper articulation of underlying mechanisms by the coding system can be anticipated to support greater dialogue with other disciplines and achieve improved

IJzendoorn, M. H. (2018) Oxytocin and human sensitive and protective parenting. *Current Topics in Behavioral Neurosciences*, 35, 421–448.

<sup>897</sup> For example, Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2014) Confined quest for continuity: The categorical versus continuous nature of attachment. *Monographs of the Society for Research in Child Development*, 79(3), 157–167.

<sup>898</sup> Bakermans-Kranenburg, M. J., Dagan, O., Cárcamo, R. A., & Van IJzendoorn, M. H. (2024) Celebrating more than 26,000 Adult Attachment Interviews: Mapping the main adult attachment classifications on personal, social, and clinical status. *Attachment & Human Development*, forthcoming.

<sup>899</sup> Sallis, H., Szekely, E., Neumann, A., Jolicoeur-Martineau, A., Van IJzendoorn, M., Hillegers, M., ... & Evans, J. (2019) General psychopathology, internalising and externalising in children and functional outcomes in late adolescence. *Journal of Child Psychology and Psychiatry*, 60(11), 1183–1190; Neumann, A., Muetzel, R. L., Lahey, B. B., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Jaddoe, V. W., ... & Tiemeier, H. (2020) White matter microstructure and the general psychopathology factor in children. *Journal of the American Academy of Child & Adolescent Psychiatry*, 59(11), 1285–1296.

<sup>900</sup> Martini, J., Wade, M., Prime, H., & Jenkins, J. (2024) Dimensions of parenting during infancy: Testing a latent bifactor model. *Social Development*, e12763.

<sup>901</sup> Van IJzendoorn, M. H. (2019) Toward a general psychopathology and a general parenting factor. Universidad Autonoma de Barcelona. Barcelona, 30 September 2019; Cortes Hidalgo, A. P., Thijssen, S., Delaney, S. W., Vernooij, M. W., Jansen, P. W., Bakermans-Kranenburg, M. J., ... & Tiemeier, H. (2022) Harsh parenting and child brain morphology: A population-based study. *Child Maltreatment*, 27(2), 163–173.

prediction of relevant developmental (endo-)phenotypes, benefiting research as well as clinical and policy practice.<sup>902</sup>

In terms of the *characteristic mode of communication* in the study of attachment, Van IJzendoorn and Bakermans-Kranenburg considered the role of unpublished manuscripts, correspondence, and invite-only meetings in the paradigm's early decades. As we saw in [Chapter 1](#), the secure base script approach emerged out of such conversations and circulation of unpublished manuscripts among Ainsworth's circle, only reaching print in Waters and Waters' 2006 article. Ainsworth's sensitivity scale finally became publicly available as late as 2015, in the new edition of *Patterns of Attachment*.<sup>903</sup> Modes of communication that relied on private discussions and close relationships helped sustain and support the nascent attachment research community, though they also contributed to in-group/out-group dynamics.

From the 1980s, especially with the work of the Minnesota group, attachment research achieved a credible place within developmental science, with publications in leading journals like *Child Development*. Researchers outside of Ainsworth's circle, among them Van IJzendoorn, were themselves able to enter into the conversation of attachment research on the basis of publications, using the Strange Situation, in such journals. Van IJzendoorn and Bakermans-Kranenburg noted the growing maturity of attachment research with the establishment of a home journal (*Attachment & Human Development*, 1999–) and compendiums synthesizing research knowledge (*The Handbook of Attachment*, 1999–).<sup>904</sup>

Van IJzendoorn and Bakermans-Kranenburg imply that the direction of communication has been towards somewhat greater public availability. Even if attachment research is regarded by researchers in cognate disciplines as unusually closed off,<sup>905</sup> Van IJzendoorn and Bakermans-Kranenburg perceive movement towards a rather more open community. Yet if attachment research has become more open about its knowledge claims, Van IJzendoorn and Bakermans-Kranenburg believe this is still not enough.

Firstly, the process of attachment research needs to be more transparent. If researchers are left with the freedom to torture their data until it gives up the results they want, there will be an endemic risk of false positive and false negative results. In general, researchers have a great deal of freedom in how to analyse and report data: a study by Botvini-Nezer and colleagues asked 70 independent teams to analyse the same set of neuroimaging data, and every group ultimately decided on a different analytic approach.<sup>906</sup> This is a particular problem in attachment research given that many attachment measures can be analysed in a wide variety of ways: secure vs insecure; three categories; four categories; individual scales.

<sup>902</sup> Madigan, S., Fearon, R. M., Van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J., ... & Verhage, M. L. (2023) The first 20,000 strange situation procedures: A meta-analytic review. *Psychological Bulletin*, 149(1–2), 99–132, p. 120, parentheses suppressed. Karen attributes a position to Van IJzendoorn, presumably from conversation, not stated outright in print: 'Van IJzendoorn has proposed replacing the Strange Situation with observations and neuroendocrine assessments taking place periodically throughout the first years and appraising a variety of challenges and stresses, including moments when the parent will need to discipline.' Karen, R. (2024) *Becoming Attached*, 2nd ed. Oxford: Oxford University Press, p. 362.

<sup>903</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press.

<sup>904</sup> On the *Handbook of Attachment*, see also Kroonenberg, P. M. & Stoltenborgh, M. (2023) Handbooks as a means of mapping a discipline: An exploration of the world of attachment. In A. Okada, K. Shigemasu, R. Yoshino, & S. Yokoyama (eds), *Facets of Behaviormetrics: The 50th Anniversary of the Behaviormetric Society* (pp. 123–143). New York: Springer.

<sup>905</sup> Mann, A., Thompson, M., Foster, S., Beckwith, H., Madigan, S., Fearon, R. P., ... & Duschinsky, R. (2023) The perspectives of senior researchers in applied disciplines on the current state of developmental attachment research: An interview study. *Sage Open*, 13(2), 21582440231179204.

<sup>906</sup> Botvini-Nezer, R., Holzmeister, F., Camerer, C. F., Dreber, A., Huber, J., Johannesson, M., ... & Avesani, P. (2020) Variability in the analysis of a single neuroimaging dataset by many teams. *Nature*, early view.



Instead, studies need to be pre-registered (and before analyses are run, rather than afterwards!). The fruits of empirical studies should be assembled into meta-analytic datasets freely available for researchers and publics to examine and interrogate. Van IJzendoorn and Bakermans-Kranenburg pointed to the work of Schuengel, Verhage, and colleagues at VU Amsterdam (CATS)<sup>907</sup> and Madigan and colleagues at Calgary (CASCADE) in developing the infrastructure for such open research for the study of attachment (Chapter 5).

Secondly, the study of attachment needs to be undertaken within global, interdisciplinary consortia. Research on attachment is all too often limited to a small community, geographically limited in their spread, who seem primarily interested only in learning from each other. Attachment research should aspire to contributing to global consortia interested in broader issues, such as institutional care or infant mental health. In turn, attachment research should aspire to benefit from input from scholars from across disciplines and countries. Van IJzendoorn and Bakermans-Kranenburg did not imply that these cross-disciplinary conversations should be limited to positivist science. They gave the example of the value of citizens assemblies for open communication and mediation between scientists and publics.<sup>908</sup>

Finally, Van IJzendoorn and Bakermans-Kranenburg traced the changing *relationship between research and practice* in the study of attachment. They began with Bowlby's development of attachment theory out of, and as an aide to, his clinical work. On the basis of emergent findings in the 1980s, a few attachment researchers started to offer advice to practitioners about how best to support children and families. However, Van IJzendoorn and Bakermans-Kranenburg observed that, in their view, the misunderstandings and misapplications of attachment theory set in train by Bowlby's popular remarks have meant that attachment researchers generally learnt not to attempt such influence on practice: 'the restraint of most members of the first and second generation in going public is admirable.'<sup>909</sup> That said, they noted that some in the attachment community have still continued to make overblown, populist claims in favour of premature translation, without the due basis for such translation in replicable research findings, ethical arguments, and cost-benefit analysis.

For Van IJzendoorn and Bakermans-Kranenburg, the relationship between research and practice shifted with the development of attachment-based interventions. Many interventions have begun to influence practice. As an illustration, the Circle of Security has become embedded within clinical and child welfare contexts,<sup>910</sup> though Van IJzendoorn and Bakermans-Kranenburg regard the evidence for this intervention as still inadequate, with many small studies, few randomized control trials, a range of outcomes and populations, and mixed results. Van IJzendoorn and Bakermans-Kranenburg urged that applications in practice should not depend on such inadequate evidence. Other interventions, such as

<sup>907</sup> Verhage, M. L., Schuengel, C., Duschinsky, R., Van IJzendoorn, M. H., Fearon, R. P., Madigan, S., ... & Collaboration on Attachment Transmission Synthesis. (2020) The collaboration on attachment transmission synthesis (CATS): A move to the level of individual-participant-data meta-analysis. *Current Directions in Psychological Science*, 29(2), 199–206; Verhage, M. L., Schuengel, C., Holopainen, A., Bakermans-Kranenburg, M. J., Bernier, A., Brown, G. L., ... & Ward, M. J. (2022) Conceptual comparison of constructs as first step in data harmonization: Parental sensitivity, child temperament, and social support as illustrations. *MethodsX*, 9, 101889.

<sup>908</sup> Bakermans-Kranenburg, M. J. & Van IJzendoorn, M. H. (2024) Anything goes for participant, patient and public involvement in youth mental health research. *JCPP Advances*, 2024; e12258.

<sup>909</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2021) Replication crisis lost in translation? On translational caution and premature applications of attachment theory. *Attachment & Human Development*, 23(4), 422–437, p. 431.

<sup>910</sup> Nielsen, B., Oddli, H. W., Slinning, K., & Drozd, F. (2020) Implementation of attachment-based interventions in mental health and social welfare services: Therapist's experiences from the Circle of Security-Virginia Family intervention. *Children and Youth Services Review*, 108, 104550.



Attachment and Biobehavioural Catchup, have a much stronger evidence-base, as does VIPP.<sup>911</sup> A value of such robust evidence is that conclusions can be synthesized about what kinds of interventions may impact caregiver behaviour and child-caregiver attachment, contributing in turn to attachment theory.

Van IJzendoorn and Bakermans-Kranenburg saw an integration of practice and theory in the 2017 consensus statement on disorganized attachment, led by Granqvist and myself, on which they were co-authors.<sup>912</sup> Yet Van IJzendoorn and Bakermans-Kranenburg also characterized the consensus statement as reflecting the potential exhaustion of attachment research. There is considerable scientific consensus about what is and is not known about disorganized attachment, with little sign of bold new hypotheses arising to be tested; the research community seems comparatively settled in what is known and not known about the category, and in the lack of integration of work on disorganized attachment into wider scientific discussions and debates.

Such consensus statements can be valuable. Yet they can also reflect a kind of exhaustion and diminishing marginal returns on existing theory and measures for being able to contribute to practice. Van IJzendoorn and Bakermans-Kranenburg argued for the rejuvenation of attachment research through capitalizing on the capacity of randomized trials to shed light on causal processes. Evaluation of practices should lead future research. With a sharper sense of relevant causal processes, the study of attachment can then make decisive policy-relevant claims—as it has already, for example, in the case of research on institutionalization and its harms to children.

In considering Van IJzendoorn and Bakermans-Kranenburg's characterization of transitions in attachment research, and the prospect of looming exhaustion or rejuvenation, perhaps a relevant frame of reference is Streeck and Thelen's model of institutional change.<sup>913</sup> Streeck and Thelen distinguish four forms of change:

1. Displacement: the removal of existing rules and the introduction of new ones, a form of change predisposed when there is little community discipline and little pressure from the environment.
2. Layering: the introduction of new rules on top of or alongside existing ones, a form of change predisposed when there is considerable community discipline and little pressure from the environment.
3. Drift: the changed impact of existing rules due to shifts in the environment, a form of change predisposed when there is little community discipline and considerable pressure from the environment.
4. Conversion: the changed enactment of existing rules due to their strategic redeployment, a form of change predisposed when there is considerable community discipline and considerable pressure from the environment.

In these terms, much of the history of attachment research to date has been a layering of new theory on to old theory, new methods on to old methods. Or the appearance of such. When Main rerouted attachment research, a variety of means were used to make

<sup>911</sup> Dozier, M. & Bernard, K. (2019) *Coaching Parents of Vulnerable Infants: The Attachment and Biobehavioral Catch-up Approach*. New York: Guilford.

<sup>912</sup> Granqvist, P., Sroufe, L. A., Dozier, M., Hesse, E., Steele, M., Van IJzendoorn, M., ... & Duschinsky, R. (2017) Disorganized attachment in infancy: A review of the phenomenon and its implications for clinicians and policy-makers. *Attachment & Human Development*, 19(6), 534–558.

<sup>913</sup> Streeck, W. & Thelen, K. (eds) (2005) *Beyond Continuity: Institutional Change in Advanced Political Economies*. Oxford: Oxford University Press.

this appear an extension of attachment theory and research to date, even at the price of confusion about the meaning of concepts as fundamental as ‘attachment’ and ‘insecurity’. Existing elements were redeployed or recomposed, their meaning and implications adjusted or, sometimes, outright transformed.<sup>914</sup> The use of a strategy of layering seems to have been motivated much more by an attempt by Main to win acceptance for her work within the attachment research community and express love for Bowlby and Ainsworth (and their ideas), than by an attempt to respond to external pressures facing the attachment research community.

Van IJzendoorn and Bakermans-Kranenburg’s image of Attachment Research 2.0, and their pursuit of this image in their own work, appears to be closer to conversion, with the fruitful elements of Attachment Research 1.0 taken up and redeployed within a broader interdisciplinary framework, organized within international consortia, pursuing a more open mode of communication, and with a changed relationship between research and practice. As we saw earlier, Van IJzendoorn and Bakermans-Kranenburg advocate for a clear division of labour between researchers and stakeholders, in which stakeholders contribute to the goals and questions for research and to deliberations about what implications findings have for policy and practice, but researchers alone should develop hypotheses and generate findings.

In proposing these changes, they seem to acknowledge existing strengths of the attachment research community, but also the existence of considerable pressures on this community in terms of its health and even long-term survival within developmental science. Van IJzendoorn and Bakermans-Kranenburg see the potential for the rejuvenation of the study of attachment to stimulate bidirectional learning between attachment research and wider developments in the sciences, to attract funding and resources, as well as to attract bright young talent.

### Attachment Research and Clinical Practice

Van IJzendoorn has been dismayed by the considerable discrepancy between what clinical and child welfare practitioners believe about attachment theory and research, and the positions of researchers themselves. Attachment forms part of the curriculum in many countries for children’s practitioners. Yet studies have found that practitioners are variously over- and under-confident in their knowledge of attachment, and generally are taught, and understand, little about developments in attachment research after Bowlby and Ainsworth.<sup>915</sup> What knowledge practitioners have of attachment-based interventions has

<sup>914</sup> Cf. Foucault, M. ([1969] 1972) *The Archeology of Knowledge and the Order of Discourse*, trans. A. M. Sheridan Smith. London: Tavistock Press: ‘To say that one discursive formation is substituted for another is not to say that a whole world of absolutely new objects, enunciations, concepts, and theoretical choices emerges fully armed and fully organized in a text that will place that world once and for all; it is to say that a general transformation of relations has occurred, but that it does not necessarily alter all the elements; it is to say that statements are governed by new rules of formation, it is not to say that all objects or concepts, all enunciations or all theoretical choices disappear. On the contrary, one can, on the basis of these new rules, describe and analyse phenomena of continuity, return, and repetition: we must not forget that a rule of formation is neither the determination of an object, nor the characterization of a type of enunciation, nor the form or content of a concept, but the principle of their multiplicity and dispersion. One of these elements—or several of them—may remain identical (preserve the same division, the same characteristics, the same structures), yet belong to different systems of dispersion, and be governed by distinct laws of formation’ (173).

<sup>915</sup> Lesch, E., Deist, M., Booysen, L., & Edwards, E. (2013) South African social workers’ knowledge of attachment theory and their perceptions of attachment relationships in foster care supervision. *Children and Youth*

been found to be inversely associated with the extent of empirical evidence for these interventions. In a qualitative study by Foster, many social workers reported turning away from ideas and findings about attachment, based on a simplified image of attachment theory and research.<sup>916</sup> Similar findings were reported by Smith-Bresky in her study of narrative therapists, who approached attachment theory and research with ‘resistance, hesitation, or concern.’<sup>917</sup>

In a survey by Hammarlund and colleagues, 85% of child protection professionals stated that they formed an opinion about a child’s attachment in all or most of their investigations of the safety of children under the age of one, whereas academics do not believe that attachment relationships are fully formed before 11 months.<sup>918</sup> In the survey conducted by Botes and Ryke, participants reported a strong understanding of attachment theory, with 65% feeling able to identify a child’s attachment pattern, and 59% reporting that their knowledge of attachment theory allows them to effectively support the relationships between children and caregivers. Yet the average score of participants on an assessment of understanding attachment theory, concepts, methods and interventions was 24 out of 100. Only 7% of participants had heard of the Strange Situation procedure.<sup>919</sup> A qualitative study by Tilbury and Tarleton with child welfare and court professionals found a commonly held view that practitioners should *not* be reliable and consistent in their support for struggling families with a parent with an intellectual disability, in case this consistency inadvertently led the child to form an attachment relationship with the professional.<sup>920</sup> Participants assumed, incorrectly, that any additional attachment relationship would be at the expense of the child–mother relationship.<sup>921</sup> A qualitative study by Sales found that foster carers had likewise understood from their training that any attachment relationship a child formed would be at the expense of another, and as such they should limit the child’s contact with their birth family.<sup>922</sup>

Challenges of communication between research and practice are certainly a broader problem for developmental science. Whilst reflecting these broader challenges, the situation has been worse for attachment research, where ideas about attachment, in a cut-price,

*Services Review*, 35(7), 1101–1109; Edwards, R. & Gillies, V. (2019) (M)othering and the politics of early intervention: Biologisation and the reproduction of gendered, classed and raced inequalities. In F. Portier-Le Cocq (ed.), *Motherhood in Contemporary International Perspective: Continuity and Change* (pp. 18–31). London: Routledge; North, G. (2019) Assessing for bruises on the soul: Identifying and evidencing childhood emotional abuse, *Journal of Social Welfare and Family Law*, 41(3), 302–320; Bjerre, L.S., Madsen, O.L., & Petersen, A. (2023) But what are we doing to that baby? Attachment, psy-speak and designed order in social work. *European Journal of Social Work*, 26(1), 54–65.

<sup>916</sup> Foster, S. L. (2023) Attachment and reflective functioning in child welfare assessment: A mixed methods study. Unpublished doctoral thesis, Northumbria University.

<sup>917</sup> Smith-Bresky, K. M. (2021) Re-storying attachment theory: An interpretive phenomenological analysis of narrative therapists’ experience with attachment theory. Doctoral dissertation, The Chicago School of Professional Psychology, p. 121.

<sup>918</sup> Hammarlund, M., Granqvist, P., Elfvik, S., Andram, C., & Forslund, T. (2022) Concepts travel faster than thought: An empirical study of the use of attachment classifications in child protection investigations. *Attachment & Human Development*, 24(6), 712–731.

<sup>919</sup> Botes, W., & Ryke, E. (2011) The competency base of social workers with regard to attachment theory in foster care supervision: A pilot study. *Social Work/Maatskaplike Werk*, 47(1).

<sup>920</sup> Tilbury, N. & Tarleton, B. (2023) *Substituted parenting: What does this mean for parents with learning disabilities in the family court context?* Bristol: University of Bristol, <https://www.bristol.ac.uk/media-library/sites/sps/documents/wtpn/SP%20Report.pdf>.

<sup>921</sup> See also Aamodt, H. A. & Hennum, N. (2024) The child welfare service’s ignorance: The use of attachment theory in Norwegian child welfare. In Helder Ferreira do Vale (ed.) *Social Welfare—Policies, Services, and Institutions for the Poor, the Sick, and the Elderly*, <https://www.intechopen.com/online-first/1192410>.

<sup>922</sup> Sales, S. (2018) Damaged attachments & family dislocations: The operations of class in adoptive family life. *Genealogy*, 2(4), 55.

simplified form (allodoxia—see [Chapter 1](#)), have entered into widespread circulation.<sup>923</sup> Attachment theory offers a vocabulary (e.g., ‘attachment’, ‘separation’, ‘sensitivity’, ‘disorganization’), well suited to drawing in various possible meanings, then masking this diversity. Attachment research can seem to be part of and in agreement with the prevailing allodoxia. A key reason is that it combines use of (i) an apparently intuitive and accessible vocabulary shared with the allodoxia, though integrated with (ii) subtle, technical distinctions in the use of concepts and theory, and (iii) complex observational measures.<sup>924</sup>

To take an example discussed earlier: Juffer, Van IJzendoorn, and Bakermans-Kranenburg characterized the target of VIPP-SD as caregiver sensitivity. In ordinary language this phrase suggests ‘warmth, tenderness, and attention to detail.’<sup>925</sup> To the attachment research community, this phrase suggests Ainsworth’s definition: the caregiver will ‘perceive and interpret accurately the signals and communications implicit in her infant’s behavior, and given this understanding, respond to them appropriately and promptly.’<sup>926</sup> However, in fact, examination of the manual reveals that VIPP-SD focuses also but not exclusively on secure base/safe haven signals specifically. This does not appear to be known by other attachment researchers, at least going by published discussions. If the use of the familiar language of attachment theory can leave academic researchers confused or misdirected by one another, the situation is all the more challenging for practitioner audiences!

Reflecting on the challenge of discrepancies in the understanding of attachment between researchers and practitioners, 44 attachment researchers from around the world published a consensus statement on the implications of attachment research for child welfare and family court practice.<sup>927</sup> Van IJzendoorn was among the eight lead authors who worked on and developed an initial draft by Sagi-Schwartz and myself, though in turn this draft was considerably informed by discussions with Van IJzendoorn and Bakermans-Kranenburg. The consensus statement, by Forslund and colleagues, proposed that three kinds of misapprehensions regarding attachment theory and research could sometimes be seen in child welfare and court practice. It should be underlined that these concerns were not based on empirical evidence, but on the experiences of the authors.

First, Forslund and colleagues discussed misunderstandings regarding the nature of attachment. This included the assumption that the qualities of the attachment relationship equal the quality of the relationship, and the assumption that single behaviours can reveal whether or not a child is insecure. Second, Forslund and colleagues considered misunderstandings regarding the interaction between a child’s different attachment relationships. This included the assumption that children’s attachment with one caregiver will be at the expense of their relationship with another, not recognizing the value to a child of access to a network of sources of secure base and safe haven provision.

<sup>923</sup> White, S., Gibson, M., Wastall, D., & Walsh, P. (2019) *Reassessing Attachment Theory in Child Welfare: A Critical Appraisal*. Bristol: Policy Press; Verhage, M. L., Tharner, A., Duschinsky, R., Bosmans, G., & Fearon, R. P. (2023) On the need for clarity about attachment terminology. *Journal of Child Psychology and Psychiatry*, 64(5), 839–843.

<sup>924</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press

<sup>925</sup> Waters, E., Petters, D., & Facompre, C. (2013) Epilogue: Reflections on a Special Issue of Attachment & Human Development in Mary Ainsworth’s 100th year, *Attachment & Human Development*, 15(5–6), 673–681, p. 676.

<sup>926</sup> Ainsworth, M., Blehar, M., Waters, E., & Wall, S. ([1978] 2015) Appendix: Maternal caregiving and interaction scales. In *Patterns of Attachment: A Psychological Study of the Strange Situation*. Bristol: Psychology Press.

<sup>927</sup> Forslund, T., Granqvist, P., Van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M., ... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52.

Third, Forslund and colleagues discussed misunderstandings regarding the applicability of measures of attachment and caregiving developed by researchers for applied practice. This included the assumption that insecure attachment or disorganized attachment mean that a child has been harmed, and overestimations of the extent to which insecure attachment forecasts poor development outcomes and so provides an index of what would or would not be in a child's best interests.

Having seen Bowlby's early claims contribute to widespread misapprehensions about attachment theory, many of the second generation of attachment researchers, including Main, refrained from attempts to disseminate their work beyond academic audiences. In *Matters of Significance* Van IJzendoorn and Bakermans-Kranenburg praised this as wise forbearance:

To her credit, Main did not promote herself as an authority on what parents should do, emphasizing that her suggestions might not be interpreted as authoritative for practitioners. In contrast to John Bowlby, most members of the first and second generation of empirical attachment researchers have also avoided going public. It is hoped that Mary Main's caution in translating preliminary, shaky results to practice is inherited by the coming generations of attachment researchers.<sup>928</sup>

The few attachment researchers who have sought a practitioner audience, such as Fonagy, have generally appreciated, and benefited from, the widespread public interest in attachment.<sup>929</sup> In turn, practitioners may make reference to attachment in their practice, capitalizing on the credible status of this knowledge, but without more than superficial engagement with the research paradigm. For Van IJzendoorn and Bakermans-Kranenburg these attachment researchers and practitioners have to an extent been feeding one another illusions, as if they were the terms of a friendship.<sup>930</sup> Though not a true friendship: this would be characterized by feeding one another truths, on the basis of what each sees uniquely.<sup>931</sup>

The gap between researchers and their public, where it is not left empty, has often been occupied by professional trainers and their books: their distance from empirical research on attachment and the field's oral culture opens varied opportunities for quick-fix misapplications.<sup>932</sup> With rare and excellent exceptions, one of the defining characteristics of

<sup>928</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. UCL Press, pp. 86–87, parentheses suppressed.

<sup>929</sup> Duschinsky, R. & Foster, S. (2021) *Mentalization and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press.

<sup>930</sup> Ibsen, H. ([1896] 1960) *John Gabriel Borkman*, trans. Michael Meyer. London: Hart-Davis:

*Borkman*: Haven't you sat here and built up my hopes and beliefs with lies?

*Foldal*: It wasn't a lie, as long as you believed in my vocation. As long as you believed in me, I believed in you.

*Borkman*: Then we have deceived each other. And perhaps we have deceived ourselves too.

*Foldal*: But isn't that what friendship really is, John Gabriel? (47)

<sup>931</sup> The comparison here is between Van IJzendoorn and Bakermans-Kranenburg's account of the division of labour between researchers and their stakeholders, and Gadamer's account of friendship as reciprocal co-perception. Gadamer, H.-G. ([1985] 1999) *Friendship and self-knowledge: Reflections on the role of friendship in Greek ethics*. In J. Weinsheimer (ed.), *Hermeneutics, Religion, and Ethics* (pp. 128–141). New Haven: Yale University Press.

<sup>932</sup> Shemmings, D. & Shemmings, Y. (2014) *Assessing Disorganized Attachment Behaviour in Children: An Evidence-Based Model for Understanding and Supporting Families*. Jessica Kingsley Publishers; Granqvist, P. (2016) Observations of disorganized behaviour yield no magic wand: Response to Shemmings. *Attachment & Human Development*, 18(6), 529–533; Wilkins, D. (2021) Disorganised attachment does not indicate child maltreatment. *Journal of Social Work Practice*, 35(2), 219–220.

books written as guidance for practitioners and other public audiences about attachment is that they assiduously *ignore meta-analyses*.<sup>933</sup> It is not that their authors are unaware of meta-analytic research on attachment, but that the sober conclusions of research in the context of justification are a hindrance for the simplified, resonant, life-touching stories these books often wish to tell.

Van IJzendoorn and Bakermans-Kranenburg have criticized several such popularizers, for instance characterizing Schore's statements about attachment and neuroscience as 'misleading', and an extreme overreach from the available empirical research.<sup>934</sup> They have dedicated particular criticism of the work of Crittenden and collaborators, who have claimed that adaptations of Main's measures can be used effectively within child welfare practice, a position also advocated by Bob Marvin and Sue Spieker.<sup>935</sup> Van IJzendoorn and Bakermans-Kranenburg have argued that meta-analytic research clearly indicates that these instruments only have moderate, group-level precision. They have also not been validated for use by practitioners assessing individual cases.<sup>936</sup> Indeed, it is not clear whether parents may be overstressed when assessed in a child welfare context, with their behaviour not reflecting how they would parent in naturalistic settings and not interpretable according to the way measures were developed in a research context.<sup>937</sup>

Beckwith, Van IJzendoorn, and colleagues (including myself) used Q-methodology to examine the perceptions of attachment knowledge and its applications for practice among 30 UK practitioners working with children and families, and an international group of 31 attachment researchers.<sup>938</sup> Beckwith and colleagues found several lines of agreement between the two groups, including agreement on the idea that individual differences in attachment are shaped by experiences of caregiving and are adaptive to these environments. Nonetheless, attachment researchers and applied practitioners had important divergences in their understanding of attachment difficulties, and the implications of early attachment difficulties for assessment of risk and predicting what will likely happen to a child in the future.

<sup>933</sup> Duschinsky, R., Bakkum, L., Mannes, J. M., Skinner, G. C., Turner, M., Mann, A., ... & Beckwith, H. (2021) Six attachment discourses: Convergence, divergence and relay. *Attachment & Human Development*, 23(4), 355–374. For exceptions, see for example Prior, V. & Glaser, D. (2006) *Understanding Attachment and Attachment Disorders: Theory, Evidence and Practice*. London: Jessica Kingsley Publishers; Allen, B. (2023) *The Science and Clinical Practice of Attachment Theory: A Guide from Infancy to Adulthood*. New York: American Psychological Association; Mucha, L. (2024) *Please Find Attached*. London: Bloomsbury

<sup>934</sup> Van IJzendoorn, M. H., Tharner, A., & Bakermans-Kranenburg, M. J. (2021) Are attachment security and disorganization etched on the brain? In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: The Fundamental Questions* (pp. 195–203). New York: Guilford Press. See also remarks by Van IJzendoorn cited in Karen, R. (2024) *Becoming Attached*, 2nd ed. Oxford: Oxford University Press, pp. 531–533.

<sup>935</sup> Marvin, R. S. & Schutz, B. M. (2009) One component of an evidence-based approach to the use of attachment research in child custody evaluations. *Journal of Child Custody*, 6(1–2), 113–138; McKinsey Crittenden, P., Farnfield, S., Landini, A., & Grey, B. (2013) Assessing attachment for family court decision making. *Journal of Forensic Practice*, 15(4), 237–248; Spieker, S. J., Crittenden, P. M., Landini, A., & Grey, B. (2021) Using parental attachment in family court proceedings: An empirical study of the DMM-AAI. *Child Abuse Review*, 30(6), 550–564.

<sup>936</sup> Van IJzendoorn, M. H., Bakermans, J. J., Steele, M., & Granqvist, P. (2018) Diagnostic use of Crittenden's attachment measures in family court is not beyond a reasonable doubt. *Infant Mental Health Journal*, 39(6), 642–646. See also Hamaker, E. L., Mulder, J. D., & Van IJzendoorn, M. H. (2020) Description, prediction and causation: Methodological challenges of studying child and adolescent development. *Developmental cognitive neuroscience*, 46, 100867: 'It is tempting to assume that such an average causal effect represents the causal effect for each individual; yet this requires the additional assumption of a constant effect'

<sup>937</sup> Galbally, M., Stein, A., Hoegfeldt, C. A., & Van IJzendoorn, M. (2020) From attachment to mental health and back. *The Lancet Psychiatry*, 7(10), 832–834.

<sup>938</sup> Beckwith, H., Van IJzendoorn, M., Freeston, M., Woolgar, M., Stenner, P., & Duschinsky, R. (2022) A 'transmission gap' between research and practice? A Q-methodology study of perceptions of the application of attachment theory among clinicians working with children and among attachment researchers. *Attachment & Human Development*, 24(6), 661–689.

In particular, practitioners were more likely than researchers to regard attachment difficulties as indicative of risk and trauma, and as having definite consequences for children's social, emotional, and neurological development. Beckwith and colleagues found that the education and training of practitioners was influential for their perceptions of attachment knowledge and its applications, with some practitioners appearing to rely on their pre-qualifying education in attachment, and others reading work written for practitioners interpreting the attachment tradition but without deep knowledge of the research literature. The practitioners in the study did not appear to be directly accessing empirical attachment research.

The UK attachment researcher Elizabeth Meins has argued that Van IJzendoorn and colleagues hold some responsibility for this situation, accusing them of working in an ivory tower, and failing to develop an account of attachment theory and research that offers clear guidance to parents and practitioners. In the absence of such guidance from experts, non-experts have gained ascendance in influencing policy and practice:

Attachment researchers understand the nuances in Van IJzendoorn and colleagues' meta-analyses. The problem is that nuanced interpretations are lost when findings are digested for the wider public. Their complex meta-analytic results on attachment and internalising and externalising behaviours are simply interpreted as insecure attachment in infancy causing children to become mentally ill. The real concern is that these caricatures of attachment research are informing policy and practice for children and families.<sup>939</sup>

Van IJzendoorn and Bakermans-Kranenburg reflected that Meins's claims stem from a confusion between the context of discovery and context of justification. In their view, it can only lead to bad policy and practice if researchers attempt premature translation, by offering guidance to practitioners and parents based on individual studies.<sup>940</sup> Meta-analytic research, for all its limitations, is necessary because it produces more dependable results, which stand a better chance of adding value to policy and practice.<sup>941</sup> Rather than producing guidelines, Van IJzendoorn and Bakermans-Kranenburg have argued that, in the present moment and given the current state of communication breakdown between research and practice, the greatest contribution developmental scientists can make to practice is by dispelling myths: 'developmental researchers should practise translational caution by prioritising falsification of fake facts.'<sup>942</sup>

More positively, they have proposed that attachment research can also contribute to applied practice in two ways. First, in providing general principles that practitioners can draw on in their work, less directive and more 'modest' than guidelines but also better grounded in available convergent evidence.<sup>943</sup> The 2022 consensus statement on

<sup>939</sup> Meins, E. (2017) Attachment—Meins responds. *The Psychologist*, <https://www.bps.org.uk/psychologist/attachment-public-and-scientific-discourse>.

<sup>940</sup> In this sense Bakermans-Kranenburg and Van IJzendoorn consider the infamous 'replication crisis' in fact is a translation crisis, in which unreplicated results are prematurely translated into practice or policy recommendations. Bakermans-Kranenburg, M. (2024) Crisis? What Crisis? Replication, translation and academic freedom in attachment research. Chair's remarks at symposium at the International Attachment Conference, Rouen, France, July 2024. See also Cubelli, R. (2023) La psicologia in tribunale: le teorie non sono ricette. *Psicologia clinica dello sviluppo*, 27(1), 133–136.

<sup>941</sup> Van IJzendoorn, M. H. (2019) Commentary: Addressing the replication and translation crises taking one step forward, two steps back? A plea for slow experimental research instead of fast 'participatory' studies. *New Directions for Child and Adolescent Development*, 2019(167), 133–140.

<sup>942</sup> Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. UCL Press, p. xiv.

<sup>943</sup> IJzendoorn & L. Rosmalen (eds) (2016) *Pedagogiek in Beeld: Een inleiding in de pedagogische studie van opvoeding, onderwijs en hulpverlening*. New York: Springer: 'Empirical pedagogy is modest in the sense that it

attachment and family court practice offered three central principles that practitioners may take from the cumulative weight of evidence from attachment research:

- ‘The development of attachment relationships, and the benefits for psychosocial development that may stem from these relationships, depend on experiences of safe haven provision by particular, familiar, and non-abusive caregivers.’<sup>944</sup>
- ‘Expectations about safe haven availability stem from particular relationships and are not simply transferrable. Extreme caution should therefore be exercised in disrupting children’s attachment relationships.’<sup>945</sup>
- ‘Additional attachment relationships can be an asset for children. They do not typically disturb existing attachments unless they represent a source of threat or block access to existing relationships.’<sup>946</sup>

These principles drew especially on the work of Van IJzendoorn and Bakermans-Kranenburg, and Van IJzendoorn had a particular role in formulating them.

The principles follow Van IJzendoorn and Bakermans-Kranenburg’s concern with the role of practitioners in ensuring that children have good-enough care. They have criticized those, such as Howard Steele, who have argued that every child has a right to a secure attachment.<sup>947</sup> For Van IJzendoorn and Bakermans-Kranenburg, practitioners can certainly seek to improve child–caregiver attachment security, but this is not an inherent right of the child.<sup>948</sup> Children are entitled to safe, stable, and shared care (what they term ‘Triple S care’), not secure attachment.<sup>949</sup>

Van IJzendoorn and Bakermans-Kranenburg have argued that a second contribution of attachment research to applied practice lies in attachment-based interventions, supported by empirical research and acceptable to caregivers. In this regard, Van IJzendoorn and Bakermans-Kranenburg have drawn a distinction between attachment-based interventions such as their own VIPP and Dozier’s Attachment and Biobehavioral Catchup, and attachment-based interventions without a dependable evidence base. The Circle of Security intervention, for example, is relatively widely used, but Van IJzendoorn and Bakermans-Kranenburg have flagged that much of the supporting evidence comes from non-randomized research designs. Barbot, Van IJzendoorn, and colleagues have advocated the need for researchers to ‘strengthen outreach and engagement with the public, including teachers or staff in education, on the role and significance of developmental science. This includes providing training to pertinent stakeholders and policy-makers to help them gauge preventive interventions and their utility across domains and developmental

will never prescribe to pedagogues in practice what education should look like. These educators, teachers and social workers will determine this for themselves, based on their own insights and experiences, and preferably after having taken note of the most recent scientific knowledge’ (9).

<sup>944</sup> Forslund, T., Granqvist, P., Van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M., ... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52, p. 25.

<sup>945</sup> Ibid., 26.

<sup>946</sup> Ibid., 28.

<sup>947</sup> Steele, H. (2019) Commentary: Money can’t buy you love, but lack of love costs families and society plenty—A comment on Bachmann et al. *Journal of Child Psychology and Psychiatry*, 60(12), 1351–1352.

<sup>948</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 84.

<sup>949</sup> Bakermans-Kranenburg, M. & Van IJzendoorn, M. (2024) Family matters: Growing up in family-based care makes a world of a difference. *Proceedings of the Shevchenko Scientific Society. Medical Sciences*, 73(1).



time.<sup>950</sup> In terms of attachment research, Van IJzendoorn and Bakermans-Kranenburg interpret this as the responsibility to pursue myth-busting regarding misunderstandings and misapplications of attachment theory, measures, and research.

Van IJzendoorn and Bakermans-Kranenburg's position—with support from the Stockholm group<sup>951</sup>—stands in polar contrast to advocates for dependence on attachment measures in clinical and court practice, such as Marvin and Crittenden. However, there has also been a group of attachment researchers who have advocated a middle-ground, in which measures of attachment and caregiving can be used, as part of a battery of assessments, to inform practitioner judgement about how best to provide support. This includes Miriam Steele, Danya Glaser, and Sheri Madigan.<sup>952</sup> This axis of dissensus is stated in the consensus statement:

Some of us therefore believe that attachment assessments can be informative, if they are used responsibly. That is, various measures must be taken to maximize their validity and ensure that they are not given inappropriate weight at the expense of other considerations. More specifically, attachment measures should never be used in isolation but be part of a larger assessment battery that also includes direct assessment of caregiving behaviour. Indeed, assessment of caregiving should be the primary focus, with attachment assessments a possible complement: We should first and foremost assess the parent's ability to understand and respond effectively to the child's needs, to know and value the child, and to be consistently in charge in the relationship.<sup>953</sup>

While collaborators on many meta-analytic projects, and without open opposition, Madigan's perspective, epistemology, and research agenda seems to differ in marked ways from that of Van IJzendoorn and Bakermans-Kranenburg, representing quite a different *style*. Madigan has taken on the high-stakes role of public intellectual, largely abandoned by attachment researchers since Bowlby, against the forbearance recommended by Van IJzendoorn and Bakermans-Kranenburg.

Van IJzendoorn and Bakermans-Kranenburg have emphasized primarily what practice can gain from an accurate understanding of research, and the need for a division of labour between researchers and non-researchers. Within this division of labour, non-academics should be involved in setting the overarching research agenda, and in deliberations about the implications of results for policy and practice. Adopting a very different stance, Madigan has advocated for bidirectional learning between research and applied practice, with practitioners contributing also to the conduct of attachment research, as well as setting the agenda and interpreting the implications of results.

Furthermore, Madigan has been interested in 'distilled' scalable versions of measures developed by the attachment field, for use in epidemiological studies, in low-resource contexts, and by practitioners. Madigan and collaborators' work will be described in [Chapter 5](#). For their part, Van IJzendoorn and Bakermans-Kranenburg have been highly

<sup>950</sup> Barbot, B., Hein, S., Trentacosta, C., Beckmann, J. F., Bick, J., Crocetti, E., ... & Van IJzendoorn M. H. (2020) Manifesto for new directions in developmental science. *New Directions for Child and Adolescent Development*, 2020, 135–149, p. 144, parentheses suppressed.

<sup>951</sup> Forslund, T., Hammarlund, M., & Granqvist, P. (2021) Admissibility of attachment theory, research and assessments in child custody decision-making? Yes and No!. *New Directions for Child and Adolescent Development*, 2021(180), 125–140.

<sup>952</sup> Glaser, D. (2005) Child protection issues and the law. *Psychiatry*, 4(9), 137–141; Steele, M. (2018) The 'added value' of attachment theory and research for clinical work in adoption and foster care. In J. Kenrick, C. Lindsey, & L. Tollemache (eds), *Creating New Families* (pp. 33–42). London: Routledge.

<sup>953</sup> Forslund, T., Granqvist, P., Van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M., ... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52, p. 31.

committed to labour-intensive observational measures, if these are required to ensure psychometric adequacy and predictive validity. They warn of the risks of adapting and shrinking measures until what can be offered produces too many false positives and false negatives.<sup>954</sup>

## Research Culture

Starting from the 1970s and accelerating in the 1990s, pressure on researchers to deliver scientific progress was increased by the introduction of performance-based and competitive project-focused funding mechanisms across many Western countries.<sup>955</sup> Rather than block grants to universities that could be used for teaching, administration, and research, and gave academics considerable freedom in the pacing of their work, the new regime sought to incentivize productivity and academic excellence through competition for grants that would give space for research.<sup>956</sup> The operating assumption was that good and credible science is conducted by laboratories overseen by individuals with a track record of large grants and numerous publications in related areas. This made the quantitative accumulation of grants and publications fundamental to the acquisition of future grants and publications, producing what has sometimes been called an environment of ‘publish or perish’.<sup>957</sup>

Even though much of the research funded by a project grant is actually conducted by a team, the framing of the competition for grants has been resolutely focused on the individual researcher and their personal achievements and discoveries.<sup>958</sup> The laboratory head is forced into the role of employer: whilst he or she has a degree of power over students and postdoctoral researchers, the research leader is also made to accumulate grants in order to survive. In Foucault’s terms, contemporary research groups in the sciences tend to be structured by sovereign power, similar to a patriarchal family:

- there is an intense individualization of the person at the top of the hierarchy;
- the relationship between lead and employees is defined by the lead’s acquisitions;
- and the sovereign holds together in their person a diversity of relations, ranging from affective bonds to contractual obligations.<sup>959</sup>

Individual research group leads will vary in how or whether they negotiate, or even resist, this predicament.<sup>960</sup> Some may embrace it as well aligned with their values or, pragmatically, suited to their goals. There is, regardless, a price: the pressures of competition

<sup>954</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 157.

<sup>955</sup> Auranen, O. & Nieminen, M. (2010) University research funding and publication performance—An international comparison. *Research Policy*, 39(6), 822–834.

<sup>956</sup> Daalder, H. (1975) ‘The Dutch Universities between the “New Democracy” and the “New Management”’. In P. Seabury (ed.), *Universities in the Western World* (pp. 195–231). New York: Free Press; De Boer, H., Enders, J., & Leisyte, L. (2007) Public sector reform in Dutch higher education: The organizational transformation of the university, *Public Administration*, 85, 1, 27–46.

<sup>957</sup> Lofthouse, S. (1974) Thoughts on ‘publish or perish’. *Higher Education*, 3(1), 59–80.

<sup>958</sup> Kleinman, D. L. (2010) The commercialization of academic culture and the future of the university. In H. Radder (ed.), *The Commodification of Academic Research. Science and the Modern University* (pp. 24–43). Pittsburgh, PA: University of Pittsburgh Press.

<sup>959</sup> Foucault, M. ([1974] 2006) *Psychiatric Power*, trans. G. Burchell. New York: Picador.

<sup>960</sup> Degn, L., Franssen, T., Sørensen, M. P., & de Rijcke, S. (2018) Research groups as communities of practice—a case study of four high-performing research groups. *Higher Education*, 76(2), 231–246. Cf. Liboiron, M. (2021) *CLEAR Lab Book: A Living Manual of Our Values, Guidelines, and Protocols (Version 3) Civic Laboratory for*

and accumulation in the sector in turn place intense pressures on research groups and individual researchers.

An international survey of researchers by the Wellcome Trust found that 78% of scientists feel that high levels of competition have created unkind and aggressive working conditions.<sup>961</sup> Nearly two-thirds had witnessed bullying and harassment, and 41% had experienced this themselves. Over half of respondents had sought, or felt they should have sought, clinical support for anxiety or depression. A survey of US postdoctoral researchers found that 65% had reported experiences of bullying.<sup>962</sup> Half had considered leaving science because of mental health difficulties stemming from their work; the proportion was higher for women, and higher yet for respondents with disabilities.

In a survey of 2,546 academic staff in the Netherlands, 78% reported that the pressure of work meant that they had to work through evenings and weekends, and 45% continued to work when ill.<sup>963</sup> Efforts to achieve academic success, which holds out the promise of happiness through a contribution to the generation of knowledge, appear to hinder the conditions for happiness in the job (and outside the job). In a formal sense, a line towards tragedy is part of the working conditions of contemporary academic life. There are a variety of circumstances that shape whether this vector is followed or accelerated.

As we have seen, research on attachment at Leiden by Van IJzendoorn was initially supported by some talented pre-existing colleagues with commensurate interest, such as Kroonenberg. Nonetheless, it was really from 1990, with the award of the Pioneer grant from the Nederlandse Organisatie voor Wetenschappelijk Onderzoek (NWO), that the scope and scale of research could propel the Leiden group to international visibility. The Pioneer grant funded the appointment of Juffer and Bakermans-Kranenburg, who would become major allies and co-leaders of the research group and receive tenure in the 1990s. Then in 2004, Van IJzendoorn won the 1.5 million Euro Spinoza Prize, opening a new chapter for the group.

Leiden researchers in the sociology of science, Franssen and colleagues, have reflected on the effects of winning a Spinoza Prize on research groups. They stressed the unusual flexibility of the Spinoza funds, which can be used for any purpose, and without time limit. Franssen and colleagues report that the Spinoza Prize has often been associated with investment in research capacity building that would not otherwise have been possible and, closely related to this, greater departure from disciplinary norms by prize winners.<sup>964</sup> In the case of Van IJzendoorn, the Spinoza Prize provided funds for a rich programme of research on attachment, parenting, and maltreatment often drawing on biomedical assessments. This programme depended considerably on the departure from disciplinary norms made available by the Spinoza Prize: attachment research was becoming less attractive and fundable by the 2000s,<sup>965</sup> and use of biomedical assessments was still relatively expensive and unfamiliar in developmental science. For example, money could be spent immediately

*Environmental Action Research (CLEAR), Memorial University of Newfoundland, St. John's, Newfoundland and Labrador.* <https://doi.org/10.5281/zenodo.5450517>.

<sup>961</sup> Moran, H., Karlin, L., Lauchlan, E., Rappaport, S. J., Bleasdale, B., Wild, L., & Dorr, J. (2020) Understanding research culture: What researchers think about the culture they work in. *Wellcome Open Research*, 5(201), 201.

<sup>962</sup> Woolston, C. (2020) Pandemic darkens postdocs' work and career hopes. *Nature*, 585(7824), 309–312.

<sup>963</sup> FNV (2017) Rapport Werkdruk in Universiteiten (Report on Work Pressure in Universities). Retrieved from [www.fnv.nl/site/nieuws/webassistent/Annika-Heerekop/werkdruk-medewerkers-universiteiten-ongezon-d-hoog-3/onderzoekwerkdrukuniversiteiten.pdf](http://www.fnv.nl/site/nieuws/webassistent/Annika-Heerekop/werkdruk-medewerkers-universiteiten-ongezon-d-hoog-3/onderzoekwerkdrukuniversiteiten.pdf).

<sup>964</sup> Franssen, T., Scholten, W., Hessels, L. K., & de Rijcke, S. (2018) The drawbacks of project funding for epistemic innovation: Comparing institutional affordances and constraints of different types of research funding. *Minerva*, 56(1), 11–33.

<sup>965</sup> White, K. & Schwartz, J. (2007) Attachment here and now: An interview with Peter Fonagy. *Attachment*, 1(1), 57–61.

on DNA analyses, which made possible the discovery of genetic differential susceptibility by the Leiden group (Chapter 3).

Franssen and colleagues observed, however, that the Spinoza Prize has also had negative consequences for the researchers who received it. The term ‘prize’ already reflects this ambiguity, as noted by the historian Johan Huizinga (another Leiden scholar).<sup>966</sup> It comes from the Latin *pretium*, which meant price, value, or wages. It is the origin of the words praise, price, precious, appreciate/depreciate, and also to prise—as in to force access to something. There is the positive meaning of reward and appreciation, as well as a negative meaning, signalling the cost of something, the harsh demands of obtaining it, and the precious resource that others may envy.<sup>967</sup> The Spinoza Prize may give a researcher unprecedented power and autonomy, in this case supporting an explosion of attachment, parenting, and maltreatment research at Leiden. At the same time, this power and autonomy may come at a price.

In the same year that Van IJzendoorn won the Spinoza Prize, several other members of the research group were also awarded research grants:

- Bakermans-Kranenburg won the NWO’s VIDI grant (600,000 Euro), the funder’s highest mid-career award.
- Mesman won the NWO’s VENI grant (250,000 Euro), the funder’s highest early career award.
- Juffer won a project grant from NWO (180,000 Euro) for research on adoption and attachment, which made possible the first study evaluating VIPP.

Other major grants followed:

- Links with the US attachment community were strengthened by Alink’s receipt of NWO’s Rubicon Award to spend two years at the University of Minnesota.
- In 2009/10, Mesman won the VIDI and an ERC Starting Grant, and Bakermans-Kranenburg won the NWO’s VICI grant (1.5m Euros), the highest Dutch award for an established researcher, which funded two postdoctoral researchers and three doctoral students.
- In 2014 Van IJzendoorn with five colleagues from other Dutch universities received the largest Dutch (gravity) grant of 26m Euros of which he could spend 6m Euros to set up the L-CID experimental longitudinal twin study at Leiden University.
- In 2015, Bakermans-Kranenburg won the most prestigious European grant, the ERC Advanced Grant, amounting to 2.5m Euros for a series of experiments on paternal care.

This extraordinary accumulation of grant income permitted the research group to undertake several lines of inquiry at the same time, any one of which would normally be considered a strong level of productivity for a research group. It allowed for balance between susceptibility and unsusceptibility, with the research group having sufficient ballast to develop a clear agenda and reputation, but with openness to new methods and

<sup>966</sup> Huizinga, J. ([1938] 2014) *Homo Ludens*. London: Routledge, p. 51.

<sup>967</sup> The connotations of prise as forceful taking are especially strong in the French, and discussed by Althusser, L. (1993) *Sur la Philosophie*. Paris: Gallimard.

opportunities.<sup>968</sup> The accumulation of grant income also allowed the group to hire and retain a cohort of exceptional early career researchers with the skills and capacity to undertake this diversity of research activity.

Yet by the mid-2010s, there were growing signs that the institutional environment at Leiden university and elsewhere in Dutch academia was becoming highly pressured and unhappy. Declining undergraduate student numbers increased pressure on research grants as a source of income.<sup>969</sup> The staff survey in 2015 characterized a staff body feeling considerable strain.<sup>970</sup> A large survey of graduate students across the university also found high levels of reported overwork and stress.<sup>971</sup> There was a rise in formal complaints by staff and declining staff satisfaction across the university.<sup>972</sup>

Complaints were made that Van IJzendoorn and Bakermans-Kranenburg were over-demanding in their interactions with research colleagues and in student supervision. For their part, Van IJzendoorn and Bakermans-Kranenburg regarded these complaints as politically motivated. They felt that the success of their research programme generated professional tensions in the context of a shrinking department.<sup>973</sup> When interviewed, Van IJzendoorn reflected that, yes, the bar was set high, and he had been demanding of students.<sup>974</sup> But he felt that demands were within reason and based on civilized conduct, to the benefit of the completion of the productive PhD and postdoc projects at Leiden, and their successful research careers afterwards (e.g., 13 former doctoral students are full Professors; 28 are tenured or tenure-track Associate/Assistant Professors; 19 are in senior research roles).

In 2017, the department dissolved the attachment research programme that Van IJzendoorn and Bakermans-Kranenburg had led. It was broken in various smaller parts. Some elements were relocated to the psychology department; the maltreatment component directed by Alink remained in the pedagogical department; Bakermans-Kranenburg moved to the Vrije Universiteit Amsterdam. Van IJzendoorn was reaching mandatory retirement age, and became emeritus with a formal, paid scientific consultant position for the following five years. He continued his part-time professorial position at Erasmus University Rotterdam as one of the leads of the Generation R study.

<sup>968</sup> Compare the discussion of Strategy A versus Strategy B in Bakermans-Kranenburg, M. J., & Van IJzendoorn, M. H. (2015) The hidden efficacy of interventions: Genex environment experiments from a differential susceptibility perspective. *Annual Review of Psychology*, 66, 381–409, p. 389.

<sup>969</sup> Mudde, T. (2018) Tiran of zondebok: Geprezen hoogleraar Rien Van IJzendoorn (65) vertelt zijn kant van het verhaal, *De Volkskrant*, 27 January 2018, <https://www.volkskrant.nl/nieuws-achtergrond/tiran-of-zondebok-geprezen-hoogleraar-rien-van-ijzendoorn-65-vertelt-zijn-kant-van-het-verhaal~b46f78945/>: 'Leiden University confirms that the number of bachelor's students in pedagogical sciences has fallen sharply and speaks of "a national trend that has no relationship with the working climate within the institute of pedagogical sciences". The primary intake (excluding students who do pedagogical sciences as a minor subject) has fallen from 238 students to 117 students over the past ten years.'

<sup>970</sup> Leiden University (2015) Jaarverslag 2015. [https://www.universiteitleiden.nl/binaries/content/assets/algemeen/over-ons/nieuw-jaarverslag-2015\\_universiteit-leiden.pdf](https://www.universiteitleiden.nl/binaries/content/assets/algemeen/over-ons/nieuw-jaarverslag-2015_universiteit-leiden.pdf). The Leiden University (2015) Reactie Instituutsbestuur Pedagogische Wetenschappen Personeelsmonitor gives a subject-by-subject breakdown. The survey results for Pedagogical Sciences do not deviate from the wider university picture. [https://issuu.com/universiteit-leiden/docs/jaarverslag\\_2015\\_universiteit\\_leide](https://issuu.com/universiteit-leiden/docs/jaarverslag_2015_universiteit_leide).

<sup>971</sup> Waaijer, C. J. F. (2016) Quantized careers: Origins and consequences of the preponderance of temporary and junior jobs in academia. Unpublished doctoral thesis, Leiden University, chapter 7.

<sup>972</sup> Simons, W. (2018) Meer conflicten universiteit. *Leidsch Dagblad*, 26 June 2018.

<sup>973</sup> Van IJzendoorn, M., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 215.

<sup>974</sup> Mudde, T. (2018) Tiran of zondebok: Geprezen hoogleraar Rien Van IJzendoorn (65) vertelt zijn kant van het verhaal, *De Volkskrant*, 27 January 2018, <https://www.volkskrant.nl/nieuws-achtergrond/tiran-of-zondebok-geprezen-hoogleraar-rien-van-ijzendoorn-65-vertelt-zijn-kant-van-het-verhaal~b46f78945/>.

Given his working-class background, Van IJzendoorn did not take education and the privilege of being an academic for granted, as Van Esterik has noted.<sup>975</sup> Van IJzendoorn understood the ethos from his father of ‘Don’t nag. Work’, discussed in the *De Volkskrant* interview.<sup>976</sup> However, in the interview, he also stressed his care for students’ success.<sup>977</sup> He sought to modulate his ambitions for them to what was realistic for the Dutch and international academic job market.<sup>978</sup>

Van IJzendoorn and Bakermans-Kranenburg pointed to the definition of bullying offered by the Wellcome Trust: ‘any offensive, intimidating, malicious or insulting behaviour which can make the person being bullied feel vulnerable, upset, humiliated, undermined or threatened.’<sup>979</sup> They criticized such definitions of bullying as ‘container terms with heterogenous content. Moreover, the perceptions and feelings of the “victims” instead of the actual behaviours are crucial.’<sup>980</sup> Clearly ‘there is no place in academia for (sexual) violence or coercion, discrimination or hate speech, nor for other criminal acts.’<sup>981</sup> Nonetheless, Van IJzendoorn and Bakermans-Kranenburg argued that academic freedom should permit robust debate and criticism within the domain of expertise of the discussants, including within research groups and between research groups. As such, their position suggested that debate and criticism should be paramount, and form a constitutionally protected right, within the academic context. Van IJzendoorn and Bakermans-Kranenburg stressed that perceptions and feelings about such debate and criticism do not necessarily imply the presence of bullying.

Citing Popper’s *The Logic of Scientific Discovery*—not, notably, *Logik der Forschung* with its greater emphasis on cooperation and community norms—Van IJzendoorn advocated for scientific rough-and-tumble:

Karl Popper (1959), philosopher of science, argued that we can only approach truth by undermining cherished but untrue assumptions. Donald Campbell (1960) argues that the basic mechanism of science is the evolutionary dynamic of ‘variation and selective retention’, that is the promotion of wild ideas, bold hypotheses and daring theories, and subsequent rigorous selection in sometimes fierce adversarial clashes.<sup>982</sup>

<sup>975</sup> Van Esterik, C. (2011) *No Satisfaction. Hoe we werden wie we zijn*. Meppel: Uitgeverij Boom/SUN.

<sup>976</sup> Mudde, T. (2018) Tiran of zondebok: Geprezen hoogleraar Rien Van IJzendoorn (65) vertelt zijn kant van het verhaal, *De Volkskrant*, 27 January 2018, <https://www.volkskrant.nl/nieuws-achtergrond/tiran-of-zondebok-geprezen-hoogleraar-rien-van-ijzendoorn-65-vertelt-zijn-kant-van-het-verhaal~b46f78945/>.

<sup>977</sup> Mudde, T. (2018) Tiran of zondebok: Geprezen hoogleraar Rien Van IJzendoorn (65) vertelt zijn kant van het verhaal, *De Volkskrant*, 27 January 2018, <https://www.volkskrant.nl/nieuws-achtergrond/tiran-of-zondebok-geprezen-hoogleraar-rien-van-ijzendoorn-65-vertelt-zijn-kant-van-het-verhaal~b46f78945/>.

<sup>978</sup> Van IJzendoorn, M. (2023) Balancing attachment: Replication, translation, academic freedom. Valedictory Lecture, 12 May 2023, Rotterdam: University of Rotterdam, [https://www.marinusvanijzendoorn.nl/wp-content/uploads/2023/05/van\\_IJzendoorn-230505-proofs-Balancing-Attachment-Valedictory-Lecture-EUR-\\_3.pdf](https://www.marinusvanijzendoorn.nl/wp-content/uploads/2023/05/van_IJzendoorn-230505-proofs-Balancing-Attachment-Valedictory-Lecture-EUR-_3.pdf).

<sup>979</sup> Wellcome (n.d.) <https://wellcome.org/grant-funding/guidance/bullying-and-harassment-policy>.

<sup>980</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 213.

<sup>981</sup> Van IJzendoorn, M. (2023) Vrije wetenschap is belangrijker dan een sociaal veilige Universiteit, *Trouw*, 9 May 2023, <https://www.trouw.nl/opinie/vrije-wetenschap-is-belangrijker-dan-een-sociaal-veilige-universiteit~ba91fb7c/>.

<sup>982</sup> Van IJzendoorn, M. (2023) Balancing attachment: Replication, translation, academic freedom. Valedictory Lecture, 12 May 2023, Rotterdam: University of Rotterdam, [https://www.marinusvanijzendoorn.nl/wp-content/uploads/2023/05/van\\_IJzendoorn-230505-proofs-Balancing-Attachment-Valedictory-Lecture-EUR-\\_3.pdf](https://www.marinusvanijzendoorn.nl/wp-content/uploads/2023/05/van_IJzendoorn-230505-proofs-Balancing-Attachment-Valedictory-Lecture-EUR-_3.pdf), citing Campbell, D. T. (1960) Blind variation and selective retentions in creative thought as in other knowledge processes. *Psychological Review*, 67(6), 380–400; Popper, K. (1959) *The Logic of Scientific Discovery*. London: Routledge.



In his view, research contexts are the true home of debate and critical discussion between individuals reciprocally treated as intellectually and emotionally robust adults. Van IJzendoorn's position aligns with that of Belsky (Chapter 3) and many other scientists inspired by Popper's work, who have also seen science as benefiting from adversarial clashes, and been criticized on these grounds for lacking a warm and supportive tone.<sup>983</sup>

Van IJzendoorn criticized Carel Stolker, the vice chancellor during his last years at Leiden, who had conceptualized the University as a 'safe haven.' Stolker proposed that 'the University is much more a community of people than an organization. Good mutual relations are essential for a community.'<sup>984</sup> Van IJzendoorn argued that 'universities are not communities, not a group of people who share common personal goals, values, ideologies, rituals and warm relationships.... I wholeheartedly disagree with this prioritizing [of] community values above academic freedom.'<sup>985</sup>

Kant had proposed that certain feelings or dispositions [*stimmung*] support thinking and communication.<sup>986</sup> Van IJzendoorn and Bakermans-Kranenburg identify such dispositions with the feeling of safety. They define this, following Bowlby, as the absence of threats.<sup>987</sup> Van IJzendoorn and Bakermans-Kranenburg argued that the university culture and interactions within it should not be a source of fear. They should be *safe* for everyone.<sup>988</sup> However, Van IJzendoorn and Bakermans-Kranenburg held that universities and research environments should not be expected to provide a feeling of *security* to research staff or graduate students, nor be judged on the extent to which they provide warm relationships or a felt sense of belonging. As we shall see in Chapter 5, this is a position that Madigan would contest.

Bus and Van IJzendoorn demonstrated in the 1990s that, in family relationships, security may contribute to learning, confidence, and freedom for exploration. In the 2000s, this was extrapolated to the idea that the VIPP intervener should serve as a secure base for a caregiver's exploration, highlighting strengths in caregivers' expertise as well as things to learn. The value of secure base provision may be extrapolated to teachers' relationships with primary and secondary school students.<sup>989</sup> Bakermans-Kranenburg and collaborators recently tested VIPP-SD for the first time with teachers, finding that the

<sup>983</sup> Derksen, M. (2019) Putting Popper to work. *Theory & Psychology*, 29(4), 449–465. See Fiske, S. T. (2016, 1 November) A call to change science's culture of shaming. *APS Observer*, <http://www.psychologicalscience.org/publications/observer/2016/nov-16/a-call-to-change-sciences-culture-of-shaming.html>.

<sup>984</sup> Stolker, C. (2018) Diversity of views: the university as a safe haven. Dies lecture on 8 February 2018, on the occasion of the 443rd Dies Natalis of Leiden University. Leiden: Leiden University, The Netherlands, <https://www.universiteitleiden.nl/binaries/content/assets/algemeen/plechtigheden/dies-2018/toespraak-carel-stolker-dies-natalis-2018-engelstalig.pdf>.

<sup>985</sup> Van IJzendoorn, M. (2023) Balancing attachment: Replication, translation, academic freedom. Valedictory Lecture, 12 May 2023, Rotterdam: University of Rotterdam, [https://www.marinusvanijzendoorn.nl/wp-content/uploads/2023/05/van\\_IJzendoorn-230505-proofs-Balancing-Attachment-Valedictory-Lecture-EUR-3.pdf](https://www.marinusvanijzendoorn.nl/wp-content/uploads/2023/05/van_IJzendoorn-230505-proofs-Balancing-Attachment-Valedictory-Lecture-EUR-3.pdf).

<sup>986</sup> Kant, I. ([1790] 2000) *Critique of the Power of Judgment*, trans. P. Guyer & E. Mathews. Cambridge: Cambridge University Press.

<sup>987</sup> Bowlby, J. (1973) *Separation: Anxiety and Anger*, London: Penguin, p. 214.

<sup>988</sup> Van IJzendoorn, M. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation and Academic Freedom in Developmental Science*. London: UCL Press, p. 217.

<sup>989</sup> A foundational assumption of the Dutch discipline of pedagogy is that parenting and educational contexts can be studied together as having reciprocally relevant principles. See Cyr, C. & Van IJzendoorn, M. H. (2007) Attachment in the schools: Toward attachment-based curricula. *Journal of Early Childhood and Infant Psychology*, 3, 95–118; Starreveld, K. M., Overbeek, M. M., Willemen, A. M., & Bakermans-Kranenburg, M. J. (2024) Adapting a video-feedback intervention to support teacher–child interaction and behavior regulation of young children at school: A qualitative pilot study. *School Psychology International*, 45(1), 16–35.

intervention resulted in large improvements in teacher sensitivity with their pupils ( $d = 0.87$ , CI 0.33–1.41).<sup>990</sup>

However, for Van IJzendoorn and Bakermans-Kranenburg, the relevance of security is secondary in research contexts populated by adults.<sup>991</sup> As in classic liberal political theory, following Kant, nurturance of adults may be beneficial, but it is not a responsibility or imperative as it is in the case of children and other dependents.<sup>992</sup> Rather, in interactions between adults in the context of university research, academic freedom has priority. Van IJzendoorn advocated that the university should be judged ultimately on its contribution to scientific progress and its translatability into policy and practice, scaffolded by academic freedom as the constitutional right of every academic. Even their harshest critics acknowledged Van IJzendoorn and Bakermans-Kranenburg were never more than an e-mail away to make time for a meeting to discuss their work.<sup>993</sup> In the view of Van IJzendoorn and Bakermans-Kranenburg, a research leader's care for junior colleagues should be expressed above all in efforts to ensure the integrity and improve the quality of their research, and in doing so set them up for professional success.<sup>994</sup>

## Concluding Remarks

Accepting the lifetime achievement award at the International Attachment Conference in Vancouver, in 2019, Van IJzendoorn described himself as a bridge between the second and third generation of attachment researchers.<sup>995</sup> When he entered the field in the 1980s, the paradigm was dominated by Ainsworth's circle and allies. Attachment research within developmental science was just getting fully established. Main's work was offering the

<sup>990</sup> Starreveld, K. M., Overbeek, M. M., Willemsen, A. M., & Bakermans-Kranenburg, M. J. (in press) Video-feedback intervention to promote positive parenting and sensitive discipline in early elementary education (VIPP-School): A randomized controlled trial. *Attachment and Human Development*.

<sup>991</sup> They appear to concur with Main, who argued that 'security can be gained by many means and in relationship to many persons. Moreover, since in truth no position is objectively safe, acceptance of complete insecurity, even regarding the nature of knowledge, is a foundation on which our knowledge rests.' Main, M. (1977) Sicherheit und Wissen. In K. E. Grossmann (ed.), *Entwicklung der Lernfähigkeit in der sozialen Umwelt* (pp. 47–95), München, Germany: Kindler, p. 89.

<sup>992</sup> Kant, I. ([1784] 1991) An answer to the question: 'What is enlightenment?', in H. Reiss (ed.), *Kant's Political Writings* (pp. 54–60). Cambridge: Cambridge University Press. Cf. Bhandary, A. & Baehr, A. R. (eds) (2020) *Caring for Liberalism: Dependency and Liberal Political Theory*. London: Routledge.

<sup>993</sup> Mudde, T. (2018) Tiran of zondebok: Geprezen hoogleraar Rien Van IJzendoorn (65) vertelt zijn kant van het verhaal, *De Volkskrant*, 27 January 2018, <https://www.volkskrant.nl/nieuws-achtergrond/tiran-of-zondebok-geprezen-hoogleraar-rien-van-ijzendoorn-65-vertelt-zijn-kant-van-het-verhaal~b46f78945/>.

<sup>994</sup> These efforts have been acknowledged by many of their graduate students. At Leiden, the convention was for students not to thank their supervisors. From the acknowledgements of some post-Leiden graduate students:

*Jana Runze:* Marian, I am glad to have gotten the chance of working together with you. At each step of my PhD, you encouraged and supported me, whatever my plans were. You helped me forming a solid foundation for my future career. I couldn't have asked for a better supervisor.

*Andrea Cortes Hidalgo:* Marinus: I have learnt lots from you. Your guidance in research has been gold for me. You know what is interesting and how to approach it. I am also well aware that I can count on you. You carefully listen to me and your advice is always the best. Thank you for offering me such strong support and for believing in me. I sincerely hope I can continue working with you for many more years. Marian: I cannot and will not forget your outstanding support. You were present in my first oral presentation in a conference (in which I was quite nervous!) You supported me fully in discussions and meetings, and you even gifted me the most beautiful recommendation letter I have ever read.

<sup>995</sup> Van IJzendoorn, M. H. (2019) Remarks on accepting the Lifetime Achievement Award. 20 July 2019, International Attachment Conference, Vancouver, Canada.



prospect of exciting extensions to attachment research. By 2019, attachment research had become a well-established approach, indeed considered by some developmental scientists as no longer adapted to the current environment and due for renovation.<sup>996</sup>

In accepting the lifetime achievement award, Van IJzendoorn downplayed his own achievements and highlighted his decades-long collaboration with Marian Bakermans-Kranenburg. He emphasized his pride in his contributions to supporting and mentoring exceptional younger developmental scientists to pursue attachment research, again in collaboration with Bakermans-Kranenburg. This includes many of the contemporary leaders of research on attachment. Van IJzendoorn felt that he had conveyed something of his scientific values to them, such as the importance of replication, and the need for bidirectional dialogue between attachment research and the wider world of scientific discoveries. In these remarks, there was a tone of tenderness for the study of attachment and caregiving, as worth defending and bringing into this wider scientific conversation, as well as translation into policy and practice. In the next chapter we will see how the positions of Van IJzendoorn and Bakermans-Kranenburg have been taken on and renegotiated by some of this younger generation of researchers.

<sup>996</sup> Mann, A., Thompson, M., Foster, S., Beckwith, H., Madigan, S., Fearon, R. P., ... & Duschinsky, R. (2023) The perspectives of senior researchers in applied disciplines on the current state of developmental attachment research: An interview study. *Sage Open*, 13(2), 21582440231179204.

# Sheri Madigan and the Determinants of Child Development Lab, Calgary

## Biographical Sketch

Sheri Madigan is one of a number of younger researchers, comprising a ‘third generation’ of developmental scientists working on attachment and caregiving. Her work illustrates the contemporary opportunities and challenges facing this generation of researchers. From Van IJzendoorn and Bakermans-Kranenburg, one set of early mentors, she has absorbed a passion for meta-analytic research. The meta-analyses undertaken by Madigan and colleagues draw together the current state of knowledge of child attachment and caregiver sensitivity. This has included surprising findings that have challenged long-standing assumptions within attachment research. Another of Madigan’s mentors has been Lyons-Ruth, with whom she shares a clinical orientation towards the study of attachment and caregiving. Madigan has served as a trainer for the AMBIANCE measure developed by Lyons-Ruth and colleagues and has also worked in recent years to adapt the measure for use by professionals in applied practice with families. She has also taken on a leadership role for the international attachment community through a new project, the CARE Collaboration, that seeks to draw together researchers and practitioners interested in attachment.

## Introduction

Though it has not stopped their work and writing, the second generation of attachment researchers have been reaching retirement. In this context, a new group of researchers have taken up leadership roles for the attachment community within developmental science and managing large research groups. By no means exhaustive, among those mentioned in earlier chapters include Roisman (Minnesota), Schuengel and Oosterman (VU Amsterdam), Dozier (Delaware), Cyr (Montréal), Granqvist (Stockholm), Jacobvitz (Texas at Austin), Bosmans (Leuven), Madigan (Calgary), and Fearon (UCL, then Cambridge; and President of the Society for Emotion and Attachment Studies since 2016).

As discussed in *Cornerstones of Attachment Research*, if this group can be identified as a ‘third generation’ of attachment researchers, this is not defined by their chronological age. The concept of a ‘generation’ can be used pragmatically to characterize members of a cohort who, facilitated by structural factors that suggest commonalities, regard themselves as facing a bundle of common challenges, including delimitation and appraisal of the legacy of an earlier generation.<sup>1</sup> A third generation of attachment researchers have been constituted by the playing out of problems in theory and method—especially in the legacy of Main’s work, though not exclusively—at a time when many of the second generation

<sup>1</sup> On the concept of ‘generations’, see Aboim, S. & Vasconcelos, P. (2014) From political to social generations: A critical reappraisal of Mannheim’s classical approach. *European Journal of Social Theory*, 17, 165–183.

of attachment researchers are putting down their tools. Additionally, part of the stakes of attachment research for the second generation was its role as a symbolic anchor for the relational wing of developmental science (Chapter 1). However, as relational approaches have become mainstreamed, new answers need to be developed regarding the meaning and relevance of attachment research.

Many third-generation attachment researchers are students or mentees of the second generation, continuing the community's tradition of genealogical filiation of its leaders. Yet the third generation have also asked challenging questions of the second generation. This has included reevaluating Main's assumption of 'transmission of attachment' between the Adult Attachment Interview and the Strange Situation (Chapter 4). Indeed, there may be some symbolism in this target of inquiry—transmission—given that part of the challenge faced by this younger group of researchers was that of what elements of received wisdom in attachment research should be preserved, rejected, or renegotiated.

In *Cornerstones*, I offered discussion of work by Roisman, Schuengel, Dozier, and their collaborators; I also addressed third-generation attachment researchers in the social psychological tradition. I've written about Granqvist's approach to attachment theory elsewhere.<sup>2</sup> In the present chapter, I will give particular attention to Madigan. For this book about developments in attachment research, Madigan's work is of particular interest, in that she has actively sought to characterize the current strengths and weaknesses of the state of attachment research, and to offer leadership to the international community in responding to opportunities and challenges. Her approach illustrates especially clearly the work entailed for contemporary developmental scientists as they seek to bear or resist the inheritance of the second generation of attachment researchers and create a new path for themselves and the field.

The field-defining legacy of the second generation remains a powerful one. After all, seawater can stiffen cloth long after it has dried. In their different developmental pathways, some third-generation researchers have been more susceptible (reactive or open; Chapter 3) to the specific pressures and opportunities of developmental and clinical science; some have primarily focused on capitalizing on existing, canalized strengths within attachment research.<sup>3</sup> Roisman offers an illustration of the former approach,<sup>4</sup> Jacobvitz an illustration of the latter.<sup>5</sup> Regardless of where they fall on this spectrum,

<sup>2</sup> Duschinsky, R. (2020) Who has faith (in attachment theory)? *American Journal of Psychology*, 133(4), 532–536.

<sup>3</sup> Belsky, J. & Pluess, M. (2013) Beyond risk, resilience, and dysregulation: Phenotypic plasticity and human development. *Development and Psychopathology*, 25(4.2), 1243–1261: 'Some individuals may manifest limited malleability, with their development highly canalized, trading off the benefits of being able to thrive in more than a single ecological niche against costs of a breakdown in the developmental machinery and processes needed to do so' (1247).

<sup>4</sup> E.g. Roisman, G. & Groh, A. (2021) The legacy of early attachments: Past, present, future. In R. A. Thompson, J. A. Simpson, & L. J. Berlin (eds), *Attachment: the Fundamental Questions* (pp. 187–194). New York: Guilford Press: 'Attachment scholars [should] question whether innovations in the assessment of early attachments may now be necessary, particularly given that most attachment-based interventions and even some recent child custody recommendations rest on arguably outdated assumptions about the strengths and limitations of the SSP ... it is possible that research on the legacy of early attachments has entered what van IJzendoorn and Tavecchio (1987) described decades ago (building on the concepts of the philosopher of science Imre Lakatos) as a period of exhaustion, in which theoretical and methodological rigidity are dominant features, and correspondingly as the field turns away from basic science toward translation—an obviously worthy goal. On the other hand, such a reappraisal might serve as a generative (and generational) reckoning regarding the degree to which acceptance of limited refinements in the measurement of early attachments over the past few decades along with a continued reliance on evidence drawn from underpowered studies (1) has slowed our basic scientific understanding of the legacy of early attachments and/or (2) might be hampering efforts to optimally translate what we know' (192).

<sup>5</sup> Jacobvitz and Hazan have foregrounded continuities in their work with the theoretical and methodological contributions of Main, and downplayed lines of disagreement or questions about the tradition. Their most visible innovation has been in the profound integration of attachment research with family systems theory. See e.g. Jacobvitz, D., Aviles, A. I., Aquino, G. A., Tian, Z., Zhang, S., & Hazen, N. (2022) Fathers' sensitivity in infancy

contemporary attachment researchers must earn possession of the tradition, rather than possession by the tradition. Madigan's work illustrates this with particular clarity.<sup>6</sup>

Madigan grew up in rural Canada without the expectation of attending university. At most, it was considered that she might attend teacher training in her hometown.<sup>7</sup> Although she began her undergraduate training majoring in geography, she discovered a passion for psychology. Near the end of her undergraduate studies Madigan was taken under the wing of Susan Goldberg at the Hospital for Sick Children in Toronto. Goldberg was one of the second generation of attachment researchers, and stood out for the clarity, insight, and independence of her understanding of attachment theory (Chapter 1).<sup>8</sup> For instance, Goldberg was able to balance recognition of the tremendous contributions of Main's work, with awareness of the limitations of Main's legacy.<sup>9</sup> She was regarded with respect for her ability to remain open to, but not pressured by, the field's norms and politics.<sup>10</sup> Goldberg was able to fund a summer internship for Madigan in 1999,<sup>11</sup> and after graduation she hired Madigan as a research assistant. Soon after starting this role, Madigan attended the first training provided by Lyons-Ruth and Bronfman in the AMBIANCE (Chapter 2).

In 2000, Madigan joined the Pederson/Moran laboratory at the University of Western Ontario. This was a gentle, close, and supportive laboratory environment, essentially run like an extended family, on the explicit principles of *research supervision as a secure base and safe haven* for members of the group, their learning, their critical thinking, and their scientific work.<sup>12</sup> Attachment research felt enjoyable and attractive to Madigan in part because it was modelled in the supervision she received at Western Ontario.<sup>13</sup>

For her master's thesis, she developed rating scales for the AMBIANCE measure, an advance on the previous system of counting behaviours, and later integrated into the AMBIANCE coding manual. For her doctorate in clinical psychology, Madigan coded

and externalizing problems in middle childhood: The role of coparenting. *Frontiers in Psychology*, 13, 805188; Tian, Z., Hazen, N., & Jacobvitz, D. B. (2023) Triadic family interactions at 2 years: The role of prenatal marital quality and infants' attachment configuration with mother and father. *Attachment & Human Development*, 25(5), 524–543; Zhang, S., Tian, Z., MacLaine, B. A., Hazen, N., & Jacobvitz, D. (2024) Trust over the transition to parenthood: Links to attachment, perception of partner's caregiving, and parenting. *Journal of Family Psychology*, early view.

<sup>6</sup> I am thinking here of Goethe, Faust, Part I, lines 682–683: 'That which you inherit from your fathers/You must earn in order to possess.'

<sup>7</sup> Madigan, S. (2017, December). Lots of hard work ... and a bit of luck: My path to becoming a university researcher. University of Calgary's Undergraduate Research Symposium Awards Gala. Calgary, AB. Sheri Madigan personal archive.

<sup>8</sup> E.g. Goldberg, S. (2000) *Attachment and Development*. London: Routledge. The book was completed during Madigan's time with Goldberg's group.

<sup>9</sup> E.g. Raval, V., Goldberg, S., Atkinson, L., Benoit, D., Myhal, N., Poulton, L., & Zwiens, M. (2001) Maternal attachment, maternal responsiveness and infant attachment. *Infant Behavior & Development*, 24, 281–304.

<sup>10</sup> A good example is her editorial role in Goldberg, S., Muir, R., & Kerry, J. (1995) *Attachment Theory: Social, Developmental and Clinical Perspectives*. Hillsdale, NJ: The Analytic Press, given the diversity of perspectives among the authors.

<sup>11</sup> Later published as Madigan, S., Ladd, M., & Goldberg, S. (2003) A picture is worth a thousand words: Children's representations of family as indicators of early attachment. *Attachment & Human Development*, 5(1), 19–37.

<sup>12</sup> Pederson, D. (2005) SRCD oral history interview, [https://www.srcd.org/sites/default/files/file-attachments/pederson\\_interview.pdf](https://www.srcd.org/sites/default/files/file-attachments/pederson_interview.pdf).

Zarbatany: So is there anything else you would like to have recorded for posterity in terms of your experience as an academic and—

Pederson: Well, one question that you pointed out that wasn't—maybe it was addressed and we—maybe I skipped it in terms of answering—was the role of being a mentor to graduate students and how marvelous this is in terms of it—in many ways it's like being a parent, but without all of the responsibility, that you see these young folks enter graduate school being quite timid and unsure of themselves, and foster their both research and intellectual and personal development, and see them come out as incredibly fine confident young people. It's been, it's—I think that is a thrill for me in my career, has been mentoring students and watching their development both in graduate school and after graduate school.'

<sup>13</sup> S. Madigan, personal communication, September 8, 2024.

home observations from an at-risk adolescent sample when their infants were 12 months, documenting associations between AMBIANCE and disorganization in the Strange Situation. Additionally, as part of her doctorate, together with Van IJzendoorn and Bakermans-Kranenburg she conducted a meta-analysis of Lyons-Ruth's AMBIANCE and Main and Hesse's frightened/frightening coding systems and their associations with parent unresolved status and infant disorganized attachment, suggesting equivalent associations with both coding systems (Chapter 2).

Following her graduation in 2007, Madigan took up a postdoctoral fellowship at Ryerson University, working jointly with Leslie Atkinson and Diane Benoit. Madigan became increasingly disillusioned with attachment research, frustrated by its power dynamics, and tendencies towards fixed ideas.<sup>14</sup> She also experienced a lot of self-doubt. She decided to leave academia, in favour of working clinically. Madigan's decision illustrates a threat faced by attachment research in the transition from the second to third generation, that the optimism required to continue the tradition could fail to be transmitted, thereby ending it.<sup>15</sup>

In 2010 she began as the Staff Psychologist for the Hospital for Sick Children, working clinically with children who had experienced maltreatment. She had maternity leaves in 2009, 2011, and 2017, the last for twins. In 2012, following an encouraging meeting with a potential mentor, Jenny Jenkins at the University of Toronto, Madigan recommitted to pursuing an academic path, though not to undertake attachment research. She received the prestigious early-career Banting Postdoctoral Fellowship to work with Jenkins, while continuing to undertake clinical work from 2012 to 2015. Jenkins had been a collaborator of Goldberg, with broad-ranging research interests around family relationships, caregiver sensitivity, and language development, but was not primarily an attachment researcher. Her approach to developmental psychopathology proved influential for expanding Madigan's own research agenda, which has subsequently addressed various topics including abuse and neglect, children's screen time, adolescent sexting, perinatal and paediatric services, and family mental health.<sup>16</sup>

Madigan was drawn back into attachment research from 2013, through her friendship with Fearon and Schuengel, and worked with them on plans for using pooled data to interrogate dominant assumptions about the intergenerational transmission of attachment (Chapter 4).<sup>17</sup> Collaboration with Fearon and Schuengel renewed her faith in attachment research and its potential. Schuengel's own involvement with the attachment research community (reflected in co-authored publications and jointly held grants), and focus on research addressing attachment and caregiving, also increased considerably after 2013 as a result of this collaboration.<sup>18</sup> Reflecting this renewed engagement with the attachment research community, and feeling of being able to work with international peers to help it develop, Schuengel would join the board of the Society of Emotion and Attachment Studies in 2016, under Fearon as its new President.

<sup>14</sup> Ibid.

<sup>15</sup> Psychoanalytic theory has characterized a related concept: aphanisis, the fear of loss of desire or the capacity for desire. Heim, R. (2022) Aphanisis: Freuds letzte Lektüre. *Psyche—Zeitschrift für Psychoanalyse*, 76, 497–526. See also Schönplüg, U. (ed.) (2008) *Cultural Transmission: Psychological, Developmental, Social, and Methodological Aspects*. Cambridge: Cambridge University Press.

<sup>16</sup> E.g. Madigan, S., Browne, D., Racine, N., Mori, C., & Tough, S. (2019) Association between screen time and children's performance on a developmental screening test. *JAMA Pediatrics*, 173(3), 244–250; Madigan, S., McArthur, B. A., Anhorn, C., Eirich, R., & Christakis, D. A. (2020) Associations between screen use and child language skills: A systematic review and meta-analysis. *JAMA Pediatrics*, 174(7), 665–675.

<sup>17</sup> S. Madigan, personal communication, September 8, 2024.

<sup>18</sup> C. Schuengel, personal communication, September 16, 2024.

In 2015, Madigan was recruited to the University of Calgary, where she holds a Tier 2 Canada Research Chair in Determinants of Child Development. In this post, her output has been perhaps even a match for Van IJzendoorn and Bakermans-Kranenburg. In 2022 she won the Royal-Mach-Gaensslen Prize for Mental Health Research for her efforts to bridge research and applied practice with children and families.

Much of Madigan's orientation can be seen established already very early in her career, in her doctoral research (Chapter 2). In this work, tensions can be seen between the visions of developmental science offered by Lyons-Ruth and Van IJzendoorn, two early influences. Lyons-Ruth and Van IJzendoorn could agree on the value of observational assessment of caregiving behaviours for understanding the child–caregiver attachment relationship and later child development. However, Madigan's doctoral study remained caught between Lyons-Ruth's clinical orientation and passion for exploring the ramification of caregivers' struggles, and Van IJzendoorn's use of meta-analytic research as the basis for both dependable claims and new discoveries. As discussed in Chapter 2, this tension was reflected in the discussion section of Madigan's 2006 meta-analysis of associations between assessments of alarming caregiver behaviour and classifications of the child–caregiver relationship in the Strange Situation.

At issue in the 2006 paper was the AMBIANCE measure, developed by Lyons-Ruth and colleagues as an assessment of various forms of caregiving anticipated to alarm young children: affective communication errors in response to infant care-seeking signals; role/boundary confusion; disorientation; intrusiveness/hostility; and withdrawal in response to infant care-seeking signals. Madigan attended the first training in AMBIANCE and was coding samples even before beginning graduate school. She has been one of the primary trainers in the measure. The AMBIANCE has been something of a fulcrum for several of Madigan's otherwise wide-ranging interests in families, trauma, adversity, assessment, and support. A concern with the theme of vulnerability has been central to her interest in the AMBIANCE. Like Lyons-Ruth, and reflected in the differentiated scales of the AMBIANCE, Madigan has been interested in how, when, and why someone is vulnerable, rather than taking this as an individual characteristic.

This has also been integrated within her later meta-analytic research. As an example, in a 2014 meta-analysis, Madigan and colleagues documented that a history of sexual (OR = 1.73, CI, 1.47–2.04) or physical abuse (OR = 1.48, CI, 1.23–1.77) was significantly associated with increased risk of adolescent pregnancy, whereas emotional abuse and neglect were not.<sup>19</sup> Or to take another example, Madigan's team worked with several other third-generation attachment researchers—Alink, Cyr, and Fearon—on a meta-analysis addressing the intergenerational transmission of child maltreatment.<sup>20</sup> Drawing on data from 149 samples (227,918 dyads), they found that a parent's experience of maltreatment had an association of  $d = 0.45$  (CI 0.37–0.54) with maltreatment of their own children. These findings agree well with the umbrella review of Van IJzendoorn, Bakermans-Kranenburg, and colleagues described in Chapter 4 ( $d = 0.47$ ).<sup>21</sup> Madigan and colleagues

<sup>19</sup> Madigan, S., Wade, M., Tarabulsky, G., Jenkins, J. M., & Shouldice, M. (2014) Association between abuse history and adolescent pregnancy: A meta-analysis. *Journal of Adolescent Health*, 55(2), 151–159.

<sup>20</sup> Madigan, S., Cyr, C., Eirich, R., Fearon, R. P., Ly, A., Rash, C.,... & Alink, L. R. (2019) Testing the cycle of maltreatment hypothesis: Meta-analytic evidence of the intergenerational transmission of child maltreatment. *Development and Psychopathology*, 31(1), 23–51.

<sup>21</sup> Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Coughlan, B., & Reijman, S. (2020) Annual research review: Umbrella synthesis of meta-analyses on child maltreatment antecedents and interventions: Differential susceptibility perspective on risk and resilience. *Journal of Child Psychology and Psychiatry*, 61(3), 272–290.

also differentiated between subtypes of abuse. They found, for example, a higher transmission of emotional abuse ( $d = 0.57$ , CI 0.43–0.71), and a lower (but still significant) transmission of neglect ( $d = 0.24$ , CI 0.11–0.37).

Madigan and colleagues sought to think about what these findings may mean for the experience of parents with a history of abuse. They emphasized that continuities should not be taken to imply judgement of parents. Rather they argued how difficult it may be to find the skills, confidence, and coping strategies to parent adequately, without having adequate role models for such parenting oneself: ‘in individuals who experienced maltreatment in their childhood, there is often a considerable desire to create measurable change in how they choose to parent their own children, although this parental capacity to change may not always be realized.’<sup>22</sup>

For instance, the impact of sexual abuse on subsequent maltreatment ( $d = 0.39$ , CI 0.24–0.55) does not imply that the victim becomes a perpetrator. More likely, Madigan and colleagues argued, victims are at risk of difficulties with monitoring of their child, due to challenges such as mental health difficulties or alcohol use, leaving the child vulnerable to predation.<sup>23</sup> Their meta-analysis found that maternal experience of sexual abuse had equivalent associations with child neglect and sexual abuse. Maternal experience of neglect was just as likely to lead to physical or sexual abuse as to neglect of offspring. Maternal experience of physical abuse had equivalent associations with neglect, emotional abuse, sexual abuse, and physical abuse of offspring. These findings are hard to interpret according to prevailing social learning explanations, in which maltreated parents go on to display the same behaviours to their children. Instead, they suggest a much greater role for deficits in relationship skills, confidence, and coping strategies.<sup>24</sup> It may really be *these challenges* that are ‘transmitted’, with continuities in abuse in fact a byproduct. This aligns with the findings from the Leiden group (Chapter 4) that interventions to reduce maltreatment appear only to be effective if they offer parent training, not just support.

Madigan has been careful to try to avoid undue determinism in considerations of relationships between context, caregiving, and child development. This can be seen especially in her work on self-report of adverse childhood experiences. Self-report for adverse childhood experiences has been a widely used measure for research, and associations have been documented with various negative outcomes. As such, it has been considered as a potential screening tool for use by clinical services.<sup>25</sup> For instance, \$45 million of state funding

<sup>22</sup> Madigan, S., Cyr, C., Eirich, R., Fearon, R. P., Ly, A., Rash, C.,... & Alink, L. R. (2019) Testing the cycle of maltreatment hypothesis: Meta-analytic evidence of the intergenerational transmission of child maltreatment. *Development and Psychopathology*, 31(1), 23–51, p. 41. See also Lapierre, S. (2010) Are abused women ‘neglectful’ mothers? A critical reflection based on women’s experiences. In B. Featherstone, C. Hooper, J. Scourfield, & J. Taylor (eds), *Gender and Child Welfare in Society* (pp. 121–148). Chichester, UK: Wiley-Blackwell; Del Mar Cabezas, M. & Pitillas, C. (2019) Invisible victims and public health: Epistemic injustices in the intergenerational transmission of trauma. In J. Vallverdú, A. Puyol, & A. Estany (eds), *Philosophical and Methodological Debates in Public Health* (pp. 107–124). New York: Springer International Publishing.

<sup>23</sup> Moderation analysis provided evidence for this hypothesis: ‘Transmission of sexual abuse was found to be highest when G3 measures of abuse were assessed via case reports (e.g., CPS reports;  $d = 0.59$ ) versus questionnaires ( $d = 0.11$ ). This finding potentially suggests a degree of the caregiver underreporting the child’s history of sexual abuse in questionnaire measures. This may occur because the caregiver is unaware that sexual abuse is occurring or has transpired’ (39).

<sup>24</sup> See also Langevin, R., Gagné, M. E., Brassard, A., & Fernet, M. (2023) Intergenerational continuity of child maltreatment: The role of maternal emotional dysregulation and mother–child attachment. *Psychology of Violence*, 13(1), 1; Marshall, C., Fernet, M., Brassard, A., & Langevin, R. (2023) ‘I was trying to be the mother to her that I didn’t have’: Mothers’ experiences of child sexual abuse and intergenerational maltreatment. *Violence against Women*, 10778012231216712; Bennett, K. (2024) Relational trust in adult survivors of childhood sexual abuse: A grounded theory study. Unpublished doctoral dissertation, Capella University.

<sup>25</sup> Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998) Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults:



has been allocated in California to increase ACEs screening and trauma-related training in paediatric care settings.<sup>26</sup> Yet Madigan and colleagues have been critical of the leap from associations with negative outcomes to the use of the measure as a screening tool: it first needs to be validated for that purpose.

Together with her postdoctoral fellow, Nicole Racine, Madigan investigated whether self-report adverse childhood experiences applied in perinatal health services can predict differences in clinical needs, and whether it does so over and above demographic factors. The results were resoundingly negative. In practice, self-report of adverse childhood experiences made a trivial difference to prediction of pregnancy health risks over and above routinely collected data; current financial difficulties, by contrast, were a considerably more robust predictor.<sup>27</sup> Self-report of adverse childhood experiences did predict postnatal depression, but not to any great degree, and this association was dwarfed by a measure of current social support for the mother.<sup>28</sup> Racine, Killam, and Madigan urged against developmental determinism at the expense of attention to the important role of a family's current situation. Those considering screening for adverse childhood experiences should never 'preclude a comprehensive assessment of current psychosocial risk factors (e.g., poverty), environmental influences such as parenting, and protective or resilience factors that may mitigate risk.'<sup>29</sup>

As Thompson has observed, 'it is not easy to be theoretically guided in this atheoretical, data-driven era.'<sup>30</sup> In particular, developmental scientists can be impatient with attachment theory, which many regard as having failed to move with the times.<sup>31</sup> The demands of competition for project-based grants (Chapter 4) have contributed to utility for developmental scientists of empirical studies, produced as quickly as possible, rather than cumulative work within a theoretical framework.<sup>32</sup> Despite this context, attachment theory has frequently been drawn on as an explanatory resource in Madigan's work in developmental psychopathology. But, influenced by Jenkins, this has been without

The Adverse Childhood Experiences (ACE) Study. *American Journal of Preventive Medicine*, 14(4), 245–258; Bellis, M. A., Hughes, K., Ford, K., Ramos Rodriguez, G., Sethi, D., & Passmore, J. (2019) Life course health consequences and associated annual costs of adverse childhood experiences across Europe and North America: A systematic review and meta-analysis. *Lancet Public Health*, 4(10), e517–e528.

<sup>26</sup> Discussed in Racine, N., Killam, T., & Madigan, S. (2020) Trauma-informed care as a universal precaution: Beyond the adverse childhood experiences questionnaire. *JAMA Pediatrics*, 174(1), 5–6.

<sup>27</sup> Van Roessel, L., Racine, N., Dobson, K., Killam, T., & Madigan, S. (2021) Does screening for maternal ACEs in prenatal care predict pregnancy health risk above and beyond demographic and routine mental health screening? *Child Abuse & Neglect*, 121, 105256; Racine, N., Ereyi-Osas, W., Killam, T., McDonald, S., & Madigan, S. (2021) Maternal-child health outcomes from pre-to post-implementation of a trauma-informed care initiative in the prenatal care setting: A retrospective study. *Children*, 8(11), 1061.

<sup>28</sup> Racine, N., Zumwalt, K., McDonald, S., Tough, S., & Madigan, S. (2020) Perinatal depression: The role of maternal adverse childhood experiences and social support. *Journal of Affective Disorders*, 263, 576–581.

<sup>29</sup> Racine, N., Killam, T., & Madigan, S. (2020) Trauma-informed care as a universal precaution: Beyond the adverse childhood experiences questionnaire. *JAMA Pediatrics*, 174(1), 5–6, p. 6. The Calgary team did, however, find modest benefit to infant outcomes when applying a trauma informed care approach to perinatal care. Racine, N., Ereyi-Osas, W., Killam, T., McDonald, S., & Madigan, S. (2021) Maternal-child health outcomes from pre-to post-implementation of a trauma-informed care initiative in the prenatal care setting: A retrospective study. *Children*, 8(11), 1061.

<sup>30</sup> Thompson, R. A. (2008) Measure twice, cut once: Attachment theory and the NICHD study of early child care and youth development. *Attachment & Human Development*, 10(3), 287–297, p. 296.

<sup>31</sup> Mann, A., Thompson, M., Foster, S., Beckwith, H., Madigan, S., Fearon, R. P.,... & Duschinsky, R. (2023) The perspectives of senior researchers in applied disciplines on the current state of developmental attachment research: An interview study. *Sage Open*, 13(2), 21582440231179204.

<sup>32</sup> Vostal, F. (2016) *Accelerating Academia: The Changing Structure of Academic Time*. New York: Springer; Lilienfeld, S. O. (2017) Psychology's replication crisis and the grant culture: Righting the ship. *Perspectives on Psychological Science*, 12(4), 660–664.



claiming child–caregiver attachment as the central and cross-cutting determinant of child socioemotional development, as in Sroufe.<sup>33</sup>

For example, reflecting on meta-analytic findings regarding associations between adverse childhood experiences and inter-partner violence in adult relationships, Zhu, Madigan, and colleagues considered a variety of hypotheses: ‘parent–child attachment may play a role, such that abuse perpetrated by a caregiving figure (e.g., father; stepfather) towards the child or the child’s attachment figure (e.g., mother) may impact the child’s sense of safety and security. When a child’s safety and security is threatened, they may develop the perception that the world is hostile and engage in more aggressive tendencies towards others as an adaptation process.’<sup>34</sup> Or, at another level, it could be argued that ‘repeated exposure to stress can lead to physiological stress responses that have negative implications for neurological development. This, in turn, can lead to impairments in stress responses and coping, and the management of emotional arousal, thereby increasing the likelihood of engaging in violent behavior.’<sup>35</sup> Furthermore, it is possible that adverse childhood experiences may be related to partner violence on account of the fact that ‘genes associated with violent behaviors may be shared between parents and offspring.’<sup>36</sup> Madigan and colleagues highlighted the need for research to examine these and other possible mechanisms. Intervention research could be an asset, in appraising the effectiveness of taking different targets for support and help.

In such reflections, attachment theory has a valued place at the table, but with a different role than in Sroufe’s work. Not that Sroufe was doctrinaire, as Belsky and others have alleged. Rather, Sroufe proceeded from attachment, conceptualized as a general process within development, in considering any particular aspect of development. Madigan proceeds from the particular, and without Sroufe’s tendency to imply a thing called ‘attachment’ as a discrete causal mechanism.<sup>37</sup> In Madigan’s work, secure base/safe haven availability and caregiver sensitivity are conceptualized as among the possible influences on development, but not intrinsically relevant to all psychosocial development. They have a good claim to potential relevance, but this claim requires case-by-case evaluation.

## Updating the Study of Attachment

One line of Madigan’s research has entailed cohort research and use of attachment measures. Like Lyons-Ruth, this work has tended to ask questions in relation to orthodox assumptions in attachment research following Main (Chapter 1). For instance, as part of her postdoctoral fellowship in the early 2010s, Madigan and colleagues recruited a sample of 84 families, and conducted the AAI, Strange Situation, and the Working Model of the Child Interview (Chapter 2). As Solomon and George had controversially predicted in the 1990s, associations between the AAI and Strange Situation were fully mediated by

<sup>33</sup> E.g. Sroufe, L. A. (1997) Psychopathology as an outcome of development. *Development and Psychopathology*, 9(2), 251–268; Sroufe, L. A. (2005) Attachment and development: A prospective, longitudinal study from birth to adulthood. *Attachment & Human Development*, 7(4), 349–367.

<sup>34</sup> Zhu, J., Exner-Cortens, D., Dobson, K., Wells, L., Noel, M., & Madigan, S. (2024) Adverse childhood experiences and intimate partner violence: A meta-analysis. *Development and Psychopathology*, 36(2), 929–943, p. 934. The association between adverse childhood experiences and partner violence perpetration was  $r = 0.172$  (CI 0.119–0.223). The association between adverse childhood experiences and partner violence victimization was  $r = 0.200$  (CI 0.143–0.255).

<sup>35</sup> Ibid.

<sup>36</sup> Ibid.

<sup>37</sup> Cf. Benton, D. T. (2022) The elusive ‘developmental mechanism’: What they are and how to study and test them. *Developmental Review*, 65, 101034.

caregivers' thoughts and feelings about their child. This finding rather demystified the AAI. Rather than a special predictor of child attachment, exercising an unconscious influence on caregiver behaviour, the findings of Madigan and colleagues suggested that the AAI is only relevant to child attachment to the extent that it influences caregivers' *conscious* perceptions of their child. Studies of caregiving might do better to assess these perceptions directly, rather than make use of the AAI.

As part of her postdoctoral fellowship work with Diane Benoit, Madigan, and colleagues recruited a sample of 55 pregnant adolescents. Here she and colleagues interrogated the relationship between unresolved states of mind on the AAI and self-reported trauma symptoms. This research suggested some strengths and limitations of the AAI questions. The AAI seemed to be superior to self-report measures for eliciting report of emotional abuse. That said, with no question included about maltreatment in the standard AAI protocol, Madigan felt that this represents a potential weakness.<sup>38</sup> Madigan found that in her sample participants rarely spontaneously mentioned sexual abuse during the AAI—until a question that their team added to the protocol. Then half of the participants disclosed experiences of sexual abuse, many displaying lapses in discourse or reasoning around these events and receiving an unresolved classification.<sup>39</sup>

In part as a result of asking about sexual abuse, then, as many as 78% of the sample received an unresolved state of mind classification in this sample, much higher than the 39% in the Pederson/Moran sample from Madigan's doctoral studies. Yet in the Pederson/Moran sample, '52% of adolescent mothers with dismissing attachment representations were in disorganized attachment relationships with their infants, suggesting that some mothers who were classified as dismissing may have been misclassified due to insufficient questions and probes regarding maltreatment experiences.'<sup>40</sup>

A study by Harari and collaborators, including Bakermans-Kranenburg and Madigan, found that severity of unresolved state of mind was associated with dissociation. This mirrored earlier findings by the Leiden group, who found an association of  $r = 0.80$  in their study of combat veterans.<sup>41</sup> For Van IJzendoorn, Bakermans-Kranenburg, and colleagues, the extent of this association suggested that the AAI and self-report of dissociative symptoms were measuring the same construct. Van IJzendoorn and Bakermans-Kranenburg wondered whether unresolved states of mind on the AAI 'shows sufficient incremental validity beyond established measures for posttraumatic stress symptomatology' to be worth continuing to use, acknowledging that 'this may be considered an unresolved issue.'<sup>42</sup> To further explore this issue Madigan and colleagues assessed whether self-report of abuse in childhood mediated associations between unresolved states of mind and self-report of dissociative symptoms. They found full mediation.

<sup>38</sup> Though see Nivison, M. D., Filetti, C. R., Carlson, E. A., Jacobvitz, D. B., & Roisman, G. I. (2024) Agreement between retrospective and prospective assessments of childhood abuse revisited. *Development and Psychopathology*, early view.

<sup>39</sup> Madigan, S., Vaillancourt, K., McKibbin, A., & Benoit, D. (2012) The reporting of maltreatment experiences during the Adult Attachment Interview in a sample of pregnant adolescents. *Attachment & Human Development*, 14(2), 119–143.

<sup>40</sup> Ibid., 136. Though see Nivison, M. D., Filetti, C. R., Carlson, E. A., Jacobvitz, D. B., & Roisman, G. I. (2024) Agreement between retrospective and prospective assessments of childhood abuse revisited. *Development and Psychopathology*, early view.

<sup>41</sup> Harari, D., Bakermans-Kranenburg, M. J., De Kloet, C. S., Geuze, E., Vermetten, E., Westenberg, H. G. M., & Van IJzendoorn, M. H. (2009) Attachment representations in Dutch veterans with and without deployment-related PTSD. *Attachment & Human Development*, 11(6), 515–536, p. 350.

<sup>42</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2014) Confined quest for continuity: The categorical versus continuous nature of attachment. *Monographs of the Society for Research in Child Development*, 79(3), 157–167, p. 165.

There is a subtlety here. Other researchers, including Lyons-Ruth as we have seen (Chapter 2), would usually put self-reported abuse experiences first in a hierarchical regression model, and test the additional contribution of unresolved states of mind to an outcome of interest, here dissociation. The abuse experiences are historically prior to the state of mind regarding attachment. In considering self-reported abuse experiences as a *mediator*, Madigan and colleagues have accepted the critique of Van IJzendoorn and Bakermans-Kranenburg that such self-report measures cannot be treated in any straightforward manner as reflecting historical events. However, rather than dismissing such measures, Madigan and colleagues here used adolescents' self-report of abuse as a legitimate measure of their conscious perceptions about their experiences. The finding that these perceptions mediate associations between the AAI and dissociative symptoms then implies that the link between the AAI and self-reported dissociation is actually accounted for by participants' *conscious* awareness of the abuse they experienced. This finding places further weight on Van IJzendoorn and Bakermans-Kranenburg's concern about the incremental validity of the unresolved classification beyond self-report measures of posttraumatic stress symptoms.

Despite her work with cohort data, the primary line of research on attachment by Madigan has been a programme of meta-analytic studies. In 2020 her group established the Child Attachment Studies Catalogue And Data Exchange (CASCADE), a data repository consisting of extracted, compiled, and coded data from all studies that have observationally measured child–parent attachment in infancy, early childhood, or middle childhood. Use of this repository has greatly increased the rapidity with which meta-analytic research on attachment can be conducted. Madigan has led a series of programmatic meta-analyses, often with input from Fearon, Schuengel, Van IJzendoorn, and Bakermans-Kranenburg. These include studies of measures of child attachment in infancy, preschool years, and later in childhood; and the studies of the sequelae of caregiver sensitivity. These will be addressed in turn.

### New Meta-analyses of Measures of Child Attachment

In 2023, Madigan, Fearon (shared first authors), and colleagues (including Van IJzendoorn and Bakermans-Kranenburg; and myself) published a meta-analytic review of the Strange Situation procedure, drawing data from 285 studies and 20,720 dyads.<sup>43</sup> Of these studies, 273 were of infant–mother dyads, and 12 were of infant–father dyads. The overwhelming majority of studies were conducted in North America (203), with the remainder conducted in Europe (57), Israel (6), Asia (5), Africa (4), and South America (5). Seventy-seven (27%) were recruited on the basis of socioeconomic disadvantage, and 42 (15%) were racially minoritized samples.

The global distribution of classifications was 51.6% secure, 14.7% avoidant, 10.2% resistant, and 23.5% disorganized.<sup>44</sup> There was no significant association identified between

<sup>43</sup> Madigan, S., Fearon, R. M., van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J., ... & Verhage, M. L. (2023) The first 20,000 strange situation procedures: A meta-analytic review. *Psychological Bulletin*, 149(1–2), 99–132.

<sup>44</sup> This updated van IJzendoorn, Schuengel and Bakermans-Kranenburg's 1999 meta-analysis. Van IJzendoorn, M. H., Schuengel, C., & Bakermans-Kranenburg, M. J. (1999) Disorganized attachment in early childhood: Meta-analysis of precursors, concomitants, and sequelae. *Development and Psychopathology*, 11(2), 225–249. Based on 2,104 dyads, the 1999 meta-analysis had reported North American norms as 62% secure, 15% avoidant, 9% resistant, and 15% disorganized. Strangely, these have not infrequently subsequently been reported as the *international* norms, including by van IJzendoorn and Bakermans-Kranenburg e.g. Van IJzendoorn, M. H., Palacios,

Strange Situation classifications and child age, child gender, child medical condition, child prematurity, or parent gender. Differences in classifications between six samples of parents with experiences of maltreatment and the other samples were non-significant. This was a surprising finding as many clinicians and developmental scientists had assumed that parents' experiences of maltreatment would clearly result in greater disturbances in child-caregiver attachment. That said, Madigan, Fearon, and colleagues reflected that 'objective and subjective experiences of childhood maltreatment only partially overlap and may differ in their prediction of maltreatment-related psychopathology and maladaptive parenting practices'.<sup>45</sup>

Differences in classifications between six samples with children with neurodevelopmental difficulties and the other samples were also non-significant. There has been a growing consensus among attachment researchers that neurodevelopmental difficulties do not disrupt child-caregiver attachment, except in the infrequent cases where the extent of intellectual disability is so considerable that the child is not able to interpret their caregiver's secure base and safe haven availability.<sup>46</sup> The findings did not agree with an earlier narrative review and an earlier meta-analysis.<sup>47</sup>

An unexpected finding was a decline in avoidance over time compared to security, as measured by date of publication (see [Figure 5.1](#)).<sup>48</sup> Madigan, Fearon, and colleagues suspected, and hoped, that this reflected normative changes towards more child-centric parenting styles. If so, the relative decline of avoidance but not resistance or disorganization may suggest that the change is specifically in decreased acceptability of rebuff of child care-seeking behaviours. Sociological trends such as more dual working parents and increased divorce rate were also considered; however, it is not clear how these would contribute to lower rates of avoidance. An alternative sociological trend might be a trend in increased paternal involvement in childcare.

In samples facing socioeconomic disadvantage, rates of disorganization were 31% (CI 28–36%), compared to 21% (CI 19–23%, note typographical error in the manuscript)<sup>49</sup>

J., Sonuga-Barke, E. J., Gunnar, M. R., Vorria, P., McCall, R. B.,... & Juffer, F. (2011) I. Children in institutional care: Delayed development and resilience. *Monographs of the Society for Research in Child Development*, 76(4), 8–30. The same error can be seen in other papers. The international norms are available in Table 1: 51.5% secure, 17.4% avoidant, 10.6% resistant, and 20.4% disorganized.

<sup>45</sup> Madigan, S., Fearon, R. M., van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J.,... & Verhage, M. L. (2023) The first 20,000 strange situation procedures: A meta-analytic review. *Psychological Bulletin*, 149(1–2), 99–132, p. 117.

<sup>46</sup> E.g. Rutgers, A. H., Bakermans-Kranenburg, M. J., IJzendoorn, M. H., & Berckelaer-Onnes, I. A. (2004) Autism and attachment: A meta-analytic review. *Journal of Child Psychology and Psychiatry*, 45(6), 1123–1134; Schuengel, C. & Janssen, C. G. (2006) People with mental retardation and psychopathology: Stress, affect regulation and attachment: A review. *International Review of Research in Mental Retardation*, 32, 229–260; Rozga, A., Hesse, E., Main, M., Duschinsky, R., Beckwith, L., & Sigman, M. (2018) A short-term longitudinal study of correlates and sequelae of attachment security in autism. *Attachment & Human Development*, 20(2), 160–180.

<sup>47</sup> Hamadi, L. & Fletcher, H. K. (2021) Are people with an intellectual disability at increased risk of attachment difficulties? A critical review. *Journal of Intellectual Disabilities*, 25(1), 114–130; Alexander, S. L., Frederico, M., Long, M., & Vicendese, D. (2023) Attachment security in children with disability or developmental delay: Systematic review of quality and interventions. *Journal of Occupational Therapy, Schools, & Early Intervention*, 27(2), 228–258.

<sup>48</sup> Use of year of sample recruitment would have resulted in a more accurate analysis, given the potential for considerable discrepancy between recruitment and publication date. However, year of sample recruitment was not reliably reported.

<sup>49</sup> Page 109 states that the CI is 16–20%, but this does not agree with Table 3. The figures in Table 3 are correct. Madigan, S., Fearon, R. M., van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J.,... & Verhage, M. L. (2023) The first 20,000 strange situation procedures: A meta-analytic review. *Psychological Bulletin*, 149(1–2), 99–132,

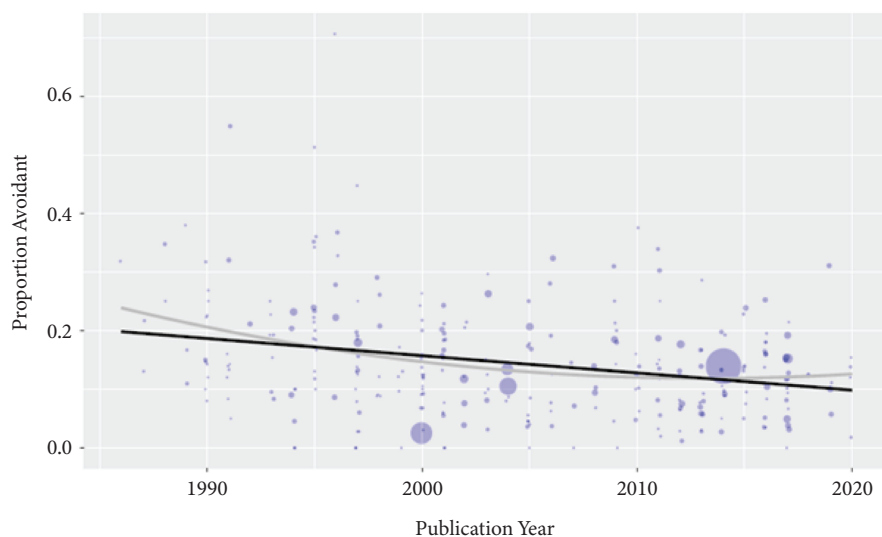


**Figure 5.1** Scatterplot of Proportion of Samples Coded as Avoidant by Publication Year

*Note.* Size of the circles is proportional to sample size. Black line is linear trend, grey line is quadratic trend

in samples not facing acute socioeconomic pressures.<sup>50</sup> Rates of security were commensurately lower in economically disadvantaged samples (42%, CI 38–46%) compared to other samples (55%, CI 53–57%). A similar set of associations, though stronger, was seen for samples with documented maltreatment compared to community samples. And a similar set of associations, though weaker, was seen for samples with caregivers recruited on the basis of mental health difficulties compared to non-clinical samples.

An important finding was the minimal association between any such contextual variables and rates of avoidance or resistance. These findings are discrepant with the earlier 2010 meta-analysis by Cyr and colleagues which found that maltreatment, socioeconomic disadvantage, and adolescent motherhood were all associated with higher rates of insecurity. Yet Cyr and colleagues only split secure vs insecure, whereas Madigan and colleagues provided four-way distributions. The associations between insecurity and maltreatment, socioeconomic disadvantage, and adolescent motherhood in the meta-analysis by Cyr and colleagues may then have actually been driven by disorganization. Since Ainsworth, attachment researchers—including Belsky and Lyons-Ruth—have generally assumed that family adversity and maltreatment would contribute to more avoidance and resistance.<sup>51</sup> Surprisingly, Madigan, Fearon, and colleagues' findings suggested that this was a misapprehension. These results align with the conclusions of Main, and of Van IJzendoorn and Bakermans-Kranenburg, that the mechanisms contributing to avoidance/resistance and disorganization are quite distinct.

This is highly intriguing. It suggests that contextual factors minimally contribute to avoidance and resistance, with caregiver behaviour a major intermediary—as suggested

<sup>50</sup> Cf. McIntosh, J. E., Schnabel, A., Youssef, G. J., & Olsson, C. A. (2021) Preconception and perinatal predictors of offspring attachment disorganization: Advancing the replicated evidence. *Development and Psychopathology*, 33(1), 240–251.

<sup>51</sup> E.g. Ainsworth, M. D. S. (1980) Attachment and child abuse. In G. Gerbner, C. J. Ross, & E. Zigler (eds), *Child Abuse: An Agenda for Action*. New York: Oxford University Press, pp. 35–47; Belsky, J. (1999) Interactional and contextual determinants of attachment security. In J. Cassidy & P. Shaver (eds), *Handbook of Attachment* (pp. 249–265). New York: Guilford Press.

by the first model (Figure 1) in Belsky's process model paper (Chapter 3). By contrast, contextual factors may contribute more strongly to disorganization—as suggested by the second model (Table 1) in Belsky's process model paper. This conclusion is supported by Cyr and colleagues' meta-analysis, where cumulative adversity was associated with disorganization but not insecurity. Given these findings, Madigan, Fearon, and colleagues reflected that the absence of a disorganized scale on the AQS potentially represented a significant limitation for research with at-risk or maltreated samples.

In the paper by Madigan, Fearon, and colleagues, the only moderator associated with material differences in rates of organized insecurity was the finding that rates of avoidant attachment were considerably lower in samples that had been fostered/adopted (6%, CI 3–10%) compared to other samples included in the meta-analysis (15%, CI 14–16%). At the same time, rates of disorganized attachment were higher in fostered/adopted children (40%, CI 27–52%) compared to children in other samples (23%, CI 21%, 25%).<sup>52</sup> The distribution of secure attachment among fostered and adopted infants was not significantly different from biologically related infants, findings that aligned with the position of Juffer, Van IJzendoorn, and Bakermans-Kranenburg that adoption or fostering have no necessarily negative implications for child security (Chapter 4).

Across every statistical test conducted by Madigan, Fearon, and colleagues, there were *no* significant predictors of resistant attachment. Previously, attachment researchers had generally assumed that the classification was not well understood as it is relatively infrequent—1 in 10 in an average sample—and so tests for its correlates were underpowered. But the meta-analysis of 20,000 Strange Situations was perfectly well powered. These findings raise questions about the meaning and value of the classification, concerns as we have seen that others share, such as Sroufe and Van IJzendoorn (Chapter 4). Madigan, Fearon, and colleagues accepted that their meta-analysis only permitted across-sample comparisons, and analysis of direct effects, which might mask some correlates of resistant attachment. They identified that a next step would be use of pooled raw data.

Madigan, Fearon, and colleagues next examined regional differences in distribution of attachment classification. Somewhat higher rates of security were found in African and Asian samples, and somewhat lower rates of disorganization. Admittedly, the small number of studies make these findings very provisional. As we saw in Chapter 4, commentators have often been too quick to interpret regional differences in distributions of attachment classifications based on a small number of studies in terms of favoured accounts of inter-cultural differences, when ultimately these findings have disappeared in further replications. Not least, Madigan, Fearon, and colleagues caution that continent-by-continent comparisons are unlikely to be especially useful, given the sheer extent of variation within such units of analysis: 'A more detailed approach using multidimensional characterization of cultural differences between smaller geographic regions with a large set of psychosocial and economic scales might better represent cultural niches and provide

<sup>52</sup> It may be that the experience of adoption or fostering, and the need to build an attachment relationship with a new carer, hinders access to an avoidant strategy among young children. Insecure adopted or fostered children may instead display the disorganization that Main theorized was held back by avoidance, with the conditional strategy functioning as a form of attentional regulation and way of managing the relationship (chapter 1). Together with the earlier experiences of adverse or abusive care for many adopted or fostered young children, this difficulty accessing an avoidant strategy may be contributing to a higher rate of disorganization. An alternative line of explanation might be in terms of the caregiving characteristics of foster carers, who may be less likely to rebuff the distress of their foster children, but who may also struggle to deal with challenging behaviours, resulting in alarming behaviours such as withdrawal.

a more granular comparison of cultural attachment differences.<sup>53</sup> Madigan, Fearon, and colleagues affirmed Van IJzendoorn's earlier assertion (Chapter 4) that the small extent of regional variation in distributions of attachment classifications does not provide evidence for the cross-cultural validity of the Strange Situation, which has to be established or contested on the basis of its correlates.

Madigan, Fearon, and colleagues concluded that the Strange Situation will continue to be used for years to come, given its value in discerning important aspects of children's secure base and safe haven expectations. It appears to have more to teach us, for instance in being able to distinguish avoidance from disorganization, which seem to have quite distinct antecedents. Still, the limitations of the measure were prominently highlighted: 'the SSP and its associated coding systems are highly unlikely to capture all the important aspects of attachment behavior, such as its individual developmental trajectory, its context-dependence, or how attachment is expressed in the presence of multiple caretakers'.<sup>54</sup>

In line with Attachment Research 2.0 (Chapter 4), Madigan, Fearon, and colleagues recommended that attachment researchers should now seek to refocus on mechanisms, entering into dialogue with other disciplines, with methods such as the Strange Situation used as a tool rather than guiding the direction of research and sequestering researchers from this wider scientific conversation:

We anticipate that further investigation, including the use of machine learning approaches and/or wearable technologies, validated through comparison with existing approaches, may eventually allow us to pick out these mechanisms more sharply, strengthening continuous attachment ratings, pruning the coding systems, and permitting their automation. In turn, this sharper articulation of underlying mechanisms by the coding system can be anticipated to support greater dialogue with other disciplines and achieve improved prediction of relevant developmental (endo-)phenotypes, benefiting research as well as clinical and policy practice.<sup>55</sup>

This is a radical conclusion, hard to imagine from attachment researchers a dozen years ago. It suggests appetite for a major methodological transformation for the sake of moving the study of attachment and caregiving forward. In a sense, then, this meta-analytic summing-up of the Strange Situation pursued by Madigan, Fearon, and colleagues is, in part, for the sake of being or becoming ready to put the measure down, or at least not to hold it so tightly.

As a companion to Madigan and colleagues meta-analysis of 20,000 Strange Situations, another meta-analysis was undertaken, focused on the Marvin–Cassidy adaptation of the Strange Situation for preschool-aged children and Main and Cassidy's six-year system (Chapter 1) (95 samples and 8,076 children).<sup>56</sup> This meta-analysis was led by Audrey-Ann Deneault, who had joined Madigan's research group in 2021 as a postdoctoral fellow, following graduate study with Bureau at Ottawa addressing child–father attachment in

<sup>53</sup> Madigan, S., Fearon, R. M., van IJzendoorn, M. H., Duschinsky, R., Schuengel, C., Bakermans-Kranenburg, M. J., ... & Verhage, M. L. (2023) The first 20,000 strange situation procedures: A meta-analytic review. *Psychological Bulletin*, 149(1–2), 99–132, p. 118.

<sup>54</sup> *Ibid.*, 120.

<sup>55</sup> *Ibid.*, 120, parentheses suppressed.

<sup>56</sup> Deneault, A. A., Bureau, J. F., Duschinsky, R., Fearon, P., & Madigan, S. (2023) A meta-analysis of the distribution of preschool and early childhood attachment as assessed in the strange situation procedure and its modified versions. *Attachment & Human Development*, 25(2), 322–351.



the preschool period.<sup>57</sup> Deneault and colleagues (including myself) reported that the global four-way distribution was 53.5% secure, 14.0% avoidant, 11.0% ambivalent, and 21.5% disorganized/controlling. That is to say, *almost identical* to the distribution in the meta-analysis of the infant Strange Situation. Given the extreme maturational differences between infants and preschool or six year olds, these were extraordinary findings.

Deneault and collaborators considered two reasons for the sheer extent of alignment. First, it may be that secure base/safe haven dynamics occur across this age-range, with children forming relatively more secure relationships unless they need to respond to caregiver behaviour suggesting relative lack of secure base and safe haven availability. This would offer confirmation of Main's bold claim that the same attentional strategies can be seen throughout development, as alterations of the output of the attachment motivational system (Chapter 1). Alternatively, the congruence may reflect that the modified versions of the Strange Situation were based on the infant system, and coders have implicitly used infant distribution norms—such as available from Van IJzendoorn and colleagues' earlier meta-analysis (Chapter 4)—when coding samples.

As in Madigan, Fearon and colleagues' meta-analysis of the infant Strange Situation, Deneault and collaborators reported a decline in avoidant classifications compared to secure classifications over the decades. Replication of this finding in adaptations of the Strange Situation offers further support for the observation. As in the infant Strange Situation meta-analysis, there was minimal evidence of geographical variation at continent level, though Deneault and collaborators fully acknowledged the limitations of such comparison and the available cross-national research.

Another finding shared with the infant Strange Situation was that samples with child maltreatment had a much higher rate of disorganized/controlling attachment (47.3%) than non-maltreated samples (19.2%), and rates of security were much lower in maltreated samples (25.0%) than those without maltreatment (55.7%). There was no difference identified in distributions by child sex, ethnicity, or child medical diagnosis.

Unlike for the infant Strange Situation meta-analysis, there was no difference identified between samples facing or not facing socioeconomic adversity in distributions in the preschool or six-year systems.<sup>58</sup> Deneault and collaborators were hesitant about this finding. One possibility is that the analysis was underpowered, given fewer studies available compared to the infant Strange Situation meta-analysis. It could be that the effect of socioeconomic adversity on child attachment relationships is affected by child age, for instance with older children going to school and spending fewer hours with their caregivers, or with older children more able to distinguish between socioeconomic strain on the family and caregiver availability. Deneault and colleagues also reflected on Cyr and collaborators' earlier meta-analysis: the researchers there considered that socioeconomic adversity may not make a direct contribution to child–caregiver attachment insecurity or disorganization, but might be better conceptualized as an indirect measure for experiences that leave a parent feeling frightened and overwhelmed. This could contribute to variation between studies not well captured by a general index of socioeconomic adversity in a sample.

<sup>57</sup> Deneault, A. A., Bureau, J. F., & Yurkowski, K. (2022) Do child–father and child–mother preschool insecure attachment types predict the development of externalizing behaviors in boys and girls during middle childhood? *Developmental Psychology*, 58(7), 1360–1370.

<sup>58</sup> See also Smith, A. R., Manly, J. T., Warmingham, J. M., & Lynch, M. (2024) Pilot examination of independent and interactive effects of maltreatment and neighborhood risk on child attachment. *Attachment & Human Development*, early view.



An additional analysis, permitted by the older age of the children, was whether the seven samples recruited on the basis of child mental health difficulties significantly differed in their distributions in the Strange Situation. They did not. This finding runs directly against accounts, often circulating in texts aimed at practitioner audiences, characterizing attachment insecurity and/or disorganization as fundamental for children's mental health difficulties.<sup>59</sup> That said, confidence intervals in the meta-analysis were large. It may be that more subtle, indirect relationships will be demonstrated across future research, perhaps with insecurity and/or disorganization as a moderator of the relationship between adversity and mental health difficulties, or with security functioning as a protective factor.<sup>60</sup>

As mentioned above, in the infant Strange Situation meta-analysis rates of avoidant attachment were considerably lower in samples that had been fostered/adopted, while rates of disorganized attachment were higher. This finding did not hold in data using the Marvin–Cassidy preschool or six-year systems. Deneault and collaborators acknowledged that this could reflect that fewer studies were available, and so they would not have had the statistical power to detect a small effect. Alternatively, it may be that by the preschool years and early childhood, children who were adopted at a young age have had time and opportunity to develop trust in their caregiver or recover from the loss or the adverse pre-fostering/adoption caregiving that had contributed to disorganization.

Within the studies drawn on in the meta-analysis, 40 samples (4,213 dyads) reported a breakdown of subtypes of disorganized attachment: 63.8% of children from dyads with a disorganized classification displayed the set of behaviours listed in Main and Solomon's indices; 15.9% of children from dyads with a disorganized classification displayed controlling caregiving behaviour; 10.8% controlling-punitive behaviour; and 9.5% were classified as controlling but neither punitive nor caregiving. The results were a great surprise: Main and Cassidy had anticipated that the majority of infants with a disorganized classification would be assigned a controlling classification in the preschool years, and this had been confirmed by an influential 2005 study by Moss and colleagues. It could be argued that controlling behaviours were still developing and would be more common in older children. However, Deneault and collaborators tested this, and there was no moderation by age. Deneault and colleagues reflected that, partly as a result of no trainings being provided in Main and Cassidy system over decades, too little remains known about the controlling patterns and how they develop. It should also be acknowledged that it is vanishingly rare for researchers to report inter-rater reliability in distinguishing the subtypes. For all that meta-analytic synthesis can be undertaken, from the perspective of Van IJzendoorn and Bakermans-Kranenburg, this work has therefore not yet met the threshold for a scientific inquiry (Chapter 4).

Deneault and colleagues examined observational measures of childhood attachment after infancy but left aside the many representational measures (e.g., story stem narrative assessments; adaptations of the AAI) and questionnaire measures of security of attachment (e.g., Kerns' security scale). This was addressed in another meta-analysis by Madigan

<sup>59</sup> Beckwith, H., van IJzendoorn, M., Freeston, M., Woolgar, M., Stenner, P., & Duschinsky, R. (2022) A 'transmission gap' between research and practice? A Q-methodology study of perceptions of the application of attachment theory among clinicians working with children and among attachment researchers. *Attachment & Human Development*, 24(6), 661–689.

<sup>60</sup> E.g. Macdonald, H. Z., Beeghly, M., Grant-Knight, W., Augustyn, M., Woods, R. W., Cabral, H.,... & Frank, D. A. (2008) Longitudinal association between infant disorganized attachment and childhood posttraumatic stress symptoms. *Development and Psychopathology*, 20(2), 493–508.

and colleagues who examined this literature and looked particularly at prediction of child externalizing and internalizing difficulties.<sup>61</sup>

From 116 studies, with a total of 24,689 participants, Madigan and colleagues found somewhat larger effect sizes for representational ( $d = 0.43$ , CI 0.30–0.56) and questionnaire measures ( $d = 0.51$ , CI 0.43–0.58) of security than Fearon and colleagues in their 2010 meta-analysis ( $d = 0.27$ , CI 0.18–0.36) of behavioural measures. Madigan and colleagues also found a considerable association between representational measures of disorganization and externalizing difficulties ( $d = 0.58$ , CI 0.42–0.74). Again, this was larger than Fearon and colleagues' 2010 report ( $d = 0.34$ , no confidence interval reported). Resistant and avoidant attachment classifications were not significantly associated with externalizing difficulties. This ran contrary to predictions by the Minnesota group that avoidant attachment relationships would predispose externalizing difficulties across childhood.<sup>62</sup>

There was no moderation by child age. Similarly, there were no differences in effect sizes between the various types of questionnaires, or the type of representational measures (AAI vs Story Stem). Effect sizes were smaller for representational and questionnaire measures in samples facing risk, socioeconomic adversities, or with a majority of ethnic minority participants. All three factors were associated with one another. Madigan and colleagues found no contribution from risk or economic adversity once ethnic minority status was included in a meta-regression. Yet the test conducted by Madigan and colleagues was an assessment for *unique* contributions. That is to say, the test assessed the contribution of specific factors made completely independently from the others: the test may not be interpreted as showing that ethnic minority status was making a *more important* contribution than risk or socioeconomic factors.

In 165 studies, with a total of 48,224 participants, Madigan and colleagues found that associations with internalizing difficulties were highly equivalent between representational measures ( $d = 0.39$ , CI 0.25–0.53) and observational measures ( $d = 0.37$ , CI 0.27–0.46). The association was considerably stronger when questionnaire measures were used:  $d = 0.63$ , CI 0.56–0.70. Though this large effect stemmed from questionnaire measures with child report. Children reporting on both their own attachment and on their own depressive symptoms may have led to inflated correlations. Effect sizes for parent ( $d = 0.21$ , CI 0.12–0.30) and teacher ( $d = 0.21$ , CI 0.12–0.30) report were much lower. Madigan and colleagues considered that some of the strength of the self-report measures may stem from the fact that they yielded continuous data, as opposed to the categorical data produced by representational and observational measures. Effect sizes were much larger in studies using depression-specific measures ( $d = 0.81$ , CI 0.72–0.90), compared with those examining global internalizing difficulty ( $d = 0.45$ , CI 0.37–0.52) or anxiety ( $d = 0.38$ , CI 0.23–0.52).

Effect sizes were smaller for representational and questionnaire measures in samples facing risk, socioeconomic adversities or with a majority of ethnic minority participants; again, only ethnic minority status contributed unique variance to this moderation. By comparison, the meta-analyses of behavioural measures of attachment reported no moderation by socioeconomic status or sample ethnicity. Madigan and colleagues reflected that their findings imply that representation and questionnaire measures will require a programme

<sup>61</sup> Madigan, S., Brumariu, L. E., Villani, V., Atkinson, L., & Lyons-Ruth, K. (2016) Representational and questionnaire measures of attachment: A meta-analysis of relations to child internalizing and externalizing problems. *Psychological Bulletin*, 142(4), 367–399.

<sup>62</sup> Carlson, E. & Sroufe, L. A. (1995) The contribution of attachment theory to developmental psychopathology. In D. Cicchetti & D. Cohen (eds), *Developmental Processes and Psychopathology: Vol. 1. Theoretical Perspectives and Methodological Approaches* (pp. 581–617). Cambridge: Cambridge University Press.

of work to assess their cross-cultural validity; they may be more vulnerable to cultural differences than the behavioural observational measures. Furthermore, representational and questionnaire measures may potentially be less suited to populations facing adversity, again suggesting a programme of work to establish their cross-demographic validity. It may be that verbal communication skills, often more developed in more socioeconomically advantaged samples, help support the validity of representational and questionnaire measures. Though this logic would imply that child age should have increased associations between measures of attachment and internalizing/externalizing difficulties, which was not what Madigan and colleagues found.

As we saw in [Chapter 4](#), Groh and colleagues had—to the surprise of many attachment researchers—reported minimal associations between observational measures of early attachment insecurity and internalizing difficulties. Bowlby, Sroufe, and several other attachment theorists had high hopes for the resistant and disorganized classifications as predictors of internalizing problems. In the meta-analysis, only avoidant attachment in the Strange Situation was associated, and only weakly, with later internalizing difficulties ( $d = 0.17$ , CI 0.03–0.31).

Madigan and colleagues reported quite different results for the insecure classifications. Across 15 studies, with 921 participants, including 13 representation and two questionnaire measures of attachment, the combined association between resistant attachment and internalizing problems was  $d = 0.40$  (CI 0.17–0.64). This was larger than for avoidant attachment and internalizing problems ( $d = 0.20$ , CI 0.01–0.39), though with overlapping confidence intervals. The findings suggest that associations between resistant attachment and internalizing difficulties, anticipated by attachment theory, may only emerge after infancy. This finding is especially important as there is no other meta-analytic evidence of resistant attachment being associated with anything much, except temperament, and a small association with insensitivity. Where many attachment researchers today are questioning the value of the resistant classification, Madigan and colleagues suggested that the classification applied to older children may have considerable relevance for internalizing problems, measured using children's verbal responses.<sup>63</sup> This is debatable. An alternative explanation, not addressed by Madigan and collaborators, could be that differences in temperament predispose *both* resistant verbal responses to measures of attachment and verbal report of internalizing difficulties. It could also be that a child's internalizing problems lead to verbal responses on attachment measures that appear distressed and care-seeking, and so get coded as resistant: what appears to be resistant attachment may in fact be the internalizing problems themselves, mistaken for a correlate.

In 18 studies using representational measures of disorganization, with 1,107 participants, the combined effect size for internalizing problems was  $d = 0.47$ . However, there was considerable evidence of publication bias, no doubt due to the weight of expectations on the disorganized classification, and an adjusted combined effect size was  $d = 0.26$  (CI 0.16–0.37).

Overall, the new meta-analyses of measures of child attachment conducted by Madigan and her team have offered many surprises and raised considerable questions, for example regarding how socioeconomic adversities shape attachment relationships, and how and whether the resistant attachment classification is relevant. Yet limitations with measures of child attachment have also repeatedly raised the question of whether researchers are going about conceptualizing and assessing early experiences in attachment relationships

<sup>63</sup> Dagan, O. & Bernard, K. (2021) It takes a village: A call for engaging attachment with adjunct disciplines to clarify 'in-house' clinical conundrums. *Attachment & Human Development*, 23(4), 455–467.

in the right way. As mentioned in [Chapter 1](#), according to Bowlby, early care would influence child expectations about the availability of attachment figures, and these expectations would then shape later development. This theory led the attachment research community to give priority and precedence to the Strange Situation, at the expense of studies of caregiving behaviour.<sup>64</sup> Indeed, Ainsworth's sensitivity scale remained unpublished in English until the 2015 reprint of *Patterns of Attachment*. Still today, the legacy of this prioritization remains. As a case in point, the *A-Z of Attachment* by Wilkins and colleagues contains no entry on sensitivity.<sup>65</sup>

Yet already in the 1980s Lamb and Thompson argued that it could just as well be that the care a child received (assessed in terms of sensitivity) was actually the cause of *both* expectations about attachment figures (assessed in terms of security in the Strange Situation or with other measures) and later outcomes. Expectations about attachment figures may or may not be making any independent contribution. As such, meta-analytic findings of associations between assessments of early attachment and later outcomes may be epiphenomenal. Considering this issue in their meta-analytic work on the sequelae of the Strange Situation and AQS, Fearon and colleagues worried that it could be that, actually, sensitivity was predicting both the Strange Situation or AQS, and their ostensive developmental correlates ([Chapter 4](#)).

The question was consequential on a number of levels. In terms of measurement, it could be that the Strange Situation and AQS had all along been indirect and less effective measures for what could have been better assessed by observation of caregiver behaviour. In terms of theory, it would suggest that concern with kinds of insecurity may have been a distraction, and the research focus should have been on different kinds of caregiver behaviours. In terms of interventions, efforts to change children's attachment patterns or representations could have been of little relevance compared to change in caregiver sensitivity. Evaluation of interventions for their effectiveness for increasing security may in fact have been an indirect, and less relevant and accurate, outcome measure.

### Meta-analyses of the Sequelae of Caregiver Sensitivity

Madigan initiated a programme of meta-analytic research on the sequelae of sensitivity during her Banting Postdoctoral Fellowship with Jenny Jenkins at the University of Toronto. Language development was a longstanding interest for Jenkins. In a 2019 paper, Madigan, Prime, and colleagues began by examining studies that had reported associations between caregiver sensitivity or caregiver warmth with child language development. The paper situated itself as a response to mixed findings in the literature on caregiver behaviour and child language development, as an attempt to understand more of the general picture.

It is curious that the topic chosen was not one addressed by the meta-analyses by Fearon, Roisman and collaborators in studying the sequelae of the Strange Situation and AQS. In addition to the influence of Jenkins, the choice of topic by Madigan and colleagues could be regarded as an attempt to fill in a gap left by this earlier work, with assessment of caregiver

<sup>64</sup> E.g. Steele, H. (2013) Earliest experiences and the process of attachment. In D. Narvaez, J. Panksepp, A. Schore, & T. Gleason (eds), *Evolution, Early Experience and Human Development: From Research to Practice and Policy*. New York: Oxford University Press: 'infant patterns of attachment ... merit close attention because it is infant attachment security that has been longitudinally linked to optimal social, emotional, and moral outcomes across the childhood years into adulthood' (421–426).

<sup>65</sup> Wilkins, D., Shemmings, D., & Shemmings, Y. (2016) *A-Z of Attachment*, London: Palgrave.

sensitivity treated as equivalent to assessment of child attachment. After all, both are windows into the early child–caregiver relationship. The Minnesota group, for instance, would sometimes use one measure and sometimes the other, without adequate explanation, on the basis that both were simply indirect measures of the child’s experience of early care.<sup>66</sup> Madigan and colleagues had earlier conducted a meta-analysis of early attachment and associations with internalizing difficulties at the same time as Groh and colleagues, resulting in duplication and considerable wasted effort.<sup>67</sup> Madigan’s intention was to refocus on sensitivity to avoid duplication with the work of Fearon, Groh, Roisman, Van IJzendoorn, and Bakermans-Kranenburg, who showed no signs of pursuing meta-analytic research on the sequelae of sensitivity, except prediction of the Strange Situation.

From another perspective, it may be considered that Madigan’s choice to work on language development as a correlate of sensitivity served also as a means to duck controversy. Following Bowlby, the orthodox position within attachment research was that the effects of caregiver sensitivity on later outcomes would be fully mediated by the Strange Situation or AQS as assessments of children’s expectations about their caregiver’s availability (the ‘hourglass model’; Chapter 1). Hence, this is why Fearon, Roisman, and collaborators focused on the sequelae of the Strange Situation and AQS. The decision to start with language development in investigating the sequelae of sensitivity may have reflected a choice, at the start of meta-analytic investigation of the sequelae of sensitivity, to avoid a head-to-head comparison between sensitivity and the Strange Situation/AQS. Evidence in favour of a desire to avoid controversy is that the paper failed to cite prominent earlier theory and findings. This included work by Van IJzendoorn and collaborators addressing the effects of qualities of the child–caregiver relationship on language development (Chapter 4). Yet the position of Van IJzendoorn and collaborators was directly contrary to clear statements by Sroufe and by Main—whose points of agreement generally defined the orthodoxy of the second generation of attachment research—that no such association would be expected between the quality of early care and language development.<sup>68</sup>

From 36 studies (7,315 parent–child dyads), Madigan, Prime, and colleagues found that sensitivity was associated with child language development, with a composite effect size of  $r = 0.27$ , CI 0.21–0.33.<sup>69</sup> For the nine studies with fathers (552 father–child dyads), effect sizes for the effects of paternal sensitivity were found to be equivalent ( $r = 0.21$ , CI 0.13–0.29).<sup>70</sup> Associations between sensitivity and language development were contrary to much common wisdom, even resulting in coverage by national and international media.<sup>71</sup> They would later align with an individual participant data meta-analysis by Dagan and colleagues (including Madigan and myself), which found that maternal and paternal child–caregiver security had equivalent associations with child language development. Indeed, children with two secure attachment relationships had higher language competence scores

<sup>66</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 4.

<sup>67</sup> Groh, A. M., Roisman, G. I., van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., & Fearon, R. P. (2012) The significance of insecure and disorganized attachment for children’s internalizing symptoms: A meta-analytic study. *Child Development*, 83(2), 591–610; Madigan, S., Atkinson, L., Laurin, K., & Benoit, D. (2013) Attachment and internalizing behavior in early childhood: A meta-analysis. *Developmental Psychology*, 49(4), 672–689.

<sup>68</sup> Sroufe, L. A. (1988) The role of infant–caregiver attachment in development. In J. Belsky & T. Nezworski (eds), *Clinical Implications of Attachment* (pp. 18–38). Hillsdale, NJ: Erlbaum.

<sup>69</sup> Madigan, S., Prime, H., Graham, S. A., Rodrigues, M., Anderson, N., Khoury, J., & Jenkins, J. M. (2019) Parenting behavior and child language: A meta-analysis. *Pediatrics*, 144(4).

<sup>70</sup> Rodrigues, M., Sokolovic, N., Madigan, S., Luo, Y., Silva, V., Misra, S., & Jenkins, J. (2021) Paternal sensitivity and children’s cognitive and socioemotional outcomes: A meta-analytic review. *Child Development*, 92(2), 554–577.

<sup>71</sup> E.g. Rapaport, L. (2019) Responsive mothers may have kids with better language skills. Reuters, <https://www.reuters.com/article/us-health-parenting-speech/responsive-mothers-may-have-kids-with-better-language-skills-idUSKBN1W92Z1/>.

than those with only one or no secure attachment relationships ( $d = 0.26$ ).<sup>72</sup> These findings provide clear evidence for the importance of the attachment network, discussed in Chapters 3 and 4.

In interpreting Madigan, Prime, and colleagues' meta-analysis, it should be noted that the researchers cast their net wide in what they counted as a measure of sensitivity; several of the inclusions seem to reflect a more general measure of harmonious interaction rather than the technical construct of sensitivity set out by Ainsworth. Few studies by members of the attachment research community or used measures established by attachment researchers such as Ainsworth's sensitivity scale or the MBQS (Chapter 1). No doubt in part this reflected the fact that, despite the proposals of Van IJzendoorn and Bus (Chapter 4), members of the attachment research community generally did not regard language development as an expectable correlate of the quality of early attachment relationships.

Madigan's early mentor Susan Goldberg urged attachment researchers to be clear about what they meant when using the term 'sensitivity'.<sup>73</sup> Perhaps reflecting Goldberg's influence, Madigan has proposed that, though it will be difficult, a key task for the next period of attachment research will be to distinguish sensitivity in Ainsworth's classic conception, and examine the respective contribution of 'other positive domains of caregiver behaviors ... including warmth, mutuality, synchrony, stimulation, positive affect, and autonomy support'.<sup>74</sup> For Madigan and colleagues, the term 'sensitivity' is a stand-in (or cataphoric reference; Chapter 1) for what later researchers will scope and fill out in more detail, much like 'internal working model' for Bowlby. In light of this subsequent call for specificity regarding the sensitivity construct, I will here refer to the broader index from Madigan, Prime, and colleagues' 2019 paper as sensitivity+.

Already a step towards this agenda, in their 2019 paper Madigan, Prime, and colleagues examined caregiver warmth. Drawing data from 13 studies (1,961 parent-child dyads), the association found between maternal warmth and child language development was less strong than for sensitivity+:  $r = 0.16$ , CI 0.09–0.21.<sup>75</sup> The association between sensitivity+ and language development was moderated by socioeconomic status. There was a stronger composite effect size for samples facing socioeconomic adversity ( $r = 0.37$ , CI 0.19–0.53) than for samples drawn from middle- or upper-class groups ( $r = 0.15$ , CI 0.05–0.24), though with overlapping confidence intervals.

Madigan, Prime, and colleagues concluded that caregiver engagement and support for emotion regulation, indexed by sensitivity+, may be especially important for families facing socioeconomic adversity, and provide opportunities to enhance learning. This interpretation was supported by a later meta-analysis by Borairi, Fearon, Madigan, Plamondon, and Jenkins.<sup>76</sup> Use of meta-analytic structural equation modelling allowed the researchers to

<sup>72</sup> Dagan, O., Schuengel, C., Verhage, M. L., Madigan, S., Roisman, G. I., Bernard, K.,... & Volling, B. L. (2024) Configurations of mother-child and father-child attachment relationships as predictors of child language competence: An individual participant data meta-analysis. *Child Development*, 95(1), 50–69.

<sup>73</sup> Goldberg, S., Grusec, J. E., & Jenkins, J. M. (1999) Confidence in protection: Arguments for a narrow definition of attachment. *Journal of Family Psychology*, 13(4), 475–483; Goldberg, S. (2000) *Attachment and Development*. London: Routledge, chapter 4.

<sup>74</sup> Madigan, S., Deneault, A. A., Duschinsky, R., Bakermans-Kranenburg, M. J., Schuengel, C., van IJzendoorn, M. H.,... & Verhage, M. L. (2024) Maternal and paternal sensitivity: Key determinants of child attachment security examined through meta-analysis. *Psychological Bulletin*, 150(7), 839–872, p. 859.

<sup>75</sup> Madigan, S., Prime, H., Graham, S. A., Rodrigues, M., Anderson, N., Khoury, J., & Jenkins, J. M. (2019) Parenting behavior and child language: A meta-analysis. *Pediatrics*, 144(4).

<sup>76</sup> Borairi, S., Fearon, P., Madigan, S., Plamondon, A., & Jenkins, J. (2021) A mediation meta-analysis of the role of maternal responsivity in the association between socioeconomic risk and children's language. *Child Development*, 92(6), 2177–2193.

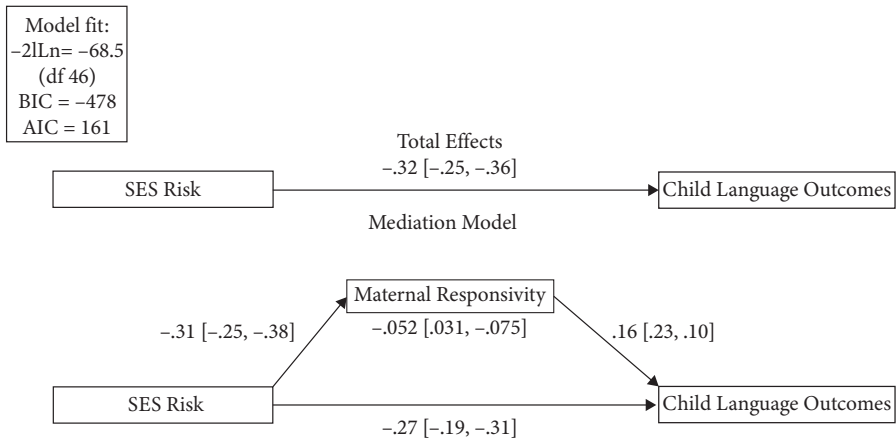


**Figure 5.2** One-stage meta-SEM model of the total, direct, and indirect effects (95% CIs in square brackets). AIC, Akaike information criterion BIC, Bayesian information criterion; BIC, Bayesian information criterion; SEM, structural equation modeling; SES, socioeconomic status

demonstrate that caregiver sensitivity+ partially mediated associations between socioeconomic risk and children’s language development. Contrary to Figure 1 of Belsky’s process model (Chapter 3), this mediation was partial: socioeconomic risk also had some direct association with children’s language development even taking into account sensitivity+ (see Figure 5.2).<sup>77</sup>

In a 2022 paper, Madigan’s group, in work led by doctoral student Jessica Cooke, for the first time made a direct comparison of sensitivity+ and the Strange Situation/AQS in a meta-analysis of prediction of child behavioural problems.<sup>78</sup> A variety of measures of caregiving were used. The most popular measure, used in 16% of studies, was the HOME (Chapter 3), which measures the quality of learning materials in the home, and whether the home seemed physically well organized around the child, as well as interactional features such as whether the caregiver showed acceptance towards their child and seemed involved with them. Ainsworth scales (or a minimal adaptation) was used by 12% of studies. The same percentage used the NICHD scales (Chapter 3). The MBQS (Chapter 1) was used in 7% of studies. Over half of studies used another coding system, with great heterogeneity. Most of these focused on assessment of harmonious child–caregiver interaction.

Additionally, from 94 studies (25,418 dyads) Cooke and colleagues reported that sensitivity+ predicted fewer externalizing difficulties:  $r = -0.14$ , CI  $-0.17, -0.11$ . This was equivalent in magnitude to the positive association between disorganized attachment and externalizing difficulties, the strongest of the associations reported by Fearon and colleagues from the Strange Situation. Though the association was much weaker than for insecure attachment as measured by the AQS ( $d = 0.70$ , no confidence interval reported).<sup>79</sup>

<sup>77</sup> Cf. Gerlach, J., Fößel, J. M., Vierhaus, M., Sann, A., Eickhorst, A., Zimmermann, P., & Spangler, G. (2022) Effects of family risk on early attachment security: Gender-specific susceptibility and mediation by parenting behavior. *Developmental Child Welfare*, 4(1), 20–40.

<sup>78</sup> Cooke, J. E., Deneault, A. A., Devereux, C., Eirich, R., Fearon, R. P., & Madigan, S. (2022) Parental sensitivity and child behavioral problems: A meta-analytic review. *Child Development*, 93(5), 1231–1248.

<sup>79</sup> Fearon, R. P., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Lapsley, A. M., & Roisman, G. I. (2010) The significance of insecure attachment and disorganization in the development of children’s externalizing behavior: A meta-analytic study. *Child Development*, 81(2), 435–456.



Cooke and colleagues reported prediction from different measures of sensitivity, and found largely equivalent prediction from Ainsworth's scale, the HOME and the NICHD scales (Chapter 3). Unexpectedly, the MBQS did not significantly predict externalizing difficulties.<sup>80</sup>

Strikingly, associations were *only* identified in samples facing economic adversity; there was no association between sensitivity+ and externalizing difficulties in more socioeconomically comfortable samples. These findings suggest a stress-diathesis account (Chapter 3), in which less caregiver sensitivity+ contributes to externalizing problems only in the context of socioeconomic stress. It may be that caregiver sensitivity+ can help reduce children's experience of strain and frustration in the context of socioeconomic adversity. As such, Cooke and colleagues reflected that this finding 'illustrates the undue burden placed on parents to shelter their children from adversities within their social ecologies.'<sup>81</sup> Across the 19 studies with father-child dyads ( $N = 2,634$ ), associations between paternal sensitivity+ and child externalizing problems had overlapping confidence intervals ( $r = -0.08$ ,  $CI -14.0 -0.03$ ).<sup>82</sup>

From 69 studies (14,729 dyads), Cooke and colleagues reported that sensitivity+ significantly predicted fewer internalizing difficulties:  $r = -0.08$ ,  $CI -0.12, -0.05$ . This was equivalent in magnitude to the positive association between resistant attachment in the Strange Situation and internalizing difficulties, and stronger than the null prediction from the other Strange Situation classifications (Chapter 4). Though again, the association was much weaker than for insecure attachment as measured using the AQS ( $d = 0.54$ ,  $CI 0.34-0.73$ ).<sup>83</sup> There was no moderation by sample socioeconomic status—though Cooke and colleagues suspected that this lack of moderation reflected the broad-brush nature of the comparison by sample socioeconomic status. They anticipated that 'social determinants of health not assessed herein, such as maternal poverty status, receipt of public assistance, or neighborhood violence, may relate more directly to externalizing problems.'<sup>84</sup> Once again the MBQS did not significantly predict internalizing difficulties, concerning results for the value of the measure.

Across the eight studies with father-child dyads ( $N = 1,057$ ), the association between paternal sensitivity+ and fewer child internalizing difficulties was not significant.<sup>85</sup> These findings need to be treated with caution, though. The average age of children in these eight studies was only six, which is young for the effective assessment of internalizing difficulties. Furthermore, none of the eight studies used child-report of internalizing difficulties, which generally has a stronger association with measures of care than parent or teacher report.<sup>86</sup>

In a 2023 paper, Madigan's team worked with international collaborators (including Fearon, Van IJzendoorn, Roisman, and myself) to take comparison of sensitivity and

<sup>80</sup> Cooke, J. E., Deneault, A. A., Devereux, C., Eirich, R., Fearon, R. P., & Madigan, S. (2022) Parental sensitivity and child behavioral problems: A meta-analytic review. *Child Development*, 93(5), 1231–1248, Table 1.

<sup>81</sup> *Ibid.*, 1242.

<sup>82</sup> Rodrigues, M., Sokolovic, N., Madigan, S., Luo, Y., Silva, V., Misra, S., & Jenkins, J. (2021) Paternal sensitivity and children's cognitive and socioemotional outcomes: A meta-analytic review. *Child Development*, 92(2), 554–577.

<sup>83</sup> Madigan, S., Atkinson, L., Laurin, K., & Benoit, D. (2013) Attachment and internalizing behavior in early childhood: A meta-analysis. *Developmental Psychology*, 49, 672–689.

<sup>84</sup> Cooke, J. E., Deneault, A. A., Devereux, C., Eirich, R., Fearon, R. P., & Madigan, S. (2022) Parental sensitivity and child behavioral problems: A meta-analytic review. *Child Development*, 93(5), 1231–1248, p. 1243.

<sup>85</sup> Rodrigues, M., Sokolovic, N., Madigan, S., Luo, Y., Silva, V., Misra, S., & Jenkins, J. (2021) Paternal sensitivity and children's cognitive and socioemotional outcomes: A meta-analytic review. *Child Development*, 92(2), 554–577.

<sup>86</sup> *Ibid.*, 570. Cf. Madigan, S., Prime, H., Graham, S. A., Rodrigues, M., Anderson, N., Khoury, J., & Jenkins, J. M. (2019) Parenting behavior and child language: A meta-analysis. *Pediatrics*, 144(4).



the Strange Situation/AQS to a new level. Measures of sensitivity were limited to those relatively congruent with Ainsworth's definition: this was a study more of sensitivity, rather than sensitivity+. Led by Deneault, the team undertook meta-analytic structural equation modelling to examine what respective contribution each makes to child outcomes, in this case child cognitive and language skills.<sup>87</sup> On the one hand, this built from the existing work on language outcomes in Madigan's group. On the other, again it may be regarded as a more circumspect challenge to orthodoxies in attachment theory than if the same analysis had been run with socioemotional outcomes. Bowlby's theory predicted that the effects of maternal care on child socioemotional outcomes would be fully mediated by children's expectations of their caregiver, as reflected in the Strange Situation. In selecting to examine cognitive and language skills, Madigan and colleagues avoided a head-on confrontation with Bowlby's mediational theory. The decision was also partly pragmatic, given the piecemeal way that many groups have reported findings of associations between early care and behavioural problems.

Deneault and collaborators found that, in a model together, both maternal sensitivity ( $r = 0.21$ , CI 0.13–0.29) and the Strange Situation/AQS ( $r = 0.12$ , CI 0.07, 0.15) predicted child cognitive outcomes. However, only a tiny amount of variance in cognitive outcomes was explained by an indirect path from maternal sensitivity+ to child cognitive outcomes through child–mother attachment ( $r = 0.03$ , CI 0.02–0.04). These two factors (prediction from maternal sensitivity; and the Strange Situation/AQS) represented almost entirely *independent* direct effects. Similar findings were reported for language outcomes. In a model together, these were predicted by maternal sensitivity ( $r = 0.13$ , CI 0.09–0.17) and the Strange Situation/AQS ( $r = 0.23$ , 95% CI 0.16–0.29), with a tiny indirect pathway ( $r = 0.02$ , CI 0.01–0.03).

These findings suggest that the Strange Situation/AQS may be measuring something relevant to child development somewhat distinct from caregiver behaviour. For instance, these findings could fit with the ideas of Waters and Cummings (Chapter 1) who argued that children's perceptions of secure base and safe haven availability would be an important independent predictor of child outcomes, not reducible to the caregiver sensitivity. For example, conflict between parents and the emotional climate of the home may influence feelings of security without necessarily altering the sensitivity a caregiver shows their child when observed by a researcher (e.g., without observers present, a potentially sensitive caregiver may be distracted or hindered by marital conflict).<sup>88</sup>

Across their findings, Deneault and colleagues were struck by the relative strength of prediction from caregiver sensitivity to cognitive and language outcomes, compared to meta-analytic reports for psychosocial outcomes. As we saw in Chapter 3, the same goes for prediction from the Strange Situation. Bowlby had anticipated that the primary effects of early care would be on psychosocial development, and only through this on cognitive and language outcomes. Sroufe had anticipated that there would be no prediction from early care to cognitive and language outcomes at all. In fact, it appears that cognitive

<sup>87</sup> Deneault, A. A., Duschinsky, R., van IJzendoorn, M. H., Roisman, G. I., Ly, A., Fearon, R. P., & Madigan, S. (2023) Does child–mother attachment predict and mediate language and cognitive outcomes? A series of meta-analyses. *Developmental Review*, 70, 101093.

<sup>88</sup> Davies, P. T. & Cummings, E. M. (1998) Exploring children's emotional security as a mediator of the link between marital relations and child adjustment. *Child Development*, 69(1), 124–139; Cummings, E. M. & Davies, P. T. (2010) *Marital Conflict and Children: An Emotional Security Perspective*. New York: Guilford Press. See also Frosch, C. A., Mangelsdorf, S. C., & McHale, J. L. (2000) Marital behavior and the security of preschooler–parent attachment relationships. *Journal of Family Psychology*, 14(1), 144–161; Raikes, H. A. & Thompson, R. A. (2005) Links between risk and attachment security: Models of influence. *Journal of Applied Developmental Psychology*, 26(4), 440–455.

and language outcomes are the most salient developmental correlate of both caregiver sensitivity+ and measures of early attachment.

Deneault and colleagues note that their analysis was made possible by the availability of meta-analytic structural equation modelling (MASEM) as a methodology: ‘The debate as to the mediational pathway from sensitivity to attachment to child outcomes was difficult to test prior to the development of advanced meta-analytical methods such as MASEMs. MASEMs will be an important way forward, in that they can test further mediational paths to understand the complexity of developmental pathways.’<sup>89</sup> That said, there are a number of limitations with MASEM as a methodology. One issue is that structural equation modelling can be dicey when categorical variables are used. Future research would need to establish whether equivalent results are reported when using dimensional data rather than the categories.

A second limitation is that MASEM is limited to the variables reported by the original studies. For instance, Del Giudice and Haltigan have warned that what may appear as direct effects in attachment research need to be examined for hidden effects of heritable intelligence and cognitive factors.<sup>90</sup> Pitillas and Grey, as well as sociologist commentators, have warned that what appear as direct effects in attachment research need to be examined for hidden effects of socioeconomic adversities. So here, parents with a higher IQ or wealthier could, on average, be somewhat more sensitive; they may also have children who do better on language and cognitive assessments, without sensitivity playing a causal role.<sup>91</sup> MASEM using only published data would not be in a position to assess these concerns: it would depend on whether the original studies had relevant unpublished data as to whether the analysis could be undertaken by pooled raw data with an individual participant data meta-analysis.

A further point to acknowledge is that MASEM is limited in its capacity to analyse bidirectional processes and mutual influence between child and caregiver behaviour. However, such analyses can be fruitfully conducted using cross-lagged models on longitudinal cohort data.<sup>92</sup> Deneault and colleagues acknowledged that ‘despite their capacity to test mediational models that go beyond traditional meta-analyses, MASEMs cannot account for the full complexity of families and mechanisms that predict child development. Longitudinal models assessing the same measures multiple times and testing for developmental

<sup>89</sup> Deneault, A. A., Duschinsky, R., van IJzendoorn, M. H., Roisman, G. I., Ly, A., Fearon, R. P., & Madigan, S. (2023) Does child-mother attachment predict and mediate language and cognitive outcomes? A series of meta-analyses. *Developmental Review*, 70, 101093, pp. 22–23.

<sup>90</sup> Del Giudice, M. & Haltigan, J. D. (2023) A new look at the relations between attachment and intelligence. *Developmental Review*, 67, 101054.

<sup>91</sup> Pitillas, C. (2021) *El Daño que se Hereda: Comprender y abordar la transmisión intergeneracional del trauma*. Bilbao: Desclee De Brouwer; Grey, B. (2023) Beyond sensitivity: Understanding caregiving compromises in adverse contexts using the Meaning of the Child Interview. In S. Chrzastowski & A. Vetere (eds), *Safety, Danger, and Protection in the Family, Community, and the World: A Systemic and Attachment-Informed Approach*. London: Routledge. See also Edwards, R. & Gillies, V. (2019) (M) othering and the politics of early intervention: Biologisation and the reproduction of gendered, classed, and raced inequalities. In F. Portier-Le Cocq (ed.), *Motherhood in Contemporary International Perspective* (pp. 18–31). Abingdon: Routledge.

<sup>92</sup> On bidirectional influence between child behaviour and caregiver sensitivity, see Brown, G. L., Mangelsdorf, S. C., & Neff, C. (2012) Father involvement, paternal sensitivity, and father–child attachment security in the first 3 years. *Journal of Family Psychology*, 26(3), 421–430; Kok, R., Linting, M., Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., Jaddoe, V. W., Hofman, A.,... & Tiemeier, H. (2013) Maternal sensitivity and internalizing problems: Evidence from two longitudinal studies in early childhood. *Child Psychiatry & Human Development*, 44, 751–765; Zvara, B. J., Sheppard, K. W., & Cox, M. (2018) Bidirectional effects between parenting sensitivity and child behavior: A cross-lagged analysis across middle childhood and adolescence. *Journal of Family Psychology*, 32(4), 484–495.

cascades as well as the temporality and directionality of effects represent an important avenue for future progress in this area.<sup>93</sup>

Deneault and colleagues attempted to characterize various possible pathways that might account for these findings, for future research to explore.<sup>94</sup> The pathways may sometimes co-occur, and sometimes operate separately; they may also be more or less common across socioecological contexts, parenting cultures, and between attachment figures (e.g. based on maternal and paternal social roles). As we saw in [Chapter 4](#), Van IJzendoorn and Bus had put forward a set of proposals for potential causal relationships between early attachment and cognitive and language development. Building on these, Deneault and colleagues discussed four potential pathways:

1. Secure early attachment relationships may contribute to learning. Children with a secure attachment may be less distracted by the attachment-related aspects of interactions (e.g., the potential availability of the caregiver), and thus are able to derive more cognitive and language stimulation from their interactions with the caregiver.<sup>95</sup> After all, Sroufe and Fleeson had observed that insecure children were ‘seemingly embroiled in a struggle of wills that took precedence over the problem solving, and the interaction deteriorated as task difficulty was increased.’<sup>96</sup>
2. Secure relationships may contribute to exploration, as Ainsworth proposed. As first shown by Main’s doctoral research, children with a secure attachment may be more adept at and comfortable with exploring their environment, and so derive more cognitive and language stimulation from the environment.<sup>97</sup>
3. Secure attachment relationships may additionally facilitate the child’s network. Children with a secure attachment are often more socially competent—as Groh and colleagues documented in their meta-analysis ([Chapter 4](#))—and may therefore engage in more cognitively and linguistically stimulating interactions with others (e.g., childcare educators, teachers). O’Connor and McCartney found that security was associated with more positive relationships with their teachers.<sup>98</sup>
4. Furthermore, it could be that secure attachment contributes to cooperativeness. As such, they may cooperate better with experimenters during cognition and language

<sup>93</sup> Deneault, A. A., Duschinsky, R., van IJzendoorn, M. H., Roisman, G. I., Ly, A., Fearon, R. P., & Madigan, S. (2023) Does child–mother attachment predict and mediate language and cognitive outcomes? A series of meta-analyses. *Developmental Review*, 70, 101093, p. 23, citing as examples Bernier, A., Lapolice-Thériault, R., Matte-Gagné, C., & Cyr, C. (2023) Paternal mind-mindedness and children’s academic achievement: Investigating developmental processes. *Developmental Psychology*, 59(4), 758–769; Yirmiya, K., Motsan, S., Kanat-Maymon, Y., & Feldman, R. (2021) From mothers to children and back: Bidirectional processes in the cross-generational transmission of anxiety from early childhood to early adolescence. *Depression and Anxiety*, 38(12), 1298–1312.

<sup>94</sup> Deneault, A. A., Duschinsky, R., van IJzendoorn, M. H., Roisman, G. I., Ly, A., Fearon, R. P., & Madigan, S. (2023) Does child–mother attachment predict and mediate language and cognitive outcomes? A series of meta-analyses. *Developmental Review*, 70, 101093, Table 1, summarized in the subsequent paragraphs.

<sup>95</sup> Bretherton, I., Bates, E., Benigni, L., Camaioni, L., & Volterra, V. (1979) Relationships between cognition, communication, and quality of attachment. In E. Bates, L. Benigni, I. Bretherton, L. Camaioni, & V. Volterra (eds), *The Emergence of Symbols: Cognition and Communication in Infancy* (pp. 223–269). New York: Academic Press.

<sup>96</sup> Sroufe, L. A. & Fleeson, J. (1986) Attachment and the construction of relationships. In W. Hartup & Z. Rubin (eds), *Relationships and Development* (pp. 51–71). New York: Psychology Press.

<sup>97</sup> Main, M. (1983) Exploration, play, and cognitive functioning related to infant–mother attachment. *Infant Behavior & Development*, 6(2), 167–174. See also Grossmann, K., Grossmann, K. E., Kindler, H., & Zimmermann, P. (2008) A wider view of attachment and exploration: The influence of mothers and fathers on the development of psychological security from infancy to young adulthood. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (pp. 857–879). New York: Guilford Press.

<sup>98</sup> O’Connor, E. & McCartney, K. (2006) Testing associations between young children’s relationships with mothers and teachers. *Journal of Educational Psychology*, 98 (1), 87–98.

tests, leading them to receive higher scores. As we saw in [Chapter 4](#), the meta-analysis of attachment and prosociality by Madigan's lab had found that security predicted cooperativeness.

Deneault and colleagues therefore also considered potential mechanisms that might link sensitivity to cognitive and language outcomes.

1. Sensitivity may contribute to teaching. Caregivers may provide verbal responses that accurately and appropriately translate the child's experience into words, with timely responses helping the child perceive the link between words and experience.<sup>99</sup> On this basis, children may learn to organize their experience, as well as plan, and benefit from responsive interactions, thereby resulting in benefits for cognition and language skills.
2. Sensitivity could also facilitate exploration, including support for the child's autonomy.<sup>100</sup> By being more attuned to their child, sensitive caregivers may promote learning in more opportune moments for children (e.g., when the child is alert) or by using their child's specific interests.
3. Sensitivity may help a child's network. Experience of contingent, relatively harmonious interactions may support the development of a child's social skills, helping to sustain more cognitively and linguistically stimulating interactions with others.
4. Finally, sensitivity may contribute to cooperativeness. Experiences of sensitive discipline may contribute to greater cooperation with experimenters during tests.<sup>101</sup>

Deneault and colleagues also acknowledged the proposal made by Del Giudice and Haltigan that IQ and other inheritable components of cognition may influence caregiver sensitivity, and child attachment security, as well as language development.<sup>102</sup> Van IJzendoorn and Bakermans-Kranenburg have a study underway exploring this possibility.

A final meta-analysis that will be considered here is a 2024 paper by Madigan, Deneault, and collaborators (including Fearon, Van IJzendoorn, Bakermans-Kranenburg, and myself), examining associations between caregiver sensitivity and the Strange Situation/AQS, updating De Wolff and Van IJzendoorn's 1997 paper ([Chapter 4](#)).<sup>103</sup> There were 181 studies included, with data from 23,597 dyads. In this meta-analysis, most of the measures used were based on Ainsworth's construct of sensitivity: 37% used Ainsworth's scale, 12% used the MBQS, and 11% used the Emotional Availability Scales. Caregiver sensitivity and secure child-caregiver attachment were significantly associated:  $r = 0.25$ , CI 0.22–0.28. Despite the much larger sample of primary studies in 2024 compared to 1997, this was essentially identical to the effect size reported by De Wolff and Van IJzendoorn. Given the extent of theoretical emphasis on this association within attachment research, surprisingly

<sup>99</sup> Prime, H., Browne, D., Akbari, E., Wade, M., Madigan, S., & Jenkins, J. M. (2015) The development of a measure of maternal cognitive sensitivity appropriate for use in primary care health settings. *Journal of Child Psychology and Psychiatry*, 56(4), 488–495.

<sup>100</sup> Cimon-Paquet, C., Bernier, A., Matte-Gagné, C., & Mageau, G. A. (2020) Early maternal autonomy support and mathematical achievement trajectories during elementary school. *Learning and Individual Differences*, 79, 101855.

<sup>101</sup> Feldman, R. & Klein, P. S. (2003) Toddlers' self-regulated compliance to mothers, caregivers, and fathers: Implications for theories of socialization. *Developmental Psychology*, 39(4), 680–692.

<sup>102</sup> Del Giudice, M. & Haltigan, J. D. (2023) A new look at the relations between attachment and intelligence. *Developmental Review*, 67, 101054.

<sup>103</sup> Madigan, S., Deneault, A. A., Duschinsky, R., Bakermans-Kranenburg, M. J., Schuengel, C., van IJzendoorn, M. H., ... & Verhage, M. L. (2024) Maternal and paternal sensitivity: Key determinants of child attachment security examined through meta-analysis. *Psychological Bulletin*, early view.

Madigan, Deneault, and colleagues found no evidence of publication bias. This theoretical emphasis does not appear to have functioned as a form of pressure on researchers, in the same way as the reception of Main's work (Chapter 1).

The association in the studies that examined father–child dyads was much the same,  $r = 0.21$ , CI 0.14–0.27. Though the confidence intervals are overlapping, this was somewhat higher than the effect size for fathers reported in an earlier 2011 meta-analysis by Lucassen and colleagues ( $r = 0.12$ , CI 0.06–0.17).<sup>104</sup> This may reflect the larger number of studies available in 2024. It may reflect that the earlier meta-analysis was limited to infants, whereas Madigan, Deneault, and colleagues included all studies using the Strange Situation or AQS, and father involvement with children increases on average after infancy. It may also reflect a societal trend for more engaged fathering over time, including in part due to paternal leave policies.<sup>105</sup>

The association between caregiver sensitivity and avoidant attachment in the Strange Situation was  $r = -0.24$ , CI  $-0.34$  to  $-0.13$ . The association with resistance was smaller:  $r = -0.14$  CI  $-0.22$  to  $-0.07$ , though with overlapping confidence intervals. Finally, the association with disorganized attachment was:  $r = -0.22$ , CI  $-0.31$  to  $-0.13$ . In a 1999 meta-analysis of ten studies, Van IJzendoorn and colleagues had reported that caregiver sensitivity predicted security ( $r = 0.24$ ) better than disorganization ( $r = 0.10$ ). Since then, attachment researchers have generally assumed that sensitivity predicts security and not disorganization, whereas alarming caregiver behaviour predicts disorganization. This conclusion has been written into clinical guidelines for practitioners working with child–caregiver relationships facing difficulties relating to attachment, for instance the 2015 NICE Guidelines on child attachment in the UK.<sup>106</sup>

Yet contrary voices included Lyons-Ruth (Chapter 2) as well as Moran and Madigan,<sup>107</sup> who argued that some forms of insensitivity may contribute to disorganization, perhaps especially in high-risk samples. The findings from the 2024 meta-analysis in fact show that insensitivity is actually *just as good* a predictor of disorganization, as it is of avoidance. The association between insensitivity and disorganization is likewise equivalent in size to the positive association between sensitivity and security. Contrary to the expectations of Lyons-Ruth, Moran, and Madigan, the negative association between sensitivity and disorganization was not moderated by the socioeconomic risk of the sample.

This finding has already begun to add fuel to discussions regarding the aspects of insensitive care that may contribute to disorganized attachment.<sup>108</sup> Madigan, Deneault,

<sup>104</sup> Lucassen, N., Tharner, A., Van IJzendoorn, M. H., Bakermans-Kranenburg, M. J., Volling, B. L., Verhulst, F. C., & Tiemeier, H. (2011) The association between paternal sensitivity and infant–father attachment security: A meta-analysis of three decades of research. *Journal of Family Psychology*, 25(6), 986–992.

<sup>105</sup> E.g. Knoester, C., Petts, R. J., & Pragg, B. (2019) Paternity leave-taking and father involvement among socioeconomically disadvantaged U.S. fathers. *Sex Roles: A Journal of Research*, 81(5–6), 257–271; Earle, A., Raub, A., Sprague, A., & Heymann, J. (2023) Progress towards gender equality in paid parental leave: An analysis of legislation in 193 countries from 1995–2022. *Community, Work & Family*, 1–21. <https://www.tandfonline.com/doi/full/10.1080/13668803.2023.2226809>.

<sup>106</sup> National Institute for Clinical Excellence. (2015) Children's attachment: Attachment in children and young people who are adopted from care, in care or at high risk of going into care. NICE Guideline [NG26]: November.

<sup>107</sup> E.g. Moran, G., Forbes, L., Evans, E., Tarabulsky, G. M., & Madigan, S. (2008) Both maternal sensitivity and atypical maternal behavior independently predict attachment security and disorganization in adolescent mother–infant relationships. *Infant Behavior and Development*, 31(2), 321–325; Wang, F., Cox, M. J., Mills-Koonce, R., & Snyder, P. (2015) Parental behaviors and beliefs, child temperament, and attachment disorganization. *Family Relations*, 64(2), 191–204; McIntosh, J. E., Schnabel, A., Youssef, G. J., & Olsson, C. A. (2021) Preconception and perinatal predictors of offspring attachment disorganization: Advancing the replicated evidence. *Development and Psychopathology*, 33(1), 240–251.

<sup>108</sup> E.g. Alkalay, S. & Sagi-Schwartz, A. (2024) The legacy of Mary Main in attachment and developmental research in Israel. *Attachment & Human Development*, early view.

and colleagues pointed out that the association between insensitivity and disorganization remained smaller than the effect size reported in Madigan's 2006 doctoral meta-analysis, which examined alarming caregiving behaviour as a predictor of disorganization ( $r = 0.34$ ).<sup>109</sup> All the same, this latter meta-analysis is now nearly 20 years old, during which time Main and Hesse's FR coding system has almost never been used (Chapter 1). The 2006 meta-analysis did not include the subsequent coding of AMBIANCE on 219 dyads from the large NICHD sample, which, as usual, reported a considerably smaller effect ( $r = 0.22$ ).<sup>110</sup> An updated meta-analysis would be needed to adequately support the claim that alarming caregiver behaviour is more significant for disorganization than insensitivity—and such claims would face the scepticism of those attachment researchers who tend to give greater weight to the NICHD study than the results of meta-analytic findings (Chapter 3).

With six times as many participants as De Wolff and Van IJzendoorn, Madigan, Deneault, and colleagues were able to examine a considerable number of potential moderators. Madigan, Deneault, and colleagues also reported no moderation by sample sociodemographic status. Associations were somewhat stronger when sensitivity was assessed at home compared to the laboratory, though with overlapping confidence intervals.

It had generally been assumed that multiple assessments of caregiver sensitivity would give a clearer signal.<sup>111</sup> Yet Madigan, Deneault, and colleagues, to their surprise, found that associations with the Strange Situation were not stronger when sensitivity was measured on multiple occasions than when it was measured once. Madigan, Deneault, and colleagues interpreted the finding as suggesting that a single assessment of sensitivity is sufficient for researchers to measure this aspect of caregiving.<sup>112</sup> However, they did not assess whether the multiple assessments occurred in different contexts, or with different levels of challenge to the child or the dyad. It could well be that multiple assessments of the same sequence (e.g., feeding) give little additional information, but multiple assessments of different sequences (e.g., feeding, play) offer additional insight, as clinical commentators and anthropologists have argued.<sup>113</sup> In line with this interpretation, Madigan, Deneault, and colleagues found that the association was stronger when observations were longer, perhaps because longer observations capture a greater variety of kinds of interaction.

<sup>109</sup> Madigan, S., Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., Moran, G., Pederson, D. R., & Benoit, D. (2006) Unresolved states of mind, anomalous parental behavior, and disorganized attachment: A review and meta-analysis of a transmission gap. *Attachment & Human Development*, 8(2), 89–111.

<sup>110</sup> Reported in Haltigan, J. D., Madigan, S., Bronfman, E., Bailey, H. N., Borland-Kerr, C., Mills-Koonce, R., & Lyons-Ruth, K. (2019) Refining the assessment of disrupted maternal communication: Using item response models to identify central indicators of disrupted behavior. *Development and Psychopathology*, 31(1), 261–277.

<sup>111</sup> Lindhiem, O., Bernard, K., & Dozier, M. (2011) Maternal sensitivity: Within-person variability and the utility of multiple assessments. *Child Maltreatment*, 16(1), 41–50.

<sup>112</sup> This finding is relevant to a question raised by Forslund and colleagues in their consensus statement, especially if the finding holds in subsequent work in applied contexts: 'Do multiple assessments of caregiving in forensic contexts have higher predictive value than one assessment? If so, are multiple assessments more cost-effective than single assessments? Assessments of caregiving (and attachment) are costly. However, ineffective interventions and placements in foster care are also costly. A developmentally-informed health-economic evaluation of the potential economic benefits of conducting multiple assessments would be important.' Forslund, T., Granqvist, P., van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M.,... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52, p. 36.

<sup>113</sup> E.g. Chapin, B. L. (2014) *Childhood in a Sri Lankan Village: Shaping Hierarchy and Desire*. New York: Rutgers University Press; Funk, L., Scheidecker, G., Chapin, B. L., Schmidt, W. J., El Ouardani, C., & Chaudhary, N. (2023) *Feeding, Bonding, and the Formation of Social Relationships: Ethnographic Challenges to Attachment Theory and Early Childhood Interventions*. Cambridge: Cambridge University Press; Pace, C. S. (2023) Teoria dell'attaccamento: definizione dei costrutti e utilizzo clinico degli strumenti in ambito di tutela dei minori. *Psicologia clinica dello sviluppo*, 27(1), 129–132.



For fathers, but not for mothers, child age moderated associations between caregiver sensitivity and the Strange Situation/AQS, with a stronger association for older children. This may reflect societal norms and gendered working patterns, in which children form an attachment but may nonetheless take longer to become fully familiar with their father's caregiving style if they spend less time with him than their mother.<sup>114</sup>

As usual, associations were larger for studies using the AQS:  $r = 0.34$ , CI 0.28–0.39. Associations were similarly much higher when the measure of sensitivity used was the MBQS:  $r = 0.46$ , CI 0.38–0.53. In part, this reflected that some samples had coded the AQS and MBQS from the same recorded observations. However, this only accounted for part of the greater prediction of each of the measures. In a multilevel meta-regression model examining the respective contributions of different moderators, the MBQS remained significantly more predictive than other measures of sensitivity. On the other hand, the AQS no longer outperformed the Strange Situation. Madigan and colleagues reflected that a contributor to the stronger association for the MBQS may be how the measure is coded: the MBQS generally assesses a longer observational period. Furthermore, 'the method of ascertaining a sensitivity score using the MBQS involves an extensive sort of 90 caregiving descriptors, which takes considerable time (~1 hr). The coding process of the MBQS therefore, may lend itself to greater reflection and possibly greater precision and variance, on the true quality of maternal sensitivity.'<sup>115</sup> A further difference between assessments, not reported by the primary studies and so unaddressed by Madigan, Deneault, and colleagues, was whether the same person conducted and then coded the observation: this may occur especially often the case for the MBQS. Some finer details or aspects of tone or atmosphere may be available to a coder who also conducted the observation, compared to a coder working from film alone.

Overall, the programme of meta-analytic research led by Madigan and her team represents a major revision and updating of attachment theory and research. It suggests a different image of what attachment research always was and might be in the future. The programme of meta-analyses suggests that sensitivity+ was never merely a predictor of attachment security, but was making as much, or more, of a contribution to children's later outcomes. And among these outcomes, child cognitive and language development might take first place among the sequelae of early relationships, rather than being given minimal place in attachment theory (besides Van IJzendoorn and colleagues; [Chapter 4](#)) or regarded as only a secondary effect or more fundamental psychosocial outcomes. In retrospect, many of these points were claims made by the Grossmanns decades ago ([Chapter 1](#)), but attachment research appears to have not been ready to hear them until now, supported by the credibility of meta-analytic research methods and the growing independence and confidence of a third generation of attachment researchers. Meta-analytic structural equation modelling has allowed researchers to further specify and articulate the specific mechanisms that early researchers could only often gesture at under the rubric of 'attachment'. These developments offer the prospect of further transformations in theory and method, and for refining potential targets for clinical intervention.

<sup>114</sup> Cabrera, N. J. & Tamis-LeMonda, C. S. (2013) *Handbook of Father Involvement: Multidisciplinary Perspectives*. London: Routledge; Diniz, E., Brandão, T., Monteiro, L., & Verissimo, M. (2021) Father involvement during early childhood: A systematic review of the literature. *Journal of Family Theory & Review*, 13(1), 77–99.

<sup>115</sup> Madigan, S., Deneault, A. A., Duschinsky, R., Bakermans-Kranenburg, M. J., Schuengel, C., van IJzendoorn, M. H.,... & Verhage, M. L. (2024) Maternal and paternal sensitivity: Key determinants of child attachment security examined through meta-analysis. *Psychological Bulletin*, early view.

## The AMBIANCE-Brief

There is considerable appetite from clinicians and practitioners for the use of measures developed by attachment researchers to understand child–caregiver relationships.<sup>116</sup> In part, this appetite has been stoked by the claims of researchers about the predictive value of these measures.<sup>117</sup> Yet there has been a lack of validation of such measures when used in clinical and applied practice, including whether they have the same correlates as when used in research contexts, and whether they can identify the needs of children and families with any greater accuracy or acuity than assessment as usual. This has been stressed as a critical contemporary challenge for the field of attachment research.<sup>118</sup>

Sroufe reflected that it might be possible to validate cut-down measures for use at scale or in applied practice. Even so, he underlined the considerable challenge and long path entailed on the way to validation:

Everett Waters and I have argued for years that you don't need the Strange Situation to study attachment. All you need to do is develop another procedure that can be readily administered yet taxes the organizing capacities of the relationship, and then show that it has construct validity; that is, that it is related to attachment/exploration balance and secure base behavior in the home and that it is not related to temperament or neurological status. Ideally it will also predict the things the Strange Situation does. This could be done. It is just a lot of work.<sup>119</sup>

As we saw in [Chapter 4](#), Van IJzendoorn and Bakermans-Kranenburg regard such attempts as more than a lot of work. In their view it is likely a hopeless task, based on what is known about the properties of available measures developed by attachment researchers. No measure developed by attachment researchers has more than a modest association with maltreatment or poor child outcomes. So use of such measures by practitioners, in their view, will have the semblance for applied practitioners of a prestigious evidence-base but in fact is doomed to ultimately misinform practitioners with considerable false positive and false negative results. Attachment measures have nothing of any direct use to practitioners that could improve upon existing professional judgement. The contribution of attachment

<sup>116</sup> Beckwith, H., van IJzendoorn, M., Freeston, M., Woolgar, M., Stenner, P., & Duschinsky, R. (2022) A 'transmission gap' between research and practice? A Q-methodology study of perceptions of the application of attachment theory among clinicians working with children and among attachment researchers. *Attachment & Human Development*, 24(6), 661–689. See also Tryphonopoulos, P. D., Letourneau, N., & Ditommaso, E. (2014) Attachment and caregiver–infant interaction: A review of observational-assessment tools. *Infant Mental Health Journal*, 35(6), 642–656; Vischer, A. F. W., Grietens, H., Knorth, E. J., & Mulder, H. (2017) Assessing parenting in the context of reunification of infants/toddlers and their families: How to face the challenges? *Infant Mental Health Journal*, 38(3), 406–421; Barrutieta, A. H., Pedro-Viejo, A. B., & Salvá, C. P. (2023) The quality of parental responsiveness: The validity and reliability of a new observational measure. *Anuario de Psicología/The UB Journal of Psychology*, 53(1); Maggi, M. D. (2023) La prospettiva del tribunale per i minorenni. *Psicologia Clinica Dello Sviluppo*, 27(1), 123–128.

<sup>117</sup> E.g. George, C., Isaacs, M. B., & Marvin, R. S. (2011) Incorporating attachment assessment into custody evaluations: The case of a 2-year-old and her parents. *Family Court Review*, 49(3), 483–500; Spieker, S. J. & Crittenden, P. M. (2018) Can attachment inform decision-making in child protection and forensic settings? *Infant Mental Health Journal*, 39(6), 625–641; Ostler, T., Zhan, M., & Bronfman, E. (2022) A support-based measure of adult attachment: Links between the Attachment Style Interview and an observational measure of parenting in a sample of at-risk mothers. *Adoption & Fostering*, 46(4), 437–454.

<sup>118</sup> Forslund, T., Granqvist, P., van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M.,... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52.

<sup>119</sup> Sroufe, L. A. (2021) Then and now: The legacy and future of attachment research. *Attachment & Human Development*, 23(4), 396–403, p. 399.



research lies solely in principles that may inform practitioners, based on the convergent findings of empirical research.

The Stockholm group have agreed with Van IJzendoorn and Bakermans-Kranenburg with regards to the use of assessments developed by attachment researchers in child welfare practice, given the high stakes.<sup>120</sup> However, they are more amenable to the use of these assessments to guide supportive interventions. This is a point that has also been brought out prominently by Steele and Steele, who have advocated for the value of the AAI in identifying children's mental health needs, pinpointing effective targets for intervention, or predicting children's future outcomes in the absence of an intervention.<sup>121</sup> Unfortunately, the AAI is highly resource-intensive. For Madigan, the first step is to develop a brief, versatile, and usable measure that distils a portion of the insight of decades of attachment research. This can then be evaluated for whether it offers practitioners something of value compared to assessment-as-usual for guiding supportive practice with families.<sup>122</sup>

Generally, there has been growing interest in the potential for shorter versions of measures developed by attachment researchers. Tarabulsky and colleagues worked with the creators of the MBQS to validate a short version of the measure in the 2000s.<sup>123</sup> Waters and Waters developed the secure-base coding system for the first questions of the AAI (Chapter 1), and Dozier used these first questions in screening for coaches for her Attachment and Biobehavioral Catchup intervention.<sup>124</sup> There have also been attempts, including by Cadman, Belsky, Fearon, and collaborators, to develop a distilled version of the AQS.<sup>125</sup> The VU Amsterdam group has developed an e-learning tool and interactive decision tree to help practitioners assess caregiver sensitivity.<sup>126</sup> From their perspective, part of the gain for attachment theory of such research is that, in distilling measures to their essence, researchers can seek to drill down to what is most important, instead of trying to include in measures a variety of elements that may or may not turn out to be important.<sup>127</sup>

Orienting the priorities of such work, there has been a growing consensus among attachment researchers that observation of caregiving will be more informative for practitioners

<sup>120</sup> Forslund, T., Hammarlund, M., & Granqvist, P. (2021) Admissibility of attachment theory, research and assessments in child custody decision-making? Yes and No! *New Directions for Child and Adolescent Development*, 2021(180), 125–140; Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation, and Academic Freedom in Developmental Science*. London: UCL Press, p. 157.

<sup>121</sup> Steele, H. & Steele, M. (eds). (2008) *Clinical Applications of the Adult Attachment Interview*. New York: Guilford Press.

<sup>122</sup> Racine, N., Eirich, R., & Madigan, S. (2022) Fostering resilience in children who have been maltreated: A review and call for translational research. *Canadian Psychology/Psychologie canadienne*, 63(2), 203–213; Racine, N., Madigan, S., Cardinal, S., Hartwick, C., Leslie, M., Motz, M., & Pepler, D. (2022) Community-based research: Perspectives of psychology researchers and community partners. *Canadian Psychology/Psychologie canadienne*, 63(4), 523–535.

<sup>123</sup> Tarabulsky, G. M., Provost, M. A., Bordeleau, S., Trudel-Fitzgerald, C., Moran, G., Pederson, D. R.,... & Pierce, T. (2009) Validation of a short version of the maternal behavior Q-set applied to a brief video record of mother–infant interaction. *Infant Behavior and Development*, 32(1), 132–136.

<sup>124</sup> Caron, E.B., Roben, C.K., Yarger, H.A., & Dozier, M. (2018) Novel methods for screening: Contributions from Attachment and Biobehavioral Catch-up. *Prevention Science*, 19(7), 894–903.

<sup>125</sup> Posada, G., Longoria, N., Cocker, C., & Lu, T. (2011) Attachment ties in military families: Mothers' perception of interactions with their children, stress, and social competence. In S. MacDermid Wadsworth & D. Riggs (eds), *Risk and Resilience in US Military Families* (pp. 131–147). New York: Springer; Cadman, T., Belsky, J., & Fearon, R.M.P. (2018) The Brief Attachment Scale (BAS-16): A short measure of infant attachment. *Child: Care, Health and Development*, 44(5), 766–775; Sumer, N., Kahya, Y., Erel, S., & Alsancak-Akbulut, C. (2024) A Screening Measure for Infant Attachment: The Turkish Adaptation of the Brief Attachment Scale-16. [https://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=4835498](https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4835498).

<sup>126</sup> Forrer, M. L., Oosterman, M., Tharner, A., & Schuengel, C. (2024) Testing reliability and validity of practitioner-rated parental sensitivity: A novel tool for practice. *Infant Mental Health Journal*, 45(2), 234–246.

<sup>127</sup> See also Bakum, L., Verhage, M. L., Schuengel, C., Duschinsky, R., Cornelisz, L., Van Klaveren, C.,... & Behrens, K. (2023) Exploring the meaning of unresolved loss and trauma in more than 1,000 Adult Attachment Interviews. *Development and Psychopathology*, 35(2), 587–603.

than observation of child attachment behaviour. In the Forslund and colleagues' consensus statement on family court practice, the authors (including myself) considered that 'we regard assessments of a caregiver's capacity to provide a safe haven for the child when alarmed as more valuable for targeting supportive interventions than is information about the child's attachment classification per se, especially when provision of more effective caregiving is the key concern.'<sup>128</sup> As such, the adaptation and validation of measures of caregiving for use in practice have received a particular focus.

### Development of the AMBIANCE-Brief

Madigan, Lyons-Ruth, and collaborators have explored the potential of a distilled version of the AMBIANCE coding system (Chapter 2), with the ambition of developing a system that practitioners can apply in real-time, rather than need to code from a recording. AMBIANCE is a complex measure, with 147 behavioural items in five categories. A pooled dataset (N = 343) was created drawing from AMBIANCE coding from four samples: Lyons-Ruth's Harvard sample, a subset of the NICHD sample (Chapter 3), Goldberg's Toronto samples of children with chronic illnesses and controls,<sup>129</sup> and a small UK sample of mothers with borderline personality disorder and controls.<sup>130</sup> Given the small size of the other samples, around two-thirds of the pooled sample were from the NICHD dataset. In all studies there was information about disorganized attachment: as we saw in Chapter 2, since Main the standard criterion for validity for new or adapted measures has been the Strange Situation. However, it should also be noted that questions have been repeatedly raised about the adequacy of the NICHD coding of disorganization.

Haltigan and colleagues (including Lyons-Ruth) applied latent-trait item response theory to the data, a kind of factor analysis, permitting modelling of the underpinning dimensions of item-level data and how informative any given item is proving in terms of these dimensions.<sup>131</sup> They found that generally the components of AMBIANCE reflected a single underlying dimension, often strongly. For over two-thirds of the components, there were strong associations ( $r \approx 0.59$ ) between items and this underlying dimension. Haltigan and colleagues interpreted their underlying dimension as reflecting alarming caregiving behaviour.

When it was created, AMBIANCE incorporated items from various scales, and critics had wondered whether some of these items reflected non-alarming insensitivity, and therefore a different construct (Chapter 2). AMBIANCE incorporated role confusion items from the Minnesota group, and disruptions of child-caregiver interactive synchrony from the Penn State group, when there had been no evidence that such items were associated with disorganized attachment. Haltigan and colleagues found that only some of the Minnesota and Penn State items converged with the underlying dimension. Role confusion generally did converge, though not the subscale for treating the child like a sexual partner.

<sup>128</sup> Forslund, T., Granqvist, P., van IJzendoorn, M. H., Sagi-Schwartz, A., Glaser, D., Steele, M.,... & Duschinsky, R. (2022) Attachment goes to court: Child protection and custody issues. *Attachment & Human Development*, 24(1), 1–52, pp. 34–35.

<sup>129</sup> Goldberg, S., Gotowiec, A., & Simmons, R. J. (1995) Infant-mother attachment and behavior problems in healthy and chronically ill preschoolers. *Developmental and Psychopathology*, 7, 267–282.

<sup>130</sup> Hobson, R. P., Patrick, M., Hobson, J. A., Crandell, L., Bronfman, E., Lyons-Ruth, K. (2009) How mothers with borderline personality disorder relate to their one-year-old infants. *British Journal of Psychiatry*, 195, 1–6.

<sup>131</sup> Haltigan, J. D., Madigan, S., Bronfman, E., Bailey, H. N., Borland-Kerr, C., Mills-Koonce, R., & Lyons-Ruth, K. (2019) Refining the assessment of disrupted maternal communication: Using item response models to identify central indicators of disrupted behavior. *Development and Psychopathology*, 31(1), 261–277.

That said, in general, the findings support the idea that most of the AMBIANCE items reflect a single underlying dimension.

In the Harvard and MIND samples, when any other dimension of AMBIANCE was present, disrupted affective communication was generally also observable (Chapter 2). This suggested to Lyons-Ruth, aligned with the theory elaborated by the Boston Process Study Group, that disrupted affective communication represented a kind of basic or central form of disrupted caregiving. In their later study, Haltigan and colleagues found very different results: only one of the three subscales for affective communication converged with the underlying dimension: Inappropriate responding to infant's cues (e.g., laughing while infant is crying). The other two subscales, reflecting lack of interactive synchrony, did not converge. It appears that lack of interactive synchrony may accompany disrupted caregiving, but is not itself part of the underlying phenomenon. A comparison may be drawn with stereotypic behaviour in the coding of disorganized attachment: it is often shown by children in dyads who receive a disorganized classification, but, since it functions as a general indicator of stress, cannot therefore be the sole basis for this classification (no italicized markers in the Main and Solomon coding system).<sup>132</sup>

Haltigan and colleagues were then faced with a dilemma: should elements of AMBIANCE not reflecting the underlying dimension be excluded? Elsewhere Lyons-Ruth and Jacobvitz had argued that elements of the Main and Solomon coding system should be pruned to improve its psychometric properties and prediction of risk.<sup>133</sup> Haltigan and colleagues had access to data on disorganized attachment for the whole pooled dataset, and access to data on child externalizing behaviour for 313 of their 343 participants. Ultimately, they decided to keep these subscales. Perhaps this decision was shaped by Bronfman and Lyons-Ruth's involvement with the paper. The authors justified this decision, arguing that 'omitting items from AMBIANCE subdimensions considered clinically and conceptually important would have substantively altered the meaning and conceptual content of the reduced item set in relation to the full AMBIANCE system'.<sup>134</sup> Though they accepted that future work may lead to a decision to remove these items.

To reduce the number of items, Haltigan and colleagues selected up to three of the items for each subscale that were most associated with the underlying dimension. A panel of experienced clinicians and AMBIANCE coders confirmed this selection. Haltigan and colleagues felt that the selection process likely sharpened the focus of the five AMBIANCE dimensions, with theoretical stakes. In fact, some dimensions seem much the same as the original. The items selected for role confusion do not seem qualitatively distinct from those in the full set, for example. However, there are some dimensions that seem sharpened.

For example, within the intrusive subscale, the forms of physical communication selected were those that were physically invasive (e.g., turns infant's head), in contrast to less discriminatory markers, often less invasive, such as 'touches infant in manner appearing affectionate but is irritating to infant'. The stronger association of physically invasive items with the underlying dimension—presumed to be alarming caregiving—could be

<sup>132</sup> Solomon, J., Duschinsky, R., Bakkum, L., & Schuengel, C. (2021) Issues of method in the assessment of disorganized attachment. In E. Waters, B. E. Vaughn, & H. S. Waters (eds), *Measuring Attachment: Developmental Assessments across the Lifespan* (pp. 170–193). New York: Guilford Press.

<sup>133</sup> Lyons-Ruth, K. & Jacobvitz, D. (2016) Attachment disorganization from infancy to adulthood: Neurobiological correlates, parenting contexts, and pathways to disorder. In J. Cassidy & P. R. Shaver (eds), *Handbook of Attachment: Theory, Research, and Clinical Applications* (Vol. 3, pp. 667–695). New York: Guilford Press.

<sup>134</sup> Haltigan, J. D., Madigan, S., Bronfman, E., Bailey, H. N., Borland-Kerr, C., Mills-Koonce, R., & Lyons-Ruth, K. (2019) Refining the assessment of disrupted maternal communication: Using item response models to identify central indicators of disrupted behavior. *Development and Psychopathology*, 31(1), 261–277, p. 270.

theoretically and methodologically significant. There has been an understated but ongoing debate among attachment researchers as to whether or when intrusiveness would contribute to disorganized attachment or avoidant/resistant attachment (Chapter 2).<sup>135</sup> Lyons-Ruth has been in favour of the importance of intrusiveness for disorganization, and in her Harvard sample the intrusiveness scale was able to discriminate maltreating mothers from the rest of the sample and dyads classified as disorganized and non-disorganized at 18 months. Haltigan and colleagues considered that it may be invasiveness specifically that is alarming, in contrast to other forms of intrusiveness, which are merely insensitive. An alternate explanation may be that invasiveness simply represents a more intense form of intrusiveness as a dimension, which can be alarming and/or insensitive depending on the dyad's circumstances.

Another example of where the AMBIANCE-Brief may have sharpened the original AMBIANCE items is in the scales for distorted affective communication and withdrawal. As discussed in Chapter 2, Lyons-Ruth had theorized that unassuaged infant distress would be frightening for the child and lead to disorganized attachment. The items selected for the scales for distorted affective communication and withdrawal rather converge in the image they present: they indicate that the caregiver stonewalls or demeans the child when the latter is visibly distressed, engaging in dangerous behaviour, or on reunion following separation. Here the child needs comfort or help and there are clear and immediate cues for the caregiver to provide this. If the caregiver stonewalls these cues it may be inferred that there is some important barrier to recognition. This is not merely difficulties in identification and interpretation of the child's signals as in the case of insensitivity, but evidence of a high level of *exclusion* (in Bowlby's terms) of these signals occurring even when the child has reason for alarm.<sup>136</sup>

The AMBIANCE-Brief retains items indicating frightening behaviour by the caregiver, which date back to Main and Hesse's theory of alarming caregiver (Chapter 1). Additionally, the AMBIANCE-Brief gives a prominent place to indications that the caregiver is demeaning their child's attachment signals. Like stonewalling, this is again suggestive of a resistance to providing help or comfort, or even registering the child's signals (e.g., removes toy from infant despite engagement). In the full AMBIANCE set the bar is not so high: this may be one reason that AMBIANCE predicts resistant attachment as well as disorganization, since some caregivers' lack of availability may be overcome through the child's expressions of distress and frustration. In the narrower AMBIANCE-Brief set, the items are those that speak to a stricter exclusion. The refined item set suggests caregiver attempts to (i) *stonewall* or (ii) *demean their child when they have reason for alarm* may be especially significant as systematic obstacles to assuagement of distress.

Haltigan and colleagues reported that their reduced, 45-item set (the AMBIANCE-Brief) remained very effective at predicting the dimensional and categorical summaries of the full AMBIANCE item set (area under the curve = 0.85). Both the reduced set and the full set had associations with disorganized attachment of  $d \approx 0.36$ . Haltigan and colleagues also reported specifically for the NICHD dataset that associations for the full and reduced set were  $r \approx 0.23$  (so, extremely loosely,  $d \approx 0.47$ ). In terms of the debate about

<sup>135</sup> E.g. Padrón, E., Carlson, E. A., & Sroufe, L. A. (2014) Frightened versus not frightened disorganized infant attachment: Newborn characteristics and maternal caregiving. *American Journal of Orthopsychiatry*, 84(2), 201; McIntosh, J. E., Schnabel, A., Youssef, G. J., & Olsson, C. A. (2021) Preconception and perinatal predictors of offspring attachment disorganization: Advancing the replicated evidence. *Development and Psychopathology*, 33(1), 240–251.

<sup>136</sup> On Bowlby's four-category hierarchy of forms of defensive exclusion, see Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 1.

the validity of the coding of infant disorganization in the NICHD dataset (Chapter 3), this association with an expected antecedent offers important evidence in favour of validity, even if prospective prediction is poor.<sup>137</sup>

However, the strength of the associations in the pooled dataset are considerably lower than the meta-analytic association between AMBIANCE and disorganization reported by Madigan's doctoral work ( $r = 0.35$ , so, again loosely,  $d \approx 0.75$ ). Van IJzendoorn and Bakermans-Kranenburg have pointed out that such a modest association, while meaningful in a research context, gives even less confidence in the relevance of the brief version of the AMBIANCE for clinical and applied practice.<sup>138</sup> Elsewhere they have argued for the importance of prospective prediction of child development for decisions about the validity of psychological measures in developmental science,<sup>139</sup> and Haltigan and colleagues did not analyse the rich information from the NICHD or their pooled dataset on child externalizing outcomes.

A further criticism may be raised of the AMBIANCE-Brief. A graduate student of Lyons-Ruth's, DiPalma, criticized the AMBIANCE as oriented by a deficit-focused account, neglecting attention to the ways that a caregiver can offer their child a secure base, encouragement and support (Chapter 2). This criticism was mostly, but not entirely fair. The AMBIANCE manual asks coders to consider 'ameliorating behaviour', and when these are present, the coder is requested to lower the score for disrupted behaviour.<sup>140</sup> Ameliorating behaviour in AMBIANCE are those inferred to reflect continuity in the intersubjective field, with the caregiver available to help the infant regulate his or her own states, and feel wanted and safe. Initially it had been planned to develop these into a separate scale, but ultimately Lyons-Ruth and colleagues settled for asking the coder to make a qualitative judgement about the extent to which they seemed to modulate the effects of disrupted caregiver behaviour on dyadic coregulation and the infant's states. Identification of ameliorating behaviour has been retained in the AMBIANCE-Brief. Still, the stakes are raised by the use of the measure in assessment in practice contexts. No psychometric work has been conducted on the ameliorating behaviours, and it remains unknown whether or not they indeed reduce the impact of disrupted caregiving behaviours. They remain an unexamined passenger within the AMBIANCE-Brief.

### Steps towards Validation

The pooled dataset used by Haltigan, Madigan, and colleagues was largely drawn from community samples. To continue efforts in validation, Cook and collaborators in Madigan's team next examined the AMBIANCE-Brief on a further sample facing considerable risk and adversity: a group of 69 adolescent mothers collected by the Moran/Pederson

<sup>137</sup> Faiad, Y. (2020) The Role of early environmental factors in predicting adolescent psychopathology: A secondary data analysis of NICHD SECCYD data using machine learning. Unpublished doctoral thesis, University College London.

<sup>138</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation, and Academic Freedom in Developmental Science*. London: UCL Press, p. 157.

<sup>139</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. J. (2014) Confined quest for continuity: The categorical versus continuous nature of attachment. *Monographs of the Society for Research in Child Development*, 79(3), 157–167.

<sup>140</sup> The forms of ameliorating behaviour are: the pleasure a parent takes in interacting with their child; provision of tender and comfortable physical contact; prompt and appropriate response to the baby's cues; monitoring of the infant's focus of attention; following and supporting the child's initiatives; and taking the initiative when the child needs help.

group at Western Ontario.<sup>141</sup> Madigan had coded the dyads for play sessions with and without toys for AMBIANCE as part of her doctoral research (Chapter 2).<sup>142</sup> Madigan and colleagues now examined the performance of the AMBIANCE-Brief against the full measure, with the AMBIANCE-Brief coded based on one viewing of the recording as a proxy for observation in real-time.<sup>143</sup> Inter-rater reliability on the AMBIANCE-Brief was adequate for the play session with toys ( $ICC = 0.72$ ) and good for the play session without toys ( $ICC = 0.86$ ), presumably because more relevant caregiver behaviours were displayed given the mild additional stress of lack of toys to facilitate and smooth interaction. No attempt was made to assess reliability on individual scales of the AMBIANCE-Brief: Madigan and colleagues hold that these have heuristic value but would not be possible to assess in real-time.<sup>144</sup>

The AMBIANCE-Brief had very good convergence with the full AMBIANCE in the play session with toys ( $r = 0.65$ ) and without toys ( $r = 0.61$ ).<sup>145</sup> This convergence held across all five AMBIANCE dimensions, except for the fearful/disorientation dimension in the play session with toys. Since Main and Hesse's original work, it has been acknowledged that these forms of caregiver behaviour can be subtle;<sup>146</sup> it may require some degree of stress in the situation for these codes to be clearly elicited, or additional training for coders to help them identify the potentially fleeting behaviours. Additionally, the items retained for the AMBIANCE-Brief are quite extreme (e.g., 'Exhibits highly vigilant posture in presence of infant'), which may make it harder for coders to extrapolate back to more moderate forms. Disorganized attachment in the Strange Situation was also predicted by the AMBIANCE-Brief coded in the play session with toys ( $r = 0.36$ ) and without toys ( $r = 0.32$ ), though this was lower than for the full AMBIANCE ( $r = 0.52$ ).<sup>147</sup> In this sample 9% of dyads were classified as avoidant, 33% as secure, and 58% as disorganized, so it was not possible to see whether the sharpening of the AMBIANCE to focus on items that predicted the underlying dimension contributed to better discrimination between disorganization and avoidance/resistance.

<sup>141</sup> Moran, G., Pederson, D. R., & Krupka, A. (2005) Maternal unresolved attachment status impedes the effectiveness of interventions with adolescent mothers. *Infant Mental Health Journal*, 26(3), 231–249. On the adversity experienced by adolescent mothers, see also Thompson, G., Madigan, S., Wentzel, K., Dineley, B., Lorber, S., & Shouldice, M. (2015) Demographic characteristics and needs of the Canadian urban adolescent mother and her child. *Paediatrics & Child Health*, 20(2), 72–76.

<sup>142</sup> Madigan, S., Moran, G., Schuengel, C., Pederson, D. R., & Otten, R. (2007) Unresolved maternal attachment representations, disrupted maternal behavior and disorganized attachment in infancy: Links to toddler behavior problems. *Journal of Child Psychology and Psychiatry*, 48(10), 1042–1050.

<sup>143</sup> Cooke, J. E., Eirich, R., Racine, N., Lyons-Ruth, K., & Madigan, S. (2020) Validation of the AMBIANCE-brief: An observational screening instrument for disrupted caregiving. *Infant Mental Health Journal*, 41(3), 299–312.

<sup>144</sup> Madigan, S., Eirich, R., Racine, N., Borland-Kerr, C., Cooke, J. E., Devereux, C.,... & Lyons-Ruth, K. (2021) Feasibility of training service providers on the AMBIANCE-Brief measure for use in community settings. *Infant Mental Health Journal*, 42(3), 438–451, p. 442.

<sup>145</sup> Cooke, J. E., Eirich, R., Racine, N., Lyons-Ruth, K., & Madigan, S. (2020) Validation of the AMBIANCE-brief: An observational screening instrument for disrupted caregiving. *Infant Mental Health Journal*, 41(3), 299–312.

<sup>146</sup> Main, M. & Hesse, E. ([1992] 2021) Disorganized/disoriented infant behaviour in the Strange Situation, lapses in the monitoring of reasoning and discourse during the parent's Adult Attachment Interview, and dissociative states. In T. Forslund & R. Duschinsky (eds), *Attachment Theory and Research: A Reader* (pp. 108–132). New York: Wiley. Madigan and colleagues reflected that 'behavioral codes such as 'exhibits sudden loss of affect' or 'exhibits highly vigilant posture in presence of infant' may occur quickly and go undetected without the ability to pause or re-watch mother–infant interactions'. Cooke, J. E., Eirich, R., Racine, N., Lyons-Ruth, K., & Madigan, S. (2020) Validation of the AMBIANCE-brief: An observational screening instrument for disrupted caregiving. *Infant Mental Health Journal*, 41(3), 299–312, p. 308.

<sup>147</sup> The difference between the full AMBIANCE and the AMBIANCE brief was statistically significant in the play session without toys, but not statistically significant with toys.



In a further effort in validation of the AMBIANCE-Brief, Abdelmaseh, a student of Yvonne Bohr (York University), coded home observations of 50 US community mother-infant dyads when the infants were five months using the AMBIANCE-Brief.<sup>148</sup> These home observations were separately coded for caregiver sensitivity using the Ainsworth's sensitivity scale and MBQS-mini. Inter-rater reliability on all three scales was excellent. Maternal report of child behaviour was coded at four years, and the children were asked about their perceived cognitive and physical competence. When participants were 10 years old, they reported on their self-worth and mental health and completed the Kerns security scale to assess their felt security in the parent-child relationship. The negative association between the AMBIANCE-Brief and the Ainsworth sensitivity scale was considerable ( $r = -0.60$ ), as was the association with the MBQS-mini ( $r = -0.55$ ). Abdelmaseh observed that at first sight this would suggest that the AMBIANCE-Brief represented merely the inverse of sensitivity. However, curiously, the participants with low scores on the AMBIANCE-Brief did not have higher scores on the sensitivity scales: 'As such, these findings altogether do not lend support to the theory that disrupted maternal behaviour is merely an extreme form of insensitive maternal behaviour. Rather, the results suggest that disrupted maternal behaviour and maternal insensitivity may in fact be two conceptually different constructs that share a large proportion of variance.'<sup>149</sup>

In Abdelmaseh's study, the AMBIANCE-Brief was not significantly associated with the infant's age, infant's gender, mother's age, mother's level of education, or family socioeconomic status. In a regression including the AMBIANCE-Brief and the two sensitivity scales, only the AMBIANCE-Brief was associated with later outcomes. It predicted children's self-perceived cognitive and physical competence at age four, and self-worth at age 10. Abdelmaseh concluded that it speaks well to the value of the AMBIANCE-Brief that it had greater predictive value than sensitivity in this sample. Despite this, the lack of association with parent or child report of socioemotional health was striking, given that associations with such measures had been demonstrated for the full AMBIANCE. Abdelmaseh reflected that the null findings could be for various reasons including: the small sample, the low-risk nature of the sample, or loss of acuity from the reduction of the AMBIANCE to a brief measure. Abdelmaseh expressed disappointment that it was not possible to examine subscales of the AMBIANCE-Brief for post hoc analysis, as it would have been for the AMBIANCE.

A potential challenge with the AMBIANCE-Brief item set stems from their method of identification: these are generally the items that best predict the underlying dimension. They are therefore also generally the most extreme, and therefore may require the coder to extrapolate back to more mild forms in individual cases, a difficulty we saw above with the fearful/disorientation items. Abdelmaseh raised the question of whether this makes the AMBIANCE-Brief more challenging to code in low-risk samples.

A further question is whether the AMBIANCE-Brief can be successfully applied by practitioners. Madigan and colleagues conducted a study to address this concern, providing a two-day workshop for local community practitioners ( $N = 46$ ) in coding the AMBIANCE-Brief. At the start of the training, the practitioners reported low levels of confidence and comfort in utilizing observational protocols in their work ( $3.96/10$ ), and only 13% had any prior experience of doing so. Yet 89% of the practitioners were successful in gaining reliability on the measure. Madigan and colleagues examined whether practitioner education,

<sup>148</sup> Abdelmaseh, M. (2020) The AMBIANCE-Brief: An investigation of a novel tool designed to assess disrupted maternal behaviour. Unpublished masters thesis, York University, Toronto.

<sup>149</sup> Ibid., 25.

years of experience, age, work hours, experience with observational measures, or understanding of attachment theory predicted success in the reliability test. None of these were statistically significant.

A potential concern is that 44% of practitioners expressed some degree of worry as to whether families would appreciate having their behaviour with their children considered in terms of the AMBIANCE-Brief. This may reflect the fear and worry that practitioners sense that caregivers feel when their caregiving is scrutinized: ‘many clients involved with child welfare agencies are mandated to be involved in service. The non-voluntary nature of involvement in family services can be an exceptionally stressful experience for parents already navigating a system that can feel scrutinizing. Thus, given the sensitive nature of clientele in family service settings, it is understandable that integrating this measure into clinical care may be perceived by family service providers as being difficult for some parents.’<sup>150</sup> It remains to be seen whether caregivers actually find assessment with the AMBIANCE-Brief less acceptable than assessment-as-usual where family services are involved on a nonvoluntary basis.

Part of the question of acceptability lies in what use is made of the AMBIANCE-Brief by practitioners. The large majority of practitioners who attended the training—85%—were interested or enthusiastic about utilizing what they had learnt in their professional work with children and families. Madigan and colleagues acknowledged that a limitation of their study was that they did not ask how their participants intended to use the assessment. In line with the Forslund and colleagues consensus statement, Madigan and collaborators stressed that the AMBIANCE-Brief ‘is not a diagnostic tool, cannot corroborate or indicate maltreatment, and should only be used as part of a comprehensive, multimethod assessment. Within those guidelines, however, the AMBIANCE-Brief can provide a valuable resource for informing and personalizing interventions for parents and children at risk.’<sup>151</sup> Or at least, the practitioners surveyed reported that it provided a valuable resource. More substantive demonstration of the measure would require showing some form of incremental validity compared to assessment-as-usual.

In an online follow-up, Eirich and colleagues in the Madigan’s lab asked attendees whether or how they had used the AMBIANCE-Brief in their work.<sup>152</sup> The tool was generally regarded favourably: most practitioners reported that they found the AMBIANCE-Brief feasible to incorporate into their clinical work (76%). Whereas Madigan had anticipated that the AMBIANCE-Brief would be coded in real-time, actually a slight majority (56%) of the 26 practitioners reported that they coded videotaped interactions. Around 45% of participants mentioned barriers to using the measure in their practice. The most frequent issues raised were: the time it takes to use the measure (39%), cross-cultural limitations (19%), the financial costs associated with the measure (12%), a desire for more training (12%), the measure not being relevant to cases seen (12%) or not validated on the age group the practitioner worked with ( $n = 3$ ; 11.5%). Among these obstacles, it is notable to see cross-cultural limitations highlighted. As things stand, this seems a fair concern in light of the meagre body of cross-cultural research on alarming caregiving behaviours (Chapter 4).

<sup>150</sup> Ibid., 447–448.

<sup>151</sup> Madigan, S., Eirich, R., Racine, N., Borland-Kerr, C., Cooke, J. E., Devereux, C.,... & Lyons-Ruth, K. (2021) Feasibility of training service providers on the AMBIANCE-Brief measure for use in community settings. *Infant Mental Health Journal*, 42(3), 438–451, p. 449. See also Barone, L. & Cassibba, R. (2022) L'utilizzo del costrutto di attaccamento in ambito giuridico: Per un suo corretto uso a difesa dell'interesse del minore. Un invito alla discussione. *Psicologia clinica dello sviluppo*, 26(2), 295–308.

<sup>152</sup> Eirich, R., Pador, P., Watt, J., Racine, N., Lyons-Ruth, K., & Madigan, S. (2024) Evaluating the use of the AMBIANCE-Brief measure in clinical settings: Assessing acceptability, feasibility, and utility of the AMBIANCE-Brief. *Infant Mental Health Journal*, 45(5), 438–448



A sizeable number of the practitioners (68%) reported using the measure in case conceptualization and clinical formulation, which was encouraging to see. This implied that the training offered insights helpful for understanding children and families and thinking about how best to support them. However, nearly half of the practitioners used the AMBIANCE-Brief in parenting capacity assessments in a child protection context. This finding offers apparently direct corroboration of Van IJzendoorn and Bakermans-Kranenburg's concerns. Even if a tool like the AMBIANCE-Brief had been developed to help target supportive interventions and had been taught to practitioners as only relevant for targeting supportive interventions, nonetheless nearly half of those trained then used the tool in assessing whether children were safe with their parents.

Eirich and colleagues have acknowledged this concern. However, they admit that the survey question is difficult to interpret. They did not ask whether the AMBIANCE-Brief was being used to corroborate or indicate maltreatment or as part of a comprehensive, multimethod assessment. In their view, the meaning of this finding is unclear in terms of the use or misuse of the measure.

### **Beyond the Academic Silo**

In 2024, Madigan led a successful application for \$2.5m to Canada's Social Science and Humanities Research Council to establish an international consortium, the Caregiving and Attachment Research and Education (CARE) Collaboration, focused on bridging the divide between researchers and practitioners interested in attachment.<sup>153</sup> I supported Madigan and collaborators in development of the application. The consortium brings together over 300 attachment researchers, practitioners and educators (among them myself), with the goal of making research accessible, renewing reciprocal learning between research and practice, strengthening global dialogue about attachment and caregiving, and lowering barriers to young researchers and practitioners to engage with attachment research. Principles of diversity and inclusion will be central to the project, with the goal of helping every person interested in attachment feel they have a place and are welcome. The approach of the CARE Collaboration reflects points of alignment between Madigan's values and vision for attachment research and other members of the consortium such as Schuengel, Fearon, and Cyr.

A central component of the CARE Collaboration will be the further development, validation and evaluation of measures from attachment research that can be used in practice. Certainly, this will include further validation and appraisal of the AMBIANCE-Brief, which is the furthest along in terms of relevant research. An important next step will be to understand the rates of false positives and false negatives when the AMBIANCE-Brief is used by practitioners to identify children's needs or predict their trajectory. Other measures that might be considered for evaluation include the MBQS-mini and the brief AQS.

In the context of widespread misinformation about sensitivity and attachment, another project under the grant will be the creation and curation of a website ([www.carecollaboration.org](http://www.carecollaboration.org)) that can serve as a centralized forum—a secure and dependable depot—for knowledge exchange and portal to reliable information on caregiver sensitivity and child attachment. Information will be tailored to be accessible and comprehensible to

<sup>153</sup> Madigan, S. (2023) The International Consortium for Research on Enhancing Attachment in Children through Training, Education, and Dissemination. Grant application to the Social Sciences and Humanities Research Council of Canada. Sheri Madigan personal archive.

practitioners, parents, and other researchers in cognate disciplines. Additionally, the website will host a training platform featuring standardized virtual simulations of caregiver sensitivity and attachment, designed to enhance applied learning.

The CARE Collaboration will also support the development of networks for discussion and collaboration through initiatives such as communities of practice, journal clubs, and applied conferences. Additionally, the collaboration will pay for mentoring infrastructure for young researchers and practitioners interested in attachment research, informed by theory and research on how attachment theory can inform mentoring relationships.<sup>154</sup> Inspired by the Pederson/Moran laboratory at Western Ontario, it is assumed that researchers and practitioners will learn best, ask the best questions, and sustain effective dialogue when they feel secure.<sup>155</sup> Perhaps one might see here an attempt by Madigan to provide the support and optimism for attachment research that, at one point in her career, was so lacking that she decided to leave academia.

A comparison may be drawn with the efforts of Sroufe and others in Ainsworth's circle to preserve and defend the fledgling attachment research paradigm by efforts to forge it as a community, including through strong investment in personal mentorship, training, events, prizes, and the policing of social norms, which in turn contributed to in-group/out-group dynamics (Chapter 1). Looking back with regret, Waters jokingly characterized Sroufe, himself and other members of Ainsworth's circle as like a squad of Huns riding into battle whenever a threat was sensed.<sup>156</sup> The CARE Collaboration takes as one of its goals the nurturance of a community engaged with understanding attachment and caregiving, but without defensiveness and with an open door. No riding into battle. Though it remains to be seen the extent to which this lack of defensiveness and open door will be fully achieved.

As we saw in Chapter 4, Van IJzendoorn and Bakermans-Kranenburg proposed a vision for the future of attachment research which they termed Attachment Research 2.0. This entailed transformation across four domains: the content of the study of attachment, the methodology used, the characteristic modes of communication, and the relationship between research and practice. Van IJzendoorn and Bakermans-Kranenburg's image of Attachment Research 2.0 has begun to gain adherents. Most prominently, advocacy for this vision was the overt basis for Tereno's keynote address to the International Attachment Conference in 2024.<sup>157</sup> Madigan's approach agrees with certain aspects of Attachment Research 2.0, and these points of overlap have no doubt facilitated her ongoing collaborations with Van IJzendoorn and Bakermans-Kranenburg on numerous meta-analytic projects. Madigan signed on as a co-author to the consensus statements by Forslund and colleagues on family court practice, which had a highly cautionary tone regarding translations of attachment research into practice, shaped in considerable part by Van IJzendoorn.

In terms of the content of the study of attachment, Madigan's position agrees with Van IJzendoorn and Bakermans-Kranenburg and their vision for Attachment Research 2.0

<sup>154</sup> E.g. Watkins, C. E., Jr., & Riggs, S. A. (2012) Psychotherapy supervision and attachment theory: Review, reflections, and recommendations. *The Clinical Supervisor*, 31(2), 256–289; Biggart, L., Ward, E., Cook, L., & Schofield, G. (2017) The team as a secure base: Promoting resilience and competence in child and family social work. *Children and Youth Services Review*, 83, 119–130; Williams, J. (2023) Supervision as a secure base: The role of attachment theory within the emotional and psycho-social landscape of social work supervision. *Journal of Social Work Practice*, 37(3), 309–323.

<sup>155</sup> S. Madigan, personal communication September 8, 2024.

<sup>156</sup> Waters, E. (2017) The secure base script in attachment theory and research. Presentation to the Rapaport-Klein Study Group, [https://www.psychomedia.it/rapaport-klein/Waters-2017\\_Talk+Slides\\_1-Intro.mp4](https://www.psychomedia.it/rapaport-klein/Waters-2017_Talk+Slides_1-Intro.mp4).

<sup>157</sup> Tereno, S. (2024) Attachment theory and research: some ideas to face challenges in the new century. Keynote address to the International Attachment Conference, Rouen, France, July 2024.

that attachment theory and research needs to take its place within a broader interdisciplinary framework. She agrees that methodological, theoretical, and statistical innovations from other areas of science should not be drawn upon occasionally, but routinely and pervasively, as illustrated by her work with MASEM.

Compared to Van IJzendoorn and Bakermans-Kranenburg, Madigan has argued for a central role of practitioners and policy-makers in shaping the future focus of attachment research as part of a two-way dialogue. Furthermore, there are major differences between Madigan's vision of the future of attachment methodology. Van IJzendoorn and Bakermans-Kranenburg aim to bring ideas and replicated findings from attachment research into a reciprocal conversation with the wider scientific community. By contrast, Madigan has been interested in adapting measures developed by the attachment community so that they can travel outside of this community for more ready use by other researchers in epidemiological research and low resource settings, and by practitioners in their work with families.

In terms of the characteristic mode of communication in the study of attachment, for Van IJzendoorn and Bakermans-Kranenburg, Attachment Research 2.0 is characterized by transparency and openness. Studies should be pre-registered. And the fruits of empirical studies should be assembled into meta-analytic datasets freely available for researchers and publics to examine and interrogate. Madigan clearly agrees on this point, and this is just what she and colleagues have done with their ACEs Hub website (<https://www.aceshub.org/catalogue/>), a catalogue of all research to date on adverse childhood experiences.

The CARE Collaboration is in line with the vision of Van IJzendoorn and Bakermans-Kranenburg for the formation of global, interdisciplinary consortia. However, it is a different kind of consortium to that envisioned by Van IJzendoorn and Bakermans-Kranenburg. The CARE Collaboration seeks to facilitate a two-way dialogue between research and practice throughout the research lifecycle in empirical and meta-analytic studies, which Van IJzendoorn and Bakermans-Kranenburg have argued will contaminate the research process. Whereas Van IJzendoorn and Bakermans-Kranenburg regard the adaptation of measures from attachment research for use by practitioners as somewhat premature, Madigan and collaborators have made this one of the central components of the CARE Collaboration.

Furthermore, Van IJzendoorn and Bakermans-Kranenburg have conceptualized the role of consortia as the promotion of bold hypotheses and daring theories, and subsequent rigorous selection in potentially fierce adversarial clashes. By comparison, the CARE Collaboration has placed a central emphasis on communities of practice and communal values.

If Van IJzendoorn and Bakermans-Kranenburg advocate for a Habermasian perspective aligned with Kant's classical liberal political theory, and its opposition between minor and adult, the CARE Collaboration may be considered to align with critiques of liberal political theory in terms that emphasize the imperative to sustain felt security among adults across their differences.<sup>158</sup> Curiously, one resource for these critiques has been appeal by political philosophers to classical attachment theory, in particular the proposal that feelings

<sup>158</sup> There are echoes here of an earlier debate between Kohlberg, the primary theoretical influence on van IJzendoorn's doctoral research, and Gilligan, regarding the relationship between nurturance, compassion, belonging, development, reason and moral responsibility. See Benhabib, S. (1987) The generalized and the concrete other: The Kohlberg–Gilligan controversy and moral theory. In E. F. Kittay and D. T. Meyers (eds), *Women and Moral Theory* (pp. 154–177). Totowa, N.J.: Rowman & Littlefield; Tronto, J. C. (1993) *Moral Boundaries: A Political Argument for an Ethic of Care*. London: Routledge. Madigan cites Gilligan favourably in Madigan, S., Quayle, E., Cossar, J., & Paton, K. (2013) Feeling the same or feeling different? An analysis of the experiences of young people in foster care. *Adoption & Fostering*, 37(4), 389–403. For a riposte to an ethics of care from a perspective

of security may support dialogue and exploration, including interest and trust in others' perspectives, willingness to take seriously the value of their ideas and perceived needs, and desire to work together to expand the realm of what might be effectively conceived or pursued.<sup>159</sup>

This is a point that has been made by several of Habermas' own students: the forms of deliberative communication adequate to practical reason depend in relevant ways upon the nurturance of feelings of community and recognition across different knowledge stakeholders.<sup>160</sup> Habermas was initially sceptical, concerned that feelings of community and recognition would hinder rational discussion.<sup>161</sup> However, in the past decade, through reflections on the role of the sacred in society, Habermas has adjusted his position to incorporate these points. His position is now: it depends. Feelings of community and recognition are not necessary, and can even be a hindrance, when agents face no major social obstacles to forms of deliberative communication. Where agents face social fragmentation, experiences of alienation from one another, or a deficiency of motivation to engage ('motivationale Defizit'), these will represent serious obstacles to deliberative communication. Efforts to establish or nurture feelings of community and recognition then become a necessity and priority.<sup>162</sup>

In Habermas's terms, Madigan and Van IJzendoorn and Bakermans-Kranenburg might be regarded as differing in the extent to which fragmentation and feelings of alienation between researchers and practitioners represent an obstacle to deliberative communication. Van IJzendoorn and Bakermans-Kranenburg have observed that 'communicative platforms strengthen social bonds between researchers'.<sup>163</sup> The feelings of security and recognition that social bonds may engender can certainly be an asset in the development of general priorities for research and the translations of findings into policy and practice.<sup>164</sup> Yet Van IJzendoorn and Bakermans-Kranenburg do not regard science as a domain where feelings of community and recognition should ever have priority above the paramount right to academic freedom, dictate the process of scientific inquiry, or impact the evaluation of its claims to truth. In their view, a lack of independence from the demands of

influenced by Popper, see Rudnick, A. (2001) A meta-ethical critique of care ethics. *Theoretical Medicine and Bioethics*, 22, 505–517.

<sup>159</sup> E.g. Honneth, A. ([1992] 1995) *The Struggle for Recognition: The Moral Grammar of Social Conflicts*, trans. J. Anderson, Cambridge: Polity; Kraemer, S. & Roberts, J. (eds) (1996) *The Politics of Attachment: Towards a Secure Society*. London: Free Association Press; Engster, D. (2020) Care ethics and liberal freedom. In A. Bhandary & A. R. Baehr (eds), *Caring for Liberalism* (pp. 97–119). London: Routledge. For criticism of such uses of attachment theory within political theory, see e.g. Miller, G. (2008) Why Scottish 'personal relations theory' matters politically. *Scottish Affairs*, 62(1), 47–62; Butler, J. (2008) Taking another's view: Ambivalent implications. In M. Jay (ed.), *Reification: A New Look at an Old Idea* (pp. 96–119). Oxford: Oxford University Press.

<sup>160</sup> E.g. Brumlik, M. (1992) *Advokatorische Ethik. Zur legitimierung pädagogischer Eingriffe*. Bielefeld: Böllert KT; Forst, R. ([1994] 2002). *Contexts of Justice: Political Philosophy beyond Liberalism and Communitarianism*. Oakland, CA: University of California Press; Kompridis, N. (2011) *Critique and Disclosure: Critical Theory between Past and Future*. Cambridge, MA: MIT Press. See also Benhabib, S. (1986) *Critique, Norm and Utopia: A Study of the Foundations of Critical Theory*. New York: Columbia University Press.

<sup>161</sup> Habermas, J. (1990) Justice and solidarity: On the discussion concerning Stage 6. In T. E. Wren, W. Edelstein, & G. Nunner-Winkler (eds), *The Moral Domain*, trans. S. W. Nichol森 and T. E. Wren (pp. 224–251). Cambridge, MA: MIT Press; Habermas, J., Long, C., & Scheuerman, W. E. (2000) Remarks on Erhard Denninger's triad of diversity, security, and solidarity. *Constellations: An International Journal of Critical & Democratic Theory*, 7(4), 522–528.

<sup>162</sup> Habermas, J. ([2012] 2017) *Postmetaphysical Thinking II: Essays and Replies*, trans. C. Cronin. Cambridge: Polity; Habermas, J. ([2019] 2023) *Also a History of Philosophy*, trans. C. Cronin. Cambridge: Polity; Callegaro, F. (2017) Justice as the sacred in language: Durkheim and Habermas on the ultimate grounds of modernity and critique. *Journal of Classical Sociology*, 17(4), 342–360.

<sup>163</sup> Van IJzendoorn, M. H. & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation, and Academic Freedom in Developmental Science*. London: UCL Press, p. 36.

<sup>164</sup> Bakermans-Kranenburg, M. J. & van IJzendoorn, M. H. (2024) Anything goes for participant, patient and public involvement in youth mental health research. *JCPP Advances*, e12258.

practitioners and their desire for guidance from academic authorities—a lack of recognition of the appropriate division of labour—might misdirect researchers in the process to, for example, validate the AMBIANCE-Brief for applied practice.<sup>165</sup>

Finally, a last component of Attachment Research 2.0 for Van IJzendoorn and Bakermans-Kranenburg is a transformed relationship between research and practice. For Van IJzendoorn and Bakermans-Kranenburg, attachment researchers should only offer recommendations for practice and to parents based on meta-analytic findings and considerable convergent evidence. So, for example, meta-analytic research shows the harms of institutional care and the lack of long-term harm to the child of adoption (Chapter 4). Such findings can support evidence-based policy and practice. Of special importance is research on attachment-based interventions. Here the mature findings of researchers regarding the efficacy of particular interventions can be translated into applications in practice. Research on such applications can then help inform further improvements in the interventions. For Van IJzendoorn and Bakermans-Kranenburg this empirical dialogue is at the heart of closing the research–practice gap.

Where mature evidence is absent, Van IJzendoorn and Bakermans-Kranenburg have urged researchers to have forbearance in communicating with the public. They have pointed to the dangers illustrated by the misapprehensions brought into widespread circulation by Bowlby's premature pronouncements in the 1950s, and they have praised researchers like Main for avoiding engagement with publics and practitioners when a research programme is not yet sufficiently mature. In their view, as an alternative, the public role of attachment researchers can focus on combatting the myriad misapprehensions held about attachment and caregiving, and what they imply.

Here is a fundamental point of disagreement with Madigan. For Madigan, 'the public are looking for information, and will get misinformation unless we extend research findings to the public. I am taking it as a responsibility of mine to disseminate information to those who want it, often parents and clinicians.'<sup>166</sup> This moral responsibility extends beyond dissemination of replicated findings, as for Van IJzendoorn and Bakermans-Kranenburg, and includes dissemination of a wider spread of emergent forms of knowledge from within the fields of attachment research and developmental science. There is a difference in how Madigan experiences the moral implications of the research–practice gap, based on a difference in how she regards the epistemology of academic knowledge compared to Van IJzendoorn and Bakermans-Kranenburg. The CARE Collaboration website ([www.carecollaboration.org](http://www.carecollaboration.org)) will certainly headline meta-analytic findings. However, the website will also include new research findings and reflections on their potential implications for policy and practice. Hopefully this dissemination will acknowledge limitations on the

<sup>165</sup> Van IJzendoorn, M. H., Bakermans, J. J. W., Steele, M., & Granqvist, P. (2018) Diagnostic use of Critten-den's attachment measures in family court is not beyond a reasonable doubt. *Infant Mental Health Journal*, 39(6), 642–646. The same argument would hold for other such efforts to respond to practitioner calls for accessible measures for use in applied work with families, such as the e-learning tool and interactive decision tree developed by the VU Amsterdam group to help practitioners assess caregiver sensitivity. Forrer, M. L., Oosterman, M., Tharner, A., & Schuengel, C. (2024) Testing reliability and validity of practitioner-rated parental sensitivity: A novel tool for practice. *Infant Mental Health Journal*, 45(2), 234–246. Van IJzendoorn and Bakermans-Kranenburg have argued that 'in many countries child protection services are under- staffed and under- funded as well as have large turnover rates and poorly educated professionals. From an emancipatory perspective, they may feel less empowered by yet another "promising" assessment tool or technique and might be better supported by a collaborative focus on improving their professional working conditions as well as the living conditions of the families in their care.' Van IJzendoorn, M. H., & Bakermans-Kranenburg, M. (2024) *Matters of Significance: Replication, Translation, and Academic Freedom in Developmental Science*. London: UCL Press, p. 158.

<sup>166</sup> Madigan, S. (2019) Beyond the academic silo: Collaboration and community partnerships in attachment research. Paper presented on 20 July 2019, International Attachment Conference, Vancouver, Canada.

dependability of emergent findings, but this remains to be seen—and represents a potential challenge in communication with audiences potentially unfamiliar with calculations of statistical power and confidence intervals.

Given the extent of public and practitioner interest and the vast availability of misinformation, Madigan has regarded it as the responsibility of attachment researchers to adopt the role of public intellectuals. She has regularly written for popular outlets, representing attachment research in the media. To date, her media presence has included around 50 appearances for television; around 60 appearances on radio; and around 35 news articles. Part of the context is no doubt the pressure on contemporary Canadian academics to pursue community and public engagement around their research, in sharp contrast to the lack of professional rewards, or even penalties, for such activity for second generation attachment researchers in developmental science.<sup>167</sup> Admittedly, the media have shown more interest in Madigan's work on screen time, sexting and the mental health consequences of the pandemic than her publications directly addressing attachment and caregiving. Nonetheless, Madigan has brought ideas from the study of attachment and caregiving to her public interpretation of these current issues.<sup>168</sup>

### Concluding Remarks

The CARE Collaboration is just getting started and remains promissory. For instance, a central place is given to the further validation of the AMBIANCE-Brief for applied practice. However, it is still unknown whether the measure is capable of adding sensitivity and specificity to assessment-as-usual for supportive work with families. There are also concerning initial indications that the measure will be applied to assess the safety of children with their parents in child protection contexts, contrary to what the research community—reflected in the Forslund and colleagues consensus statement—appear to regard as appropriate for such high-stakes decisions.

Nonetheless, Madigan's work seems to represent an attempt to offer a breath of fresh air for research on attachment and caregiving. The direction she is pointing attachment research draws from Bowlby's clinical orientation and populism, Ainsworth's concern with observation of caregiving behaviour, Sroufe's desire to sustain attachment research as a community, Lyons-Ruth's passion for understanding child-caregiver interaction in the context of adversity, the value placed by Goldberg on improving the clarity of conversation about attachment and sensitivity, Pederson and Moran's example of research leadership envisaged as provision of a secure base and safe haven, and Van IJzendoorn and Bakermans-Kranenburg's advocacy for meta-analytic methodology and for placing attachment research back into dialogue with the wider scientific discussion. Nevertheless, the configuration appears to represent something new for attachment research. It may be regarded as a response to the perception that the field is in a time of transition, which will be discussed further in the Epilogue.

<sup>167</sup> Besley, J. C., Newman, T. P., Dudo, A., & Tiffany, L. A. (2020) Exploring scholars' public engagement goals in Canada and the United States. *Public Understanding of Science*, 29(8), 855–867.

<sup>168</sup> E.g. ABC's Good Morning America (2018, February): Sexting among teens is on the rise: <http://abcnews.go.com/GMA/Family/video/sexting-teens-rise-study-53383161>; Madigan, S. & Vaillancourt, T. (2023) What to do if your child is struggling: Steps caregivers can take to help kids and teens with their mental health. <https://theconversation.com/what-to-do-if-your-child-is-struggling-steps-caregivers-can-take-to-help-kids-and-teens-with-their-mental-health-207393>.





# Epilogue

Attachment theory in the developmental tradition has at times been characterized as, to all intents and purposes, basically set and unbreathing over time, with new research largely moving in the same direction, aligned with the principles of the early pioneers, and using terms and measures in a stable way. What movement is registered is merely regarded as a simple, imperturbable line between two fixed points. Individual elements are assumed to be less important, creative or relevant than the paradigm as a whole.<sup>1</sup>

Such a simplified picture may be helpful for popular advocates for attachment theory and research, offering this coherence as a symbol of its truth and dependability, attracting a sense of respect from practitioners and belonging for developmental researchers.<sup>2</sup> Attachment researchers themselves have, with varying degrees of intent, frequently abetted such accounts of the paradigm as only ever trilling one song. The language of attachment research often uses terms that become rather free-floating, available for and drawing in various possible meanings, then obscuring this diversity. Their absorptiveness can help support the impression of continuities across time, across research groups, and across contexts. Still, this comes at a price for the transmission of meaning.<sup>3</sup>

For instance, since Main it has been common to use ‘attachment’ as a shorthand for what is measured by both the Ainsworth Strange Situation and AAI. Not only does such a framing imply the expectation of stability in individual development; it implies stability in the conceptualization of individual differences across generations of researchers (Chapter 1). This provided support and cover for Main’s rerouting of attachment theory and research. Yet Main’s own work has shown that we should be cautious when we hear idealizing stories of continuity from past to present, without interest in the rub between our semantic generalizations and the specifics of what has taken place.

The long history of public and practitioner interest in ideas about attachment since Bowlby gives researchers an unusually large, and unusually treacherous, social platform. Waters has speculated that part of the reason subsequent researchers continued to call their work ‘attachment theory’ or ‘attachment research’ has been as much in order to gain access to this platform as because their work genuinely retained a serious debt to Bowlby beyond the idea of the caregiver as a safe haven, and the relevance of safe haven availability for later development.<sup>4</sup> This is not to say that there is not more to learn from revisiting Bowlby’s work and considering less well familiar and well-trodden aspects; quite the opposite.<sup>5</sup>

The flattening of discontinuities—so that Bowlby and Ainsworth are made to agree with any claim about attachment today and vice versa—also sustains a simplified picture helpful for critics seeking to rally opposition to a strawman. The appearance of a horde of heavy-handed, indistinguishable attachment theorists, representing ‘arguably the dominant paradigm of child development in mainstream psychology,’<sup>6</sup> can function as an allegory for a particular form of research or applied practice.

<sup>1</sup> In the terms of Deleuze and Guattari, this is an ‘arborescent’ scheme, with the meaning and unfolding of particular elements completely static, since they are implied and determined by the general. Deleuze, G. & Guattari, F. ([1980] 1987) *A Thousand Plateaus*, trans. B. Massumi, Minneapolis, MN: University of Minnesota Press.

<sup>2</sup> E.g. Pearce, C. (2016) *A Short Introduction to Attachment and Attachment Disorder*. 2nd ed. London: Jessica Kingsley Publishers.

<sup>3</sup> Duschinsky, R., Bakkm, L., Mannes, J. M., Skinner, G. C., Turner, M., Mann, A., ... & Beckwith, H. (2021). Six attachment discourses: Convergence, divergence and relay. *Attachment & Human Development*, 23(4), 355–374.

<sup>4</sup> Waters, E. (2011) The positive sides of secure base use, 4/23/2011. Unpublished manuscript. Everett Waters personal archive.

<sup>5</sup> Waters, E. & Petters, D. D. (2021) Cornerstones and discourses in attachment study: Celebrating the publication of a new landmark. *Attachment & Human Development*, 23(4), 404–411.

<sup>6</sup> Davis, O. & Dean, T. (2022) *Hatred of Sex*. Lincoln: University of Nebraska Press, p. 98. Also: ‘Attachment theory’s deterministic etiology of mental illness, which attributed it to deficiencies in the early caregiving environment, was never more than an oft-repeated speculative presumption resting precariously on Bowlby’s quite arbitrary methodological decision to narrow the scope of his research by focusing on one simply observable



For example, Sosteric and Ratkovic characterize attachment theory as a dominant perspective in social work practice, insisting on an exclusive focus on family relationships. On their account, ‘attachment theory, which has not changed significantly since its inception, is a reductive theory that ignores a wider range of human needs and has caused significant hardship and trauma.’<sup>7</sup>

Regardless of whether attachment theory is characterized as hero or villain, the picture of continuity across researchers and across time is a fantasy, for all that it can offer a sense of easy coherence. It allows for a depiction of attachment theory and research in developmental psychology as a dominant force, a characterization interestingly discrepant with the comparatively small number of active research groups and its rather dominated position within contemporary developmental science.<sup>8</sup> At the same time, the simplified picture disavows the revolutions that have taken place within the craft of attachment research since Bowlby and Ainsworth, the major ongoing debates and elaboration of critical arguments, and the tremendous diversity that exist in theory, methods (and how they are used), in use of common terms, and visions of the future. This includes:

1. ‘vertical’ differences between researchers over time;
2. ‘horizontal’ differences between contemporary research groups;
3. ‘applicate’ differences between researchers and their publics.

A single book could not possibly capture the full diversity along any of these axes. My ambition with *Developments in Attachment Research* has been to chart some lines of *movement*, different vectors of development in the study of attachment and caregiving within developmental science. Chapters have sought to consider how these trajectories build from or transform earlier attachment theory and research, discern points of consensus or dissensus with others within the attachment research community, and examine how and when the researchers have sought to bridge the gap between research and practice. As in *Cornerstones of Attachment Research* and *Mentalizing and Epistemic Trust*, my goal in each chapter has been to spend enough time with a research group’s work to offer a sense of from where, and in what manner, they are understanding attachment theory and research; their characteristic ways of thinking and tone; the wagers from which their work proceeds; their priorities and contributions. I have wanted to help the reader access ways of thinking about attachment and caregiving *with* these researchers, to know what is offered by their differences in vantage and susceptibility towards scientific discoveries beyond attachment research, and to have a sense of what following or elaborating on their respective vectors might entail.

Bowlby himself warned against the danger of failing to take the past seriously: ‘so long as our history is hidden from us, so long as we hide our history from ourselves, we are very likely to see the present and future in the terms of the past.’<sup>9</sup> If Main regarded the AAI as seeking to “surprise the unconscious” with respect to attachment, through repeated, insistent probing’ into autobiographical memory,<sup>10</sup> an analogy may be drawn with a study of the history of specific research groups in the attempt to identify and understand what has become hidden in conventionalized understandings of attachment theory and research, to support other ways of seeing and acting in the present and the future.

With *Developments in Attachment Research*, my hope has been specifically to inform awareness of vertical, horizontal and applicate differences within theory and methods, from the vantage of deep consideration of particular research groups and their lines of convergence or divergence. I have

facet of the young child’s external world ... There was never any cogent scientific or rational justification for that narrowing’ (103–104).

<sup>7</sup> Sosteric, M. & Ratkovic, G. (2022) Theoretical research: It takes a village: Advancing attachment theory and recovering the roots of human health with the circle of seven essential needs. *Aotearoa New Zealand Social Work*, 34(1), 113–127. For another recent example, see Steggall, D. & Scollen, R. (2024) Clown-based social work as dissent in child protection practice. *The British Journal of Social Work*, early view.

<sup>8</sup> Mann, A., Thompson, M., Foster, S., Beckwith, H., Madigan, S., Fearon, R. P., ... & Duschinsky, R. (2023) The perspectives of senior researchers in applied disciplines on the current state of developmental attachment research: An interview study. *Sage Open*, 13(2), 21582440231179204.

<sup>9</sup> Bowlby, J. (1989) *Attachment and Loss: Continuing Education Seminars*. Film produced by D. S. May & M. Solomon. Distributed by Insight Media.

<sup>10</sup> George, C., Kaplan, N., & Main, M. (1985) Adult attachment interview, March 1985. First edition. Unpublished manuscript. John Bowlby Archive, Wellcome Collection, PP/Bow/J.4/4.

wanted to correct the assumption of attachment theory and research as a seemingly unified paradigm and to understand the drivers of its clashing and contradictory elements. The tools of historical research are uniquely suited to revealing the Homeric battlefield upon which attachment research in fact takes place, on which a host of interpretive and methodological options are occasionally openly or, more frequently, implicitly in conflict.<sup>11</sup>

After Chapter 1, which set the scene, each of the subsequent chapters of this book addressed groups that represent distinct projects for attachment research in the developmental tradition, with some overlapping and many conflicting elements. These are of course not the only currents at work today. Elsewhere I have discussed in detail work on attachment by social psychologists,<sup>12</sup> which has been a growing influence on the younger cohort of developmental psychologists working on attachment. In addition to a considerable practitioner following in Europe, some clinically oriented developmental psychologists have also been attracted by the Dynamic Maturational Model.<sup>13</sup> Or again, in Chapter 1 I traced the long history of an approach to attachment research that gives central place to the idea of a secure base script, raising questions about longstanding orthodoxies for theory and measurement. However, the differences among the four positions considered in the present book array, I think, a good number of the key choices confronting attachment research within developmental psychology, during a period of significant transition, agenda-setting, and change in leadership, comparable only to the 1980s.<sup>14</sup>

Though they have some overlapping strata, the four groups represent distinct and semi-competing approaches to attachment research. Contrary to Schuengel's early belief that attachment researchers use the same terms and thankfully understand one another,<sup>15</sup> this is not what this book has shown. Even their basic conceptualization of attachment security is different. All four groups discussed in this book agree that security is *not* merely the absence of insecurity (Shaver and Mikulincer) or the absence of distortion of attachment-relevant information (Main and Hesse). They nonetheless differ considerably in what they understand security, in fact, to be. For Lyons-Ruth, security means positive and effective caregiver–child coregulation; for Belsky, security means positive attitudes towards close relationships; for Van IJzendoorn and Bakermans-Kranenburg, security means an individual's feeling of access to secure base and safe haven provision, likely from a network of sources. Madigan does not seem to have a specific theoretical stake, but regards security as more than the absence of insecurity, and wants to be clear about what exactly is being measured by various assessments of security, concerned that these may smuggle in quite various theoretical commitments and have different meanings.

Lyons-Ruth and Belsky barely cite each other after the early 1990s: Belsky appears uninterested in Lyons-Ruth's attempts to refine Main's theory and measures; Lyons-Ruth developed her own theory of developmental processes, in dialogue with colleagues in the Boston Change Process Study Group, reducing her interest in Belsky's account. Van IJzendoorn and Bakermans-Kranenburg do not frequently cite Lyons-Ruth's work, regarding her cohort as precariously small, and her methodological innovations as so far lacking evidence of incremental validity. Belsky is selective in what he cites of Van IJzendoorn and Bakermans-Kranenburg, for instance ignoring their work on attachment networks and institutional care. Only Madigan cites all the others, though this also causes her potential difficulties. Her writings juggle absorptive concepts and their various specific meanings

<sup>11</sup> Cf. Jameson, F. (1988) *The Ideologies of Theory: Essays 1971–1986* (Vol. 1). London: Routledge.

<sup>12</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*. Oxford: Oxford University Press, chapter 5.

<sup>13</sup> E.g. Hautamäki, A., Hautamäki, L., Neuvonen, L., & Maliniemi-Piispanen, S. (2010) Transmission of attachment across three generations. *European Journal of Developmental Psychology*, 7(5), 618–634; Farnfield, S. & Holmes, P. (2014) *The Routledge Handbook of Attachment* (Vols. 1–3). London: Routledge; Iyengar, U., Rajhans, P., Fonagy, P., Strathearn, L., & Kim, S. (2019). Unresolved trauma and reorganization in mothers: Attachment and neuroscience perspectives. *Frontiers in Psychology*, 10, 110; Del Mar Cabezas, M. & Pitillas, C. (2019). Invisible victims and public health: Epistemic injustices in the intergenerational transmission of trauma. In J. Vallverdú, A. Puyol, & A. Estany (eds), *Philosophical and Methodological Debates in Public Health* (pp. 107–124). New York: Springer International Publishing.

<sup>14</sup> Duschinsky, R. (2020) *Cornerstones of Attachment Research*, Oxford: Oxford University Press, Conclusion; Thompson, R. A., Simpson, J. A., & Berlin, L. J. (eds) (2021) *Attachment: The Fundamental Questions*. New York: Guilford Publications.

<sup>15</sup> Schuengel, C. (ed.) (1996) Fragments of disorganised/disoriented infant behaviour—Notebook. 1995 Leiden. The Netherlands Workshop on the Analysis of Disorganised/disoriented infant Strange Situation Behaviour. Unpublished conference pack. Leiden University.

(e.g., the distinction between sensitivity and sensitivity+), and she may meet challenges in the diverse goals of members of the CARE Collaboration as a coalition.

The familiar, common ideas of attachment theory and research, and the euphemism offered by some common words, mask serious questions about the exact points of agreement or disagreement between researchers.<sup>16</sup> It is not that there are different ‘camps’ with exclusive perspectives. However, despite considerable points of overlap and convergence, the groups considered in this book do differ in substantial ways in their visions for the future. They would also likely differ in their perceptions of the degree and location of the value of the present book, and how it should be read.

With Lyons-Ruth’s group we can see one possible future:

- Attachment research in developmental psychology continues as a tradition of small- or moderate-scale studies, intimately understood and meticulously examined over time, out of which emerge new hypotheses, in dialogue with classic theorists such as Bowlby, Ainsworth, Main, and Sroufe. Attachment relationships are regarded as having a profound, holistic and causal role for development and as requiring specialized forms of measurement. The focus of research remains on the child–primary caregiver relationship, with the study of contextual factors acknowledged but not given a central place.
- However, there are also important transitions. Researchers give increasing attention to at-risk populations and questions of assessment and intervention. Neurobiological measures are heavily integrated in order to further investigate regulatory and developmental processes in the child–caregiver relationship. Efforts are made to refine measures of attachment and caregiving, and extend or adapt their application to new ages and populations. Main’s work remains the basic frame of reference for attachment theory, but with increasing freedom to elaborate on her theory and measures.
- Attachment research in the developmental tradition retains a strong identity as a field. Its contributions do travel, but not readily, within the scientific community, who find its theory and measures difficult to use or interpret. Nonetheless, it continues to have some impact within developmental psychopathology, and retains its audience among clinical and applied practitioners.

In terms of this vision of the future of attachment research, the relevance of understanding attachment research in its diversity is in helping researchers and practitioners make sense of various common pathways linking forms of adversity to poor developmental outcomes. On the basis of Lyons-Ruth’s theory of meaning—and therefore of reading—the book may be used to inform intersubjective communication, informing dialogue and exchange between attachment research and its audiences to help both. The chapters can help readers find influence and inspiration, partially taking on a perspective for a time, but also pursue exploration themselves and form their own conclusions.

With Belsky, and others such as Fonagy and collaborators who position attachment within a broader view of developmental psychopathology,<sup>17</sup> we can see another possible future:

- The history of attachment research is considered as a community unduly closed in around some basically good ideas, over-focused on preserving theoretical and methodological orthodoxies. In the future represented by Belsky’s work, the strong identity of attachment research in the developmental tradition is dissolved as a hindrance to the travel of ideas and research findings into and out of the study of attachment relationships. Distinctions between the developmental and social psychological traditions of attachment research are also put aside.

<sup>16</sup> Laclau, E. (2005) *On Populist Reason*. New York: Verso: ‘The name becomes the ground of the thing. An assemblage of heterogeneous elements kept equivalentially together only by a name is, however, necessarily a singularity. The less a society is kept together by immanent differential mechanisms, the more it depends, for its coherence, on this transcendent, singular moment’ (100). The language used may then be ‘imprecise and fluctuating: not because of any cognitive failure, but because it tries to operate performatively within a social reality which is to a large extent heterogeneous and fluctuating’ (118). See also Deleuze, G. (1983) *Plato and the Simulacrum*. Trans. Rosalind Krauss, October, 27, 45–56.

<sup>17</sup> Duschinsky, R. & Foster, S. (2021) *Mentalizing and Epistemic Trust: The Work of Peter Fonagy and Colleagues at the Anna Freud Centre*. Oxford: Oxford University Press.

- Research taking place specifically to address child attachment and caregiving is treated firmly as a wing of developmental psychopathology as a broader movement, responsive to and directly engaged with the current concerns of this movement much more than with questions arising from the tradition of attachment theory. Attachment theory and research are subordinated within broader frameworks at the intersection of developmental and biological science, such as differential susceptibility or life history theory. Priority is given to the generation of high-stakes hypotheses with cross-cutting relevance for developmental psychopathology, which can then be appraised pragmatically using the measures available from cohort studies.
- Care is taken to avoid overclaiming the developmental importance of individual differences in early attachment relationships, which form one factor among many, in complex interaction, shaping developmental outcomes. Attachment measures are aggregated within broader assessments of risk and resilience. The child-caregiver relationship is situated within a proximal context including daycare, peers, and other family members, though with some other contextual factors such as culture, ethnicity, immigration status, and neighbourhood violence remaining sidelined.

In terms of this vision of the future of attachment research, understanding attachment research in its diversity may perhaps have value in helping put classical attachment theory to bed, emphasizing the contingency of prevailing orthodoxies, and excavating what is good from attachment research for the wider scientific community. A reader may consider what they know about what makes them open or reactive to what they read or think about, for instance talking the ideas through with a friend, or attempting to write them down in their own words. If the reader wants to be changed by what they read, and anticipates the change will be positive, these open or reactive aspects may be especially relevant to bring to bear in reflecting on the book. Other readers, however, may want to use the book without being changed, and again this may have bearing for what they do with what they have read.

The approach of Van IJzendoorn, Bakermans-Kranenburg, and their collaborators represents another image of the past and future for attachment research:

- The history of attachment research represents the accumulation of empirical findings, supported by common methods and pointers, which point to a number of dependable conclusions, including adjustments to classic attachment theory. Partly implied already by their research to date, Van IJzendoorn and Bakermans-Kranenburg have explicitly set out a vision for Attachment Research 2.0. In this future, attachment research in the developmental tradition retains its strong identity, grounded in the strengths of accumulated battle-tested propositions from the theoretical tradition. Research consortia pursue well-powered new empirical studies or meta-analytic inquiries. Attachment research increases its global reach.
- Attachment theory and research are firmly lodged and integrated—not subordinated—within a broader scientific conversation; they are not permitted to fade into a small niche. Priority is not given to fine-tuning existing measures. Instead, researchers work to surpass them, using new approaches from other disciplines such as machine learning approaches and wearable technologies. Considerable focus is given to ‘binocular’ investigation combining neurobiological and observational assessments in attachment research and developmental science.
- The focus is not on aggregating the concerns of attachment within broader categories from developmental psychopathology, but of authentically sustaining a dialogue between attachment theory and contemporary developmental and biological science. This includes in conversations about the transition to parenthood in fathers and antecedents and implications of protective parenting behaviour. A central role is given to pursuing research to understand the mechanisms at work in development, advancing beyond vague appeals to ‘attachment’ as if this was sufficient explanation. Clues from attachment-based interventions are especially prized for what they can reveal about such mechanisms. Replicated findings from attachment research form the basis for decisive statements out to other disciplines, as well as to policy and practice. In turn, methodological, theoretical, and statistical innovations from the wider scientific community, such as Mendelian randomization studies, are routinely brought to bear on classic theoretical and methodological questions.

In terms of this vision of the future of attachment research, the priority in understanding attachment research in its diversity is to recognize the distance travelled by cumulative, replicated knowledge from classical attachment theory; and the discrepancy between this knowledge and overconfident and misleading claims about attachment and its implications for practice drawing on theory or a few empirical studies. The archival impulse of Van IJzendoorn and Bakermans-Kranenburg's meta-analytic research might also see the book as documenting roads not taken, and therefore a source of hypotheses for some new studies. Beyond this, their theory of knowledge also suggests a theory of reading, in which, above all, readers may not be complacent about their understanding based on any one source. Their perspective suggests that readers should attempt to specify and pull out what they think they have gained, and compare these conclusions with other sources outside of this book; debate and criticism should be paramount.

Finally, the work of Madigan, her team, and the CARE Collaboration suggest yet another possible past and future for the study of attachment and caregiving:

- Acknowledging the heterogeneity of attachment theory and research, and viewing it as a strength, attachment theory and research is reinvested as a community. Indeed, the strong identity of the attachment research community in the developmental tradition is extended out to practitioners and publics, without defensiveness and with an open door. This is a multidirectional dialogue: inclusive community priority setting shapes the direction of research on attachment and caregiving. Principles from research on caregiving by attachment researchers are explicitly drawn on in shaping the manner in which attachment researchers interact with one another and with their knowledge stakeholders.
- Attachment research is placed into dialogue with the wider scientific conversation, with a valued place at the table, but not necessarily considered intrinsically relevant to all psychosocial development. Researchers are proactive in seeking to convey accurate information about attachment and caregiving in ways tailored to different publics. This dissemination and engagement work gives a prominent place to the findings of meta-analytic research, including new discoveries from meta-analytic structural equation modelling, but is not limited to meta-analytic results.
- Another important dimension of dissemination and engagement is the development of a suite of tools for use by practitioners, based on ideas and methods from research on attachment and caregiving, as well as ongoing efforts to evaluate whether or when these tools are proving valuable and improve them.

The priority in understanding attachment research in its diversity is to sustain a constructive conversation, 'beyond the academic silo',<sup>18</sup> about the past, present, and future of research on attachment and caregiving. Following the inspiration of the Pederson/Moran group, Madigan and colleagues have emphasized the importance of feelings of security and belonging to knowledge projects. The relevance of this book would be in offering the reader greater confidence in their understanding of research on attachment and caregiving, and a sense that they can contribute to the ongoing conversation about the meaning and implications of this research, and priorities for the future.

Attention to developments in attachment research can be part of a variety of projects. Indeed, as set out in the preface to the book, for this reason a 'wild reading' is invited of the present book, one which invites the reader to make things personal, to register complexity and ill-fit and contradictions, and to come back to the book at a later date and find different resources. In contrast to the impression from cut-price versions in ready circulation, attachment research is not a single whole; there are important vectors of current development and debate. Perception of this diversity is essential for understanding its interest and its value.

<sup>18</sup> Madigan, S. (2019) Beyond the academic silo: collaboration and community partnerships in attachment research. Paper presented on 20 July 2019, International Attachment Conference, Vancouver, Canada.

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