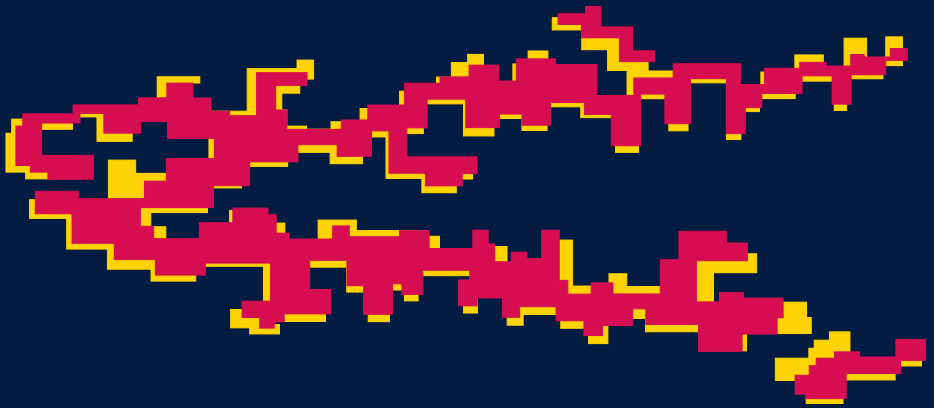# Moving Ourselves, Moving Others

Motion and emotion in intersubjectivity, consciousness and language

Edited by Ad Foolen, Ulrike M. Lüdtke,
Timothy P. Racine and Jordan Zlatev

Moving Ourselves, Moving Others

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Volume 6

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Moving Ourselves, Moving Others

Motion and emotion in intersubjectivity, consciousness and language

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Introduction

This book is inspired by the theme session "Intersubjectivity and Language: The Interplay of Cognition and Emotion" held at the 10th International Cognitive Linguistics Conference in Krakow, Poland, in July 2007. As organizers of the session, we felt that an interdisciplinary volume on this matter would be an appropriate follow-up. In addition to contributors from the theme session, we invited authors who are well known in the field. Their positive response led to a total of 16 papers, which we grouped into 3 Parts: I Consciousness, II Intersubjectivity, and III Language. We asked each of the contributors to discuss these 'higher functions' of the human mind from the foundational perspective of motion and/or emotion (See Figure 1 in the Prologue). The polyphonous result contains, we think, many harmonizing but also some disharmonizing tones. As such, the volume constitutes a relevant contribution to the actual discussions in the humanities with respect to the human mind. The 16 papers are framed by a Prologue and an Epilogue. Jordan Zlatev, one of the editors and also co-author of one of the papers in Part III, wrote the Prologue in which he introduces each paper in the overarching perspective of motion and emotion. Colwyn Trevarthen, co-author of one of the papers in Part II, followed our request to write an Epilogue, in which he reflects on the contributions of the volume and places them in a historical perspective.

Editing a voluminous collection as the present one does not involve much motion, besides moving fingers and hand on keyboard and mouse. A good deal of emotion was and is involved, however. Above all feelings of thankfulness. First of all, our gratitude goes to the authors for their work and patient cooperation over the years that the volume took shape. Secondly, we thank the colleagues who were willing to act as anonymous reviewers for the different papers. Special thanks go to Ralph Ellis, co-editor of the Consciousness & Emotion Book Series in which this volume is being published. Ralph has given us useful support along the way and even felt inspired to contribute, with Natika Newton, with a chapter. Thanks are also due to Hanneke Bruintjes and Els van Dongen, Acquisition Editors at Benjamins, who guided us through a time plan that we broke more than once. Finally, we thank Wessel Stoop, student assistant to Ad Foolen, who took care of formatting the contributions and uploading them on a website, so that authors and editors always had access to the latest versions of the texts.

After completion of the volume, hope and confidence are the dominant feelings on our side. Confidence that there is an interesting path before us, on which it will be

pleasant and exciting to move forward to a science of the mind. We hope that this book inspires the reader to join us on this path.

Ad Foolen

Ulrike M. Lüdtke

Tim Racine

Jordan Zlatev

Prologue

Bodily motion, emotion and mind science

Jordan Zlatev
Lund University

1.   Why 'motion' and 'emotion'?

This book emerged as a happy coincidence. Or was it perhaps a matter of unplanned, but non-accidental "distributed cognition"? In retrospect it seems that it was something that was just waiting to happen. Based on our edited volume *The Shared Mind* (Zlatev et al. 2008), Tim Racine, Chris Sinha, Esa Itkonen and myself proposed a theme session with the title "Intersubjectivity and Language" to the 10th International Cognitive Linguistics Conference, held in Krakow, Poland, in July 2007. At the same time, Ad Foolen and Ulrike Lüdtke independently proposed a session on "Language and Emotion". Both proposals were accepted, but we were urged to combine them, and the outcome was the stimulating whole-day workshop "Intersubjectivity and Language: The Interplay of Cognition and Emotion".

The first fruit of this, at first glance coerced, synthesis was the linking of the topics of *intersubjectivity* and *emotion*. While Zlatev et al. (2008: 1, 3) had defined the first of these notions as "the sharing of experiential content (e.g. feelings, perceptions, thoughts, linguistic meanings) among a plurality of subjects" and had stated that such "sharing of experiences is not only, and not primarily, on a cognitive level, but also (and more basically) on the level of affect, perceptual processes and conative (action-oriented) engagements" – *emotion* was not explicitly thematized in that predecessor to the present volume. This was clearly a blind spot in the programmatic attempt to frame the concept of intersubjectivity as an alternative to the cognitivist perspective of "theory of mind", which still dominates large parts of the field of social cognition.

A second, and equally important, insight that emerged from the workshop was the close link between (inter)subjectivity and *bodily motion,* or *movement*. Again, it is not that Zlatev et al. (2008: 3) had neglected the essential role of the body and its various forms of "movements" for the understanding of self and others: "Such sharing and understanding are based on embodied interaction (e.g. empathic perception, imitation, gesture and practical collaboration)." Similarly, various traditions

(all reflected in the present volume) can be seen as converging on this theme: from the phenomenological analyses of Husserl and Merleau-Ponty, the developmental psychology of Piaget, the social interactionism of Mead – to more modern discussions of the "embodied mind" (Varela, Thompson & Rosch 1991) and "mind as motion" (Port & van Gelder 1995).

Still, what arguably remains underexplored is the degree to which movement is intimately linked to "the passions", the "movements of the souls", the emotions, feelings… – or to use a common recent term, *affectivity*. One might reconsider this under-exploration quite surprising, given the close etymological and semantic relations between the terms 'motion' and 'emotion' (Bloem this volume; Zlatev et al. this volume).

On the one hand, affectivity both motivates bodily movement, and is expressed in it. But as William James (1884: 197) already pointed out, the causal relation between affectivity and bodily motion, and thus between "mind" and "body", goes both ways: "Everyone knows how panic is induced by flight, and how giving way to the symptom of grief increases those passions themselves. Each fit of sobbing makes the sorrow more acute, and calls forth another fit stronger still…"

Such an "emotion complex" is public, and affects others, at various levels of awareness. In moving ourselves, we move others; in observing others move – we are moved ourselves. The fundamental importance of this (at first glance) simple observation for our phenomenal experience of the world and of ourselves (i.e. consciousness), our connectedness with and understanding of others (intersubjectivity) and for language is the topic of this book. This can be graphically represented as in Figure 1.
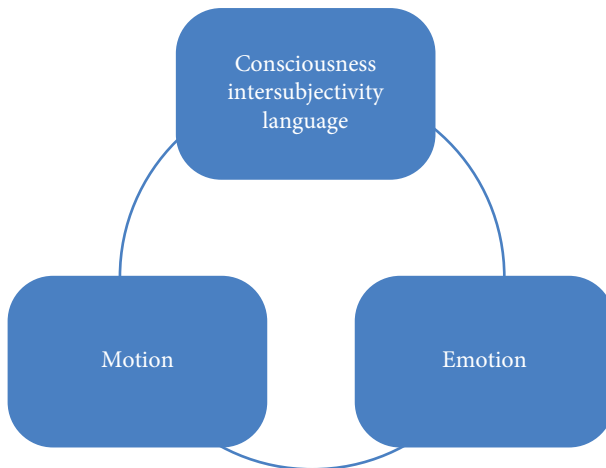
Figure 1. A schematic representation of the relations between the major concepts of the volume

2.   Bringing motion and emotion back together again

It is characteristic that in the "first generation" of cognitive science, labeled "cognitivism" by Varela et al. (1991), emotions, along with the body in general, as well as intersubjectivity (and sociality and culture more generally), were neglected. In the mind-as-computer paradigm, emotions appeared, if at all – as a special cognitive sub-routine that could be added to, or detached from the cognitive system at will.[1] When the central role of emotions for basic cognitive processes such as learning and choosing among alternative actions, was realized, this was still a very *dis*embodied, functionalist view, "defining emotions in terms of their role in the mental economy" (Evans 2001: 146). Even when, after advances in neuroscience, it was recognized that practically every cognitive process was also emotionally "valenced" (as e.g. shown by activations in the limbic system), the centrality of emotional experience, i.e. feelings, was denied in an influential book on the subject:

> Emotions evolved not as conscious feelings, linguistically differentiated or otherwise, but as brain states and bodily responses. The brain states and bodily responses are the fundamental facts of an emotion, and the *conscious feelings are the frills that have added icing to the emotional cake*.
>
> (LeDoux 1996: 302 our emphasis)

In "second generation" cognitive science, involving neuroscience and "embodied" robots rather than just software, such a view is still prevalent:

> … many people seem to regard feelings as the essence of emotion, but this is not the view of most contemporary scientists and philosophers who study emotion. From the viewpoint of modern science, it would be as foolish to deny that a computer can have emotions just because it lacked conscious feelings as to deny that a paralyzed person could have emotions because he could not make the relevant facial expressions.   (Evans 2001: 171)

Such general pronouncements on behalf of "contemporary scientists and philosophers", as well as the analogy between the machine and the paralyzed person, should, however, be questioned. With the turn of the millennium, if not earlier, consciousness has been "re-habilitated" as a subject worthy of science, and a growing number of scientists (and not just philosophers) admit that whatever other aspects the English word 'mind' includes (function, behavior, language), if it were divorced from subjectivity, or "first-person" experience, it would be vacuous. The expression 'mindless' indicates

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1.   The super-intelligent android Commander Data in the TV-series *Star Trek, Second Generation* in the late 1980s was in one episode given an "emotion chip", with nearly disastrous consequences.

this fact: we say that something is done mindlessly precisely because it lacks subjectivity.[2] In this respect the work of Damasio (1999, 2003), which has an explicit focus on consciousness as phenomenal awareness, on the complex interrelations between emotions as "brain states and bodily responses", feelings and selfhood needs to be acknowledged.

But especially from the standpoint of the present volume, Damasio's view of emotions/feelings as above all concerned with evaluation of "in-coming" sensations, and the body's state in general, is insufficient. First, it is not active enough and misses the link between emotion and self-motion (see Ellis and Newton this volume). Second, it is not intersubjective enough. A fairly established classification of emotions distinguishes between "basic" (Ekman) or "primary" (Damasio) emotions: joy/pleasure, distress, anger, fear, surprise, distress – and "higher cognitive" or "secondary" emotions such as love, guilt, pride, shame, embarrassment, envy. While the second set are acknowledged to be "social", since they are directed to, or otherwise presuppose relations to others, the "basic" emotions are claimed to be object-directed, automatic (involuntary) and universal, with both (facial) expressions and bodily/brain reactions built in through evolution. But clearly the *expressions* of the basic emotions would be superfluous if not involved in communication, and it is obvious that they play an important role for *empathy*, the capacity for "feeling in" (*Einfühlung*) or sympathy, "feeling with" someone else. In evolutionary terms, basic emotions must have been selected for due to their contribution to survival and reproduction through their "social functions". The neuroscience of empathy, as well as intersubjectivity in general, received a big boost with the introduction of the notion of "mirror neurons" in the early 1990s (Di Pellegrino et al. 1992), especially since the original discovery of neurons in the pre-motor cortex of macaques responding to performed as well as observed actions was extended and generalized to human beings, and to other brain areas, including the amygdala, which was shown to be active in a similar way both when people experience certain emotions, and when they observe others doing so (e.g. Adolphs 2003).

But if at its most basic level, empathy involves processes of "bodily resonance" (Gallagher, this volume), or "the passive or involuntary coupling or pairing of my living body with your living body in perception and action" (Thompson 2007: 392), then it is not just the specialized (facial) expressions manifest in basic emotions, but the perception of bodily movements in general, including postures, hand movements, gaits, involuntary movements like yawns and scratches etc. that become relevant. Indeed, the edited volume *On Being Moved* (Bråten 2007), which like the present book utilized the polysemy of the English verb 'move' (cf. Reddy this volume), made

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2.   I am grateful to Tim Racine for pointing out this observation in English usage.

this generalization, linking the work from developmental psychology by Colwyn Trevarthen, Daniel Stern and others on infant intersubjectivity and the development of a sense of self to "mirror neuron" neuroscience.

Still, this synthesis did not go far enough. For one thing, the debates on the proper interpretation of the empirical evidence concerning "mirror neurons" continues (see Gallagher this volume; Racine et al. this volume). But perhaps more relevantly, as the passive construction in the title of Bråten (2007) implies: the focus is on the "passive and involuntary" aspects of interpersonal emotion, not on the active, "animate" (Sheets-Johnstone this volume) or "enactive" (Ellis & Newton this volume) nature of the mind – where motion, emotion and (inter)subjectivity can be argued to meet most intimately.

Ellis and Newton (this volume) suggest that proponents of the concept of *enaction*, originally defined as "a history of structural coupling that brings forth a world… [t]hrough a network consisting of multiple levels of interconnected, sensorimotor sub-networks" by Varela, Thompson and Rosch (1991:206) have "emphasized the importance of action as a necessary grounding of consciousness, but without stressing that the difference between action and mere reaction is interconnected with the difference that emotion makes." This is so, in particular with respect to the work of some "enactivists" such as Noë (2004). However, in another recent book, *Mind in Life: Biology, Phenomenology and The Sciences of Mind*, Thompson (2007) has made a commendable effort in performing what the title of the present section states: bringing motion and emotion back together again. Based on a (re-)reading of the classics of phenomenology (above all Husserl, but also Scheler, Merleau-Ponty, Patočka and Stein), lifting up their arguments for the relevance of the "lower" emotional and bodily aspects of consciousness and intersubjectivity, and connecting this to the recent literature on enaction and "neurophenomenology" (e.g. Freeman 2000), Thompson provides a substantial contribution to articulating a coherent and productive program for *a new science of the mind* – one that embraces consciousness, in its various manifestations, unlike the reductionist program(s) of cognitive science mentioned earlier. In Chapter 12, devoted to "valence and emotion", Thompson (2007:364) writes:

> There is thus a close resemblance between the etymological sense of emotion – an impulse moving outward – and the etymological sense of intentionality – an arrow directed to a target, and by extension the mind's aiming outward or beyond itself toward the world. Both ideas connote movement. This image of movement remains discernable in the abstract, cognitive characterization of intentionality in phenomenology. […] intentionality is no mere static aboutness, but rather it is a dynamic striving for intentional fulfillment. In genetic phenomenology, this intentional striving is traced back to its roots in "original instinctive, drive related preferences" of the lived body (Husserl 2001:198). Husserl calls this type of intentionality drive-intentionality" (*Triebintentionalität*) [...]. Patočka

> calls it "e-motion." This term connotes movement, its instigation by "impersonal affectivity", and the dynamic of "constant attraction and repulsion"
>
> (Patočka 1998: 139)

Thus, the present volume can be seen as a further contribution to the elaboration of such a dynamical, active view of emotion (cf. Lüdtke this volume), along with an affect-laden view of motion – and to explore their significance for consciousness (phenomenal awareness as such), intersubjectivity, and language – as well as the close links between them.

In this respect, it is an instance of an emerging field, which following Evan Thompson can be called *mind science*. As with cognitive science, the perspective is interdisciplinary: the authors of the chapters here included are philosophers, neuroscientists, psychologists, primatologists and linguists who – alone, or in collaboration – "transgress" the boundaries of their respective fields. But while cognitive science, in both "first generation" and "second generation" (cf. Gallese & Lakoff 2005) forms, was and continues to be centered on notions such as "computation", "information-processing" and "symbolic representation", mind science focuses explicitly on what is most intrinsic to the mind: phenomenal experience, consciousness. Unsurprisingly, the influence of phenomenology is acknowledged in most of the contributions in this volume (Sheets-Johnstone; Ellis & Newton; Overgaard; Reddy; Gallagher; Fultner; Racine et al.; Zlatev et al.), though as mentioned, other theoretical traditions are important as well: the work of Habermas (Fultner; Frank and Trevarthen), Wittgenstein (Racine et al.), Mead (Carpendale & Lewis), Piaget (Carpendale & Lewis, Günther & Hennies), among others.

Therefore, the chapters are ordered not in terms of the disciplines represented, but in terms of where the primary relevance of their discussion of (e)motion lies: Consciousness, Intersubjectivity or Language. Of course, a meta-theme of the book, as reflected in the title of the workshop from which it emerged, is the *interrelations* between these three notions, so this division should be taken as approximate. Furthermore, the reader should note that while all authors consider both bodily motion and emotion, and most do so to an equal extent, some place their focus more on one than the other.

In the remainder of this prologue, I briefly summarize the chapters of the volume in relation to the themes of the book, and point out some connections, as well as (possible) disagreements between the authors. I also provide brief comments, with which the reader should feel free to disagree. My intention with this somewhat unorthodox approach for a co-editor is to open up the discussion, rather than to place myself in the position of "objective" referee, which of course would be self-defeating. Summaries from the authors' own viewpoints are provided in the abstracts that precede each chapter, and Colwyn Trevarthen's Epilogue offers a somewhat different, and no less valid perspective on the themes of the chapters, and on the book as a whole. My conviction

is that such "polyphony" is an inherent part of any dialogical (or multi-logical) enterprise, and not in any way as detrimental for the coherence of the book.

3.   Part I: Consciousness

'Consciousness' is a proverbially difficult concept, but as with the near-synonym 'mind', it's most central aspect is that of *subjectivity*, or *sentience*: the experience of 'being' – something more basic than being a 'self', which in phenomenological parlance is something *constituted* through experience, in interaction with things and with others: subjectivity and inter-subjectivity are, as already pointed out, closely related.

Sheets-Johnstone is a prominent "mind scientist" in the sense given in the previous section, combining phenomenology, evolutionary theory and empirical research on the theme of this book in the influential monograph *The Primacy of Movement* (1999). Her text in the present volume, summarizing previous work and going beyond it, is perhaps the most radical one. This makes it, along with the author's contributions to the field, appropriate to serve as a beginning to the part devoted to consciousness. Sheets-Johnstone finds even notions such as *enaction* and *embodiment* to be "band-aids", meant to mend the gaps left by dualistic conceptions rather than genuine solutions. Instead she defends, conceptually and empirically, a fundamentally non-dualistic notion, *animation*, boldly stating from the onset that "we are essentially and fundamentally animate beings. In more specifically dynamic terms, we are animate forms who are alive to and in the world, and who, in being alive to and in the world make sense of it. We do so most fundamentally through movement." On the basis of evidence from evolutionary theory and ethology (with multiple references to Darwin), developmental psychology, dance, and experiments with hypnosis she furthermore argues for a "dynamic congruency of emotion and movement" – in both (external) expression and (internal) generation processes.

One may, however, ask whether some of Sheets-Johnstone's claims are not somewhat *too* radical and her critiques towards alternatives – too sharp. For example, one kind of "received ignorance" that is rejected in the chapter – the dictionary definition of motion as "change of position" – is rather interpreted by Zlatev, Blomberg and Magnusson (in Part III), as a different, but equally valid perspective on motion: a third-person, observational one. Furthermore, by rejecting *any* "evolutionary discontinuities" Sheets-Johnstone implies degrees of consciousness and emotion in even the simplest organisms, such as motile bacteria (cf. Thompson 2007: 161), thereby *equating* mind and (animate) life.

In comparison, **Ellis and Newton's** theoretical proposal, summarizing their recent book (Ellis & Newton 2010), is considerably more cautious. In fact, the authors explicitly guard against what they view as a number of related "pitfalls" in the

current literature on motion, emotion and consciousness. One such is to regard self-movement as *sufficient* for consciousness, which would imply consciousness not only for amoebas, but for certain self-organizing systems such as traffic-patterns. Another is not to distinguish between movements as externally induced *reactions* and *self-initiated actions*. Emotion, in the sense of motivational processes, they argue, is essential for this distinction, and this in turn implies a more active role of emotion for consciousness than that expressed by Damasio (see Section 2). Finally, Ellis and Newton argue that even the combination of movement and emotion inherent in actions is not *necessary* for consciousness, or else a completely paralyzed person would not be fully conscious, which is clearly not the case. Based on a combination of empirical evidence and a notion of "subliminal" action-imagery, the authors instead state their thesis "that possible actions must be *imagined* by the subject (usually implicitly) in order for that subject to have intentional consciousness of objects." Hence, they come to a notion of *enactive representations* subserving (visual) consciousness, unlike "enactivists [who] all too often eschew any role for representations of the environment, and therefore reject action imagery as opposed to overt action in providing a grounding for the understanding of objects."

Ellis and Newton thus present a cogent argument for the necessary linking of emotion, (imaginary) movement and consciousness. What one might wish to know more about, though, is the phenomenological status of the central concept of (unconscious) "action imagery". It is clearly not the same as the Husserl-based analysis of imagery discussed by Thompson (2007: 209): "Visualizing is rather the activity of mentally representing an object or scene by way of mentally enacting or entertaining a possible perceptual experience of that object or scene". Rather, it seems to be similar to the phenomenological notion of *protention*, the forward-looking, aspect of time-consciousness, discussed in the following chapter.

Overgaard's chapter is in several respects complementary to that of Ellis and Newton – and interestingly, reaches conclusions that are in part similar, and in part different. I would suggest that the difference has to do with the fact that Overgaard (implicitly) decides to treat "the problem of perceptual presence" as being independent of emotion/motivation. This problem is a central one for an account of perceptual, and more specifically visual, consciousness: when we observe (opaque) three-dimensional objects, we observe them from one side only: we see what is sometimes called *profiles*, which may even be in part occluded by other objects. So how is it that we can see three-dimensional objects, rather than just disconnected profiles (or parts)? As Overgaard summarizes in his exceptionally clear phenomenological exposition (even for readers unfamiliar with the literature): "The proposal is marvellously simple. According to both Husserl and the enactive account, the basis of the availability of absent profiles is found in what Husserl calls our "kinaesthetic capacity" and Noë refers to as "sensorimotor skills" (Noë 2004: 63). It is, in other words, because we are able to *move* and

thereby change our perspective on things that we have a perceptual sense of the co-presence of absent profiles."

The "enactive account" of perception is thus that it is based on self-movement. Furthermore, Overgaard explains that this does not imply *actual* self-movement, but that "a subject has some (implicit) understanding of how visual appearances *would* change *if* such-and-such kinaesthetic capacities were exercised". Thus at least for Husserl, if not for Nöe, this would not imply falling in one of the "pitfalls" discussed by Ellis and Newton – the claim that perceptual consciousness is based on actual movement. Nevertheless, Overgaard shows that there is ambiguity in interpreting the enactive thesis: that the condition of perceiving external objects is (a) "having an implicit understanding of oneself as potentially moving or being moved…" or (b) "having had experience of *active* self-movement…" Overgaard defends (a) from philosophical critiques, both outside and inside phenomenology – but concludes that (b) is too strong. This is so since even experience of *passive* movement, of being moved around in a wheel-chair as it were, would be sufficient to grant a hypothetical creature the implicit understanding necessary for linking certain movements with certain perceptual changes: "When one such creature is moved, say in a linear fashion, it will surely form implicit expectations (what Husserl calls "protentions") as to what is coming next."

This conclusion seems to be in opposition to that of Ellis and Newton – at least with respect to visual consciousness. Overgaard's argumentation is (as mentioned) meticulous, and indeed, from a purely philosophical (phenomenological) basis, where the goal is to make experience "fully intelligible" it seems as though the strong version of the "enactive account" does not stand up to closer scrutiny. But while the experience of the "passively moved" creatures envisioned by Overgaard is closer to our experience (and thus more *imaginable*, and thus "intelligible") than that of the completely immovable "Weather Watchers" (rejected as counterexamples to (a) on that ground), it is also importantly different. As the author states toward the end: "To be sure, the visual experiences of such creatures would generally be marred by ambiguities. It would be only very occasionally that such ambiguities were resolved for them, and when this happened it would be nothing but a pure stroke of luck. Here we may catch a first glimpse of the enormous difference between their life-world and ours." So, even if the argument holds, in principle, it should not be taken as carrying over to actual living creatures, and to human beings in particular – which is what Ellis and Newton's proposal concerns. On a final point: Overgaard's treatment of protention seems somewhat too passive and lacking in emotion. In contrast, Thompson (2007: 362) writes that "the protentional "not yet" is always suffused with affect and conditioned by the emotional disposition (motivation, appraisal, affective tone, and action tendency) accompanying the flow." If this is necessarily (or essentially) so, or only for "empirical creatures" like ourselves, is open for discussion.

Shanker's chapter "Emotion-regulation through the ages" elegantly weaves together the two, at first glance very different, temporal dimensions implied in the title: the historical and the developmental. The Illiad, and particularly the character of Achilles, has been used by Plato as an illustration of how disastrous unregulated emotions can be. But as Shanker points out, the reasons behind this breakdown are not to be found in "destiny" (corresponding to our present popular conception of being determined by our "genes"), but lie in the interaction of our biological unique-ness ("temperament") and educational experiences. The "modern Achilles" is to be found in the many children in the Western world who are given one or another diag-nosis such as ADHD, related to a deficit in emotion-regulation or "self-control" – in Sweden popularly called *bokstavsbaren*, 'the letters children'. And while an often fruitless debate between accounts in terms of "nature" (biology) and "nurture" (social interaction) rages, the number of "letters children" and their problems, steadily increase. In other words, the issue at stake is the interaction between biology and experience in the formation of a "subjective emotional world." As Shanker states: "Emotion-regulation affords – and indeed, has afforded from the very moment that Western thinkers started thinking about the mind-body problem – a critical area in which to explore this issue."

In criticism to the historical metaphor of emotions as "wild horses" that need to be "reined in" by Reason, which has dominated Western thinking up to the present, Shanker emphasizes the indispensable *positive* role of emotions for the formation of the triangle Self-Other-World. According to the author, few have grasped the signifi-cance of the fact that Achilles is finally brought back to sanity not by a "herculean act of rational self-control", but by a strong positive emotion of compassion. Perhaps, our current predicament would be different "…if it were recognized that emotions are not simply an aspect of the mind that need to be controlled, or worse still, sup-pressed: that cultivating a child's positive and prosocial emotions is as important an aspect of emotion-regulation as learning how to control her negative ones", as the author implores.

More specifically, Shanker summarizes the four-stage model of "emotional trans-formation" over the first years of life put forward by himself and Stanley Greenspan in *The First Idea* (Greenspan & Shanker 2004). Being based on increased differentiation from more global states on the basis of physical and social interaction, this model is reminiscent of that of Piaget. But unlike in the latter, affect/emotion is given a piv-otal role, and the "schemas" formed are sensory-affect-response, i.e. "affect" serves as a mediator. Furthermore, positive emotions are those that drive development, while negative ones are (mostly) regressive ("If the experience is unpleasant, primitive neu-ral systems trigger an automatic response to avoid the experience"). After a number of such "transformations", based on interactions with sensitive caregivers, the child

becomes increasingly active and purposeful, beginning "in affective interactions to form high-level cognitive, communicative and social skills".

Shanker thus clearly represents one of the central themes of the volume: the primacy of emotions, not opposed to, but in consort with cognition. Concerning the second theme, the link between self-motion and emotion, however, it seems that the Shanker-Greenspan infant is somewhat passive: what he/she learns in the first months of life are basically "associations" between sensory stimulation and emotional reactions.

In comparison, **Reddy** views infants in more active terms, implying rather diversified conscious lives more or less from birth. As the title of the chapter, "Moving others matters", suggests, Reddy focuses on how 'moving' (in the most general sense: "with your being, your actions, your thoughts") other persons is essential for the constitution of the self: "it matters because it shows us to have been known by others". As she states toward the end of the chapter, this is not the only source for self-consciousness: movement in the world and moving things is (at least) as important, but "the feel of another consciousness engaging with you" gives rise to *mutuality*. Distortions of such mutuality result in psychopathology, or in behavior that at least seems to resemble it: cruelty with animals or war prisoners.

Without implying a developmental progression, Reddy reviews a diverse sample of evidence (behavioural, neural, experiential) on infants' "engaging, expecting, exploring" others: still-face, neonatal imitation, imitation recognition, 'clowning', showing off, teasing and others. Her argumentation is often directed against explanations in terms of "contingency learning" or other forms of non-experiential mechanisms. On her account, what is essential is rather the "emotional responsiveness" of another subject, serving as the anticipated outcome of one's acts.

In emphasizing "the response of the other" and mutuality, Reddy's chapter bridges over to the central topic of the next section: intersubjectvity. The reader may also discern a certain view, approaching consensus among the authors represented in the volume: a view of development as piecemeal and gradual. Reddy makes it clear that she is skeptical of "stages" in the development of (inter)subjectivity. By emphasizing early onset and continuity the implication is that the basic interpersonal aspects of our consciousness, and the 'social emotions' related to these, run very deep. The case for this is indeed persuasive. Still, the evidence reviewed, here and in the chapters in Part II, shows multiple differences between infants at different ages, and one naturally inquires how novel aspects of consciousness emerge. A second point worth remarking on is that Reddy's use of the verb 'move' is in a sense highly metaphorical (extended), not only from the (literal) physical motion to emotion, but to any kind of action with respect to another subject, with the goal, explicit or not, to elicit a response.

4.   Part II: Intersubjectivity

In the opening chapter of this part, **Gallagher** provides a welcome historical perspective on the recurrent question: "How are we able to understand other people – their intentions, their behaviors, their mental processes?" Much terminological (and translational) confusion is shown to be in the way, but Gallagher opts for the term *empathy*, albeit as a Wittgensteinian "family resemblance" concept. Two current debates on the nature of empathy are reviewed. In neuroscience, this concerns the role of "mirror neurons" (or more generally, self-other matching neural circuits). For Gallese, one of the discoverers of mirror neurons, these circuits are (more or less) sufficient for empathy: "I submit that the neural matching mechanism… is crucial to establish an empathetic link between different individuals." (Gallese 2001:44). For Decety, and others, "something more" is necessary for fully understanding the other, especially when the perspectives of self and other differ.

The second debate is on what more precisely this "something more" can consist of: a theory-theory (TT) of mind, a simulation-theory (ST) of mind, or Gallagher's own proposal: an interaction theory (IT). The standard type of evidence in favor of TT have been results from "false-belief" tasks, but in the author's interpretation, these may tell us when children develop a concept of belief, but not much about the implicit kind of understanding involved in empathy. The problem for ST, which is currently usually combined with "mirror neuron neuroscience", is the notion of *simulation* itself – while there may be corresponding neural patterns involving actions and emotions in the primary experiencer and the observer, it is not clear what would provide the "as if", pretense character of these for the observer. The argument is that "the mirror neuron data suggests that rather than simulation, mirror neuron activation is part of the neuronal processes that underlie a form of intersubjective enactive *perception*", and Gallagher links this to the notion of *primary intersubjectivity* of Trevarthen. "Secondary intersubjectivity" involving objects and "contexts of shared attention" is seen as a natural developmental out-growth of this process, rather than a separate stage.

Nevertheless, Gallagher maintains that there is also a more qualitative transition in the development of empathy: this happens around the age of two, and is manifested in pro-social behaviors like consolation, in mirror self-recognition, autobiographical memory and in language. Gallagher follows proposals of J. Bruner, K. Nelson and D. Hutto in attempting to explain the "something more" aspect of empathy as a matter of *narrative competence*.

Concerning the recurrent issue of stages/levels of other-understanding, we may note that, consolation and self-recognition are present at least in the great apes, and in their often quoted article in the topic, Preston and de Waal (2002) distinguish between a simpler process of perception-action matching and a higher

level of "cognitive" empathy, quite independently of language and narrative. Hence, narrative-based understanding of others would seem to correspond (at least) to a *third*, rather than to a second level of intersubjective perception (cf. the distinction between secondary and tertiary intersubjectivity made by Bråten and Trevarthen (2007)). Gallagher also does not make it explicit to what extent narratives are based on *language*; this seems to be assumed by e.g. Hutto (2008), but narrative is conceivably a more general skill that emerges around the end of the second year of life. Finally, while Gallagher writes of "empathy", the deeply emotional aspect of understanding others is not particularly emphasized in his presentation.

Fultner pays considerably more attention to affective interaction. Somewhat surprisingly, she departs from the pragmatic philosophy of Habermas, and criticizes phenomenology for bringing in "the Other" relatively late into the picture. For Habermas linguistic meaning is fundamentally social: language is essentially *communicative action*, which on its part is embedded in *the lifeworld*, at the same time as it constitutes it. The three poles of the lifeworld (a concept that Habermas appropriated from Husserl) consist of background knowledge concerning (a) the (physical) world, (b) the other and (c) the self. In relation to each of these, in any act of communication a speaker makes three kinds of "validity claims": (a′) to truth, (b′) to appropriateness/ normative rightness and (c′) to sincerity.

Fultner finds, however, this model to display a strong "cognitive bias": "[Habermas] conceives the lifeworld in overly epistemic terms and pays insufficient attention to the structures of personality and society". Without stating this explicitly, her further efforts to remedy this show that this cognitive bias is clearly related to a *linguistic* bias: what the Habermasian lifeworld lacks are precisely embodiment and affect. Relying on the work of Tomasello, Fultner emphasizes pre-linguistic aspects of intersubjectivity such as joint attention. More importantly, and of higher relevance for the present volume, she turns to Bråten's notions of "altero-centric participation" and "e-motional memory" present according to Bråten more or less from the beginning of life. An indisputably early form of attachment, illustrating the reciprocal nature of primary intersubjectivity, is that which results from the universal practice of nursing a baby. Through this, Fultner illustrates clearly what she means by a *claim to attachment*, a fourth kind of validity claim, complementing Habermas's rationalist (and language-centered) conception of the lifeworld. (Reddy's analysis, summarized above, could analogously be seen as a "claim to attention"). In a sense, the argumentation revalidates the phenomenological emphasis on the body, perhaps most clearly represented by Merleau-Ponty, quoted in the final sections of the chapter. Thus, Fultner turns full circle to phenomenology and combines diverse philosophical reasoning and empirical justification in a productive synthetic manner, illustrating nicely the point that "understanding intersubjectivity requires a multi-pronged and multi-disciplinary approach such as the one fostered in this volume".

In their contribution, **Racine, Wereha and Leavens** ask "To what extent are non-human primates intersubjective and why?" For answering this double question they consider comparative evidence from social neuroscience ("mirror neurons", once more) and behavioural evidence related to (secondary) intersubjectivity, and above all *pointing*. They argue for overwhelming similarities rather than differences between human beings and apes, and above all against any (non-Darwinian) discontinuity, particularly with respect to intersubjectivity. In the final pages the authors conclude that "the inner life of a great ape is not radically different from our own".

This is a minority position in the field, as the authors remind us. But they argue for it cogently, on the basis of three composite arguments, all related to bodily motion and emotion. The first is the Wittgensteinian conception that "understanding is not an experience", but is rather something manifest in behaviour, i.e. goal-directed bodily movement. The second is that one cannot compare the intersubjective skills of children and great apes without considering their "rearing histories", where two important differences in the latter are singled out. First, children become self-mobile later than apes in ontogeny. While in natural conditions apes can "simply retrieve a desired object … infants learn that they must manipulate the attention of their caregivers in order to retrieve objects". This gives rise to what is known as "imperative pointing", and there is indeed evidence that when captive apes face a "problem space" similar to that of human infants, they spontaneously develop the skill. More controversial is "declarative pointing", in which children point to objects for the sake of others, or for the sake of establishing joint reference to something interesting. While no apes who have not been trained in language (and the referential pointing skills related to it) display this, Racine et al. argue that we cannot conclude from this that children have an innate motivation to collaborate or a more developed understanding of others (as e.g. is done by e.g. Tomasello et al. 2005), since the learning histories of the groups are radically different: children have abundant emotionally rewarding feedback from caregivers in performing such behaviors, while captive apes do not. Finally, the authors bring up currently influential arguments for interaction between evolution and development (many of which are summarized by Thompson (2007, Chapter 7)), which favor multi-factor causality rather than genetic determinism and too much emphasis on adaptations, and they suggest that such arguments square in well with the previous two: that understanding as manifest in behaviour, and that differences between children and apes are due to "nurture" rather than "nature", to put it simply.

Since I have introduced the practice of adding comments for the other chapters, I should also in this case, when one of the authors is a co-editor, note that the reader may have some reservations. One concerns the Wittgensteinian analysis: even if understanding and intentions are not a matter of "private" mental states, they do involve, irreducibly, subjective experience – especially from the phenomenological perspective, referred to in this introductory chapter, as well as in most of the other

chapters in this volume. But even accepting that "to speak about mental capacities *is* to speak about behavioral capacities and forms of life", one cannot help but notice major differences in the intersubjective "forms of life" of human and ape infants, even prior to the development of language. Some of these are reasonably due to motoric and contextual differences, but is it not likely that during the 6 million years of evolution since our species split there has been at least some adaptations in our evolutionary history (related to bipedalism, larger groups, brain size, prolonged childhood etc – all favoring higher dependence on sociality), expressed in infants, caregivers or perhaps both? This would be consistent with "evo-devo", but also with the conjecture put forward in the introduction to *The Shared Mind*, that human beings are the quintessentially "intersubjective species".

Carpendale and Lewis review some of the same evidence as Racine et al. and Reddy, and have a similar, though not completely identical theoretical perspective. Interestingly, they attempt to reconcile Piaget, often taken (mistakenly, I believe) as a cognitivist, and G.H. Mead, a canonical representative of the view that mentality originates in social interaction: "Mental processes are fragments of the complex conduct of the individual in and on his environment", as quoted by the authors. The synthesis is approximately as follows: body (motion) and emotions are "necessary for setting up forms of interaction and routines in which communication can emerge", but it is the latter through which intersubjectivity, meaning and self-consciousness are constituted. Relevant for human forms of interaction are factors such as infant immaturity, initial short-sightedness, and emotional reactivity. Piagetian "schemes" usually concern interaction with the physical environment, but Carpendale and Lewis treat patterns of social interaction, linked with emotional experience, as "personal or affective schemas". From initially dyadic, such schemas gradually start involving aspects of the environment, thereby becoming triadic. The ability to take the perspective of the other is also described as a gradual achievement.

With respect to the nature/nurture issue, discussed in relation to the chapter by Racine et al. in the earlier chapter, the authors also emphasize the role of the environment, acknowledging the influence of a "Pan/Homo culture" in forming more human-like intersubjective skills in non-human primates. However, they consider that "a second group of neurological facts may be required for a species to fully profit from such forms of interaction to take them to another level." Thus, a "history of interaction" seems to be necessary but not sufficient for this higher level of intersubjectivity, itself a precondition for language. The distinction is made in terms of Mead's notion of *conversation of gestures*, which are automatic and not intentionally communicative, and *significant gestures* in which there is anticipation on how the other will respond. Or in terms of the title: from reaching to requesting. But what about the third level: "reflecting and thinking"? Carpendale and Lewis suggest, but do not argue for it explicitly, that this would require language. If so, they would need to part theoretical company

with Piaget (as well as with phenomenology), who rather viewed *mental imagery*, emerging from interactions and above all imitation, as a precondition for learning linguistic signs (Piaget 1962; Zlatev 2007). Unfortunately, the authors do not state clearly what they mean by "thinking" and "reflecting" in order to decide on where they stand on this theoretically important crossroads.

The extensive chapter by **Frank and Trevarthen** constitutes a good example of the kind of "multi-pronged approach" to intersubjectivity endorsed by Fultner. Inititially, the authors provide a comprehensive review of research on infant intersubjectivity, from Trevarthen's now classic writings in the late 1970s, to recent behavioral and neuroscientific studies concerning "rhythmic prospective control". Emotion and movement are tightly interwoven: development is guided by "innate impulses to move as coherent intentional and conscious selves in emotional engagement with the sensitive responses to the intentions of other persons". It is emphasized that the infant's responses are not "simple reactions to stimulation", but, as argued also by Reddy, intended to provoke further engagement in others. The transition to secondary intersubjectivity around 9 months is described as the formation of a triangle (between subject, object and other) of "emotional appraisals".

In the second section, Frank and Trevarthen extend child-caregiver intersubjectivity to relations within society, by adopting Bourdieu's notion of *habitus* and Habermas's distinction between *lifeworld* and *system*. While the first two concepts are closely related to intersubjectivity, covering notions such as "life-styles", "embodied attitude" and providing a "sense of belonging", *system* institutionalizes these into rigid forms, with the risk of empting them of spontaneity and intimacy. Further, the authors deal with Lotman's notion of *semiosphere* connecting it to Halliday's functional perspective on language. Here too, they see at the core of the phenomena "the mastery of meanings by interpersonal symbiosis, regulated by feelings of affection", rather than (institutional) rules and norms. Finally, they consider different cases in which, for different (exogenous and endogenous) reasons, the development of intersubjectivity falters: for immigrant mothers disconnected from a community, for mothers diagnosed with borderline personality disorder, and for persons with autism. The most common methods of intervention, Frank and Trevarthen argue, do not get at the heart of the problem, since they aim to constrain the environment, or to provide "system"-like, institutional solutions, rather than emotional engagement.

The chapter is a highly original synthesis of perspectives, making a strong case for the centrality of intersubjectivity in human consciousness, interaction and society. It contains a wealth of ideas and references that I cannot hope to summarize here. However, one thing that is not explained is the manner in which the human potential for intersubjectivty is "innate", and, indeed, whether it is uniquely human. In the first section, the authors write: "Animal intentions evolve and grow, from the start, with potentialities for intersubjective social collaboration, making their

intelligence communal." On another point, when Frank and Trevarthen turn to societal factors in later sections, "rules and norms" tend to be portrayed only in negative terms (on analogy with Habermas's "system"), without making a distinction between intuitive (implicit) and explicit norms. The two are commonly conflated by opponents, but can (and arguably, should) be distinguished (Coseriu 2000; Itkonen 2003; Zlatev 2011).

Lüdtke focuses on the role of emotionally-valenced intersubjectivity in *language* development, and thus serves as a bridge to the chapters in Part III. Beginning with a brief review of the classical theories of language acquisition, she finds that neither those which emphasize individual cognition (in nativist and non-nativist varieties), nor those which focus on interpersonal relations pay proper dues to "the importance of emotions in language or in prelinguistic and linguistic development". Rather, Lüdtke finds inspiration and suggestive ideas for a truly intersubjective theory of development in the work of Kristeva, with its emphasis on notions such as "desire", and "body-based materiality". A further source is the even less-known for the general reader model of emotional regulation of Simonov. A third pillar is semiotics, above all in the Peircian tradition (since unlike Saussure, Peirce was deeply concerned with "feelings"). On this basis, the author proposes an original sign concept, and the outlines of a model of semiotic development, implying "decreasing semiogenetic impact of relational emotions during language acquisition": from the "iconic mode", through the "indexical mode" to the "symbolic mode". Along psychoanalytical (Kristeva and Stern) and Peircian conceptions, such a development, however, does not discard earlier stages/modes, but rather incorporates them.

Turning to more empirical research, Lüdtke, finds support in the neuroscience of emotion (Damasio, Panskepp), mirror-neuron research, and above all, in Trevarthen's theory of "innate intersubjectivity as psychophysiological anticipation of an emotionally responding other", discussed also in the chapter by Frank and Trevarthen and the Epilogue. Based on this concept of intersubjectivity and the earlier theoretical proposals, development is divided in four stages: (1) prenatal *primordial intersubjectivity*, in which "the foetus appears to have the capacity and motivation to 'communicate' with the mother actively by means of body movements that can stimulate her and with growing proprioceptive awareness by self-touching and posture changes that may engage with the actions and feelings of her body", (2) *primary intersubjectivity* (in the first year of life), (3) *secondary intersubjectivity* (the "toddler" years) – both relatively familiar notions, but now interpreted semiogenetically – and (4) *tertiary intersubjectivity* (in primary school children) "which requires the construction of complete linguistic enunciations constituted to describe a shared abstract object of reference". As the author explains, the novelty of the model is that it sees the roots of both semiosis and intersubjectivity in prenatal development, and does not posit that the "symbolic order" of language removes emotionality, but rather "subdues" it. Finally, the author

presents the outlines of a form of therapy consistent with the model, Relational Language Therapy, which seeks to explain and treat certain disorders which though not linguistic per se affect it negatively by focusing on the transitions between the innate "virtual other" to a "significant other", and (supposedly) to a "generalized other" with full symbolic competence.

As a truly synthetic approach, Lüdtke's model has the advantage of bringing together concepts which are usually kept separate by disciplinary borders. At the same time, as with any synthesis, it may be questioned from the proponents of these different "components". Peircian semiotics is notoriously full of conflicting interpretations, so the author's linking of the classical triad of icon/index/symbol to corresponding (decreasing) levels of relational emotions will probably raise objections among some semioticians. From a developmental psychology perspective "primordial intersubjectivity" may similarly be hard to accept. Nevertheless, such unusually early development is a more palatable interpretation of "innate intersubjectvity" than what is usually understood by the term "innate": genetically specified. Finally, the validity of the approach can be defended through its attested value in therapy. And as suggested in the final section, "paradigm shifts" can make what was unthinkable yesterday and difficult to accept today into "revolutionary science" tomorrow.

5.   Part III: Language

Foolen's chapter provides a comprehensive review of current research on the relationship between language and emotions. As he points out, linguistics (and even more: philosophy of language, I may add) has traditionally underestimated the affective dimension of language, focusing on the "denotational" or "propositional" one. Even with the advent of cognitive linguistics (Lakoff 1987; Langacker 1987), with its emphasis on *embodiment* and a view of "cognition… as being grounded in motion and action" this was not really rectified. To the extent that emotion has been systematically considered in cognitive linguistics, it has been as "conceptualized" emotion, reflected above all in metaphorical expressions (Kövecses 1990). Foolen accepts that in one respect "cognition serves as intermediate between language and emotion". However, he points out that emotions are also reflected in the lexicon and grammar more or less directly, "resulting in expressive (also called emotive or affective) language", as in interjections and other emotion-laden words, in morphology (some uses of diminutives), and in exclamative sentence types and other expressive constructions. As most of the authors in Part III, Foolen addresses the question of why we often speak of emotions "figuratively". He questions the standard explanation offered by Conceptual Metaphor Theory (Lakoff & Johnson 1980, 1999): that emotions are "abstract" while physical phenomena are "concrete", and the latter are used metaphorically or metonymically

for understanding the first – that is, for the sake of cognition. His proposal is rather that the motivation for figurative expressions of emotion is itself expressive: images related to explosions or dropping hearts are likely to evoke emotions in the addressee. The predominant form of figurative "emotion language" is suggested to be metonymical: in expressions such as *my heart sank in my shoes* "the physiological effect stands metonymically for the emotional cause". We should note, however, that such a proposal is controversial, even for the authors in this volume. Racine et al. (this volume) would presumably regard such separation between physiology and emotion to be reflective of a dualistic conception of the mind. Weigand (see below) similarly rejects the literal vs. figurative distinction with respect to mental terms. Zlatev et al. on the other hand, consider both metonymical (contiguity-based) and metaphorical (similarity-based) relations between the "physical" and the "emotional", while taking a phenomenological take on both: it is a matter of relations between different *experiential* and not ontological domains.

Foolen concludes by addressing the acquisition and evolution of language, where emotion is increasingly considered to be of paramount importance, as reflected in the chapters by Frank & Trevarthen and Lüdtke in Part II. He lists a number of example fields where insights in emotive language use can have important practical implications.

Günther & Hennies take up one such "real world" phenomenon, and offer what in the present context may be taken as a case study for the importance of emotionally-laden bodily communication: the problems that deaf and hard-of-hearing children face when their parents are instructed to avoid "gestures or signs" and to solely focus on spoken language. Based on a review of recent studies, the authors show that even when such children have been provided with cochlear implants, a large proportion display delayed language acquisition, in both the spoken and written modalities. Even more, such "communication problems lead to equally severe emotional consequences", and "it is not the *diagnosis shock* of hearing parents alone which leads to the social and emotional difficulties in a deaf child's upbringing, but rather the way intervention programs deal with these initial emotions."

To support their argument for the importance of bodily interaction in languages acquisition, even in the case of hearing children, Günther and Hennies refer to Piaget's developmental model, according to which at the end of the sensorimotor period in the second year of life, sign use emerges through gestures and action imitation. As pointed out in the discussion of Carpendale and Lewis (this volume), however, Piaget did not attribute any special importance to emotion in this process. Without addressing this lack explicitly, the authors complement it, stating that "pre-linguistic gestures are part of the natural development towards language, especially since they cannot be conceptualized without addressing the emotional binding between mother and child". The conclusions are consistent with those made by Lüdtke and Foolen in earlier

chapters, namely that by unwittingly compromising the emotional dimension latent in spontaneous gestural and linguistic communication between parents and hearing impaired children, purely "oralist" intervention programs affect negatively both the children's process of language acquisition and their emotional and social development. The implications for the need of interventions based on a multimodal and emotion-laden conception of linguistic communication are clear. While the chapter may not be the most profound one in the volume in terms of "theory", it is perhaps the clearest in terms of practical applications.

Weigand's contribution can be seen as an argument for re-thinking the notion of language along the line suggested by E.O. Wilson's (1999) proposal for a "consilience" between the natural sciences, the social sciences and the humanities, with implications going beyond language and concerning human nature as such: "The 'New Science' starts from the natural object, living beings, and tries to describe their behaviour and actions by means of goal-directed observation." The author considers some recent attempts in this direction: the "selfish gene" doctrine of Dawkins (2006), the naturalized semiotics of Deacon (1997), and "the shared mind" approaches of Trevarthen and Zlatev et al. (2008) emphasizing intersubjectivity, but finds them lacking. Her alternative proposal is that human beings are fundamentally "*social individuals* who act in their own interests but inevitably have to take account of social concerns. In this sense, it is not the dialogic mind but dialogic interaction that characterizes human beings as the *dialogic species*".

Weigand presents some of the basic tenets of her specific theory, the Mixed Game Model, and focuses on how it implies a close "interaction of body, emotion, mind, and language". She emphasizes that notions such as (shared) meaning and understanding are insufficient to account for human interaction: they are always partial and context-bound, and somehow underdetermined. The essence of interaction is rather "reacting, in general by accepting or objecting, i.e. basically evaluating the speaker's position."

On Weigand's account, traditional linguistics, with notions such as "competence" and "performance" are inadequate and "reductionist", since they distort that object of study: "we have to change our traditional view of language and speaking. There is *no separate object 'language'*, only the ability to speak which is an integrated part of human competence-in-performance". Similarly, "the *notion of text* must be questioned", she argues, "as a consequence of the intrinsic interaction of language, emotion and body". What is central is rather "linguistic action", and linguistics is not capable of analyzing this alone, without the help of the biological and social sciences. Indeed, in the abstract, she describes her general perspective as that of socio-biology.

More specifically related to the topic of motion and emotion (in language), Weigand argues that to treat expressions such as German *gerührt sein* ('to be moved') as "figurative or metaphorical" would be "an artificial manoeuvre which contradicts

language use. Traditional views … separate the field of perception from cognition and explain diachronic change by a change from concrete perception to figurative cognition or from body to mind. They are based on methodological hypotheses which 'damage' the natural object."

To the extent that theories, linguistic or otherwise, construct strict boundaries between what Weigand calls the "components" of holistic phenomena, and worse: neglect vital aspects, they are indeed open to criticism such as that of the author. However, the reader may have doubts on whether E.O. Wilson's take on "consilience" is indeed the right path, or even fully consistent with the author's purposes. In his final book, Gould (2003) criticizes Wilson for misappropriating a concept used by the English philosopher of science William Whewell in 1840. For example, when Wilson (1999: 221) writes: "The central idea of the consilience world view is that all tangible phenomena, from the birth of the stars to the workings of social institutions, are based on material processes that are ultimately reducible however long and tortuous the sequences, to the laws of physics", it is clear that what Wilson has in mind is clear and simple *reductionism*. I return to this at the end of this Prologue.

Bloem's chapter, like that of Günther & Hennies, presents another specific "case study", this time using the methods of historical linguistics. The topic is one of central relevance for the volume: what is the origin of the English term "emotion", which so many of the authors of the volume seek to define? It is well-known that it derives from Old French, and earlier from Latin, but Bloem shows on the basis of both qualitative and quantitative analysis of texts from Old French and texts from the XVII century that initially the terms *mouvoir* and *émouvoir* were used more or less synonymously, referring either to physical motion, or to the "movements of the soul", the latter under the influence of the "humoural theory" dating back to Ancient Greece. This changed during the XVII century, and from them on "*mouvoir* is almost exclusively used as a verb of movement whereas *émouvoir* has become a real psychological verb. The evolution of the verb *émouvoir* can be considered a delitteralisation process". The author argues that the influence of the dualistic philosophy of Descartes played a key role in this process – while *mouvement de l'âme* was earlier taken to be a literal characterization of the movements of the "four humours" according to the classical theory, it became eventually seen as a metaphorical expression, since emotions were to be seen as part of the mental part of our being. Hence, the expression with the prefix *e(s)-* (with somewhat unclear etymology, and not necessarily as interpreted by Thompson in the quotation in Section 2 as an "impulse moving outward") became reserved for the mental counterpart to (psycho)physical movement.

Concerning the controversial issue of nature of metaphor, in general and with respect to the "motion-emotion" metaphors discussed by Zlatev et al. in the following chapter, Bloem takes an intermediary stance: "the impact of supposedly universal and ahistorical metaphors needs to be put in a cultural perspective", an important

corrective to universalist models such as Conceptual Metaphor Theory (CMT). It is thus important not to misinterpret the author's argument as a purely "linguistic constructivist" account, or even worse, as one putting the blame on "Descartes the Dualist" for more or less inventing the sphere of the mental, a claim commonly encountered in social constructivist circles.

Zlatev, Blomberg and Magnusson, as already pointed out, regard *motion* and *emotion* as closely related, but separate experiential domains, and thus analyse expressions such as *my heart dropped* as "motion-emotion metaphors". My co-authors and I distinguish three possible answers to the question why such expressions are cross-linguistically common, if not universal. According to the first, stemming from theories such as CMT, the "mappings" between the domains are determined by pre-linguistic, bodily experience. The anti-thesis, "social constructivist" answer would be that linguistic and cultural practices determine such metaphors. The (dialectical) synthesis, which we endorse, is "consciousness-language interactionism": non-linguistic experience channeled through language-and-culture specific conventions (similar to the proposal of Bloem, mentioned above). We offer empirical support for this thesis by analyzing "115 motion-emotion metaphors in English, Swedish, Bulgarian and Thai", showing both overlap and differences, the latter correlating with the distance between the languages/cultures.

The study and its conclusions are suggestive of the potential of the "emotion turn" in mind science, witnessed by the present volume, but also actualize a number of unresolved issues. As many of the other chapters, we appeal to phenomenology, and in particular to its "founding father" Husserl for an analysis of motion/movement. However, in contrast to Sheets-Johnstone (this volume), as already mentioned, we come to the conclusion that motion can be experienced both "internally" as qualitative movement, and "externally" as change-of-location – and argue that languages reflect this difference in the much discussed semantic categories Manner-of-motion and Path-of-motion (Talmy 2000). Also, similar to Foolen, but unlike Weigand, for our analysis of the expressions in question as metaphorical (and metonymical) to hold, it is important that motion and emotion are at some level distinct. Our proposal is that "in historical time some speakers could creatively use expressions referring to such analogous or contiguous (motion) events in the "external world" in order to describe their "inner worlds", and hearers could understand them, due to the motivated nature of the expressions." However, Bloem's historical analysis, summarized above, seems rather to suggest the reverse tendency: with *mouvoir* and *émouvoir* being initially conflated, and only subsequently distinguished, in part due to patterns of language use under the (partial) influence of Descartes. Thus, our analysis is likely to be regarded as "dualistic" by those who, in the manner of Sheets-Johnstone, argue that movement and affect are so to say, intermixed, from the start.

6.   Conclusions

Given his important contributions to the topics of this volume – above all on the relationships between intersubjectivity and movement in human development – the editors of this volume found it appropriate to conclude with an epilogue by Colwyn Trevarthen. After having read the final drafts of all the chapters, and a preliminary version of this Prologue, Trevarthen reflects on historical predecessors to the general approach represented here, his own contribution to the field, and offers comments on the chapters, in a way that is quite independent from the summaries provided in the previous three sections. This adds considerably to what at the end of Section 2 was referred to as "the polyphony" of the book. There is an inevitable difference in focus and perspective in the interpretations offered in this Prologue, the authors' own summaries in the abstracts, and Trevarthen's final comments. To hide these differences would be to engage in "manufacturing consent", or to take too literally the notion of intersubjectivity as a "shared mind", where individual minds and voices are coerced into an anonymous collectivity. While it should be up to the reader to make the final pronouncement in this, I believe that the different voices in this volume complement rather than contradict one another, at least on most issues. To the extent that there are disagreements – including on the definitions of the fundamental notions of "consciousness", "intersubjectivity", "language", "emotion" and "motion" – this reflects the fact that these are all *huge* notions, with traditions, literatures and in some cases whole disciplines dedicated to them. What all of the authors clearly agree on is that *for these concepts to be comprehensively understood, they need to be interrelated*, as reflected in Figure 1.

I wish to conclude by expressing my hope that the volume may contribute not only to the already prevalent "emotion turn" in cognitive science, but to the establishment of a true *mind science*. As stated in Section 2, this can be envisioned as the non-reductive study of the (human) mind, taking account of the richness of experience, uniting its bodily and social aspects in a methodologically pluralistic enterprise: uniting the first-person ("subjective") perspective of phenomenology, the second-person ("intersubjective") perspective of (empathetic) observation involved in e.g. interaction studies, and the third-person ("objective") perspective of the natural sciences. For it to validate itself as a truly new paradigm, it would need to contribute to resolving persistent "anomalies" inherited from the past. Such anomalies are most clearly reflected in dichotomies like "individual-social", "conscious-unconscious", "mental-physical", "reason-emotion", "literal-metaphorical" etc. Previous attempts to resolve these have typically sought to *reduce* one of the poles in these dichotomies to the other, typically the more "subjective" to the more "objective" side of the opposition, in the manner of E.O. Wilson's (misguided) interpretation of "consilience". The challenge is exactly

not to strive at such a reduction, but to acknowledge the existence of these divisions, not as polar opposites but rather as sides standing in dynamic inter-dependence, as in the well-known yin-yang diagram. This would be a science, in the broad sense of the word, which would indeed live up to the original meaning of 'consilience', and – in Stephen Jay Gould's terms – provide a major step to "mending the gap between [natural] science and the humanities".

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Consciousness

Fundamental and inherently interrelated aspects of animation

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This paper shows in detailed ways how animation is the evolutionary and existential ground floor of our being alive in the world and making sense of it, and thus how animation is the proper point of departure not only for basic understandings of perception, affectivity, cognition, meaning, movement, and world, but for basic understandings of the natural interrelationship of these dimensions of life. In the process of doing so, it takes a critical look at certain conceptual approaches that deflect us from a proper recognition and understanding of these multi-faceted realities of animation, or in other words, from being true to the truths of experience.

1. Introduction

Given the current practice of applying lexical band-aids in an attempt to marry mind and body, subject and world, third-person and first-person accounts of subjectivity, time, and other topics – lexical band-aids on the order of embodied action, sensorimotor subjectivity, embedded cognition, enactive emotions, and so on – the task of this paper is to recognize and address the need for a concept that embraces all aspects of life and thereby constitutes a key to understanding how all aspects of life – movement, emotion, cognition, sociality, intersubjectivity, communication, language, and more – are inherently interrelated. That key concept is *animation*: we are essentially and fundamentally animate beings. In more specifically dynamic terms, we are animate forms who are alive to and in the world, and who, in being alive to and in the world make sense of it. We do so most fundamentally through movement, unfolding a temporal-spatial-energic dynamic, a kinetic aliveness that is in play throughout the course of our everyday lives from the time we are born to the time we die. Our kinetic

aliveness and sense-making are apparent in our initial explorations of the world and in our curiosity about it to begin with. They are apparent, in other words, in the dynamic congruency of movement and emotion (Sheets-Johnstone 1999a): we move in ways coincident with our feelings, which is to say that our bodily attitudes are affectively as well as kinetically resonant. That resonance and sense-making are singularly and centrally apparent in our initial and ongoing attunements and disattunements with those about us and in the developing new attunements and disattunements we forge throughout our lives – with parents, caregivers, playmates, friends, lovers, spouses, neighbors, colleagues, employers, and more.

We make sense of ourselves as well. Again, we do so most fundamentally through movement, through our tactile-kinesthetic awarenesses and their invariants as realized in basic if/then relationships; for example: if I close my eyes, it will be dark. Consciousness is thus a central aspect of animation, a tactile-kinesthetic built-in of life, a dimension of Nature through and through. Nature is indeed "a principle of movement and change," as Aristotle lucidly and succinctly observed. Moreover as he went on logically and astutely to observe, "We must therefore see that we understand what motion is; for if it were unknown, nature too would be unknown" (Aristotle *Physics* 2001: 12–14).

Aristotle's observations validate the fact that animate creatures grow and move about in the world: they navigate with respect to their particular surrounding world, they nourish themselves, they avoid what is noxious, and so on. Science fiction scenarios and philosophical conceivability tales might incline one to think that animate life could exist without consciousness, but the point is that here on earth, that is, here in the real-life, real-time realities of earthly life, animate forms are by nature cognizant of themselves and the world about them (Sheets-Johnstone 1998). Proprioception and affectivity attest emphatically to this reality. Consciousness is thus not something apart from Nature any more than cognition is something apart from Nature. Both are through and through aspects of animation and hence of animate life (for a thoroughgoing empirical vindication of this claim, see Sheets-Johnstone 1998, 1999b/expanded 2nd ed. 2011, especially Chapters 1, 2, 8, and 12; see also Sheets-Johnstone 1990).

The bases on which this chapter will spell out fundamental and inherently interrelated realities of animation will span evolutionary biology, phenomenology, coordination dynamics, cognitive science, and psychology.

2.   Morphology

Morphology in the broad evolutionary sense of species-specific and species-overlapping kinetic/tactile-kinesthetic invariants provides precisely the stable foundation that Darwin specified as necessary to a veridical understanding of

mind: ". . . the problem of the mind cannot be solved by attacking the citadel itself. – the mind is function of body. – we must bring some stable foundation to argue from" (Darwin 1987 [1838–1839]: 564). Bodies are indeed the ground floor of animate life. Their kinetic/tactile-kinesthetic invariants – and corollaries thereof, e.g. the proprioceptive slit sensilla of spiders, the campaniform sensilla of insects – undergird the distinctive everyday kinetic dispositions and capacities of each species of animate form. The invariants are, in other words, *synergies of meaningful movement*. The primate invariants of presenting and mounting, for example, are definitive of two interanimate kinetic relationships that are differentially meaningful, and moreover differentially meaningful according to their agonistic or sexual context. The invariants of the *Tanzsprache* – the honey bee dance – are similarly meaningful and differentially so according not to social context but to variables within the dance, that is, to distinct qualitative variables inherent in movement that communicate to others the distance, direction, and value, i.e. richness, of a nectar source. In short, meaningful movement is a built-in of all animate life, including all forms of intersubjective life.[1]

Evolutionary biologist Stuart Altmann's concept of *comsigns* attests at an objective, i.e. behavioral, level to the presence of kinetic/tactile-kinesthetic invariants. Comsigns are in essence kinetic ways of relating to others that virtually all in the species are capable of both performing and understanding (Altmann 1967). They are thus species-specific synergies of meaningful movement. Without such commonly understood synergies – in the common but less exacting terms of animal biologists, without such 'displays' or 'signs' – there would be no basic coherence or order among conspecifics. Indeed, there would be no social animals to begin with since interanimate capacities and understandings would lack all foundation. An absence of comsigns would in fact be a sizable hazard to individual survival within any putative social group since not only would a threatening gesture or movement go unrecognized as would any appeasing gesture or movement, for example, but so also would any courtship and mating gestures or movements.

Species-specific kinetic/tactile-kinesthetic invariants are qualitatively perturbable coalescing patterns of movement, feeling, thought, and awarenesses of the world, thus malleable invariants. The speed of one's walk, for example, and its amplitude may vary according to intensities of feeling, train of thought, changing climatic conditions, encroaching or receding others, the surrounding world generally, and so on. The kinetic/tactile-kinesthetic invariants that constitute walking remain basically the same, but the dynamic patterning that constitutes the actual synergy of walking at any particular time or place is qualitatively variable. For example, if I want to avoid someone, I might quicken my step and move along an erratic path; if

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1. For more detailed discussions of the relationship of consciousness to movement, see Sheets-Johnstone (1998, 1999b/expanded 2nd ed. 2011).

I am tired or feeling in a reflective mood, I might amble soberly and slowly down the street. In effect, meaning motivates movement and movement generates and articulates that meaning. *A semantically congruent relationship is evident.* The semantically congruent relationship is moreover evident in if/then or consequential relationships: if I want to examine something more closely or get within better hearing range, for example, then I move in ways concordant with that desire. Whatever my particular bodily-kinetic dynamic might be, it is meaningfully motivated and my movement articulates that meaning.

It is important to recognize that while motivations are fundamentally and essentially affective in nature, they are commonly conditioned by cognitional awarenesses, precisely as in the above examples. In this context, it is of moment to underscore the difference between experientially-anchored descriptions of the relationship between movement and meaning, as in the above examples, and behavioral accounts of action and purpose. A preoccupation with purpose is at cross-purposes with fine-grained understandings of the experiential realities of animation; a verbal fixation on action is likewise. Both are preeminently third-person, objective translations of experience that fall short of elucidating the affective-kinetic-cognitional complexities and richness of experience. In the course of everyday life, we – like other forms of animate life – ordinarily think not in terms of purpose or action but in terms of movement: looking for and finding something to eat; writing a letter; waving at a passing friend; driving fast but carefully through traffic; mowing the lawn; standing up to address a meeting; and so on. Purpose is indeed a third-person way of understanding animate movement, a way that fastens on the need *to explain* or even *to justify* a mover's action and that is epitomized in one human querying another: "what is the point of your doing *that*?"– i.e. "what is your purpose?" In short, to speak of movement in terms of purpose or action puts us at a distance from the very affective-cognitional bodily-kinetic dynamics that are at the heart of animate life, and, in effect, from the meaning that motivates the dynamics and from the meaning the living dynamics generate and articulate.

Among her extensively detailed studies of plovers, ethologist Carolyn Ristau's article "Before Mindreading: Attention, Purposes and Deception in Birds?" focuses on "broken wing display or 'injury feigning'" (Ristau 1991: 212). It exemplifies just the kind of thinking that distances us from the living dynamics of animate movement. In the opening sentence of her first section titled "Purposes", Ristau suggests that "[a] mong those attributes prior to an organism's having the capacity to attribute intentions in others,. . . the species in question should itself have intentions; its behaviours should be describable in terms of purposes" (ibid: 209). After noting her affirmation of the purposiveness of the plover's feigning behavior in other research publications, but affirming too that "there are no unassailable criteria connecting observable behaviours to specific accompanying mental states" (ibid), she goes on to describe the behavior:

> Broken wing displays are so called because the bird's appearance very much resembles one with a broken wing. The full display consists in arching one or both wings and dragging them, quivering, along the ground. Sometimes the behaviour is accompanied by a raucous call. Both parents make the display, usually singly, but occasionally simultaneously. The behaviour occurs on some, but not all approaches of an intruder toward the region of the eggs or young chicks".
>
> (ibid: 210)

She subsequently points out that "[i]njury feigning "is among the most intense of a repertoire of anti-predator behaviours" (ibid).

In her following section titled "Deception", Ristau raises the question of whether, by behaving in such a way, the plover wants the predator or intruder to believe she is injured, and analogously, whether the plover "'believes she is pretending to have a broken wing'" (ibid: 213). She calls attention to the fact that though a plover may have used the display once with a particular intruder – "'lured' it away from the young," then flown away – the plover will use "the same trick again if the predator return[s]." This evidence, she states, seems to indicate that "the plover could not be attempting to deceive the predator/intruder." She remarks, however, that "given that the 'trick' continues to work, the question must be raised as to the predator's cognitive abilities. Despite the fact that the predator has observed that the plover flies away ably, it continues to follow the "broken wing displays" (ibid). While acknowledging that her experimental studies with dogs as predators are incomplete, she states: "[T]he plovers which I have observed do not behave in ways that require an interpretation of purposefully 'deceiving' the predator/intruder. The cognitive prowess of the intruder must not be assumed to be like that of a human. The broken wing display 'works' for the plover; the intruder follows it and gets farther away from the plover's vulnerable eggs/young" (ibid: 214). After considering gaze and gaze experiments in subsequent sections and urging more studies of the behavior, she concludes:

> It is unlikely that 'injury feigning' is deceptive in the sense of the plover consciously pretending to have a broken wing; it is a behaviour at the disposal of the plover. Using it is pragmatic in getting an intruder away from the region of nest/young. The behaviour can be construed as deceptive from Mother Nature's point of view, i.e. from an evolutionary perspective. Injured animals are selectively preyed upon by predators. It is adaptive, therefore, for a distractive behaviour to give an appearance of vulnerability, as the 'injury feigning' does. However, it is very possible that other avian behaviours are deceptive as accumulating evidence strongly suggests.
>
> (ibid: 221)

Ristau's description of "the behavior" and her conclusion about it are as problematic as they are significant, and at multiple levels with respect to synergies of meaningful movement. To begin with, the idea that the behavior is not consciously chosen by the plover but is simply at its "disposal" – one behaviour among others in its repertoire – is

curious. Other avian behaviours may well be deceptive, but that does not make injury feigning something other than what it is, namely, and as its label specifically indicates, a *pretense* behavior. Such behavior articulates a complex kinetic dynamic, precisely as Ristau implicitly indicates: a plover does not normally arch its wings, drag them on the ground, and quiver them as it moves forward – any more than a wolf in the throes of an actual fight normally mutes its bite. In each instance, an intentionality is evident, not in the pragmatic sense of purpose but in the phenomenological sense of meaning. Injury feigning is indeed *a synergy of meaningful movements*, movements that fall outside the normal and have an intentional scope all their own. Moreover with respect to purpose in a pragmatic sense, i.e. if injury feigning is indeed of practical value, a behavior that effectively distracts intruders or predators from eggs and young, then it cannot be a capricious choice among possible behaviors in the species' repertoire but is necessarily one that proves itself – and has proved itself – not merely efficacious but meaningful to both plover and intruder, precisely as indicated by the fact that a plover will success-fully repeat its injury feigning to the same predator or intruder, and this even if it flies away after its first success. Finally, if "the behavior" is distractive, then there must be something about it that makes it distractive; and further, if its distractiveness is indica-tive of vulnerability, then clearly there must be something about its nature that gives it the appearance of vulnerability. These latter points direct us straightaway to a more focused consideration of movement and in particular to a more detailed consideration of kinetic dynamics and their affective-cognitive motivations.

3.   Dynamics: At the qualitative heart of synergies of meaningful movement

Human parents who witness their infant flailing its arms and uttering a cry do not wonder what its purpose is, what it is coping with (see further below), or what is going on in its brain. The parents see and hear it as being moved to move, which is to say they see and hear it as being motivated: they do not attend to its flailings or cry as mechanical kinetic phenomena. Indeed, animate beings do not simply move in an epiphenomenal sense: they are *born* to move; they are *moved* to move; they move *meaningfully* on behalf of their survival; and some – notably avians and mammalians – move meaningfully on behalf of their progeny as well. That humans do not typi-cally look at plovers and other animate forms of life in this way, i.e. morphologically and dynamically in the manner of Darwin rather than mechanically as being driven unconsciously by "Mother Nature", is not only puzzling but runs against a basic evo-lutionary fact, notably, "descent with modification", and hence against an appreciation of evolutionary continuities. As empirically substantiated and discussed elsewhere (Sheets-Johnstone 1999b/expanded 2nd ed. 2011), a kinetic intelligence informs

animation – all the way "down" to "lower animals", e.g. paramecia, amoeba, fan worms. Psychologist Max Velmans substantiates this very point when he notes in more general terms that "continuity in the evolution of consciousness favours continuity in the distribution of consciousness" (Velmans 2007: 280). In short, to adjudge the movement of animate beings mere adaptively pragmatic or mechanical acts is to discredit evolutionary facts of life and, in effect, to deny built-in dynamically lived realities of animation.

When we duly observe animate creatures as the morphological and dynamic forms they are, we cease insisting they prove themselves to us. We give them due and proper credit from the beginning for their natural kinetic/proprioceptive and tactile-kinesthetic capacities. At the most fundamental level, these capacities endow them with surface recognition sensitivities in relation to their surrounding world and with an awareness of their own movement in relation to those sensitivities (Sheets-Johnstone 1998, 1999b/expanded 2nd ed. 2011). Indeed, animate creatures are not foreigners on this earth but forms of life empowered with all the sensitivities and capacities that their particular animation engenders and implies. Surely when we observe an animal controlling its own bodily movement, as in arching, dragging, and quivering its wings, and when we thus recognize that it is moving both within its morphological capacities for movement and as it sees fit within its situation, we realize that it is thinking intelligently and effectively in movement and is at the same time kinesthetically and/or proprioceptively, i.e. dynamically, attuned to its own movement (Sheets-Johnstone 1999b/expanded 2nd ed. 2011). We realize, in other words, that it is not simply reacting visually, auditorily, or olfactorily in a robotic sense to aspects of its surrounding world, but is quintessentially alive to a world that is in fact never the same from one moment to the next, and in being so alive, is affectively and cognitively attuned to its ever-changing world, and morphologically and dynamically aware of its capacity to move and to move in synergies of meaningful movement in relation to it: in this direction or that, for example, slow or fast, with abandon or cautiously, and so on, and thus notably, in a normal or feigned manner. In sum, it has a kinetic repertoire of possible movements in a changing world and a kinetic intelligence readily cognizant of that changing world, a kinetic intelligence that motivates and informs its movement (Sheets-Johnstone 1998; 1999b/expanded 2nd ed. 2011).

In conjunction with a recognition of that intelligence, we should note that when essential realities of evolutionary biology and corollary realities of animate life are overtaken by "theories of mind" or by hypothetical reductive neurologies on the order of brain modules, for example, that follow the idea "a place for everything, and everything in its place" – to appropriate the words of 19th century writer Samuel Smiles[2] – the

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2.   Samuel Smiles wrote these words in his 1875 book Thrift, but Captain Frederick Marryat wrote in his 1842 book Masterman Ready, "In a well-conducted man-of-war . . . everything is

inherent kinetic dynamics that define animate life disappear from view and along with them, the experientially grounded affective-cognitional-proprioceptive/tactile-kinesthetic foundations of those dynamics. Animation is not a theory or ideology: it is a fact of life, the most fundamental and comprehensive fact of life, and a fact in need of assiduous and painstaking examination. Given the unequivocal realities of animation, primatologists Richard Byrne and Andrew Whiten's comment on nonhuman animal intentionality is odd if not disturbing. They write, "if some animals are capable of attributing intentionality we need to *know* – perhaps most importantly because it would completely change our standards of ethics as applied to them" (Byrne & Whiten 1991:140). In truth, such cognitive human concerns and seeming conceits, wrapped up as they are in justifying theory – and more recently in privilegings of the human brain – are impediments to the achievement of a bona fide evolutionary ethics (cf. Sheets-Johnstone 2008). Indeed, the concern to know in some experimentally-devised empirical way whether a nonhuman animal is "attributing intentionality" and knows what it is doing overlooks the fact that, like we humans, nonhuman animals experience their particular *Umwelt* (von Uexküll 1928), other individuals and their movement within it.[3] We would do well in this context to recall Darwin's comment regarding insects in general and ants in particular, a comment based not on theory or ideology, but on observation:

> It is certain that there may be extraordinary mental activity with an extremely small absolute mass of nervous matter: thus the wonderfully diversified instincts, mental powers, and affections of ants are generally known, yet their cerebral ganglia are not so large as the quarter of a small pin's head …. the brain of an ant is one of the most marvellous atoms of matter in the world, perhaps more marvellous than the brain of man.   (Darwin 1981 [1871], vol. 1:145)

The "real-life", "real-time" (to use dynamic systems language)[4] kinetic dynamics of animation can be analyzed in concrete ways: we can bring the dynamics to self-evidence because they are experientially evident, in others as in ourselves. To highlight this fact and appreciate its far-reaching significance, consider first neurophysiologists Barbara Gowitzke and Morris Milner's (1988) remarks concerning voluntary movement in their chapter on "The Proprioceptors and Their Associated Reflexes", a chapter in *The Scientific Bases of Human Movement*. After acknowledging that

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in its place, and there is a place for everything," and Isabella Mary Beeton wrote in her 1861 book The Book of Household Management, "A place for everything and everything in its place."

3.   Philosopher Ernst Cassirer's concise explanation of why there are Umwelts is eloquent in the depths of its simplicity and warrants citation: "Every organism . . . has a world of its own because it has an experience of its own" (Cassirer 1970: 25).

4.   For more on "real-time" investigations, see van Gelder and Port (1995).

"[v]oluntary movement requires a foundation of automatic responses which assure a proper combination of mobility and stability of body parts", they state: "The voluntary contribution to movement is almost entirely limited to initiation, regulation of speed, force, range, and direction, and termination of the movement" (Gowitzke & Milner 1988: 256). Granted their focus is on neurophysiology, the seemingly minor role attributed to volition is nonetheless astonishing: "limitations" are not only integral to the very nature of voluntary movement but of indisputably sizable import to the mover. A phenomenological analysis of movement sets forth the spatio-temporal-energic structures that constitute the qualitative dynamics of movement and in so doing implicitly demonstrates the experiential import of the "voluntary contribution" (Sheets-Johnstone 1966; 1999b/expanded 2nd ed. 2011). What will become evident through a summary of that analysis is not just a realization of the complex qualitative structure of movement, but seminal realizations of received ignorance about movement that deflect us from an awareness of its qualitative structure, or, in other words, that awaken us to an awareness of what movement is not. It should be noted that the charge of received ignorance is meant pejoratively not toward individuals but toward habits of thought that pass for received wisdom. In particular, it is meant to call attention to the habit of not questioning common understandings of movement and common ways of thinking about movement, understandings and ways that fail to recognize much less capture the dynamics of the phenomenon and that indeed perseverate misconceptions about the very foundation of *animate* life.

Four primary qualities – tensional, linear, areal, and projectional qualities – are apparent in any movement we make (Sheets-Johnstone 1966 [1979/1980]; 1999b/ expanded 2nd ed. 2011). These qualities are inherent in movement. They define the spatial, temporal, and energic qualities of movement, none of which exists separately but each of which can be spelled out analytically in finer detail. Their particular character in any movement is created by the movement itself. Suppose, for example, that we are trudging up a steep hill: our bodies may be bent forward, our steps may be small, slow, and effortful but at the same time even-paced and smooth. *Tensional quality* defines the intensity of our movement, the effort or force we experience in trudging upward. As with any quality of movement, the tensional quality may vary in the course of our moving: we spontaneously move with less effort as the incline decreases, for example. The *linear quality* of our movement has two components: the linear design of our moving bodies and the linear pattern of our movement. As suggested by the trudging character of our walk, the overall linear design of our body is likely inclined diagonally from the hips, thus tilted forward. In terms of the overall bodily direction of our movement, the linear pattern of our walk likely proceeds in a straight line forward, linear pattern specifying the path traced by our movement. We should note, however, that not only do our feet trace out a particular linear pattern, but so also do our arms if we are swinging them forward and back, and further, that if instead of looking

continuously down at the ground, we look alternately to one side then the other, or up ahead and then again down, our head would trace yet another linear pattern. Again, it is important to note that qualities may vary. We might, for instance, come up from time to time to a vertical alignment or move sideways to avoid large boulders, and thus change the linear design of our moving bodies or the linear pattern of our movement.

Areal quality, like linear quality, has two components: the areal design of our moving bodies and the areal pattern of our movement. We may be not only tilted forward but hunched over as we trudge forward, for example, but then too, as we come to the top of the hill, we may stretch to the full. In short, the areal design our moving bodies may be anywhere from contractive to expansive. The areal pattern of movement may be correlatively anywhere from intensive to extensive. Small, trudging steps make the areal pattern of our movement intensive; large, striding steps make it extensive. Amplitude is clearly a spatial dimension of any movement and areal quality specifies amplitude in terms of both the moving body and movement itself.

Projectional quality describes the manner in which effort or force is manifest: basically in an abrupt, sustained, or ballistic manner. In trudging up a steep hill, we ordinarily move in a sustained manner, plodding upward in an even, smooth gait. But we might also move sharply, for instance, in avoiding an unexpected overhanging branch or begin swinging our arms in a ballistic manner, i.e. with an initial impulse that carries the movement forward and back through its initially generated momentum. Our movement may indeed be a combination of different projectional qualities.

As the above quite summary analysis indicates, the qualitative structure of any movement generates a particular dynamic, a dynamic that itself has a particular quality or constellation of qualities: it flows forth with a certain kinetic energy that may rise and fall in intensity, waxing and waning at the same time spatializing and temporalizing itself in ways that contour the dynamic, making it explosive, attenuated, smooth, jagged, restrained, impulsive, magnified, narrowed, and so on, and in any combination thereof. In short, the qualitative nature of any particular dynamic is formally created by the qualities of movement itself.

It is notable, then, that contrary to the dictionary definition of movement and to popular thought, movement is not "a change of position". To begin with, movement does not have a "position", so it cannot possibly change it. Furthermore, we clearly improperly define ourselves-in-movement as "changing position". While in moving about in our everyday world – in writing our name, washing our face, sweeping the floor, or getting into a car – we indeed change "positions", we do so only from a third-person, analytical, object-in-motion perspective. We ourselves are involved not in anonymous happenings taking place between two – or even more – different positions as we move in distinctive and innumerable ways throughout the day, but in rich and complex qualitative kinetic dynamics. In the course of everyday life, our dynamics are in fact commonly familiar, which is what allows them to flow forth effortlessly in the

sense that we do not have to concentrate attention on our movement. Our familiar dynamics are in the background; they are not, however, on that account outside consciousness (Sheets-Johnstone 2003; 2006; 2011; forthcoming 2012). While we recognize familiar dynamics in the form of *style* in others – the way a person walks, laughs, and drives, for example – we do not commonly focus on the character or style of our own dynamics. Yet we have all developed habits of moving in the course of learning our bodies and learning to move ourselves, ways of moving that are at bottom *coordinated dynamic patterns* that run off in consistent ways and that, being familiar and easily carried out, are commonly experienced at the margins of awareness as we focally attend to other things (Sheets-Johnstone 1999b/expanded 2nd ed. 2011; 2011). Habitual movement patterns can, however, be made focally present: we can become aware of the dynamics of brushing our teeth, for example. In fact, were someone else to brush our teeth, we would immediately recognize that someone else was brushing our teeth, not just because we were not holding the tooth brush, and not only because we could actually see someone in front of us holding and moving our toothbrush, but because *we would feel a foreign dynamics inside our mouth*. In short, when we turn attention to habitual movement patterns, to our own *coordinated dynamics* (Kelso 1995), we recognize *kinesthetic* melodies (Luria 1966; 1973; see further below); they bear the recognizable stamp of our own qualitatively felt movement patterns, our own familiar coordination dynamics, our own familiar synergies of meaningful movement.

That movement is "a change of position" is only one piece of received ignorance about movement. A further piece concerns space and time, notably, the belief or adage that movement takes place *in* space and *in* time. From a purely objective point of view, we have no quarrel with the claim and thus no difficulty assenting to its truth. But purely objective conceptions of movement belie its experiential realities, which, as even an abbreviated phenomenological analysis shows, constitute a rich and complex qualitative spatio-temporal kinetic dynamic created by movement itself. Interestingly enough, the notion of movement taking place *in* space and *in* time is conceptually tied to the dictionary definition of movement as "a change of position" (cf. Zlatev, Blomberg & Magnusson this volume). In fact, given that definition, it is no surprise that movement is conceived as taking place *in* space and *in* time. After all, one can chart *objects in motion*: they go from a certain place *here* to a certain place *there* over a certain period of time, much as an airplane flies from New York to London, or as we see someone slip and fall. As the phenomenological analysis makes clear, however, movement differs from objects in motion in creating its own time and space and in thereby creating a particular spatio-temporal kinetic qualitative dynamic. We might all the same readily observe objects in motion as having a particular dynamic, as when we see a plane flying smoothly across the sky, or diving down swiftly, or circling ponderously overhead, or climbing slowly, our attention being diverted precisely *from an object changing position and moving in space and in time to movement itself*. We might

furthermore pay attention to our own moving body as an object in motion, attending to its dynamics from a third-person viewpoint, as when we are learning a new skill – how to serve in tennis, how to make a surgical abdominal incision, how to articulate words in a foreign language. In regarding ourselves and parts of ourselves as objects in motion, we experience ourselves – and conceive and speak of our moving bodies – in terms of the speed, range, force, and direction of movement, of initiating this movement "now" at this moment, and of terminating this movement "now" at this moment. We readily take up the objective vocabulary of Gowitzke and Miller. When we observe our own movement in this way, we precisely *perceive* it, perceive it as *a force or effort put forth in time and in space*, a force or effort we are controlling or trying to control every step of the way. We do not *feel* our movement as an unfolding dynamic, a kinetic form-in-the-making; that is, we are not kinesthetically aware of the flowing qualitative spatio-temporal kinetic dynamics of movement.

The difference between experiencing the dynamics of movement itself and those of an object in motion is well exemplified, even epitomized, by an experience most Western adults have had at some time in the course of their lives. When a fully blown balloon is purposefully untied and allowed to splutter about, it creates a particular qualitative kinetic dynamic. While the balloon is clearly an object in motion, what we experience in attending to what we verbally label "spluttering" is a vigorous, erratic, highly punctuated, wholly capricious flow of movement that ends in a sudden collapsing stillness. What captures our attention and is at the heart of our experience is movement, not a balloon in motion. In effect, we have a felt sense of a qualitative kinetic dynamic.

A third piece of received ignorance about movement lurks within the distinction between movement and objects in motion (for further analysis of the distinction, see Sheets-Johnstone 1979). That third piece may in fact be already apparent in the distinction drawn between *perceiving* one's movement as an objective happening and *feeling* one's movement as a qualitative kinetic dynamic – what famed neuropsychologist Aleksandr Luria in his studies of "the working brain" termed "integral kinaesthetic structures or kinetic melodies" and which he described in painstaking detail (Luria 1973:176). Contrary to the way in which people commonly speak and write of the experience of movement, we do not have *sensations* of movement. We do not experience movement in the way we experience a twitch or an itch, a darting pain, a flash of light, a chill, or a peppery taste. As I have pointed out elsewhere, sensations are temporally punctual and spatially pointillist phenomena (Sheets-Johnstone 2003; 2005; 2006). They are discrete bodily-sensed events, momentary here-now bodily experiences.[5] In light of the experiential nature of sensations, the problem with "kinesthetic

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5.   Sensations may, however, in some instances coalesce to form either a kinetic perception or an affective feeling; see Sheets-Johnstone (2006: 366–367).

sensations" becomes obvious. We do not experience our everyday movement – reaching for a glass, opening our arms to hug a friend, and so on, movements that are indeed *voluntary* – as a series of discrete moment-by-moment, place-by-place kinetic happenings, now-here, now-here kinetic events. What we experience is the *kinesthetic feeling of a qualitative kinetic dynamic*. As we have seen, the experience of that dynamic is amenable to phenomenological analysis, that is, it can be formally elucidated. Moreover, as we will proceed to show, it can be shown to coincide formally with emotions, with feelings in an affective sense.

4.   Dynamic congruency

The bodily nature of emotions has been a subject of controversy as well as interdisciplinary discussion, the controversy and discussion being perhaps most prominently centered on, and exemplified by the writings of William James and Carl Lange on the one hand and the writings of Walter Cannon on the other. The purpose here is not to review aspects of the controversy or the contrasting theses driving it, nor is it to present arguments for sustaining a belief in the bodily nature of emotion to begin with. It is to set forth empirical evidence substantiating the intimate bond between emotions and movement, to point out the concordance of this evidence with the phenomenological analysis of movement, and on these grounds to document *the dynamic congruency* of emotion and movement (Sheets-Johnstone 1999a). The import of recognizing the dynamic congruency will become apparent not only with respect to the need to recognize animation in the sense of a whole-body dynamic – a dynamic that goes beyond facial expression, for example – but with respect to the need to recognize that talk of ourselves as "embodied" beings distracts from, if not elides altogether the foundational animation that undergirds all facets of our being and thus provides the proper point of departure for examining the full spectrum of our human faculties and dispositions.

It is notable that in his Introduction to *The Expression of the Emotions in Man and Animals*, Darwin voices concern that his analysis has a sound foundation and in this context calls attention straightaway to infants. He states: "In order to acquire as good a foundation as possible, and to ascertain, independently of common opinion, how far particular movements. . . are really expressive of certain states of the mind, I have found the following means the most serviceable. In the first place, to observe infants; for they exhibit many emotions, as Sir C. Bell remarks, 'with extraordinary force'; whereas, in after life, some of our expressions 'cease to have the pure and simple source from which they spring in infancy'" (Darwin 1965 [1872]: 13). The "after life," adult shift away from the "pure and simple source" of infancy can surely be described as a shift away from the animate body, in more precise terms, as an

espousal of measured intellect over spontaneous feeling, a definitive predilection for mind over body. A provocative observation made in a panel discussion on "Expression" during a conference on "Emotions Inside Out: 130 Years after Darwin's *The Expression of the Emotions in Man and Animals*" (Ekman, Campos, Davidson & de Waal 2003) aptly captures the muted kinetic character of adult emotion remarked on by both Darwin and Bell. An unidentified audience member comments, "I've been so excited by this whole presentation of this session because everybody is coordinated into one unit, but what has fascinated me is the absence of the body below the neck [laughter]" (ibid: 273). He or she goes on to explain: "I was fascinated by hearing the words, by seeing the faces, but I did not see the talking by the fingers, by the hands, by the movement, poise, and pattern of the people that were moving, sitting, or shifting." He/she then asks "if there is any further matter going on with the body as a Gestalt when you are communicating with your voice and your face" (ibid). Psychologist Paul Ekman responds first by citing the "pioneering work" of David Efron on gestures – what Efron referred to as "emblems"– and comments, "They are the only body language" (ibid: 273). He mentions Efron's specification of "speech illustrator movements", and then alludes to his own research on "bodily movements that we called *self-manipulative movements*," movements such as playing with one's hands or scratching one's face (ibid: 274). He concludes his response by stating, "There are other approaches that aren't looking in this formalistic way, but are looking at the flow, or quality, of movement," and goes on to remark, "These are people who primarily come out of dance. It doesn't appear that these body movements are as direct a signal source for emotion, in humans at least, as the face and voice. That's why we couldn't have found someone able to give a scientific talk on the body movements of emotion" (ibid).

The "absence of the body below the neck" might well be characterized as a chronic metaphysics of absence in "scientific talk on the body movements of emotion", and the absence of "flow, or quality, of movement" as a chronic absence of both dynamics and first-person experience in "scientific talk on the body movements of emotion." The absences conceal "the pure and simple source" of emotions that infants enjoy, a source that is quintessentially defined by animation and that is not only typically lost in the "after life" of adults but typically unrecognized in the qualitatively blinkered life of most scientists and philosophers if not academic and non-academic people generally. The deficiency of our "after life" and of a blinkered science notwithstanding, we can nonetheless clearly recognize that the absences constitute an absence of whole-body qualitative dynamics. Our voices and faces are part and parcel of those dynamics, part of the qualitative affective-kinetic dynamics created by otherwise spontaneously whole moving bodies. Animate bodies are indeed ones from which movement *flows*, and in flowing, creates a qualitative dynamic that, as we have seen, can be elucidated in fine phenomenological detail, a detailing that in truth is far

more *kinetically* elucidating and exacting than scientific disquisitions on emblematic gestures, illustrator movements, and self-manipulative movement. It is pertinent to recall in this regard that phenomenological analyses are open to verification within a methodology no less demanding than that of Western science, which means they can be brought to self-evidence by anyone caring to examine experience. Emotions do indeed "spring" from the body and in their own distinctive qualitative kinetic dynamics as both Darwin and Bell demonstrate graphically as well as descriptively (Darwin 1965 [1872]; Bell 1844). Infant psychiatrist and clinical psychologist Daniel Stern aptly terms these kinetically-charged affective dynamics "vitality affects" (Stern 1985; 1993). Obviously, to appreciate them, we need to regain touch with our primordial animation by affectively and kinetically interrogating our "after life" as adults.

In "Concluding Remarks and Summary", his final chapter on the expression of emotions, Darwin emphasizes "the intimate relation which exists between almost all the emotions and their outward manifestations" (Darwin 1965 [1872]: 365). Indeed, both implicitly and explicitly throughout his text he has validated the intimate bond. With respect to rage, for example, he observes:

> [R]espiration is laboured, the chest heaves, and the dilated nostrils quiver. The whole body often trembles. The voice is affected. The teeth are clenched or ground together, and the muscular system is commonly stimulated to violent, almost frantic action. But the gestures of a man in this state usually differ from the purposeless writhings and struggles of one suffering from an agony of pain; for they represent more or less plainly the act of striking or fighting with an enemy.   (ibid: 74)

Even as concerns speech, he observes, "The movements of expression give vividness and energy to our spoken words. They reveal the thoughts and intentions of others more truly than do words, which may be falsified" (ibid: 364)

Darwin's observations on the intimate bond between movement and emotion are consonant with the lifelong experimental studies of medical doctor and neuropsychiatrist Edmund Jacobson, who developed and honed a form of introspection that he called "auto-sensory observation".[6] The introspectional practice allowed patients to monitor and ultimately dissipate excessive, unproductive bodily tensions and in consequence to decrease their anxieties and other debilitating feelings. The self-observational technique centers essentially on tactile-kinesthetic awarenesses of one's

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6.   For a more detailed exposition of the work of Jacobson and of the work of Bull and of de Rivera that follow, see Sheets-Johnstone (1999a).

specific and overall tensional levels. Of seminal interest is Jacobson's description of the holistic nature of a trained observer's awareness. He states:

> The trained observer (not the tyro) identifies and locates signals of neuromuscular activity as integral parts of the mental act [of 'attention, imagination, recall, fantasy, emotion, or any other mental phenomena']. He does not discern two acts, one so-called 'mental' and the other 'neuromuscular', but one act only.
>
> (Jacobson 1970: 35)

As if prescient of the direction in which his neuropsychiatric profession will go, he comments that "those who would do homage to the brain with its ten billion cell-amplifiers can well continue to do so," but they must also not overlook empirical evidence: that "muscles and brain proceed together in one effort-circuit, active or relaxed" (ibid: 36, 34). Jacobson's empirical evidence of a singular muscle-brain 'effort-circuit' accords with Darwin's basic insight that movement and emotion go hand in hand.

The innovative research of psychiatrist Nina Bull delineates the intimate bond in further, strikingly revealing experiential ways that demonstrate to begin with that there is a *generative* as well as *expressive* dimension inherent in the relation between movement and emotion; that is, "a basic neuromuscular sequence is essential to the production of affect" (Bull 1951: 79). Using a methodology based on hypnosis, Bull elicits reports from subjects experiencing one of six specified emotions: fear, anger, disgust, depression, joy, triumph. With respect to fear, one subject reports, for example: "First my jaws tightened, and then my legs and feet. . . my toes bunched up until it hurt. . . and. . . well, I was just afraid of something" (ibid: 59). With respect to anger, subjects report "wanting to throw, pound, tear, smash and hit" and what restrains them, Bull reports, is "always the same, *clenching the hands*" or making some similar restraining movement (ibid: 65). Of particular interest is her locking subjects hypnotically into a particular emotion – the subjects were first read a particular description from their own experiential reports and told to adopt the specific bodily attitude they themselves had described – and were to remain in that locked position until specifically unlocked. Without unlocking them, however, Bull told the subjects they were to feel an entirely different, contrasting emotion. That they were unable to do so is indicative of the fact that a change in affect requires a change in postural tensions and general bodily attitude. As one subject responded: "I reached for joy – but couldn't get it–so tense"; another responded: "I feel light – can't feel depression" (ibid: 84, 85). What Bull's generative study shows indisputably is that affective and tactile-kinesthetic feelings are experientially intertwined. Moreover that subjects did not distinguish between the two feelings is testimony to the fact that they are experienced holistically and integrally, not as causally sequenced phenomena.

Further empirical evidence of the intimate bond is set forth by psychologist Joseph de Rivera in his "geometry of emotions," which shows that emotions move

us, "transforming" our relation to the world (de Rivera 1977:35). In delineating "The Movements of the Emotions," de Rivera singles out and illustrates four fundamental kinetic-affective relations, that is, four basic modes of bodily extension and contraction with respect to four basic emotions: anger, fear, affection, and desire. "If the arms are held out in a circle so that the fingertips almost touch, they may either be brought toward the body (a movement of contraction) or moved out in extension. The entire trunk may follow these movements" (and so, we should add, might also one's legs and thus one's whole body). De Rivera then states that "if the palms are facing in, the extension movement corresponds to a moving toward the other – a giving – as in tenderness, while the contraction movement suggests a movement toward the self – a getting – as in longing. If the palms are rotated out, the extension movement corresponds to the thrusting against of anger, while the contraction intimates the withdrawal away of fear." He points out: "If one allows oneself to become involved in the movement and imagines an object, one may experience the corresponding emotion" (ibid:40).

De Rivera actually elaborates a complex structure of emotions based on these "four basic emotional movements" (ibid:41). In addition to demonstrating the intimate bond between movement and emotion, the further point of moment here is precisely the basic one of an animated subject-world relationship: de Rivera demonstrates kinetically that emotions resolve themselves dynamically into extensional or contractive movements that go either toward, against, or away from something in one's surrounding world and correlatively away from or toward oneself. In sum, and as the previously cited research studies from Darwin onward show, emotions are *affectively-charged kinetic forms of the tactile-kinesthetic body*. To appreciate the dynamic congruency of emotions and movement thus requires recognition of a holistic whole-body qualitative dynamics.

5.   Semantic congruency and dynamic congruency: Cornerstones of animation

As we have seen, animate beings are not objects in motion but subjects of a world who move in distinctive morphological and qualitatively dynamic ways and who initiate and terminate their own movement. Regarded as objects in motion, their innate and fundamental animateness goes unrecognized; their subject-world relationship is annulled. In consequence, fundamental concepts generated in and through the experience of moving oneself, *corporeal concepts* (Sheets-Johnstone 1990; 1999b/expanded 2nd ed. 2011), go unrecognized. However stark their difference in kinetic form and evolutionary heritage, the Tanzsprache of a honeybee, for example, and the coordinated hunting manoeuvres of two lionesses testify equally to corporeal concepts, that is, to the empirical reality of nonlinguistic concepts in animate life (Sheets-Johnstone 1990; 2010). It is thus not just

the everyday movements of humans but the everyday movements of animate creatures as a whole that are generative of concepts, concepts that are tied to specific morphologies and ways of life, that are integral to survival and, with respect to social animals, to social communication. In short, fundamental concepts of space, time, and force – of distance, direction, tempo, duration, effort, and so on – originate in self-movement. In effect – and to use human examples for brevity's sake (see Sheets-Johnstone 1990; 2010, 2011 and further below for examples of and references to nonhuman animals) – it is not just that everyday human movements such as reaching and grasping, standing and sitting, pushing and pulling, bending and stretching, and so on, are dependent on, and a measure of, human movement capabilities and dispositions, but that they are and have been from the beginning generative of concepts: of near and far, up and down, weak and strong, straight and curved, slow and fast, abrupt and attenuated. As shown at length in earlier analyses of thinking and of the primacy of movement (Sheets-Johnstone 1990; 1999b/expanded 2nd ed. 2011), cognition is not separate from perception, perception from movement, nor movement from an environment or surrounding world. These inherently inter-related aspects of animation commonly pass unnoticed in talk of "behavior": they constitute the complex and often subtle whole of any actual "real-time," "real-life" self-movement as it unfolds. Synergies of meaningful movement are indeed consistently informed by spatio-temporal-energic concepts.

Ethological studies utilizing a movement analysis system[7]– John Fentress's studies of mice (Fentress 1989), for example, and Moran, Fentress, and Golani's studies of ritualized fighting in wolves (Moran, Fentress & Golani 1981) – readily demonstrate the far richer significance of analyzing and understanding the kinetic dynamics of animal movement over standard reports of animal behavior precisely because they distinguish and specify the spatial, temporal, and energic complexities of everyday animate life. In doing so, they provide gateways to understanding synergies of meaningful movement in the animate world. Neurophysiologist Gerald Edelman's experimental studies of automatons, particularly "Darwin III" that demonstrates how cognitive determinations of an object are based on freely-varied movement (Edelman 1992:93), implicitly underscore a further dimension of that richer significance, namely, that animation is first and foremost a subject-world relationship and being such is naturally an integrated affective-kinetic-cognitive phenomenon: animate beings are impelled to move on the basis of their interest in, or aversion to, what they perceive, what they recognize, and so on, and in turn, to move in ways semantically congruent with their experience. Finally,

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7.   The ethological studies cited use the Eshkol-Wachmann system (Eshkol-Wachmann 1958). For sources on Labanotation, see, for example, Laban (1975) and Hutchinson (1970). For sources on Effort/Shape, see, for example, Bartenieff and Lewis (1980) and Bartenieff et al. (1970). For sources on Benesh notation, see Benesh and Benesh (1969).

the meticulously detailed analyses of the relationship of movement to perception set forth in methodologically different but highly complementary ways by Edmund Husserl and Hermann von Helmholtz (see Sheets-Johnstone 1999b/expanded 2nd ed. 2011) show indisputably that the relationship, far from being a matter of "behavior," is a movement-perceptual-cognitional relationship motivated by and articulated within an affective framework of some kind: interest, curiosity, or play, for instance.

The above-cited analyses, observations, field studies, and experimental programs point to the need to recognize the multi-faceted realities of animation, and correlatively to recognize not only that behavior is not en par with animation, but that conceiving cognition or affectivity a "state" of the organism is as misguided as conceiving movement a "motor" phenomenon. The two misconceptions are in fact not distant from each other: in the one instance, there is an inattention to dynamics; in the other, an inattention to kinesthesia and proprioception. The inattentions are conceptually akin to the three pieces of received ignorance discussed earlier and impediments in their own right to a recognition of the foundational reality of animation. For these reasons and because they pervade diverse current literatures, they warrant finer specification.

The inattention to dynamics is not relieved by the all-encompassing lexical band-aid of "embodiment" (e.g. "embodied experience", "embodied metaphor", Gibbs 2006; "embodied self-awareness", Zahavi 2002; "embodied subjectivity", Hanna & Thompson 2003; Zahavi 2005) or what might be considered its Heideggerian-spawned existential surrogate, "coping" (e.g. Dreyfus & Spinosa 1999; Dreyfus 2000; see further below). Correlatively, the inattention to kinesthesia and proprioception is not relieved by the variable lexical band-aids of "enaction" (Varela, Thompson, & Rosch 1991), "neurophenomenology" (Varela 1999a; 1999b), "sensorimotor subjectivity" (Thompson 2007), and the like. That meaningful ways of moving are meaningfully motivated – finding something noxious and moving away from it, for example – can hardly be denied: life-enhancing capacities and dispositions are foundational to animate life. In light of this evolutionary fact of life, it is astonishing if not regrettable that the living dynamics of affectivity and cognition are sidelined in present-day pursuits of a consummate cognitive neuroscience of *the brain* and that they are unthinkingly and no less emphatically marginalized when parsed as it were and treated under the aegis of "coping" behavior (Varela 1999a; 1999b; Varela & Depraz 2005; Thompson 2007). In the former circumstance, dynamics are commonly sacrificed to a microphrenology intent on spatializing functions and even experience by giving them discrete locations in the brain, precisely as in hypothetical brain modules and in experimentally located mirror neurons. Certainly neuroscientific studies of the brain are of value, and indeed, instrumental in understanding pathologies and in treating pathologically impaired individuals. However, as noted neuropsychologist Roger Sperry long ago affirmed on the basis of his studies of its neurophysiology, the brain is an organ of and for movement that functions as an integrated whole on behalf of a "preparation to

respond" (Sperry 1952: 301), that is, on behalf of what biologists term a defining feature of life: responsivity (Curtis 1975). As such, the brain is a *dynamic* organ. Research studies in coordination dynamics address the brain in just such terms, producing findings that show it works in both localized and integrated ways (Kelso & Engstrøm 2006). The field of coordination dynamics, an elemental and critically significant domain within dynamic systems research, in fact aims not at reductionism but at an illumination of the complementary nature of Nature, indeed, the complementary nature of brain and behavior as complex dynamic systems (Kelso 1995; Kelso & Engstrøm 2006): "In coordination dynamics, the real-life coordination of neurons in the brain and the real-life coordinated actions of animals are cut, fundamentally, from the same dynamic cloth. Integrity is in turn preserved because it is never threatened. Psychophysical unity is undergirded at all levels by coordination dynamics" (Sheets-Johnstone 2004; quoted in Kelso & Engstrøm 2006: 9). Coordination dynamics is thus not just a necessary but a foundational correction to reductionist microphrenological thinking.

In the latter circumstance – that of "coping" behavior – *coping* is taken as the basic landscape on which emotion "occurs," ostensibly because, as Varela describes it, coping defines a break in transparency, that is, a break in our "unreflected absorption" in the world as we go about our everyday business – of "hammering," for instance, as in Heidegger's classic example (Heidegger 1962: 98), the example taken up by Varela (Varela 1999a: 299). "This standard Heideggerian vignette," Varela avers, "can be extended to all embodied actions, that is, actions in a fluid context where there is always a mixture of immediate coping and concurrent secondary activities of language and mental life" (ibid.). Whatever might be the specified meaning of "*embodied* actions"– the idea of disembodied ones is difficult to imagine – coping is attributed to all human actions "in a fluid context," which means along with hammering not only reaching, pushing, throwing, walking, greeting, and so on, all of which take place in a *literally fluid context*, i.e. in movement, but gasping, moaning, laughing, and even whistling: all are "embodied actions" within our "unreflected absorption" in the world. The idea that emotion is simply an "affective tonality" concomitant with a break in our absorption, in essence that emotion and coping are existential bedfellows, the break precipitating an emotion of some kind – "fear, jealousy, anger, anxiety, self-assurance, and so on" (ibid: 299–230) –[8] deprives emotion of its living dynamics. Elation is not an epiphenomenon of coping; neither are disappointment,

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8. "The loss of transparency is never distant from a dispositional affective tone . . . and that different degrees of breakdown in transparency and the multiple manners in which it happens opens a panoply of affective tonalities: fear, jealousy, anger, anxiety, self-assurance, and so on. Accordingly, the word 'emotion' is used here in its specific sense: *the tonality of the affect that accompanies a shift in transparency*. Affect, on the other hand, is a broader dispositional orientation which will precondition the emotional tone that may appear" (Varela 1999a: 299–300; italics in original).

pride, delight, jealousy, or grief. Whatever the emotion, it has its own affectively-felt dynamic contours. "Coping" removes these dynamics from view. It focuses attention on what to do about the break: when "the hammer slips and lands on the finger", for example, "[the] breakdown brings the transparent equipment into view, and a new set of action-assessments begins" (ibid: 299). Philosopher Evan Thompson focuses on emotion in ways similar to Varela in exploring "the link between emotion and the protentional aspects of temporality". Thus, he too distances himself from a recognition of the inherently distinctive qualitative dynamics of emotion. Analyzing emotion in terms of "an action tendency or readiness for action" and of "skillful coping" (Thompson 2007: 361, 374–375), he validates Varela's dual leads: on the one hand, "Coping is a readiness or dispositional tendency for action in a larger field, an *ontological readiness*, that is, an expectation as to the way the world will show up" (Varela 1999b: 132); on the other hand, "The loss of fluidity in coping is never distant from a dispositional affective tone" (ibid).

An equally basic and critical oversight exists on the cognitive side and concerns the fact that "transparency acquisition" (ibid; Varela 1999a: 299) is taken for granted; it is nowhere recognized as the animate engagement with the world that it is, an engagement that has a particular cognitional dynamic. In effect, the very attainment of "transparency"– of *familiarity* – is nowhere accounted for. It obviously rests on animation, on a kinetic-affective-cognitive engagement with the world such that *learning* takes place to begin with, the learning that grounds "transparency". How indeed do "doings" become familiar, so familiar that we are "unreflectively absorbed" in them? The answer is clearly rooted in dynamics, in the qualitative tactile-kinesthetically felt kinetic dynamics of tying a knot, sweeping, brushing one's teeth, typing, playing a Bach prelude, and so on. *Familiar dynamics* are woven into our bodies and are played out along the lines of our bodies; they are kinesthetic/kinetic melodies in both a neurological and experiential sense (Luria 1966, 1973).[9] In writing one's name, or pulling out weeds, or skipping down stairs, one's creation and constitution of a *kinesthetic/kinetic* melody are phenomenologically concurrent (see Sheets-Johnstone 1999b/expanded 2nd ed. 2011, Chapter III; 2006: 371ff.). The melody is kinesthetically felt and has a cognitive aura generated in and by the very movement that produces it at the same time that the very movement that produces it is kinesthetically and cognitively constituted as an ongoing qualitative kinetic dynamic. It has, to paraphrase Stern (Stern 1985; 1993), "vitality cognates" or "vitality cognitive affects": cognitive-kinetic shifts in momentum, for example, and cognitive-kinetic crescendos

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9.   It is worth noting that melodies are to begin with qualitative phenomena, qualitative in virtue of their spatio-temporal-energic character. Varela's description of his "exaltation" at a concert is testimony to the fundamentally qualitative character of melody and its qualitatively experienced dynamics (Varela & Depraz 2005: 67–68).

and diminuendos. Indeed, the qualitative dynamic of a melody might at times be felt not only affectively as rushed, attenuated, awkward, abrupt, delicate, jagged, fluent, and so on, but cognitively as limpid, transformable, assured, problematic, flawless, questionable, and so on. All such felt cognitive-kinetic qualities enter into the overall dynamic, the cognitive tonalities of the melody modulating the kinetic patterning throughout and the kinetic patterning modulating the cognitive tonalities through-out. It is surely clear then that *familiar* dynamics are not *embodied*; like emotion and movement, they are through and through *already a bodily phenomenon*. They are preeminently cognitive forms of animation.

The dynamics of cognition and affectivity involve us in the world, which means they animate us and are foundational to our being the animate forms we are, leading us to explore, to doubt, to fear, to come to know, to wonder, to delight, and so on. J.A. Scott Kelso's pivotal and extensive work in coordination dynamics readily exemplifies not only the foundational import of dynamics, but the dynamic concordance of affectivity and cognition – what he later terms their "complementary nature" (Kelso & Engstrøm 2006). In the course of wondering how to demonstrate spontaneously self-organizing dynamic patternings, Kelso came upon spontaneous phase transitions. His account warrants full quotation, for his discovery actually reveals two different but intertwined spontaneous phase transitions:

> It is the winter of 1980 and I'm sitting at my desk in my solitary cubicle late at night. Suddenly from the dark recesses of the mind an image from an ad for the Yellow Pages crops up: 'Let your fingers do the walking'. To my amazement I was able to create a 'quadruped' composed of the index and middle fingers of each hand. By alternating the fingers of my hands and synchronizing the middle and index fingers *between* my hands, I was able to generate a 'gait' that shifted involuntarily to another 'gait' when the overall motion was speeded up.… On hindsight, the emergence of this idea was itself a kind of phase transition.
>
> (Kelso 1995: 46)

The *idea* of letting his fingers do the walking was a spontaneous breakthrough into a new mode of thinking about spontaneously self-organized movement. It was, in other words, an *ideational* phase transition that aptly and finely exemplifies *thinking in movement* (Sheets-Johnstone 1981; 1999b/expanded 2nd ed. 2011; see also Sheets-Johnstone 2004; 2011). The result of such thinking eventuated for Kelso in a sophisticated cognitive achievement. At the most fundamental level, cognitive achievements are consistently the result of thinking in movement, that is, the result of what Husserl and von Helmholtz are both at pains to describe in relation to the integral connection of movement and perception and what Edelman's Darwin III experiments exemplify. Synergies of meaningful movement are thus experienced not only in everyday animate life, but in ideational pursuits, in highly sophisticated cognitive ventures and achievements.

Affectivity and cognition are dynamic phenomena in a historical sense as well. It is readily evident that we mature affectively over the course of our lives – or at least have the possibility of maturing affectively over the course of our lives – and that we mature cognitively, most significantly in learning our bodies and learning to move ourselves to begin with (Sheets-Johnstone 1999b/expanded 2nd ed. 2011). That affectivity and cognition are naturally developing and evolving phenomena in animate forms of life is not commonly acknowledged. Evidence presented in support of the fundamental and all-embracing reality of animation, however, shows clearly that the realities of morphology and dynamics exist not in a privileged human vacuum but across animate life generally.

With respect to the reduction of movement to a motorology and the corollary omission of kinesthesia and proprioception, we may briefly and straightaway note the ubiquitousness of the reductionist practice. It is not just neurophysiologists who write of motor behavior, motor control, motor learning, motor skills, and so on, but philosophers, psychologists, psychiatrists, anthropologists, linguists – people in virtually all academic disciplines, though likely excluding altogether the department of dance, which, as Ekman reminds us with respect to the lack of research on emotions below the neck, is concerned with flow and quality. In short, motorology is a rampant and conceptually pernicious orthodoxy bordering on an unexamined *idée fixe*. (See for example, Donald 2000: 105–109 on "The Primacy of Motor Evolution"; Merleau-Ponty 1962 on "motor intentionality"). Contrary to being puppets in a motorology drama, animate beings in their everyday lives create particular movement dynamics and straightaway know kinesthetically and/or proprioceptively that kinetic dynamic and its possible variations. Not only a slip of the hammer but a slip of the tongue discloses an unfamiliar dynamic, a lapse in semantic congruency, a lapse in an everyday synergy of meaningful movement. Indeed, human tongues are waggable, not in the same way that dogs' tails are waggable – human tongues are waggable in far more complex ways, including being mis-waggable and disingenuously waggable – but their dynamic patternings, their synergies of meaningful movement, are articulations on par with comsigns in the animate world at large: synergies of meaningful movement articulate "signs"– including signs in the form of words – that virtually all in the species are capable of performing and understanding.

In sum, dynamic congruency and semantic congruency are integrally linked. In the context of insisting on reference over meaning, philosopher Hilary Putnam exclaimed, "meaning ain't in the head." Indeed, it is not in the head: it is in moving bodies. Meanings are constituted; they involve a putting together in which "the kinestheses" (Husserl e.g. 1970; 1980; 1989) are paramount, and paramount affectively as well as perceptually, conceptually as well as environmentally, which is why synergies of meaningful movement anchor our animate presence in the world. They are what learning our bodies and learning to move ourselves are all about. They are what survival is all about. They are what social communication is all about.

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Could moving ourselves be the link between emotion and consciousness?

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The idea that emotion is an indispensable ingredient of consciousness in all modalities is not new. Panksepp and Damasio, for example, show that we can gradually eliminate cortical areas without eliminating "core consciousness," whereas knocking out emotional areas renders all types of consciousness impossible. However, opponents insist that "emotional" areas also release neurotransmitters to the cortex having nothing to do with emotion, and are merely necessary in the way that electrical current is necessary for a radio. They insist that the radio (the cortex) is what makes the music (consciousness). The subcortex is only a way to get power to the radio.

What is needed is a coherent story about the specific way in which emotion grounds other conscious states. We suggest that the brain activities involved in self-initiated action subserve consciousness, and that these action-initiating circuits are crucially dependent on motivational processes. The emotional system sets up a three-way connection between motivation, action, and consciousness. To elucidate this connection, we focus here on evidence from event related potential (ERP) studies, perceptual priming studies (e.g. inattentional blindness), motor imagery research, the role of the "mirror neuron" system in understanding others' actions, and electrodes that access action commands in the brains of animals, allowing them to move computer cursors with their minds. Thus, we argue that consciousness can occur only in beings that can initiate motivated action, that action commands create action imagery covertly as well as overtly, and that action imagery allows conscious representation of action affordances of objects.

Keywords: Enactive; emotion; consciousness; action; event related potential; perceptual priming; inattentional blindness; motor imagery; mirror neurons

1. Introduction

Much of the recently renewed interest in the relationship between consciousness and emotion is inspired by the idea that emotion may play a central role in all consciousness, not just in emotional feeling states themselves. Emotion itself may be defined

without reference to consciousness, as a system that motivates the organism to act in certain ways (e.g. Damasio 2003; Ellis 2005). Thus emotion could constitute one of the crucial ingredients of all conscious processes if the difference between conscious and non-conscious information processing hinges on the role of emotion in motivating action commands in terms of which the action affordances of environmental situations can be understood (Newton 1982; 1993; 1996; Ellis 1986; 1995; 2005; Ciompi & Panksepp 2005). Emotions, while not necessarily conscious *per se,* would then be one of the building blocks of consciousness because consciousness requires (among other things) a capacity for motivated action. Digital computers and our current (non-living) robots, on this analysis, may process information, yet are not conscious because they are not capable of motivated action. At the same time, motivated action by itself is not necessarily conscious, for reasons that are complicated and will be discussed below.

The thesis that the lack of motivation for action is the reason emotionless entities like computers cannot have consciousness brings together two loosely interconnected traditions. Some consciousness theorists, dubbed "enactivists" by Varela et al. (1991), have emphasized the importance of action as a necessary grounding of consciousness, but without stressing that the difference between action and mere reaction is interconnected with the difference that emotion makes. This tradition includes Neisser (1976), James and Eleanor Gibson (see E.J. Gibson 1988), Clark (1997), Gallagher (2005), Humphrey (2000), Kelso (1995), Thelen and Smith (1994), Thompson (2007), and Varela et al (1991). Others have observed either empirically or phenomenologically the correlations between emotion and consciousness, but without emphasizing as much as the enactivists do the capacity for action as the missing element in non-conscious information processing (e.g. Cytowic 1993; Damasio 1999; Gendlin 1962/1998; Giorgi 1973; Panksepp 2000; Watt 1998). Both traditions have roots in both phenomenology and neurophysiology, and both are prefigured by Merleau-Ponty (1941, 1942), who was ahead of his time in integrating phenomenological philosophy with neuropsychology.

In our view, both streams are needed. Action cannot be understood without motivation, and the way in which emotion is necessary for consciousness seems to be in terms of its role in motivating actions, which then allow for an understanding of the action affordances of environmental situations.

To suggest that emotion may be necessary for consciousness in this way is not to say that it is a *sufficient* condition for consciousness. Emotions, actions, and in our view even motor imagery can occur on an unconscious basis.

Nor do we mean to imply that the *object* of consciousness is necessarily the same as the object of the accompanying emotion. I may be conscious of the texture of a tree bark because I can imagine performing such actions as running my hand over the

bark. Paradoxically, I may not be conscious of my *motivation* to run my hand over the bark, or even of my motivation to direct attention to the bark's texture. And I may also be unconscious of the actions that I performed in focusing and redirecting my eyes, and all the other nervous system activities that were necessary to focus attention on the bark. I may not consciously know whether the motivation was a need to orient myself in the environment, or mere curiosity, or a desire to remember the tree under which I professed undying love to a high school sweetheart, or any number of other motives.

Our thesis, then, is that some system of motivations is necessary for an ability to perform actions relative to an object or situation, and that we are conscious of objects and situations by (usually subliminally) imagining how we could act relative to them. The ability to imagine ourselves acting is the difference between us and a passive-receiving system such as an electric eye, which merely registers "perceptual" inputs and then automatically *re*-acts to those inputs by causing a door to swing open – all without any consciousness. Since we are speaking here of the difference between conscious and non-conscious information processing, we shall confine ourselves in this paper to states of *intentional* consciousness – states in which there is some real or imaginary object or situation that the consciousness is about or toward which it is directed.

In order to say what we have said so far, we have already used the term "understanding." We have posited that motivated action is necessary for consciousness because we *understand* objects and situations by imagining how we could act relative to them, and that we understand the actions in turn by imagining ourselves performing the actions. The sense of "understanding" meant here is the one used by Newton (1996) in distinguishing between conscious information processing and the processing executed by Searle's "Chinese room," which merely contains translations of Chinese words and spits out the equivalent words, but without "understanding" Chinese. What the Chinese room is doing is similar to what a digital computer can do, and what the Chinese room is missing is also something that we conscious beings have that distinguishes us from non-conscious information processors. In this sense, "understanding" is closely interrelated to conscious as opposed to non-conscious information processing. Understanding is not equivalent to consciousness, but it plays a role in enabling consciousness.

The relevant sense of "understanding" here also has to do with the fact that the Chinese room cannot act. We understand an action when we can voluntarily execute the action, or at least imagine ourselves doing so. Before that, it is not an action, but only a random movement of an infant's limbs as they flail around indiscriminately. To understand an action is to be able to form an image of ourselves performing the action that is rich enough to serve as a guide to performing the action. We know that this has

occurred when we can deliberately repeat an action; infants quickly begin learning rudimentary control of some of their actions, notably eye movements, within days of birth. Our hypothesis is that we understand objects by (either consciously or unconsciously) imagining actions that we could execute in relation to them. To be sure, this leaves room for non-conscious understanding, but in our view the converse is not true: there is no intentional consciousness without some kind of understanding (in which we include mis-understanding).

The meaning of "understanding" crucially hinges on the meaning of "imagination." If understanding an action consists in forming an image of ourselves performing the action that is rich enough to serve as a guide to action, and if understanding can be non-conscious, then certainly the action imagery that subserves it must also be able to occur on an unconscious basis. Moreover, it seems obvious that we do not always *consciously* imagine actions when being conscious of objects. So in what sense does imagining an action figure into our consciousness of a (real or imaginary) object or situation?

It may initially sound circular to say that imagination of action affordances is required for consciousness of objects, because imagining is traditionally thought of as already a form of consciousness in its own right, and therefore we might be assuming what we purport to be "explaining." Here again, to avoid circularity requires the notion that the imagining presupposed here can be either conscious or unconscious, and it will usually be the latter.

Avoiding circularity also requires that to imagine an action is not the same thing as imagining an object. We can imagine moving our left foot without imagining some object there to kick. So our thesis is that imagining actions, either consciously or nonconsciously, is a more primitive precondition that is required for being conscious of an object.

That there is unconscious action imagery seems to be a phenomenological observation. A musician often imagines moving the fingers to finger an instrument while listening to music, and is not conscious of having done so until someone calls attention to it. Someone watching a boxing match may unconsciously move the fists, or simply imagine doing so. Those who study the mirror neuron system in the brain (e.g. Gallese et al. 1996; Gallese et al. 1998) show that, when we observe someone else performing an action, parts of the motor cortex activate in the same way as if we were to perform the same movements ourselves. And these activations are also similar to the ones that occur when we consciously imagine performing an action without overtly doing so (Jeannerod 1997). *How* there can be preconscious or non-conscious action imagery is a more complicated question, and to give a full accounting would be beyond our scope, but we will offer some remarks on this issue and some further examples as we proceed.

Another crucial problem to be addressed with regard to unconscious action imagery is whether it refers only to physiological processes that somehow are causally and/or isomorphically related to a "represented" object, or whether it refers to a more fully developed process that *potentially would be* conscious if combined with certain other physiological conditions. Action imagery in the former sense would be a very weak sense of the term, and would raise innumerable problems about how to define "imagery" without any reference to an intentional meaning. What we are referring to, by contrast, is a non-conscious state that is mental and intentional even though it may not be conscious. Here again, the musician's fingering the instrument is more than just an isomorphic physical process in the brain; when the musician's attention is called to what she is doing, she at least in some cases acknowledges that the action imagery was already there prior to becoming conscious of it.

In this paper, we need to be careful to avoid two additional pitfalls in pursuing the understanding of consciousness in terms of motivated action. On the one hand, there is the danger of under-emphasizing the role of self-movement, by treating emotion as a response to a stimulus input. The danger here is that we lose the distinction between action and mere reaction. If the working hypothesis is that conscious and non-conscious information processing are different because of the role of motivated action in the former, then it is important not to construe motivated action as just another type of reaction. In that case, one would wonder why a motivated organism should be any more conscious than a sophisticated digital computer or a robot that merely receives and transforms information.

On the other hand, there is also a contrary danger. To be sure, we can distinguish self-organizing systems from systems that merely *are moved* by external forces. Living organisms are capable of action because of their self-organizing structure. But we must also remember that there seem to be self-organizing systems that are capable of generating the structures of their own movement, as opposed to merely reacting to external stimuli, and yet are still not conscious. Traffic patterns, ice crystals, and ecosystems are self-organizing, but probably are not conscious. The same may be true for unicellular organisms or organisms lacking nervous systems. So if we make the mistake of treating self-organized action as a *sufficient* rather than only a *necessary* condition for consciousness, then we may end up leaving out the ingredient that distinguishes conscious actors from non-conscious self-organizing systems like ecosystems, traffic patterns, and amoebas.

A classic example of the first danger – a too-passive account of emotional consciousness, with a resulting over-emphasis on passive receiving of interoceptive information – is found in Damasio's recent work (Damasio 2003). In his description of "feelings," which consist of conscious awareness of emotions, Damasio states boldly, "My view is that feelings are functionally distinctive because their essence consists of

the thoughts that represent the body involved in a reactive process" (2003: 86). Further on, he approvingly credits A.D. Craig with

> the idea that we are privy to a sense of the body's interior, an interoceptive sense. In other words, the very same region that both theoretical proposals and functional imaging studies relate to feelings turns out to be the recipient of the class of signals most likely to represent the content of feelings: signals related to pain states; body temperature....   (Damasio 2003: 106)

For Damasio, feeling an emotion is a result of receiving an interoceptive afferent signal which, he emphasizes, is not different in principle from receiving an afferent signal when perceiving an external object. In both cases, the signal is afferent, which means it travels toward the central nervous system from more remote areas – either the body's extremities, or the viscera. In Damasio's account, the conscious feeling results from a receiving of interoceptive information, not from the initiating of an action command. So in his view, introducing feeling and emotion into the traditional perceptual model of consciousness adds no further participation on the part of the subject, who still remains a passive recipient of interoceptive signals. This view, then, provides no account of how conscious information processing is different from a robot's passive receiving of inputs and then transforming them into behavioral outputs.

On the contrary, the notion that action, rather than passive perception, is the basis of consciousness has recently acquired many advocates. But here again, there is a pitfall that we believe needs to be avoided in this approach: if we insist that action must undergird all conscious states, then, as Aizawa (2006) points out, it becomes mysterious how a totally paralyzed person can still be completely conscious. The action-based account must make room for the *imaging* of action to play the same kind of role that overt action can play. And in our view, this means that an account of representation is needed in which the representation of the goals of actions, and also the representation of imaginary actions themselves can play an important part in making cognitive contents conscious.

Furthermore, we need an account of how these imaginary action representations can take place on an implicit or unconscious basis when our attention is directed outward to the external world. Jeannerod (1997) has been a source of major insights about the role of action imagery, and it is commonly accepted that intentional activity requires some sort of internal modelling of the external environment (Grush 2004). Ironically, those who call themselves enactivists all too often eschew any role for representations of the environment, and therefore reject action imagery as opposed to overt action in providing a grounding for the understanding of objects.

What is needed to reconcile these two streams of work on consciousness into a coherent story, and thus also to avoid the two contrary dangers of either under-emphasizing the role of action or failing to account for the paralysis example is a story

about the specific way in which both emotion and motivated action can ground conscious states other than emotional feelings and the imagination of actions – especially how they can ground perception and perceptual imagery. We suggest that the brain activities involved in self-initiated action are indeed crucial to subserve consciousness, but also that these action-initiating circuits are crucially dependent on motivational processes grounded in the emotional brain.

We have been assuming up to this point a fundamental difference between action and merely complicated systems of reactions. This distinction has often been regarded as an outmoded and untenable Medieval teleology. But in recent years there has developed a scientific account of the difference between action and mere reaction in terms of self-organization. To be sure, action in this rudimentary sense does not require representation of the goals of action. It requires only that a system's own self-maintaining structures determine the contours of its movement in a way that is robust relative to environmental inputs. The system seeks out, appropriates, and replaces the environmental substratum elements that it can use to subserve its own patterns of activity. The patterns of activity remain relatively constant while its micro-constituents are continually replaced. This simpler notion of action, however, is an important component of the fuller concept of action.

The fuller kind of action includes not only the ability to move ourselves, but also the ability to *plan* a movement by imaging the action and the achievement of the goals of the action. This imaging of an imagined action as a goal is what we mean by suggesting that consciousness must include some kind of representation. Can there be action (in this fuller sense) without representation of some kind? We don't think so.

So on the one hand, we should not conflate these two senses of "action" with each other and assert that only self-organization is necessary for consciousness. The caution at the other extreme, of course, is that we should not reduce emotion to a mere re-action, which would under-emphasize the role of action in the more basic sense.

The thrust of our argument is that the motivation to activate motor imagery relative to environmental situations is an important ingredient in all forms of consciousness, including perceptual consciousness. Because initiating motor processes is an action rather than a mere reaction, we can clearly see that the sum total of afferent nervous processes – processes in which we receive information which then gets processed in a sequence of reactions – can never produce consciousness, not even perceptual consciousness. A significant amount of motivated action-initiating activation is needed for consciousness. The *modality* and *qualitative content* of the consciousness may vary depending on what kind of afferent input is present, but the *existence* of the underlying conscious state is not a result of the afferent inputs.

Those who would like to minimize the role of emotion in consciousness and cognition counter this point by insisting that emotion is merely a power switch for the cortical processes that actually subserve consciousness (for example, Bickle

1998; 2003). But the evidence just mentioned (which will be discussed further below) suggests that a significant amount of motivation toward self-organized action is necessary for consciousness, whereas afferent input may actually be necessary for conscious perceptions only in the way that the perceived object is necessary. That is, afferent input affects the what-content of consciousness, but may be as little a part of the substrate of the consciousness as the perceptual object itself is. Afference partly determines the *content* of consciousness, but is not sufficient, at least not by itself, to serve as the process that *does* or *executes* the consciousness. The *self-initiated action commands,* which ground the *action imagery* needed for consciousness, are an indispensable part of the actual substrates of consciousness.

2.   The enactivist approach and the problem of action imagery

Our proposal can be characterized as a version of "enactivism" (Varela et al. 1991). Enactivism holds that cognition is structured by sensorimotor patterns of the interaction of an organism with its environment. This claim entails that conceptual understanding is rooted in the understanding of our own actions, which in turn are understood in virtue of our ability to represent them in sensorimotor images. Thus all types of general and abstract concepts are grounded in sensorimotor experience. For example, I understand the abstract logical concept of conjunction because I am familiar with the activities of collecting, gathering, and grouping physical objects. One might say that all cognition is an activity of constructing metaphors for the concrete simple actions we performed as infants. The idea of concepts as metaphors was explored by Lakoff and Johnson (1987). An earlier version was proposed by the cognitive scientist Margaret Boden, who argued that the angel Gabriel, as a disembodied being, could not have learned the abstract terms he used to "talk of abstract matters to a human woman" (Boden 1982: 130).

More recent enactivist accounts of cognition and consciousness start from the same idea: no explanation of these phenomena can ignore the fact that the subject is an embodied being – that our bodies as they interact with the world essentially shape our concepts and our experience. The Cartesian notion of the incorporeal subject is a dead end. After this recognition, however, accounts diverge. Some take the idea so literally as to view the conscious thinking subject as an entity extending beyond the brain, into the physical environment with which it interacts (Clark 2008). Others go in the opposite direction, and understand embodiment to refer to bodily events at a microscopic level. Noë (2004), for example, grounds conceptual understanding in the physical adjustments of the sensory organs when processing and focusing on incoming stimuli.

The earliest pioneers of the current enactivist movement adopted neither extreme. Lakoff and Johnson (1987) located the grounding of concepts in overt physical actions, and identified human conceptual structures with metaphors for basic actions and bodily orientations. For example, in multiplying long numbers in the head, we imagine ourselves performing the act of moving numbers around, "carrying the nine," etc. Johnson-Laird (1983) pointed to the central role in reasoning of "mental models" based on sensorimotor experiences. Glenberg (1997) and Barsalou (1999) took this idea further: all concepts, abstract and concrete, are experientially grounded in common bodily activities.

We adopt this middle position in our interpretation of enactivism. Conscious experience is structured by sensorimotor activity; concepts used in cognition are grounded in self-world interactions; and preconceptual grounding of these concepts is found in primitive sensorimotor experience. All of these types of mental activity are located in the brain, in what Jackendoff (1987) has called, after Marr (1982), "intermediate-level" processing. Low-level processing handles local feature detection, and high-level processing abstracts away from the details to identify general categories. Intermediate level brain events provide the contents of experience. This means that while they may be unconscious, they may also be conscious, and either way they may help form the content of conscious experience.

We have proposed a model (see also Ellis & Newton 2010) in which early motor movements in infancy lay down experiential patterns that become the basis for action representations. These, in turn, ground all higher-level concepts. We say that all these concepts are based on action images.

2.1   Imagery and representation

It is a tricky matter to use the term "image," as a noun or as a verb, because traditionally it has referred to images in the sensory modalities only, and even more narrowly (and more commonly) to just visual images. I can image the sight, and also, independently, the taste of an orange lollypop. In the same way I can imagine myself lifting a book off a shelf. Note that in this case the image need have no sensory components except those of the way the action would feel to me. Action images in this sense are not visual images of what I would *look like* doing the action; they represent the way my body would feel when doing it.

We wish to speak of action images in a way that will both allow them to be conscious or unconscious, and correspond to the sense of action image in Jeannerod's usage. Jeannerod argues that action images that are initiated in the cerebellum and the motor cortices precede implementation of overt actions and that these images represent what it would feel like for the subject to perform the action. Since many voluntary actions are not consciously planned in advance – for example, the complicated

individual body movements I must make to walk across the room – some early representation of the actions must be formed preconsciously in order to set the activity in motion. We prefer to use the terms "images" and "representations" interchangeably because, just like sensory images, they are reproductions of earlier experiential traces of performing the actions, and they represent the actions in that they can be used in planning, initiating, and evaluating the action. These representations are about the actions of which they are traces.

We argue that very primitive forms of these images are laid down during the original thrashings and flailings of the infant even before voluntary movement becomes possible. They are the results not only of sensory input produced by the action, but also of the "efferent copy" – the action pattern that the motor system saves in issuing a motor command, and the memory of the emotional valence of the action – was it successful or frustrating in trying to reach the toy? The infant produces an initial repertoire of these action images, which it can then draw upon, consciously *or* unconsciously, when it is ready for volitional action. Involuntarily reaching for a desired toy provides imagery of all the arm's motions, as well as of the desirable toy; when more control is gained, the infant can *select* from that repertoire the movements that were most successful in attaining the goal.

We also argue that it is in terms of these initial movements that the desired object – the toy – is initially understood: as something attainable by means of those actions, in particular the individual actions and hand positions appropriate to that toy. The toy, in other words, is an early "affordance" in the infant's environment. That we understand objects in terms of the uses we can make of them explains phenomena like "utilization behavior" in certain kinds of brain damage: the patient can't name or describe the toothbrush but can grab it and use it appropriately. An important aspect of this account of action images is that it can include an explanation of intersubjectivity– our ability to share intentions, emotions, etc. with other observed subjects. The "mirror neuron" hypothesis (Rizzolati et al. 1996) fits neatly into the theory that action images ground the earliest concepts. Mirror neurons allow the subject to recognize and represent the intentional actions of others by means of the same neural activity that is active when the subject herself performs similar actions. These neural groups, when activated both by the subject's proprioceptive sensations when performing an action and by the sight of another person performing the same action, provide a grounding for the concept of the other as a subject who has the same kinds of intentions and experiences as the viewer. Because these neuronal responses appear to be hardwired and not a result of learning, subjects naturally acquire concepts of other persons at an early stage in infancy. Thus, as Jordan Zlatev (2007) argues, self-movement does not develop in solipsistic isolation, but rather evolves in a context that includes others capable of the same intentional actions.

Is the account of action imagery and consciousness that we are proposing circular? Many assume that it must be, and hence that we are invoking a regress in claiming that

imaging precedes consciousness of objects. It is not circular, because the original formation of the motor image was an automatic product of the infant's random motion, and becomes conscious only when voluntary motivated action becomes possible. Eventually, motivated goal-seeking actions require a selection from the stored and growing repertoire of motor patterns. In planning a voluntary action, one activates the various images and simultaneously inhibits them from triggering actual movements. Images are necessary for conscious action because the subject must "try out" the various hypothetical experiences that will result from the various choices, and compare them with others. Thus the subject is paying attention to the feelings aroused by the various images, and this motivated attention brings them to consciousness. Thus images themselves are necessary but not sufficient for consciousness.

3. Emotion, self-organization, and consciousness

The idea that emotion is an indispensable ingredient of consciousness in all modalities is not new. Cytowic (1993), Damasio (1999), and many others have shown that we can gradually eliminate cortical areas without eliminating "core consciousness," whereas if we knock out emotional areas, all types of consciousness become impossible. Even the recent "enactivist" accounts of consciousness – which in our view need to elaborate much further on the role of emotion – at least in principle do acknowledge that emotion is inseparable from self-motivated, consciousness-producing activity on the part of the subject.

However, even some who recognize the centrality of emotion insist that the role of "emotional" areas is that, in addition to subserving emotion, those same brain areas also release neurotransmitters to the cortex that have nothing to do with emotion or self-initiated activity, and thus are merely necessary in the way that supplying electrical current is necessary for a radio to work. Many of those who stress the importance of emotion in consciousness nonetheless seem, in spite of this emphasis, willing to accept the view that the radio (the cortex) is still what makes the music (consciousness). They grant, or at least allow the possibility, that the subcortex is only a way of getting the power to the radio.

This view treats emotional states as mere afferent stimuli *on a par with external sensory input,* although in the case of emotion the afferent "input" comes from the viscera of the body rather than from external perception. Such a view therefore tends to reduce conscious cognition to a passive reception and subsequent processing of exteroceptive and interoceptive data. As we argued in Section 1, Damasio's recent work is an example of this overly-afferent and thus corticocentric view of the consciousness of feelings. Such a view does not further an enactivist account of motivated consciousness as tied up with action affordances.

What evidence is there to suggest that action is really necessary to consciousness? It is true that we need not overtly perform any action in order to be conscious. Even a

totally paralyzed person may sometimes be conscious (Aizawa 2006). Our thesis is not that action is necessary for consciousness, but only that possible actions must be *imagined* by the subject (usually implicitly) in order for that subject to have intentional consciousness of objects. We "understand" objects, in Newton's (1996) sense, by imagining how we might act relative to them. This means that we initiate the brain processes that would normally lead to the corresponding overt action, but then we may inhibit the action command before the efferent signal reaches as far as the body's extremities. This can happen either deliberately, as when the motor, premotor or supplementary motor areas release inhibitory neurotransmitters to the cortex, even while the action is still being imagined; or it may happen involuntarily, as when paralysis results from a deficiency of efferent pathways.

3.1   Phantom limbs

In cases of "phantom limb" experience, the subject may imagine moving a limb that has been amputated. In such cases, even in spite of the lack of the corresponding afferent feedback, the subject still feels as if the limb were actually there. Many researchers find evidence for the hypothesis that the sense of the phantom limb movement occurs because the movement has been imagined by means of sending the efferent signals to the limb. "A preserved sense of agency provided by intact premotor processes translating intention into action may lead to the vivid feeling of movement in a paralyzed limb, similar to kinesthetic illusions in amputees. The interruption of thalamic afferences may explain the persistence and stability of the phantom by preventing any correction of the mismatch between expected and effective movement" (Staub et al. 2006:2141). "The results suggest that the presence of a phantom limb, whether painful or painless, is related to the sympathetic-efferent outflow of cutaneous vasoconstrictor fibres in the stump and stump neuromas" (Katz 1992:811). "Our data suggest that the experience of phantom hand movement involves the activation of hand motor commands. We propose that preserved hand movement representations re-target the stump muscles to express themselves and that when these representations are voluntarily accessible they can instruct the remaining muscles to move in such a way as if the limb is still there" (Reilly et al. 2006:2211)

We should remain cautious in proposing implications of phantom limb experiences, because some of the underlying physiological facts remain controversial. Some maintain that efferent processes alone can cause the phantom limb experience (Katz 1992; Levine 2007; Staub et al. 2006), without much in the way of afferent feedback. Others (for example Gandevial 2006; Ramachandran & Blakeslee 1998) believe that phantom limb experience and phantom limb pain (if not phantom limb *movement)* may result from afferent feedback from pathways that grow into the now-defunct part of the parietal lobe. Also, the explanation of phantom limb *movement* may be

very different from the explanation of phantom limb *pain.* The pain *per se* may result from the fact that no afferent feedback is received to cause corollary discharge of the electrical potential built up in the *efferent* system – the system that sends the action command outward to the body parts to be moved; or it may be caused by afferent feedback that is *mismatched to* those efferent action commands. But clearly, efferent processes play an important if not determinative role in either case. Ramachandran (see Ramachandran & Blakeslee 1998), even though he believes that afferent processes play a role in phantom limb pain, still emphasizes that the pain involves a mismatch between efferent signals and afferent feedback.[1]

What the phantom limb experience means for our purposes – especially the experience of phantom limb *movement* – is that efferent processes can play a crucial role in creating our conscious experiences. The phantom limb movement studies even suggest that, at least in some cases, we may sometimes consciously experience things *primarily* by means of efferent processes. We shall not argue this stronger claim here, because it is sufficient for our purposes to note that efferent processes are an important part of conscious experiences. Just by trying to move a phantom limb, the subject may consciously feel as if the limb were there. Other examples below will make a similar point about conscious experiences in other modalities – vision, for example.

It is also important for our purposes to note that in the case of phantom limb movement consciousness can occur not because the subject *actually does* move anything, but because the subject is *imagining* moving. This *imagining* of self-movement is subserved by brain processes similar to those in *actual* movement, all the way up to the point where the process may be interrupted, either by a deliberate inhibition coming from the frontal cortex, or a severing or sedating of nerves in the efferent pathway. So movement is by no means necessary for consciousness, as paralyzed patients show, but efferent processes that gear us up to imagine moving are an important part of understanding the action affordances of objects, and therefore play a role in our consciousness of them.

3.2   Inattentional blindness and utilization behavior

A similar conclusion is suggested with regard to visual consciousness if we carefully consider the Mack and Rock (1998) "inattentional blindness" findings. As long as the

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1.   This is the basis of one of Ramachandran's treatment methods for phantom limb pain. The pain can be reduced by artificially supplying some afferent feedback – for example, by having the subject "move" the missing phantom limb simultaneously with the remaining real one, and rigging mirrors so that the subject can "see" the limb moving, and thus receive afferent feedback through the visual system that is a better match for the efferent signals being sent through the motor system. Ramachandran believes that this procedure reduces the imbalance between the efferent action command and the afferent feedback from it.

subject's attention is pre-occupied, the subject fails to see a stimulus even when it is presented at or near the center of the visual field for up to 250 ms. Mack and Rock do not discuss the neurophysiological mechanisms underlying their behavioral observations, but we know from other sources (e.g. Aurell 1989) that 250 ms. is about how long it takes for the occipital area to be fully activated and to perform all the transformative functions on the incoming afferent signal. This means that, in the case of vision, all afferent processes can take place without any visual consciousness. I.e. all the relevant afferent information has been received within the first 250 ms., yet there is still no consciousness of the object, nor any conscious memory of it afterward. Consciousness of an unexpected object does not occur until a P300 electrical potential is observed in the parietal area. (In event related potential studies, the numbers, e.g. "P300," refer to the number of milliseconds after presentation of the stimulus.) So the parietal P300 occurs at the point when efferent activities affecting the parietal area come into play.

When we say "efferent," we mean nervous activity that normally would lead to some bodily movement, unless inhibited to form action imagery. Those efferent activities in turn seem to be preceded by an action-initiating circuit that in normal subjects interconnects the cerebellum with the thalamus and hypothalamus (Haines et al. 1997), beginning as early as 18 ms. after presentation of the stimulus, and then involving frontal areas, which are activated as early as 100 ms. (Damasio et al. 2000).

In event related potential studies, during the first 200–250 ms. of perceptual processing, there is a spreading of activation that is essentially *afferent* – i.e. a signal that results from receiving and transformation of incoming perceptual information. The afferent activity spreads from the stimulation of the optic nerve to transmission of signals to the thalamus, and from there to the occipital lobe. The studies show that all of these afferent processes can reach their full activation with no consciousness of the object. The occipital lobe has performed all its duties of interpreting the lines, shapes and colors of the object, but with no consciousness of the object. Only when a P300 event related potential occurs in the area of the parietal lobe does consciousness of the object result. Moreover, this parietal P300 does not occur merely as a result of spreading of activation from the occipital lobe. The speed at which neural signals travel would allow spreading of activation to occur much faster than the 100 ms. delay from occipital to parietal activation. The story must involve the fact that early hippocampal (18 ms) and cerebellar (20 ms.) activation (Woodruff-Pak 1997) – both brain areas involved in developing motivated action routines – then lead to a 100 ms. frontal ERP (Damasio et al. 2000). The frontal ERP would correspond to the inhibition of an action command. So it is very likely that brain processes associated with action commands – the early cerebellar and hippocampal activities – activate the P300 parietal ERP, and when this parietal activity resonates with occipital activity, that is when we

become conscious of the object, because we have now understood some of the object's action affordances, even though we have not overtly executed an action.

The implication, then, is that even afferent visual processing does not become conscious until it is combined with motoric and efference action-initiating processes that correspond with the motivated imagining of how we could interact with the object through bodily movement. Granted, this motor imagery occurs at a minimally conscious or even unconscious level. But it is still an intentional process in the sense that it potentially could be available to our conscious awareness in certain kinds of reflection, and normally occurs just beneath the surface. And it is fine-tuned to our experience, as when we find that complicated calculations of social situations have unconsciously affected the way we felt like acting, all at an unconscious or pre-conscious level. The implicit motor imagery is present even though we do not overtly perform the corresponding actions, in the same way that a musician might minimally imagine fingering a heard melody on an imaginary musical instrument, without even being aware of doing so.

If this hypothesis is true – if we are conscious of objects by imagining how we could interact with them, and if we do so by forming action commands which then are inhibited to prevent overt action – then we might reasonably ask what would happen with a subject whose frontal inhibitory processes had been prevented by brain trauma. There are indeed such cases. In a rare behavioral disorder called *"utilization behavior,"* the subject often becomes unable to perceive objects without actually performing overt actions relative to them (see L'hermitte 1986). For example, if the subject sees the doctor's coffee cup, he automatically picks it up and tries to drink (even if the cup is empty). If the subject walks into someone else's bedroom, he automatically lies down on the bed. Whatever typical action comes to mind relative to the particular object, the subject overtly does the action.

What makes the utilization behavior patient different from the norm is a deficiency of frontal inhibitory activity, just the kind of activity that Jeannerod (1997) shows is needed to image an action without performing it overtly. If the difference between normal and utilization behavior subjects hinges on the deficiency of the frontal inhibitory circuits needed to inhibit action commands, this fact would be highly consistent with the hypothesis that normal subjects, like utilization behavior patients, do form motor imaging when we see objects, although pre-consciously. The difference seems to be that, unlike utilization behavior patients, we are able to imagine the actions without actually going through with them, thanks to our normal frontal inhibitory activity.

If utilization behavior is consistently found to be caused by a deficiency of inhibitory neurotransmitters coming from the frontal brain areas, then it is reasonable to suppose that, in normal experience, we understand objects by imagining ourselves acting upon them or interacting with them, while at the same time we inhibit those action commands frontally, so that the overt action does not actually occur. In the case

where the frontal inhibitory process is deficient, the subject is unable to inhibit the imagined action, and as a result goes through with it.

3.3   Libet's paradox

Our hypothesis also explains the long-debated Libet "readiness potential" paradox (see Libet 1999). The paradox is that the brain activity that presumably subserves an action is observable .5 second before the willed action occurs, whereas the subject is aware of the choice to perform the action only .1 second before the action occurs. Libet assumes that this means that the actual choice occurs unconsciously .4 second before we consciously will it. The paradox, then, is that we feel that we are deciding to do an action that our brains had already decided to do .4 seconds earlier.

The idea that action requires a preliminary imaging of the action that is to be decided upon explains this paradox. If the brain activity observed by Libet corresponds to the initiation of an action, then it also makes sense that this brain activity would correspond to the preliminary *imagining* of the action – i.e. the motor imagery of ourselves doing the action, even in the absence of the overt action. Typically, when we are deliberately deciding whether or not to do an action, we first form a motor image of the action as a part of the deliberative process. Part of the question we form to ourselves has to do with what it would be like to perform that action. So we must *image* the action, in the sense of Jeannerod's motor imagery, *in order to* decide whether to overtly do the action. And this means that the brain processes that would subserve the overt action have already begun, even before we have actually decided to go through with the action. The initiation of the action command is a part of the process of imagining ourselves doing the action, and normally we do this *before* we decide to actually do the action. The brain activity that subserves an imagined action is very similar to the brain activity that subserves the corresponding overt action. The difference is that, in normal deliberate actions, the point when we decide to go through with the imagined action is the point when the frontal inhibitory processes are damped down, and the action command, which was already underway, is allowed to lead to overt action. This frontal inhibitory process is just what the victims of the utilization behavior syndrome are unable to perform, because of frontal brain trauma or chemical imbalance of frontal inhibitory neurotransmitters. (For further discussion of this point, see Ellis 2005, esp. 142–149).

3.4   Experiments with monkeys

The same conclusion is implied by the behavior of Donoghue's monkeys (see Donoghue 2002), who are taught to play a computer game, and then electrodes pick up the electrical signal from the brain activity that subserves the monkey's action command to facilitate moving its hand to move the joy stick. Now the monkey can merely *think*

of moving its hand, and the computer cursor moves just as it would if the monkey had actually moved its hand. Moreover, as the experiment proceeds for a day or two more, the monkey gradually gets away from the need to focus attention on its hand movements, or even imagining the hand movements, and seems entirely focused on the computer screen itself. I.e. as Donoghue describes it, there is a gradual transition from conscious motor behavior to motor imagery, in the sense of the monkey's moving its own hand and then only imagining doing so, to a final situation in which the monkey no longer even needs to think about its hand at all, but only focuses on the results produced on the computer cursor that is being moved. As described by Donoghue, the monkey seems only to be wanting the computer cursor to move. More recently, the same technique has been used to electrically pick up the monkey's brain signals to move a robotic arm (Velliste et al. 2008.)

Such an experiment would not be possible if not for the fact that the brain activity that subserves action *imagery* – the image the monkey forms of what it would be like to move its hand – were not very similar to the brain activity that subserves the corresponding overt action. The difference is that in action *imagery* the same action command is orchestrated just as it would be for an overt action, but then it is frontally inhibited. So when Donoghue's electrodes pick up on the signal of the action *image,* they are picking up the same signal as when the monkey was overtly executing the action. This further confirms Jeannerod's account of action imagery, in which frontal inhibition is the extra ingredient that makes the difference between overtly executing an action and merely imagining the same action. And, at least in this case, it also suggests that the Jeannerod neurophysiological story corresponds to an unconscious yet intentional and mental activity, because of the gradual transition from overt to merely imagined action, while the same motor and parietal area activity is maintained across this transition. In the case of Donoghue's monkeys, the imagining of the action then becomes sedimented, and the monkey's conscious attention is directed only to the cursor on the computer screen (or to the movement of the robotic arm in the Velliste et al. study). But in order to be conscious of what it wants the cursor (or the robotic arm) to do, the monkey is still *implicitly* imaging the moving of its hand, as suggested by the persistence of motor and parietal area activity similar to what was present in overt action. The movement of the cursor seems to be understood relative to the cursor's action affordances for the monkey. And implicitly imagining the action affordance corresponds to much of the same brain activity as explicitly imagining it, which in turn overlaps with the brain activity that would be needed to overtly move the monkey's hand. This also shows that there often can be implicit action imagery, even when conscious attention is directed to the external object.

The upshot of all these observations is that afferent processing of input by itself is insufficient for consciousness, and that action-initiating activity is needed to trigger consciousness of sensory stimuli.

3.5   Action presupposes motivation

As we have argued, actions need to be motivated by something. We first want our hand to move, and as a result it does move. Although it is beyond our scope here to go into detail (see Ellis 2005; Ellis & Newton 2010), emotional processes that play a role in gearing us up for imagined actions can help us understand why this is the case. Panksepp (1998, 2000), for example, argues that mammalian emotional tendencies like play, exploration, nurturance, bonding, and what he calls "seeking" system (which includes primarily an endogenous "exploratory" drive) are the *same circuits that initiate action.* Their motivational thrust is primarily to gear the animal up for action. If we combine Panksepp's emotion-action-initiating hypothesis with Jeannerod's work on motor imagery, we can make the argument that the having of emotions is inseparable from an intentional (even if pre-conscious) understanding of some of the action affordances of the environment. As Jeannerod shows, when the elaborated action tendencies are inhibited, that is when we get action imagery rather than overt action. This connection provides further support for the view that, if understanding the environment is a way of assessing its possible action affordances, then emotional activations are an important element in this process.

Emotional activation is not dependent on specific inputs, but just the opposite is true: emotional activation is necessary for consciousness of inputs. Panksepp provides voluminous evidence that many emotional systems in mammals, such as the exploratory system, do not need to be reinforced in order to be activated. They are innately motivated and are independent of each other. I.e. we do not need to reinforce exploration with a consummatory reward; animals will explore regardless of whether the consummatory motives are reinforced by their exploratory behavior or not. Moreover, there is now ample evidence against the long-suspect implication of traditional behaviorism that, if an animal were completely satiated, it would not be motivated to do anything. Instead, each of the innate emotional systems in the brain has its own self-energizing mechanisms making use of neurotransmitters triggered by brain-stem activation. This endogenously self-energizing view of motivation therefore offers resources not only to solve problems of mental causation and volition, but also more generally contributes to an understanding of what makes conscious processes conscious. Consciousness of the environment involves (usually unconscious) intentions to act toward it, not merely receiving and transforming inputs.

In enactivist approaches to consciousness, the difference between action and passive reaction suggested by these data can be understood scientifically via self-organization theory (e.g. Kauffman 1993). Complex systems maintain patterns of activity across replacements of physical components used to enact the pattern. Panksepp's endogenous non-consummatory behaviors such as "seeking" control our attention, curiosity and exploration, and are motivated by the desire to engage in patterns of activity consistent with a complex system's tendencies to maintain optimal

homeostasis and complexity. The efferent and pre-efferent anticipatory gearing up for possible action relative to environmental affordances is at least an important part of the substrate of consciousness, rather than only the afferent receiving of inputs.

4.   Motivated action is a necessary component, but what about representation?

Many contemporary "enactivists" try to construe our intentional activities solely in terms of overt action. While this approach has the advantage that it avoids thinking of subcortical emotional contributions merely as "triggers" for cortical activity, it also should avoid a demand for overt action to carry more weight than it really can. One way in which this problem occurs is by trying to minimize the role of representation. Many enactivists see a stress on action as a way of sidestepping the difficult issue of representation. For example, Hutto (2006) wants to avoid information-theoretic or computationalist accounts by denying that representations (which traditionally entail conceptual interpretation) are part of the enactivist taxonomy:

> The crux is that our primary modes of worldly and social responding do not involve the manipulation of representations or any inferential thought. ... On the contrary, we are intentionally directed at the intentional and affective attitudes of others (that is what we are meant to target) by means of natural signs – the expressions of others.   (Hutto 2006: 165–166)

The danger with this sort of attempt to avoid the errors of computationalist models is that it threatens to undermine the very enactivist approach Hutto supports. As we have argued, in any self-initiated action, the goal of the action must be represented as an essential component of the action program itself. Richard Menary, in his introduction to the volume on Hutto's work just quoted, makes it clear that when Hutto and some other enactivists reject representation, they are thinking of representations purely as interpretations of afferent data. Hutto and Menary are right to be wary of these. But representations of internal goals as such are necessary to the guidance and completion of any self-initiated action. The motor programs essential to the planning and execution of any voluntary action include representations of the end-state, to which sensorimotor feedback from the completed action can be compared. These representations are sent as corollary discharge to the cerebellum and elsewhere when the action is initiated, and are held online for the duration of the activity itself.

The term "representation" has been the source of confusion in much recent literature. Enactivists rightly want to reject computationalist approaches that treat mental representations as meaningless symbols that map onto the external world and are manipulated by mental calculators. But if they do so by denying a role for representations in any sense of the term, enactivism will fail. As we have argued, action imagery

that represents a planned action is central to voluntary motor activity (Jeannerod 1997). We have to imagine doing an action in the process of deciding whether or not to do it, and this involves imagery of what it will feel like to do the action: its intermediate stages and its conclusion. Entertaining such representations is not calculating over meaningless symbols; it is incorporating into cognition our interactions with the world. (For more detailed discussion of enactive accounts of representation, see Newton 2003).

It is widely agreed that the human cortex evolved in part to meet the need for complex and long-term action planning. Such planning, whether it involves preparing a meal or setting a distant educational goal, requires the weighing, over time, of a full range of alternatives, from minute-to-minute details of the process to anticipatory specification of the desired end state. This planning must be done in the head; one cannot try out these possibilities in the real world.

Planning and evaluating actions requires motor imagery, and we have argued that this motor imagery is not merely a non-intentional physiological event, but, even when it occurs only pre-consciously, it can still be an intentional one. In our view, entertaining motor imagery is the activity of representing bodily actions and interactions with the external world.

The mental process of representing is not simply a matter of encoding signals from the external world, although these may be incorporated into the representing process. Primarily, representations are mental models of the subject's embodied activities, including the activity of sensorimotor experience. There is no question here of "accuracy" or "misrepresentation" of this imagery. The imagery is an essential part of a process and does its job as part of that process. If mistakes are made, these involve mismatches between a subject's goals and the outcome of the attempt to attain the goal, not between a representation and a separate and distinct object it is intended to represent. Thus the view of representations as intrinsically meaningless symbols, manipulated syntactically in order to encode information about the external world, is completely inappropriate in the context of enactivism.

5.   Conclusion

We have argued not only that the neurophysiological substrates of emotionally motivated action commands are among the primary "neural correlate of consciousness," but also that in fleshing out this view, we should be careful not to make one of two opposite mistakes. We should take caution not to under-emphasize action by having a view of emotion that makes the emotions that motivate "actions" themselves too reactive. On the other hand, we should be careful not to over-emphasize action by implying that any system that can act is conscious. That is where we believe it is necessary to bring in a kind of "representation" in which not only action, but also *action imagery* that represents the goal of an action is important.

With regard to the role of the representation of the goal of an action: To be clear, we are not saying that some end-state out in the world must be represented. If we are sitting with our feet dangling in a swimming pool and moving them back and forth, the *goal* that we are representing may be simply to move the foot a certain distance in a certain direction. Or in some cases the goal could be just to move the foot in such a way that moving it *feels* a certain way that we can remember and plan to repeat. So we are not asserting that the "goal" is necessarily some outcome that would occur *outside of our own bodies.* But with that caveat, we can say that action requires representing what we want to do *in some way.*

In a very different kind of example, when we hit a baseball, we are not really representing a specific trajectory of movement for either the bat *or* our arms. What we represent in this case is that the ball (which also is represented) and the bat (which is not yet consciously represented) should make contact. In this case, what we represent *is* something external, even almost to the exclusion of representing anything *within* the body. Our attention is directed to something outside of ourselves, even as we plan and execute the action.

There can also be borderline cases between action and reaction. The classic example might be when improvising jazz. In some instances, we may have the idea of what we want a phrase to sound like before we execute it. Other times, we may merely automatically *re*-act, with a habituated pattern of finger movement. And in many cases, we may rapidly alternate between those two modes of playing. In effect, we alternate between "acting" and "merely reacting."

So when we say that consciousness can occur only in beings that act, we are not saying that these active beings must *always* be acting in the fullest sense. However, they are always acting in the more primitive sense we discussed above – that is, in the sense of self-organization that is implicitly oriented toward goals needed for maintaining the self-organizational system. In living beings, this involves seeking out and appropriating material components (such as food) that can be used to maintain the system. That is, living self-organizing systems are always seeking homeostasis at a suitable energy level and any other activities required to enter or sustain their preferred patterns of activity. Understanding how we could act in relation to the environment, as opposed to merely re-act to it, is therefore a crucial requirement for an organism to be capable of consciousness. And this presupposes that the organism has emotion as well.

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Visual perception and self-movement

Another look

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> [T]he eye is part of a dual organ, one of a pair of
> mobile eyes, and they are set in a head that can
> turn, attached to a body that can move from place
> to place. *(Gibson 1986: 53)*

In this chapter, I argue for two claims. First, creatures that cannot understand themselves as *potentially* moving or being moved cannot have visual experiences of three-dimensional, spatial objects "out there" in the world beyond their skin. Whilst we might be unable to detect an outright contradiction in the notion of creatures without such understanding enjoying perceptual experiences indiscriminable from ours, it is, as I will attempt to show in the first part of the chapter, highly doubtful whether we can make full sense of their experience as an experience of three-dimensional objects "out there" in space. Second, we should nevertheless not endorse what Noë terms an "enactive" account of perception. In other words, the idea that a creature cannot have visual experiences of three-dimensional objects without experiencing itself (or having experienced itself) as *actively* moving does not stand up to closer scrutiny.

Keywords: perception; movement; perceptual presence; enactivism; Noë; Husserl

1. Introduction

Nobody seriously wants to contest the statements that I have chosen as a motto for this chapter. Certainly all parties to the debate I want to consider in the following pages agree that Gibson's claims are correct as regards the vast majority of humans and animals. The dispute turns on whether there is any essential or necessary connection between self-movement and the capacity for visual perception. Phenomenologists such as Husserl (1997[1907]) and Merleau-Ponty (1962 [1945]),[1] and, more recently,

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1. For two other (more recent) examples, see Sheets-Johnstone (1999: Chapters 3–5) and Gallagher and Zahavi (2008: Chapter 5).

defenders of the so-called "enactive" approach to perception such as Alva Noë (2004), have argued that there is.[2] These philosophers have all held that there is a sense in which an ability to move is a precondition for the ability to perceive a stable world of three-dimensional, spatial objects. Others, however, have disputed this claim. They have maintained that whereas it might be the case that all seeing animals that inhabit the planet Earth – or indeed all seeing creatures throughout the Universe – are able to move themselves, this, if true, is merely a contingent fact. There *could be* immobile creatures that were endowed with visual perceptions just like ours. There is, then, no *essential* link between self-movement and visual perception. Such claims have not only been advanced outside the phenomenological tradition (e.g. in G. Strawson 1994). Recently, in fact, philosophers otherwise sympathetic to Husserl's take on perception, Peter Poellner and A.D. Smith, have argued that he ought to have abandoned the thesis of an essential link between visual perception and self-movement.[3]

I shall argue for two claims. First, creatures that cannot understand themselves as *potentially* moving or being moved cannot have visual experiences of three-dimensional, spatial objects "out there" in the world beyond their skin.[4] My argument depends, in part, on a clarification of the point of a phenomenological elucidation of visual perception. I shall suggest that phenomenology attempts to make sense of perceptual experience "from within". Whilst we might be unable to detect an out-right contradiction in the notion of such "completely motionless creatures" enjoying perceptual experiences indiscriminable from ours, it is, as I will attempt to show, highly doubtful whether we can make full sense of their experience as an experience of three-dimensional objects "out there" in space.

My second main claim, however, is that we should nevertheless not endorse what Noë terms an "enactive" account of perception. In other words, the idea that a creature

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2.   For present purposes an "enactivist" is someone who holds that "perceiving is a way of acting" (Noë 2004: 1), that is, that the ability to have perceptual experiences of spatiotemporal objects *essentially* depends on skilful, active movement. Could an enactivist, thus defined, also be a phenomenologist? An anonymous reviewer thinks not, but I disagree. Enactivism, as I understand it here, is a *thesis* about perception. Phenomenology, on the other hand, is a philosophical tradition loosely held together by particular *methodological* commitment – the commitment to let the *phenomena*, faithfully described, decide the fate of philosophical theory. There is no reason in principle why an enactivist could not accept that methodological commitment. In fact, I think Noë fits the bill. Perhaps Husserl does as well; he comes close, at any rate, to adopting the enactivist thesis.

3.   For discussions of themes closely related to the topic of this chapter, see Ellis & Newton's and Sheets-Johnstone's contributions to the present volume.

4.   I shall sometimes use the concept of "transcendence" to capture this notion of the perceived world as "external" to us.

cannot have the sort of understanding that the first part of my chapter argues is essential to visual experiences of three-dimensional objects without experiencing itself (or having experienced itself) as *actively* moving – this idea does not stand up to closer scrutiny. It is highly plausible, in my view, that the understanding in question must be derived from actual experiences of self-movement. But it is not obvious that among these experiences there *must* be experiences of active, self-initiated and self-controlled movement.

The former argument will be developed in the first part of this chapter. In the much shorter second part, I briefly, and somewhat tentatively, sketch my reservations vis-à-vis the "enactive" account of perceptual experience.

2.   The importance of self-movement

2.1   Making fully intelligible

The aim of Husserlian so-called "constitutive" or "transcendental" phenomenology is to make the life-world intelligible. More precisely, the task is to uncover the experiential structures that permit the world to be manifested or given to a subject. The aim of making the world transcendentally intelligible in this way should not be confused with the idealist project of reducing the world to subjective or mental structures. As Husserl explains:

> In advance there is the world, ever pregiven and undoubted in ontic certainty and self-verification. […] There can be no stronger realism than this, if by this word nothing more is meant than: "I am certain of being a human being who lives in this world, etc. and I doubt it not in the least." But the great problem is precisely to understand what is here so "obvious." The method now requires that the ego, beginning with its concrete world-phenomenon, systematically inquire back, and thereby become acquainted with itself, the transcendental ego, in its concreteness, in the system of its constitutive levels and its incredibly intricate [patterns of] validity-founding. At the onset of the epoché the ego is given apodictically, but as a "mute concreteness." It must be brought to exposition, to expression, through systematic intentional "analysis" which inquires back from the world-phenomenon.   (Husserl 1970b: 186–187)

Two points need emphasizing here. First, the aim of Husserlian phenomenology is, as we might put it, a "hermeneutic" one. The point is not to prove, but to make intelligible. As Husserl writes, the phenomenologist is "unable to have any other scientific theme than that of transforming the universal obviousness [*Selbstverständlichkeit*] of the being of the world – for him the greatest of all enigmas – into something intelligible [*eine Verständlichkeit*]" (Husserl 1970b: 180). Second, this making-intelligible

proceeds via "intentional analysis": we make the manifestation (or "being") of the world intelligible by "inquiring back" from the world as manifested to the intentional experiences in which the world manifests itself. Ultimately, then, we will unveil structures of the "transcendental ego" – the subject to whom the world is manifested.

Obviously, this means there is a difference between the phenomenological idea of a condition of world-manifestation and the textbook notion of a "necessary condition". To show that X is not a necessary condition of Y it is enough to produce a coherent example of Y without X. Thus, to show, for example, that believing that p is not a necessary condition of perceiving that p, we need only think of a case in which a person sees a pink rat running by; but, attributing the experience to the influence of alcohol or LSD, the person does not believe that a pink rat is running by. A condition for world-manifestation in the phenomenological sense, by contrast, is something in the absence of which we cannot make a world-manifesting experience "truly" or "fully intelligible to ourselves", to borrow some useful phrases from P. F. Strawson (cf. P.F. Strawson 1966: 11, 49, 106, and passim). For a phenomenologist, therefore, there can be cases in which X without Y is *logically possible* – involving no "formal contradiction" – but in which we cannot make X *fully intelligible* without Y.[5]

In particular, as we shall see, there can be cases where we can coherently *imagine* that creatures, which lack a certain feature we have, experience the world just as we do; but where, due to the lack of the mentioned feature, we cannot make their having such experience truly or fully intelligible to ourselves. In such a case, the phenomenologist will hold that the feature in question is a condition for world-manifestation, notwithstanding the fact that it is not a necessary condition in the standard philosophical sense. Because the phenomenologist is in the business of making intelligible, she or he has a special interest in the former, broader notion.

2.2   The problem of perceptual presence

I am right now looking at my coffee-cup placed on my desk. The cup is uniformly white, except for some writing on one side. From my current viewing position, however, I do not actually see the writing. The side facing me is uniformly white. However, the "rear side" with the writing on it is not an experiential "nothing" to me in this experience. My experience somehow seems to concern the cup as such, complete with front sides and rear sides – and an interior possibly still containing coffee (though I cannot tell from here). Compare the perceptual givenness of the desk. The cup occludes parts of the desk – namely, the parts directly under and behind the cup. Yet I somehow sense

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5.   See Husserl (1983: 108–9); and Overgaard and Grünbaum (2007).

the desk as present under and behind the cup, even though I do not actually see those parts of the desk. Generalizing from points such as these, Husserl writes:

> The object is not actually given, it is not given wholly and entirely as that which it itself is. It is only given "from the front," only "perspectively foreshortened and projected" etc. While many of its properties are illustrated in the core content of the perception, at least in the manner which the last expressions indicate, many others are not present in the perception in such illustrated form: to be sure, the elements of the invisible rear side, the interior etc. are co-intended [*mitgemeint*] in more or less definite fashion […], but they are not themselves part of the intuitive, i.e. of the [strictly] perceptual or imaginative content, of the perception.
> (Husserl 1970a 712–13; translation slightly modified)

What are we to say about these co-intended rear-sides and interiors? Psychologists commonly speak of "amodal completion" – "amodal" because there is no sensory information regarding the parts of the table and the cup that are occluded. As at least the most enlightened psychologists emphasize, however, this does not mean that the phenomenon is not genuinely perceptual (e.g. Rock 1984: 120). It is no good saying, for example, that I somehow add the hidden and occluded features in thought or imagination. For, first of all, if I just glance absentmindedly at my desk, thinking of the text I am writing, is it at all *phenomenologically* plausible to claim that I add, in thought or imagination, any of the occluded features? Surely I do not. Yet no matter how absentminded I am, the various objects are somehow fully present to me as three-dimensional objects with occluded backsides and so on. Second, consider the sheer magnitude of the task of thinking about (or imagining) all occluded features of a scene as crowded with objects as my desk (full of books, papers, pens, and so on). Perhaps a powerful computer with the right sort of software might represent all these in a fraction of second; but it is hardly plausible to suggest that I might do so either consciously or unconsciously. Finally, consider the fact that when I imagine an object, I also imagine it as "presenting" itself from a certain perspective, with certain features "in view", and thus as having certain other features that are not currently "presented". (I cannot visualize an object seen from all perspectives at once.) We lose sight of this difference, however, if we say that the "unseen" features are imagined; because so, of course, are the "presented" features in this case (cf. Husserl 1997: 47).

Somehow, then, the presence of occluded features must be a "perceptual presence" (Husserl 1997: 43; Noë 2004: 60). We have a perceptual "sense" of their presence, even though they are not strictly *seen* or otherwise perceived. To a phenomenologist seeking an understanding of how our experience can present a world consisting of three-dimensional, material objects, this presents a problem, however. The problem is to make intelligible how we can have a perceptual sense of unseen features of a scene. How are we to understand their presence? Following Alva Noë,

whose take on this problem seems deeply influenced by Husserl,[6] I shall call this "the problem of perceptual presence" (Noë 2004: 59).

Note that this problem will be central to a phenomenological account of perceptual experience. For arguably, it is crucial to the perception of objects as spatial or three-dimensional that we can have various different perspectives on them. But this precisely means having certain aspects of them in view, while others are "co-intended", as Husserl puts it. It is obvious that other, strictly "absent" aspects or profiles must be somehow present. For unless my first glance at an object already somehow anticipates other possible views of the same object, it is hard to see how any subsequent perception of the object from another perspective could count as a perception of *the same unchanged object*. That is, unless any perception of an opaque, three-dimensional object, already co-intends absent profiles of the same object, a continuous perceptual process revealing the object from other sides can hardly count as manifesting the same unaltered object. There must already be more to the object than what I currently see if any subsequent experience is to reveal new features of the same, unchanged object.

But why is it important that we can perceive the same unchanged object from varying perspectives? If all aspects of perceived objects are fully manifest, then perceived objects change whenever the sensory given changes. Suppose the sensory given of a particular experiential sequence is the same as I have when I first view my coffee cup from a position directly above it, and then slowly move my head back and down so that the cup is now in front of me. As we might put it, the sensory given at first involves a circular shape (corresponding to the circular shape the cup projects onto my retina), and then gradually more and more elliptical shapes. Unless we make room for an object to present different profiles to a viewer, then clearly the perceived object in our scenario changes. Every change in sensory content is a change in perceived object. But how, in this sort of scenario, could my visual experiences be experiences *of* something out there in the so-called "external" world? The perceived object collapses into the sensory given. That is, the perceptual experience would seem to absorb the object, so that there would be no difference between the perceived object and the experience (cf. Husserl 1997: 97–101). We only have a visual experience *of* a transcendent, physical object if it is possible for the sensory content of the experience to change while the object remains unaltered. And we can only have the latter in so far as other profiles of the same object can be "amodally" co-intended.[7]

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6.   Although I have only come across one single reference to Husserl in Noë's writings (2004: 17), it is a reference to the volume that contains all the ideas I am outlining here.

7.   What, though, about shadows? Shadows seem to be objects "out there" in the world, even if they are not genuinely material in the way that cups and tables are. But although it is true, of course, that shadows do not have "sides" the way material things do, we can nevertheless

This means that if we are to make intelligible the perceptual manifestation of three-dimensional objects we cannot ignore the problem of perceptual presence. From what was said above, it is not plausible that the key to this problem lies in the notion that we construct mental models or representations of the absent profiles. The task would be daunting, to say the least. And besides, the suggestion that we constantly engage in such internal-model building doesn't do justice to the phenomenology of experience. But if we do not represent them, what is the status of the absent profiles? Both Husserl and Noë, in their respective ways, make the intuitively plausible suggestion that the absent profiles are "present" as somehow *available*, as something to which we have *access* (Noë 2004: 63, 67). They are, as Husserl puts it, "freely at our disposal" (Husserl 2001: 47). In other words, in having one side of the coffee cup strictly presented to me, the multiple absent profiles of the cup also have a certain presence, namely as profiles that are available to be (strictly) perceived. This, however, cannot count as a satisfactory response to the problem of perceptual presence. Surely, before we can be said to have made perceptual presence fully intelligible to ourselves, we must understand what this availability of the absent profiles amounts to. This question takes us to the heart of the Husserlian proposal.

2.3   Movement and perceptual presence

The proposal is marvellously simple. According to both Husserl and the enactive account, the basis of the availability of absent profiles is found in what Husserl calls our "kinaesthetic capacity"[8] and Noë refers to as "sensorimotor skills" (Noë 2004: 63).[9] It is, in other words, because we are able to *move* and thereby change our perspective on things that we have a perceptual sense of the co-presence of absent profiles. Thus, for example, the

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view the former from various perspectives, some of which may reveal features of the shadow that are not revealed from other perspectives (see Smith 2003: 70). Moreover, we can obviously have amodal completion of shadows. Not only can objects occlude other objects, or parts of them; they can also occlude their shadows, or parts of them.

8.   Husserl (1970b: 162). Husserl coins the term *Vermöglichkeit* to capture this; see the German text of the *Crisis*: § 47; also Husserl (1973b: 284–5). *Vermögen* means ability or capacity, whereas *Möglichkeit* means possibility. A *Vermöglichkeit* is thus a possibility that I am able to realize.

9.   An anonymous reviewer points out that "kinaesthetic capacity" and "sensorimotor skills" are two very different things. The former is an experiential notion, whereas the latter is a physiological one that "has no anchorage in actual experience". I think there is something to this point. In fact, I do believe Noë wants his sensorimotor skills to be understood as anchored in experience. Husserl and Noë, it seems to me, both want to claim that our awareness of absent profiles has to do with our ability to experience self-movement. But then here is the point: If that is what Noë wants, why the physiological vocabulary?

inside of my cup is available to me as something that would be (strictly) perceived if I view the cup from above; whilst the rear side is accessible as that which I would see if I moved around the cup (or picked it up and turned it around). All of this is perceptually present to me here and now because I have an implicit awareness of my potential (at least in principle) for moving, and of how such movement would produce ordered patterns of perceptual presentation. The "feeling of perceptual presence" we have of strictly absent profiles resides, as Noë puts it, "in the immediate accessibility, through control of one's sense organs, of detail that is present there all along" (Noë 2001:51).

Let me put some more flesh on this proposal. As Husserl likes to put it, the strictly or "properly" presented profile of an object such as a cup is embedded in a "horizon" of other profiles, which are not currently presented in the strict sense. And it is so embedded because my current "kinaesthetic" situation – my current bodily posture and position – is embedded in a "kinaesthetic horizon", a horizon of "freely possible series of movement" (Husserl 2001:52) and thus of other viewing positions which I might adopt by moving myself. I am implicitly aware of the two horizonal "systems" as correlated in such a way that *if* I were to engage in this or that particular series of movement, *then* such-and-such a sequence of object-profiles would be presented to me.

There is thus a certain systematic structure to the relation between the kinaesthetic horizon and the horizon of visual profiles. A movement of my head to one side will result in a "movement" of the visual profile in the opposite direction. If there is no such (quasi-)movement, then the object will not seem stationary, but will appear to move. A linear movement such as walking up to an object will be accompanied by a continuous quasi-expansion of the visual profile of the object. If not, the object is seen to change: either its position, by moving away, or its size (shrinking). Moving around an object will lead to a continuous revelation of new profiles of the object; again, if not, then the object will seem to be turning. And of course, the continuity of the visual appearances is crucial here. It is the gapless, continuous flow of visual appearances corresponding to the continuous movement around the object that gives me an experience of the "closedness" of the three-dimensional surface of the object (Husserl 1997:175).

So, when I cast a glance at my coffee cup on the table, the whole three-dimensional cup is present to me perceptually because the strictly presented profile is encompassed by a multitude of absent profiles perceptually "present" as *available* but not presented. And this availability refers back to my implicit awareness of my own potential for bodily movement. My perceptual experience of the cup is an experience of it from a particular viewing position out of a multitude of possible viewing positions – positions that are, at least in principle, realizable via bodily movement. I am tacitly aware of the current distribution of (strict) presence and absence as one that is the result of my having realized this particular kinaesthetic situation out of an open-ended horizon of kinaesthetic possibilities.

It must be emphasized that the Husserlian claim is not that people who have become completely paralysed are unable to see transcendent, spatial objects. The crucial thing is that a subject has some (implicit) understanding of how visual appearances *would* change *if* such-and-such kinaesthetic capacities were exercised. A subject, that is, need not *actually* be able to exercise the skill in question. All he or she needs is an implicit understanding of the dependence of sensory appearances on self-movement. It might, however, be hard to see how a subject could acquire such understanding without at least at some point having had experiences of self-movement. This seems plausible to me, and I shall assume the truth of this claim in what follows; but I shall not attempt to defend it.

The Husserlian approach, as I understand it, will thus include the following claim:

(1)   Having an implicit understanding of oneself as potentially moving or being moved is a condition for the possibility of perceiving transcendent spatial objects.

Via the (I think plausible) idea that such an understanding can only be derived from actual experience of self-movement, we reach the further claim:

(2)   Having had experience of self-movement is a condition for the possibility of perceiving transcendent spatial objects.

The enactive approach, however, as suggested by its name, goes on to make a stronger claim. Perceiving, in Noë's words, "is a way of acting" (Noë 2004: 1). "Perception is not something that happens to us, or in us. It is something we do" (ibid.). And again, "perceptual experience" is "a form of active engagement with the environment" (Noë 2001: 50). Note that the suggestion is not merely the plausible one that *in fact* perception is (mostly or generally) "something we do". Rather, to say that perceiving as such is a way of acting, or a form of active engagement, is to advance a claim about the *essential* features of perception.

A similar emphasis on active movement is found in Husserl.[10] In the *Crisis*, for example, Husserl stresses that visual appearances have the character of profiles or aspects of spatial objects "only through the fact that they are those aspects continually required by the kinestheses" (Husserl 1970b: 106). He goes on to say: "Thus sensibility, the ego's *active* functioning of the living body or the bodily organs, belongs in a fundamental, essential way to all experience of bodies" (ibid., my emphasis).[11]

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10.   Although he was not oblivious to the importance of passive movement of the self (cf. Husserl 1997: 240–5).

11.   "Bodies" here translates the German *Körper*, meaning spatial, physical objects.

We are now in a position to formulate a third claim, which I shall call the "enactive" claim. The claim is as follows:

(3)   Having had experience of *active* self-movement is a condition for the possibility of perceiving transcendent spatial objects.

One might hold (1) without holding either (2) or (3). Thus, for example, someone who thinks that an understanding of self-movement could be innate will regard the argument I shall advance as missing an important piece. For anyone attracted to an empiricist outlook, however, I think the transition from (1) to something like (2) will not seem outrageous. In any case, as already indicated, I shall assume that this transition is not in dispute here. My discussion will therefore focus on (1) and (3). It is possible to hold that no (implicit) understanding of oneself as possibly moving is necessary for the perception of spatial, three-dimensional objects with absent profiles – that is, to deny (1). It is, however, also possible to accept it along with (2), but to deny the specifically "enactive" claim (3). On this view, some self-movement *is* a necessary condition for perceptual experiences of transcendent objects. But there is no reason to think it *must* be *active* self-movement.[12]

2.4   Recent criticism

The most straightforward way to prove the Husserlian thesis false is to provide a counter example: an example, that is, of some creature that is able to have visual perception of transcendent objects in just the way we do, but is incapable of any movement whatsoever, and has no understanding of itself as potentially moving either. Galen Strawson has offered an example that at least in part answers to this description. He claims we can imagine a sort of creatures – which he calls the "Weather Watchers" – that are "rooted", like trees, and completely unable to move. Nevertheless, the mental life of a Weather Watcher is strikingly similar to ours. In particular, such a creature is fully capable of visual perception:

> A Weather Watcher lives the rooted life, but there are many respects in which its mental life is like ours. It sees the sky and hopes the clouds are bringing rain. It watches a seed lodge in a gap between two rocks by the edge of the river. It forms the belief that a tree may grow there before long, and hopes that it will.
>
> (G. Strawson 1994: 255)

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12.   This would seem to be the position advocated in Smith (2002: 146–7). However, Smith goes on to suggest (at p. 149) that the idea of a wholly inert subject who has visual perceptual experiences as of objects distributed in three-dimensional space is a metaphysical possibility. His position would thus seem closer to the one discussed in the following sections.

Strawson thinks that unless we can prove that the idea of Weather Watchers is incoherent, the idea that there is a necessary connection between the ability to move oneself and the ability to see three-dimensional, spatial objects, has been shown to be false. Whilst it may well be that all seeing creatures that inhabit our planet are capable of some degree of self-movement, the fact that we can coherently *imagine* creatures for which this is not the case, means that the connection is merely contingent.

Note, however, that the Strawsonian story so far does not involve a rejection of (1). His weather watchers *might*, for all we have been told, understand themselves as potentially moving around – even though in fact they are unable to move.[13] However, others have advocated stronger claims that do involve a rejection of (1). Such points have recently been raised from within the tradition of Husserlian phenomenology. Peter Poellner, in particular, has invoked the possibility of Strawsonian creatures in direct criticism of Husserl:

> Why should a subject only be able to think of, or perceive, an object as having other, currently unperceived, aspects which could be perceived from other perspectives, if it can also understand itself, practically or otherwise, as potentially *moving* to take up those other perspectives? This does not seem to be an a priori truth. There might conceivably be subjects who, while embodied, are paralysed from birth and cannot experience or think of themselves as actively moving through space at all, and who might yet take their surrounding world to consist of spatial particulars with aspects unperceived by them, but perceivable from somewhere else. (Poellner 2007: 443)

Poellner clearly accepts that in order to have perceptual experiences as of transcendent, spatial objects, a subject must have a perceptual "sense" of absent profiles. What he rejects is the notion that in order to have this sense one needs to be able to move. In fact, Poellner rejects the weaker notion that one needs to understand oneself as *potentially* moving to take up positions from where these profiles would be visually presented. If so, his perspective cannot be reconciled with the Husserlian one.

In a footnote, Poellner makes it clear that he is committed to the strong claim that I am attributing to him: his target is the very idea that *self-movement* is essential to perceptual experiences as of spatial objects. As he writes, "Even if one accepts that a grasp of the possibility of *movement* is essential for perceiving a spatial object as having aspects currently occluded or outwith focal attention, why should this have to include

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13.   Indeed, Strawson offers a genetic story that he calls the "rooting story", according to which the natural course of development of a weather watcher takes it from "an active, mobile youth to a state of immobility" (G. Strawson 1994: 254). Given this story, of course, it is entirely reasonable to assume that weather watchers – despite their immobility – are able to understand themselves as potentially moving around.

self-movement, rather than merely movement of the object […]?" (Poellner 2007: 443, Note 44). Thus, Poellner thinks (1) must be rejected. It is enough that a subject should understand an object as potentially moving or being moved, for that subject to have visual experiences of spatial objects. Indeed, Poellner *seems* to think that not even this is strictly required. Perhaps no movement of any sort has any essential role to play in a subject's perception of spatial objects.

Poellner offers the following analogy to substantiate his criticism of Husserl:

> After all, in the parallel temporal case, we can uncontroversially think of events having objective *temporal* properties (e.g. Napoleon studying his maps for one hour on the eve of the battle of Jena) which we can neither directly witness, nor gain any clear conception of what it would be to "move ourselves" to a temporal position from which we could witness them. The claim about the role of bodily self-movement thus seems to be one instance where Husserl does not so much analyse the constitutive conditions for *any* subject's having representations of a certain (here: spatial) type, but rather the way in which certain kinds of subjects, namely humans, in fact represent the world […].   (Poellner 2007: 443)

In other words, past events have aspects that we cannot understand ourselves as "moving" ourselves in relation to, in such a way as to be able to "witness" them. Why, then, should we not be able to perceive objects as having absent aspects or profiles, even if we had no understanding of ourselves as moving into a position from which we could perceive them?

2.5   Must all absent profiles be perceivable?

In response to this criticism, the first point to consider is the force of Poellner's analogy with past events. Is the Husserlian phenomenologist committed to the claim that all types of "absent profiles" are available or accessible in the sense that one can conceive of oneself as "moving" (whether literally or metaphorically) into a position from which they can be "witnessed"? This is a rather large question, which opens up wider issues about Husserl's transcendental idealism – issues that cannot be adequately addressed in the present paper.[14] Nevertheless, I think it is fairly easy to see that the phenomenologist has no problem allowing for absent profiles with respect to which we can make no sense of the notions of "moving closer" and "witnessing". The transcendent *par excellence*, as Husserl never tires of emphasizing, are other subjectivities (cf. Husserl 1959: 495). Another subject is someone who in principle cannot be directly presented to me the way she or he is "given" to herself (Husserl 1973a: 362, 438). To encounter another subjectivity is thus to encounter something (or rather, someone) that simply

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14.   For two very different perspectives on this question, see Smith (2003) and Zahavi (2003).

cannot be presented to me "in its own self". This makes the perception of the other, as Husserl conceives of it, very different from the perception of mere spatial objects: the "improperly perceived" dimension of the other subject "makes possible no fulfilling perception, the way all anticipating moments within the perception of spatial things do" (Husserl 1959: 63).

In other words, here we have a clear case in which our experience implicates absent "profiles" that we cannot picture ourselves as possibly witnessing. And, closely connected with this, we cannot make sense of the notion of "moving closer" to these absent "profiles". There are, of course, important questions to be asked about the status these "profiles" have for us. They cannot, for example, be "available" or "to our disposition"; so how *do* they figure in our experience? However, it is not the task of this chapter to answer the phenomenological question concerning our experience of other subjects.[15] The only point we need to note is that there is no reason to think a Husserlian phenomenologist would have trouble accepting the notion of absent profiles which we cannot bring ourselves in a position to witness.

Having established this, what is to prevent us from granting that it is essential to something's being a *past* event that there is no such thing as "going back" to witness the unfolding of the event? We can obviously imagine ourselves witnessing Napoleon studying his maps before the battle of Jena. Indeed, we know what it would take for us to "move" into such a position: we would have to place ourselves in Jena in October 1806, for a start. However, we certainly have no idea how to bring such "movement" about.[16] But this is not a problem for the phenomenologist. On the contrary, there is no reason why she or he should not be prepared to accept that this is part of what it means that an event is a *past* event.

So what does the temporal analogy tell us about the perceptual case? Not much, it seems to me. For surely, it would be absurd to suggest that the absent profiles of the perceived object are *past* profiles – or indeed that they are strictly inaccessible, as are the absent "profiles" of other subjects. Of course they are neither of those things. In principle, I can bring them into view whenever I want. In the perceptual case, we sense the absent profiles as belonging to the *present* perceived scene. The absent profiles are "'co-meant' as co-present", as Husserl puts it (Husserl 2001: 40) – which is indeed why the problem we are discussing can be called the "problem of perceptual presence".

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15.   For an attempt to answer the question, see Overgaard (2007).

16.   Indeed, perhaps the very notion that it is possible to draw parallels between spatial movement and "movement in time" depends on our tendency to use spatial language to describe temporal matters. This tendency, as Jordan Zlatev has pointed out to me, is not found in all cultures. See Sinha et al. (2011).

2.6   Making sense of absent profiles

Having dealt with Poellner's analogy, we can move on to consider the case of the creatures he pictures. If we can make such creatures intelligible to ourselves as perceiving objects with absent profiles just as we do, then theses (1) and (3) must be false. It is, however, not at all clear that we can make sense of these creatures having such perceptual experiences. At least, it is so far entirely unclear what sort of response to the problem of perceptual presence Poellner is proposing.

Call creatures that cannot conceive of themselves as possibly moving or being moved "completely motionless creatures".[17] The question we would like answered is the question concerning the status of absent profiles for such creatures. Poellner has suggested (in personal correspondence) that it is possible to tell a story about the possible function such co-intending of absent profiles could have for completely motionless creatures. It might be important for the latter to be able to predict the movement of objects relative to themselves, so as to enable them to prepare mentally for possible impacts, for example.

The problem with this suggestion, however, is that it does not seem to address the right question. We can imagine all kinds of *functions* for the co-intending of absent profiles to serve, but what we want here is to make sense of the *perceptual experience* of such creatures – and make sense of it "from the inside", as it were. Noë and Husserl have given us plausible stories about the status of such profiles for us, in our perceptual experiences. The perceptual "co-presence" of the profiles is cashed out in terms of their being "available" to us; and that availability, in turn, is made sense of in terms of our kinaesthetic (Husserl) or sensorimotor (Noë) understanding. How are we to understand the co-presence of absent profiles in the experiences of completely motionless creatures? As we will see, the answer that they are "available" creates trouble. For it immediately invites the question of how that availability would be cashed out.

One of the quotes from Poellner suggests that he might attempt to cash it out in terms of the movement of perceived objects. In other words the absent profiles of, say, my cup would then not correspond to the profiles that would be strictly perceived if *I* were to move (or be moved) in such-and-such a way; but those I would perceive if *the cup* moved or was moved in such-and-such a way. The question is, however, why would such cases not be cases of objects changing their intrinsic features, as opposed to unchanged objects moving so as to reveal aspects that they had to begin with? It is the possession of absent profiles *ab initio* that we are trying to make sense of here.

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17.   I have been unable to think of a more accurate name that would not become intolerably long and inelegant. That the name is, however, awkward and inaccurate can be seen from the fact that Strawsonian weather watchers – insofar as they are immobile, yet capable of conceiving of themselves as moving – would not be completely motionless creatures.

And it does not seem that we can do so by reference to the movement of perceived objects. Rather, for a creature to be able to experience an object as moving in such a way as to reveal different aspects, the object must *already* be experienced as having other aspects to reveal. For only then can the case where initially absent profiles become fully perceptually present be distinguished from cases where objects change, either by losing the features they had, or by developing new features in addition to the ones they had.

Thus, for example, a case in which the sensory material first includes a circular shape and then gradually more and more elliptical shapes is ambiguous between a number of different scenarios.[18] It could be the object (say, the rim of my coffee cup) is changing shape; it could be it is being gradually tilted away from me; or it could be that I am changing my position vis-à-vis the object. It seems to me that not only are Poellner's completely immobile creatures unable to distinguish between the first two of these scenarios. More problematically, insofar as they cannot understand themselves as *potentially* moving into a position that would (or would not) result in the reintroduction of the original, circular visual appearance, such a distinction can hardly even make sense to them. But this precisely means that their visual experience cannot be a visual experience as of a transcendent, spatial object in anything like our sense.

The appeal to the movements of objects, therefore, is not going to give the critic of the enactive approach what he or she needs. Another suggestion that Poellner hints at is this. A completely motionless creature might form an idea of absent profiles as potentially present to *other* perceiving subjects.[19] It might have no notion whatsoever of itself moving or being moved into a position from which these profiles might be perceived; nevertheless, so the present suggestion goes, such absent profiles could figure in its perceptual experiences as profiles possibly given to (possible) other perceivers. The trouble with this suggestion, however, is that it puts the cart before the horse. We have not yet made sense of the notion that there could be "more to see" for this

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18.   An interesting question – which I shall not discuss here – is whether there is a sense in which the plate, when it projects an elliptical shape on to my retina, *looks* elliptical. Noë (2004:78) thinks there is, but see Overgaard (2010) for a critique of this view.

19.   Poellner says his creatures might understand their world as containing "spatial particulars with aspects unperceived by them, but perceivable from somewhere else" (Poellner 2007:443). It seems to me that the notion that these aspects might count as perceivable from somewhere else tacitly invokes the idea of another (possible) perceiver whose position is such that she can perceive those aspects. Also, in addition to what I point out in the text, I think there might be another vicious circularity present in Poellner's suggestion insofar as it isn't clear how his creatures could have the sort of full-fledged understanding of space that would allow them to conceive of those other positions from which the unseen aspects would be perceivable. But I shall not pursue this line of criticism.

creature than what is currently presented to it. Once such an understanding is firmly in place, we may appeal to the idea that this "more" could be understood as something given to other perceivers. However, it is entirely unclear what would motivate our completely motionless creature to form such an idea of there being more to the world than its current experience. We cannot solve this problem by helping ourselves to the notion of intersubjectivity. On the contrary, if there are to be other subjects for the motionless creatures, they must be presented to it in its experience. And before we have a basic understanding of how a transcendent, spatial object could be so presented, it is hard to see how we could make any progress with the task of explicating how other subjects might be presented in such a creature's experience.

Perhaps, finally, it could be maintained that there is no logically compelling reason why the notion of objects as being three-dimensional, and thus as possibly possessing unseen aspects, cannot be innate. Well, maybe this is true. To say this, however, would not be to answer the problem of perceptual presence; it would be a refusal to offer any answer. It would be a simple dismissal of all questions concerning the status that absent profiles may have in the experiences of completely motionless creatures. For a phenomenologist, however, the task is to try to make such experience fully intelligible. From this perspective, to renounce all such attempts is only marginally different from admitting that the task cannot be completed.

3.   The importance of active movement

So far, I have only discussed the prospects of denying (1). But the enactive theorist maintains something stronger, namely that "perceiving is a kind of skillful bodily activity" (Noë 2004: 2). More precisely, our ability to perceive depends on our having an implicit understanding of systematic relations between self-movement and sensory appearances, which is derived from experience of *active* self-movement. Above, this was formulated as follows:

(3)   Having had experience of *active* self-movement is a condition for the possibility of perceiving transcendent spatial objects.

In this brief second part of my chapter I will argue that it is highly doubtful whether this "enactive" claim can be maintained. I will consider, and reject, three reasons for thinking that experience of active, self-initiated and self-controlled movement is necessary.

First, it might be thought that if a self-movement is not self-initiated, then we cannot be subjectively aware of it as a self-movement; in particular, we cannot distinguish self-movement from object-movement. As Jeannerod and Pacherie (2004: 114) put it, "if we were only passively moved through space, we wouldn't be in a position

to distinguish between changes in our experiences that are simply a consequence of our having changed places – position-changes – and changes in our experience corresponding to actual changes in the world – state changes".[20] This, however, is wrong. Through the so-called somatosensory system we can be directly aware of the movements and positions of our limbs, even if they are not self-generated. Husserl himself speaks of two different kinds of kinaesthetic sensations besides the active, "free" kinaesthesia: passive, but "allowed" kinaesthesia such as my breathing (which I *could* hold back, if I wanted to); and "foreign" or "compulsory" kinaesthesia, as I have when someone pushes my head or arm (cf. Husserl 1973a: 447). In addition, the vestibular system informs us of the acceleration of our whole body through space, as we know from cases where the vehicle in which we are sitting speeds up or slows down.

Moreover, as Gibson has emphasized, when we are passively moved (e.g. in a vehicle), the flow of visual appearances itself is typically such as to specify this as a case of self-movement as opposed to object-movement.[21] Think of the case of looking at a landscape from a moving train. All features of the landscape are moving past you in a characteristic fashion.[22] When you are driving in your car, the landscape continuously flows towards you from the horizon, and so on. When an object or several objects are moving in relation to you, on the other hand, there is no similar transformation across the visual field as a whole. We may hence speak of a fourth sort of kinaesthesis, namely what Gibson calls "visual kinesthesis" (Gibson 1986: 125).[23]

There is thus no good reason to think that passive self-movement could not be distinguished from object-movement. So there is no obstacle to thinking that a creature incapable of self-initiated movement could experience itself being passively moved through an environment, and distinguish its own passive movement from changes in visual stimulation. However, and this is the second point that can be introduced in favour of the enactive thesis, it could be suggested that the "if-then" structure – the systematic relation between kinaestheses and visual appearances – collapses if a

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20.   For a similar claim, see Overgaard and Grünbaum (2007: 21–2).

21.   Eye-movements, it should be noted, are a special case. When one's eyes are moved passively, the scene before one's eyes seems to move. One can confirm this by closing one eye, and gently pushing the other eyeball with a finger. See Gregory (1998: 102).

22.   The closer objects race past you, while more distant things move more slowly. This is known as "motion parallax" – an important cue to distance.

23.   It does not, of course, give infallible information. We are all familiar with the illusion of the moving train. It is only when the adjoining train has passed, and we can see other features of the environment (e.g. the station building) that we realize that it wasn't our train that was moving.

perceiving subject has no experience of active, self-initiated movement.[24] A subject with experience of passive movement only "would not be able to experience a *systematic relation* between her own movements and the appearances of things in space" (Overgaard & Grünbaum 2007: 22). Rather, she or he would, at most, experience "an arbitrary relation between the dynamic structure of the visual field and the structure of the actual kinaesthetic sequence as it is actualised in this particular situation, but she or he would have no experiential grounds on which to relate it to other possible sequences and thereby to other possible appearances" (ibid.).

There are, it seems to me, two different issues here that should be held apart. The first is the question of the relation between self-movements and the flow of visual appearances. The second concerns the wider context (or "horizon") of possible movements and the associated "horizon" of visual appearances. As for the first, it is not clear why passive movements could not be related to visual appearances in the relevant systematic way. In other words, there is no obvious reason why experiences of passive movement could not lead to an implicit understanding of relations of the following sort: If I were to be moved to such-and-such a position, then such-and-such visual appearances would result. Any reason to think this will not work must hinge on the second point: that whatever movement is (passively) realized, this cannot be related to other possible movements. It cannot, as Husserl would put it, lead to the formation of a kinaesthetic "horizon". If this is right, then it would follow that the actual visual appearance cannot be understood as one profile out of a multitude of absent but "available" profiles of the same, unchanged object. And then, indeed, we would have made it impossible to conceive of perceptual experiences of transcendent, spatial objects.

However, the force of this argument depends on the idea that we cannot make sense of an open-ended kinaesthetic "horizon" for such a passive subject. It seems to me that we *can* make sense of the latter notion. When one such creature is moved, say in a linear fashion, it will surely form implicit expectations (what Husserl calls "protentions") as to what is coming next. And when the movement stops, or changes direction, such a protention will be disappointed; the creature will experience some degree of surprise that the movement did not continue. Surely, this is completely independent of the fact that the creature did not itself have anything to do with initiating or performing the movement. Yet, given such protentions, it is surely understandable that the creature might form some idea of this linear movement continuing (even though in fact the movement did not continue in this fashion). So here we see how the creature

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24.   This suggestion is again found in Overgaard and Grünbaum (2007:22). As should be evident, I am no longer convinced of the truth of some of the stronger claims advanced in that paper.

would be able to conceive of series of *possible* self-movements beyond the movements that actually occurred.

Now, it may well be that for systematic relations of the proper sort to be set up between an open-ended horizon of possible movements and a similar horizon of possible visual appearances, a creature needs to have had experiences with a fairly extensive variety of passive movements. For example, it is plausible that experiences of being moved in a linear way towards an object and away from it will not, by themselves, yield a sufficiently rich kinaesthetic horizon for fully-fledged three-dimensional objects to be perceived. For it is not clear, for example, that a creature with such limited experience would be able to form a notion of "cyclic" movement, a movement *around* an object. In fact, it seems it would rather be the *experience* of cyclic movement and the visual appearances accompanying it that would give rise to the *notion* of a three-dimensional object as something that *can* be moved around. However, a variety of experiences of being moved around would seem sufficient to equip our creature with a kinaesthetic horizon: a horizon of possible (passive) self-movement. In fact, given a sufficiently rich inventory of experiences of passive movement, our passive creature would surely be able to experience an (in principle) *open-ended* kinaesthetic horizon much as we do. And then it seems plausible to assume that the rich inventory of experiences of characteristic changes in visual stimulation corresponding to this inventory of passive movement would enable the creature to forge a link between the kinaesthetic horizon and a horizon of visual stimulation. But surely, this means we have all the ingredients needed to make sense of our passive creature as co-intending absent profiles.[25]

However, here we can introduce the third, and final, objection. Briefly stated, this objection consists in the observation that we have no adequate response to the problem of perceptual presence for passive creatures such as the ones discussed here. It is not clear, after all, that absent profiles could count as "available" to our passive creatures. In particular, the absent profiles could hardly figure in these creatures' experience as "freely at their disposal". The creatures have no way of bringing the profiles into view. This is because, for these creatures, unlike for us, the kinaesthetic horizon would not be "a horizon of freedom" (Husserl 2001: 52). Surely, it must be conceded that there would be a major difference between the experiences of the imagined creatures and

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25.   Research comparing the perceptual development of kittens being moved around passively with kittens moving around actively seems to suggest that the former are perceptually impaired (see Held & Hein 1963). However, Gregory (1998: 143) suggests reasons to be sceptical of this conclusion. Besides, here we are concerned with "essential" matters, not factual matters.

our experience. The answer to the problem of perceptual presence cannot be identical in the two cases.

The crucial question, however, is whether an answer to the problem *can* be given in the case of our passive creatures. And clearly it would be question-begging to simply assume that because absent profiles could not be *freely* at the disposal of passive creatures the problem of perceptual presence cannot be satisfactorily resolved. Whether it can or not is precisely the issue under dispute. I think it is clear that at least a beginning of an answer can be given. Absent profiles could figure in their experiences as "accessible" in some sense. For if and when fortune so decides, these profiles *are* presented to the passive creatures.

Consider also the example discussed above, in which (to put this in purely third-person terms) the rim of my cup first projects a circular shape onto my retina, and then projects gradually more elliptical shapes. I said that the series of visual appearances this gives rise to is ambiguous between three different scenarios. It could be the object is changing shape; it could be it is being gradually tilted away from me; or it could be that I am changing my position vis-à-vis the object. Now, given "visual kinaesthesis", our passive creatures would be able, in principle, to rule out the last scenario. And the distinction between the other two would certainly make sense to them. In fact, on occasion, they might be able to detect the nature of the case. For example, they could be moved immediately after the event into a position that, on the hypothesis that the cup was tilted away, would result in the reappearance of a circular sensory profile. Based on the actually resulting appearance, the ambiguity could be resolved.

To be sure, the visual experiences of such creatures would generally be marred by ambiguities. It would be only very occasionally that such ambiguities were resolved for them, and when this happened it would be nothing but a pure stroke of luck. Here we may catch a first glimpse of the enormous difference between their life-world and ours. However, to begin to gauge this difference is to begin to make sense of their visual experiences. It is to begin to appreciate what their experience might be like, "from the inside". And it does seem that, despite enormous differences, this experience might, like ours, include a co-intending of absent profiles. These would not be "available to the creatures", but they might have some measure of "accessibility".

Perhaps – and with this suggestion I will bring the present discussion to a close – the "accessibility" conclusion could be buttressed by reference to the possible presence of other perceiving subjects. If the experience of being moved about passively can give rise to some conception of the world extending beyond what is currently given to them, then there is no obstacle in principle to them forming an idea of themselves as placed in a world of three-dimensional, transcendent objects. Although a story would have to be told about how they would be able to identify certain particulars within that world as other subjects of experience, there is no reason in principle to think such

a story could not be told.[26] And then it becomes possible for the passive creatures to conceive of what is currently unavailable to their visual perception as something that is currently available to someone else's visual perception.

4.   Concluding remarks

In the preceding pages, I have discussed two theses concerning the connection between self-movement and visual perception.

First, I have argued that creatures that cannot conceive of themselves as potentially moving (or being moved) cannot have visual experiences of transcendent, three-dimensional objects. The attempt to claim otherwise fails to give a satisfactory answer to the problem of perceptual presence. For anyone who goes down that route faces a choice. Either they must concede that somehow absent profiles are co-present as available or accessible. But then we need an account of that availability; and none of the suggestions discussed seemed very promising. Or else they must claim that absent profiles are co-intended as having some other status (e.g. "accessible to others"). But then this story must be fleshed out convincingly. I have suggested that it is hard to see how one could offer a convincing story along either of these lines.

Second, I have argued that we should nevertheless stop short of adopting the "enactivist" perspective. For it seems there is no good reason to think one could not develop the required understanding of oneself as potentially moving (or moved) on the basis of a (sufficiently rich) inventory of experiences of being moved passively. There are, as I have suggested, a number of things we could say about the visual experiences of an imaginary class of passive creatures – enough, perhaps, to make their experiences "fully intelligible to ourselves". Of course, I have come nowhere near completing the latter task here. But I have shown that popular reasons for thinking that the task cannot be completed do not stand up to closer scrutiny. At the very least, this shifts the onus of proof onto the enactivist.

Acknowledgements

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26.   The passive creatures could, for example, observe that certain other particulars in the surroundings were moved around from time to time, and find themselves compelled to view these as other perceiving subjects.

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Emotion regulation through the ages*

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This paper reviews how emotion-regulation has been an archetypal, even a defining theme in the history of Western views about healthy mental functioning. The ancient Greeks bequeathed a constricted view of emotions, however, as 'wild horses' that need to be tamed by reason, which led to an equally constricted view of the development of emotion-regulation. In recent years, significant advances have enabled us to move beyond this classical outlook: most importantly, in our understanding of the types of experiences that enhance the development of emotion-regulation; the factors that can impede these experiences; and the reasons why emotion-regulation is so important for a child's long-term well-being.

1.   Introduction

> I read: "…philosophers are no nearer to the meaning of 'Reality' than Plato got, …". What a strange situation. How extraordinary that Plato could have got even as far as he did! Or that we could not get any further! Was it because Plato was so *extremely* clever?   Wittgenstein, Culture and Value

With this remark, Wittgenstein embarked on his stunning exploration of how, ever since Plato, language has kept leading Western thinkers down the same paths and into

the same cul-de-sacs. One issue he did not consider, however, is the extent to which Plato actually shaped that language, influencing the very questions that we ask and the way we try to answer them. If Wittgenstein is right, then some of the great questions that Western thinkers have struggled with for over two millennia are unanswerable because of some logical problem implicit in the question itself. But sometimes the reason for this obduracy lies in hidden assumptions that are built into the framework. And sometimes, as in the case of emotion-regulation, it is a combination of the two.

In *The First Idea* Stanley Greenspan and I explored the profound influence that a culture has on the kinds of mental traits that parents seek to inculcate in their children (Greenspan & Shanker 2004). Of all these traits, one of the most important – for parents and scientists alike – is that of emotion-regulation, which, according to modern theorists, involves the child's ability to "monitor, evaluate and modify" her emotional responses (Gross & Thompson 2007; Thompson 1994). Over the past decade, significant advances have been made in our understanding of the mechanisms involved and the connections between emotion-regulation and a child's psychological (Kochanska et al. 2000), social (Eisenberg & Spinrad 2004), prosocial (Kochanska et al. 1997), and educational development (Blair 2002). What remains unclear, however, is how these connections are forged, what sorts of biological and/or social factors can impede their formation, and how such obstacles can be mitigated and a child's emotion-regulation enhanced.

The reason why emotion-regulation has become such a leading issue in recent years may in part be due to rapid societal changes and demands that have resulted in a growing number of children with problems regulating their emotions, or children who display largely flat or negative affect. One worry here is that urbanization brings with it all sorts of physical and psychological stresses that test a child who might have coped better in a more rustic setting.[1] There is growing concern, for example, over the amount of visual, auditory, and social stimuli in cities (see Field 2007); the lack of green spaces and nature-based experiences (Kahn & Kellert 2002); the decline of

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Finally, my debt to Stanley Greenspan goes beyond anything that could be justly recorded in a footnote. Those familiar with his work will immediately recognize that the developmental theory presented in this paper was developed by Stanley Greenspan over the course of thirty years.

1.   We can get some idea of these trends from the latest Government of Canada Report (2006) on 'The Well Being of Canada's Young Children'. In 2002/3 16.7% of Canada's children 2–5 years of age displayed signs associated with emotional problems. This is up from 13.8% in the year 1998/1999. In 2002/3, 12.7% of children 2–5 years living in rural areas were reported to have emotional problems, versus 17.2% of children in urban centres. In 2002/3, 7.7% of male children living in urban centres were reported to display signs of hyperactivity and inattention versus 5.15 of rural males.

exercise as it becomes problematic for children to walk to school (Franco et al. 2007; Cotman et al. 2007); the decline of organized sports (Ratey 2008); changing family and social patterns (Mustard et al. 2007); changing leisure pursuits (Healy 1999), and especially, the exposure to violent or troubling emotional themes in the media (Levin 1998); changing eating and sleeping habits (Olfman 2005), and so on.

Furthermore, children have to adjust to the rigors of spending a large part of their day in a formal education setting at an increasingly younger age (Kirp 2007). In order to be able to deal with this challenge, a child has to maintain a calm state and settle herself when she becomes anxious or frustrated. She needs to learn how to control her emotional outbursts, attend to and become interested in what her teacher is saying, and if she is to mix comfortably with other children and take an active role in social interactions, she needs to understand what they are thinking and feeling and adjust her emotions to those of others (Loveland 2005).

What data there is suggests that a large and possibly growing number of children are having trouble meeting these challenges (Rimm-Kaufman et al. 2001). The apparent rise in behavioral problems over the past ten years (Baker & Milligan 2006) and the fact that behavior management programs for young children now abound attests to what is, at least, a widespread perception that there is a serious problem (Twenge 2008). What is unclear is the extent to which the problem may be due to environmental factors that are affecting the pre/postnatal development of prefrontal regulating systems (Kishiyama & Boyce 2009), and/or is due to society's placing ever greater demands on younger and younger children (Levin & Kilbourne 2009). What is clear, however, is that we need to develop a better understanding of the complex interplay between biological and social factors that may lead to a child becoming poorly regulated or even dysregulated.

Apart from the very real practical reasons why emotion-regulation has become such a large concern, there is also a substantial philosophical issue at stake. For emotion-regulation represents the *axis* of mind-body interaction: not the sort of gateway that Descartes claimed to have located in the pineal gland, but rather, the point at which we can identify how the social experiences that shape the growth of the child's mind thereby influence the development of the brain, and how neural structures and processes influence a child's receptivity to these very experiences.

In other words, the natural next question that arises from our exploration in *The First Idea* of the influence that a culture has on the development of a child's mind is whether the same can be asked of a child's brain. From the time of Plato onwards, Western thinkers have debated whether the mind shapes the brain or the brain shapes the mind (Kagan 1994). There is now consensus amongst developmental scientists that the answer to this archetypal question must be: *Both*. But the devil lies in the details: in our understanding of how the nurturing experiences that influence the development of self-regulation influence the organization of those parts of the brain that support

the child's ability to be remain calmly focused and alert, and how neurobiological processes and the organization of neural systems influence the kinds of experiences that a child can process or seeks out (Lewis et al. in press; Tucker 2007).

From a developmental pathways point-of-view (Shanker 2008; Mundy & Burnette 2005), the key point here is that, while these neural factors may *constrain* a child's capacity to regulate her emotions in such-and-such conditions (Lewis 2004), these conditions are constantly changing, not least of which as a consequence of the child's style of regulating her emotions. But then, the more scientists have studied this issue the more they have come to realize that emotion-regulation is not simply a matter of learning how to control one's negative affects; emotions also play a *regulating* role (Lewis et al. in press). Positive emotions are essential, not only for activating and energizing actions (Izard 1991), but also for motivating and sustaining the attention necessary for learning to occur (Tucker 2001).

Indeed, it is ultimately the child's motivation, interest, curiosity, and her feeling of security and self-worth that enable her to *thrive*: to experience what the Ancient Greeks referred to as *eudaimonia*, and what we simply refer to today as *well-being*. When the child exerts the effort required to master some new challenge, or to deal with a growing range of factors (both internal and external) that can interfere with emotion-regulation, her brain is forced to develop the networks needed to support this behavior. There is not some internal mechanism that dictates the extent to which a child can experience such drives. To be sure, a child's desire to confront and conquer these challenges is strongly influenced by biological factors; but it is fueled and supported by the types of interactions that she experiences with her caregivers and teachers (Bruner 1966).

Emotion-regulation affords – and indeed, has afforded from the very moment that Western thinkers started thinking about the mind-body problem – a critical area in which to explore this issue. At birth a child displays a number of automatic or 'reactive' self-regulating behaviors, such as gaze-aversion or withdrawal (Eisenberg 2002). Over the next few years she begins to develop more voluntary self-regulating behaviors, such as seeking out a comforting sight when stressed, or learning how to reappraise a discomfiting emotion (Rothbart 1989). There is such a complicated nexus between these two aspects of emotion-regulation that it may, for all intents and purposes, be impossible to disentangle them.

For example, is the reason why a child is having problems controlling her anxiety because she hasn't learnt how to redirect her attention, or is it because she is so excessively over-reactive to novel stimuli that this overloads her voluntary self-regulating abilities (Kagan 1998)? The same point applies to caregiving experiences. Extensive research suggests that there is a close connection between a caregiver's parenting style and the child's attentional control (Calkins & Johnson 1998). But is a caregiver overly directive because the child is overly reactive? Is maternal sensitivity to some extent

a function of a child's temperament? Or a reflection of how the parent self-regulates around the stresses involved in parenting?

What is clear is that emotion-regulation does not simply kick in when the brain reaches a certain level of maturation, although the growth of the prefrontal cortex is clearly a critical factor in the development of emotion-regulation (Diamond 2002; Stuss & Alexander 2000). Rather, emotion-regulation represents a paradigm example of why developmental scientists now think in terms of a nature/nurture *synthesis* (Lewis 2005; Gottlieb 1997). For no matter how robust a child's biological endowment, the presence of specific types of caregiver-infant interactions is decisive in the ongoing development of emotion-regulation: an idea that is not nearly quite as modern as it sounds.

As we shall see, the roots of our preoccupation with emotion-regulation are surprisingly ancient. Indeed, the very manner in which developmental neuroscientists look at emotion-regulation is surprisingly ancient: the questions asked, the processes emphasized, even the tasks used to study the relevant neural systems, have their roots in a Western outlook that traces back to Plato's reading of Homer. There is, perhaps, no more significant example of the profound influence that Plato has had on the kinds of mental traits that parents seek to inculcate in their children than that of emotion-regulation; and, perhaps, no more pressing area where we need to go beyond his way of thinking if we are to succeed in enhancing the healthy mental functioning of our children.

2.   The wrath of Achilles

Just as the culture that we inhabit is one that prizes the cognitive skills celebrated by the Ancient Greeks, so too developmental scientists remain preoccupied with the same question that preoccupied the ancient Greeks: namely, how does a child acquire the capacity to regulate her appetites and emotions? From the time of Plato onwards Western thinkers have been obsessed with the question of which kinds of caregiving practices can best support the development of this capacity. That is certainly not to suggest that the West has succeeded in developing a 'more regulated child' than other cultures: i.e. a return to the sort of absurdity seen in Charles White's thesis that the Ancient Greeks marked the apex of human evolution (see White 1799). Yet one can't help but wonder how much the incredible march of science and technology over the past 2,000 years owes to a poem: the greatest of all the ancient epics.

Whether or not Homer intended the *Iliad* to be read as a meditation on the importance of emotion-regulation, it came to symbolize and nourish an obsession with precisely that theme. Achilles was regularly used by Western thinkers to illustrate the damage wrought by uncontrolled emotions on one's well-being. In some ways the

Iliad came to be read like a medieval mystery play rather than a heroic epic. Unlike the contemporary cinematic depiction of the *Iliad*, which has much more in common with ancient mythology, Achilles served for Western philosophers as a foil to Socrates, who had *learned* to master his emotions.

The perepeteia of the *Iliad* occurs in Book IX, when Achilles, who has been deeply affronted by the insult to his honour that he has suffered at the hands of Agamemnon, the leader of the Greek armies, rejects the overtures of the peace commission led by Odysseus. We have been led all along to expect that Achilles will accept Agamemnon's "gifts of friendship" (9.113).[2] But when the critical moment arrives Achilles is unable to accept the offering, which various authorities assure us is extremely generous. Achilles seems to be as surprised as everyone else by his own intransigence (9.636–9; 9.645). He presents Agamemnon with terms that couldn't possibly be met (9.385–387), derailing a story that, up until this point, had been proceeding along standard heroic lines (as Phoinix reminds us at 9.523–6).

There have been many attempts to explain just why Achilles refuses to accept Agamemnon's lavish attempt to atone for his "moment of madness" (which includes marriage to one of his own daughters). Whatever the reason, it is clear that Achilles' decision brings a larger psychological issue to the fore; for unlike Socrates' refusal in the *Apology* to abandon the role of philosophy as he conceives it – which must, as Socrates fully recognizes, lead to his own destruction – Achilles' action (or rather, lack thereof) results in the whole-scale slaughter of his comrades (as Odysseus reminds us at 9.300–303) and not just himself.

Whereas for the ancient Greeks it was Agamemnon who was to be faulted, for Western thinkers it became Achilles who should be censured, and not without some basis in the text. For Achilles makes it clear that he held his comrades just as responsible as Agamemnon for the insult to his honour: i.e. for failing to side with him in his quarrel with Agamemnon (9.316–317). Nestor reminds us at the start of Book IX that "Out of all brotherhood, outlawed, homeless shall be that man/who longs for all the horror of fighting among his own people" (9.63–4). He is clearly alluding to Agamemnon, but for later commentators, the question being raised here is whether Achilles himself was any less guilty of this cardinal sin against his community (Sorabji 2000). The important point, however, was simply that the connection between individual and social well-being had become inextricably bound together.

Most significant is the fact that Achilles has completely lost his capacity to regulate his emotions, a victim of his own "uncontrollable fury" (*ménos*). We are repeatedly

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2.   At 1.213–214 Athena tells Achilles that "Some day three times over such shining gifts shall be given you by reason of this outrage." This is indeed what happens and, at the start of the poem, Achilles seems to be indicating that he will indeed accept this restitution when it comes.

told how he has been thrown into this dysregulated state by the combined forces of his overpowering spirit or life force (*thūmós*); Agamemnon's transgression; the failure of his society to honour its own heroic code; and the uncharted psychological waters in which he finds himself. In book XI Homer presents us with a powerful image of the paralyzed state into which Achilles has been thrown, standing on the stern of his beached ship and watching the battle unfold in the distance (11.599). From this inability to act flows a series of disasters, leading, ultimately, to the deaths of Patroclus and Hector, the "devastation" and "thousandfold pains" suffered by the Achaeans, and Achilles' own death (which is foreshadowed in the *Iliad*).

One has to be careful, of course, about allowing modern sensibilities to intrude on one's interpretation of how ancient Greeks might have construed Achilles' behavior. Yet it is noteworthy that numerous characters within the poem – including such reliable sources as Patroclus (16.29–30), Ajax (9.629–30) and even Achilles himself (16.203–206) – comment on how Achilles' spirit (*thumos*) is out of control, culminating in Apollo's warning in the final book that "*Achilles' mind is unbalanced, nor is his thought kept in check in his breast; his thoughts are wild, like a lion who gives in to his great force and overmanly heart and goes against the flocks of mortals, to seize his feast; so Achilles has lost pity, and there is no abashment in him*" (24.39–45).[3] Moreover, just before Apollo utters these lines, the narrator describes how, unable to overcome his grief over Patroclus' death, Achilles, unlike the rest of the army, is unable to sleep, weeps uncontrollably, and lies "sometimes along his side, sometimes on his back, and now again prone on his face; then he would stand upright, and pace turning in distraction along the beach of the sea".

The great question that the *Iliad* raises is: what brought Achilles to this state? Of all the many different answers that Homer himself explored, one of the most important occurs towards the end of the meeting with the peace commission in Book 9. Homer inserts a long speech by Phoinix, which, on the surface is somewhat puzzling insofar as it seems to disrupt the flow of the scene. But there is a telling line at 9.485: after learning how Peleus had entrusted him to raise his son, Phoinix remarks: "I made you all that you are now". Suddenly we are given an insight into just what sort of upbringing Achilles has had.

One is reminded of the beginning of *Don Quixote*, where we learn that Alonso Quijano has spent far too much time reading old chronicles on chivalry. What Phoinix's speech reveals is how Achilles has been raised on similar heroic stories, told to him over and over and thereby molding his character, but without the necessary experiences that would enable him to remain in control of his emotions in the face of great stress. This would explain the deep poignancy of Achilles response to this long speech,

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3.   This is Michael Clarke's translation (Clarke 2004).

in which he rejects the heroic code that Phoinix sought to instill in him (9.607–608). But what he cannot reject is the character that Phoinix stamped onto a temperament that was vulnerable to just the collapse that we witness. Or at least, this was the theme that Plato was to explore throughout his writings.

3.   The new Achilles

One of the most intriguing of all the allusions to Homer in Plato occurs in what is commonly regarded as amongst the earliest of the dialogues. Socrates tells his jurors in the *Apology* that his determination to continue as a philosopher, should they decide to spare his life, should be compared to Achilles' decision to return to battle, even though it portends his early death (*Apol* 28cd). Socrates' point is that the kind of heroism it takes to be a philosopher is comparable to the heroism displayed by Achilles.[4] It seems likely that it was the historical Socrates who originally made this comparison, but it is a studied decision on Plato's part to return to this theme over and over.

No doubt this sort of allusion to Achilles was common at the time, but in Plato's hands it is latent with psychological meaning. In the *Laches* Plato has Socrates define courage as applying, not just to a warrior's behavior on the battlefront, but as including "those who are brave in dangers at sea, and the ones who show courage in illness and poverty and affairs of state" (Laches 191d). Plato is attempting to show that the concept of courage operates at a relatively polarized level in Homer, and shift it into a grey-area concept where the individual applies it to his own behavior as an internal standard. That is, he sets out to show that Homer's definition of *courage* is one-dimensional: viz., the individual must behave in such-and-such a way in battle in order to demonstrate courage. The idea that *courage* can be applied to the behavior of someone who is ill or frightened is a question that could not arise in Homer. But what Plato is doing is not so much an attack on the Homeric ethos as an attempt to raise it to a more advanced level of psychological functioning: one that applies to all human beings and not just a demi-god.

Throughout the *Iliad* Achilles is compared to a rampaging lion. At the end of the *Laches* Plato raises the question whether a lion does, in fact, demonstrate courage, and thence, whether Achilles' behavior, which licensed this simile, can be described as courageous. Laches asks Nicias whether he is saying that wild beasts are not, in fact, brave, and Nicias answers: "rashness and courage are not the same thing"; the cases which

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4.   Plato returns to this theme in the Crito (44), the Hippias Major (292) and Hippias Minor (363), it runs all through the Republic: indeed, allusions to Achilles occur in the great majority of Plato's writings (see Hobbs 2000).

"the man in the street calls courageous, I call rash" (*Laches* 197c). Nicias makes the point that wild animals or small children who do not fear something because they don't know that it should be feared cannot be called courageous; he would not call someone who "for lack of understanding, does not fear what should be feared" courageous but rather "rash and mad" (*Laches* 197b).

Plato's intention here was not to convince his contemporaries that Achilles was not, in fact, brave, but rather to highlight the importance of the shift introduced by Homer from the pre-Homeric homage paid to the hero who goes beserk in battle to the Homeric exploration of emotional control, such as Achilles demonstrates when he reconciles with Priam. The calmly regulated person is the one who experiences pride, shame, anger, happiness, and so on, and not just his fear in battle, and controls these emotions. The kind of emotion-regulation that Plato is talking about, therefore, is that which is learned, which requires some effort on the part of the individual.

The very fact that the comparison of Socrates to Achilles is such a recurrent theme in the dialogues (sometimes quite subtle) tells us that more is involved here than a mere figure of speech. But how can we compare this towering figure of philosophical enlightenment to the great hero of the *Iliad* who, as we just saw, collapses and ultimately goes berserk before he finally recovers his equilibrium? It is always possible that Plato intended this to be read ironically, but it seems far more likely that Plato intended this comparison to be read literally: i.e. that Socrates should be seen as the 'new Achilles' of the rationalist age. This is a Socrates of heroic dimensions who at the same time serves as an Everyman: a model of what each of us can and should strive to attain.

According to this reading, the reason why there should be a section on the *Iliad* in a paper such as this on emotion-regulation is because of Plato. In Plato's words – to a significant extent because of Plato's words! – Homer should be seen as the "educator of Greece" (Resp 606e).[5] The very fact that Plato and following him, Aristotle, were so interested in the *Iliad* is often cited as important evidence of Homer's stature in ancient Greece, and was to a considerable extent the source of that stature.

Plato's (and Aristotle's) reading of Achilles is filtered through the lens of tragedy; for like both Sophocles and Euripedes, they were concerned – as indeed were several of the great Hellenic philosophers who followed in their footsteps – with the consequences of the "wrath of Achilles," not simply for his society, but more fundamentally, for Achilles' own well-being. Indeed, the point of Plato's comparison of Socrates to Achilles is very much a product of the tragedians' twinned preoccupation with the

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5.   Note that in 380BC, Isokrates recounts how it was thought that, by listening to the Iliad and the Odyssey, one would come to "desire to perform the same deeds" (Panagyrikos 159).

issues of madness and temperance.[6] But unlike the tragedians, Plato saw Achilles' emotional turmoil, not as the result of an external agent (i.e. a vengeful god), or a conflict with his society, but rather *the consequence of the manner in which his character was formed.*

In Plato's hands, the *Iliad* becomes a psychological meditation on the development of emotion-regulation: on how to tailor one's interactions with a child in order to maximize that child's potential to regulate his or her emotions. For some idea of just how influential this interpretation of the *Iliad* was on Western thought, one need only read *Emile* and Rousseau's advice to the reader early on to "Read Plato's *Republic*. It is not at all a political work, as think those who judge books only by their titles. It is the most beautiful educational treatise ever written" (Rousseau 1782).

What Rousseau is referring to here is the Enlightenment "dream of perfectability": the question of how to maximize a child's ability to master his or her emotions and appetites. As far as Rousseau was concerned, Plato's key message was that Achilles' eventual collapse was fixed by the manner in which he was raised. If we go back to the speech by Phoinix discussed in the preceding section, in which he alludes to the manner in which he raised Achilles to be a hero, we can see Plato telling us that what Phoinix accomplished was precisely the Achilles who cannot control his emotions in the face of great trauma.

That is not to say that, according to Plato, any child who had been raised in a like manner would have turned out to be an Achilles. Plato distinguishes, for example, between the effects of too much flute music on a child with a weak *thumos* and one who has a very "spirited nature" (Rep. 411b). The former "will become weak and dissolute," the latter "quick-tempered, prone to anger and filled with discontent, rather than spirited." Overlooking what must strike us today as Plato's rather curious hostility to the flute, the important point here is Plato's insistence that a child's caregiving experiences should be tailored to suit the child's temperament: something that Plato, long before Mary Rothbart sharpened our focus (1989), saw in biological terms.

Achilles operates as an example of someone born with an overweening *thumos* and raised on a regimen that no doubt included too much lyre-playing. He illustrates how those who "devote themselves exclusively to physical training turn out to be more savage than they should," where "the source of the savageness is the spirited part of one's nature" (Rep 410d). Herein lies the source of the distinction that Plato makes in the *Republic* between courage and savagery: *Thumos*, "if rightly nurtured, becomes courageous, but if it's overstrained, it's likely to become hard and harsh" (Rep. 410d).

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6.   Throughout the tragedies the chorus is constantly reminding us of the importance of harmony and balance, moderation and temperance. Typically, the antonym for madness in the great tragedies is sōphrosunē, moderation or temperance (Simon 1978:92).

Achilles is the paradigm example of the thumoeidic person who has not been "rightly nurtured," insofar as he descends into a dysregulated state. Indeed, it is for exactly this reason that Plato returns so often to the example of Achilles to illustrate his argument about the importance of appropriate nurturing for developing the capacity to regulate one's emotions.

But then, what is the key characteristic of an individual-differences approach to *appropriate nurturing*? Once again, Achilles provides Plato with the perfect vehicle for his answer. At the height of his frenzy, when his primal emotions have been unleashed, Achilles descends to the level of a beast and, in this maddened state, commits what Apollo describes as "evil" and "shameful deeds" (21.19).[7] What restores him to normalcy at the end of the poem is not a blood-letting, or soothing potions, or a sacrifice to the gods, but the fact that, by identifying Priam with his own father – what we might describe today as an act of *cognitive reappraisal*! – Achilles is able to regain control over his emotions. This idea becomes the key, not simply to the ancient Greek view of emotion-regulation, but a theme that has dominated western thinking about the subject right up to the present.

4.   The problem of Akrasia

Plato's view of unbridled emotion as the source of "mental disease" and reason as the means to "mental health" was the hallmark of the rationalist revolution that occurred in the 5th century BCE. This pivotal event in the formation of western consciousness was marked by the celebration of logic, and, intimately connected with this, the emergence of science. As far as the history of Western thinking about the mind is concerned, its most important feature was this bifurcation between reason and emotion: quite literally, in Plato's model, as belonging to different parts of the *psuchē* (see, e.g. *Rep* 604). It is an idea that is not that far removed from modern views of emotions as originating in subcortical systems and the executive functions regulating these impulses that are supported by prefrontal cortical systems (see Ledoux 1996).

For Plato, emotions are very much a part of the mind, with their own predetermined set of desires. This makes it difficult to say whether Plato viewed the bifurcation between reason and emotion as a conflict between rational and irrational (or arational) forces. But for the Stoic philosophers who followed in his footsteps it is clear

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7.   Achilles is the paradigm example of someone who can do "whatever he wishes, except what will free him from vice and injustice and make him acquire justice and virtue"; he thus illustrates the force of the point: "how can it be worth living when his psuchē – the very thing by which he lives – is ruined and in turmoil?" (Rep 445b)

that the bifurcation between reason and emotion does not involve a conflict between the rational and irrational; for they regarded emotions themselves as *cognitive* phenomena: judgments about the value of responding in such-and-such a way to an event. Indeed, it is precisely because of this cognitive basis that emotions were thought to be amenable to "philosophical therapy." Thus for the ancients there was no problem of explaining how our emotional responses are elicited by our appraisals of the significance of an event, for them, emotions just *are* 'cognitive appraisals'.

To be sure, the Stoics talk about 'first movements', which encompass what we would describe as autonomic and automatic reactions. But for the Stoics these 'first movements' are not in any way primitive emotions, or even part of emotions; rather, they are simply physical reactions triggered by an event that may or may not elicit an emotion. An emotion must, by definition, involve the value judgment that there is benefit or harm at hand and that it is appropriate to react in such-and-such a way to this event (see Sorabji 2000). For example, I may get goose bumps from a breeze but that does not elicit a feeling of fear, whereas goose bumps produced by the sight of a charging lion are likely accompanied by such an emotion. The 'first movements' themselves are similar in both cases; the difference between my two responses lies in my having no emotional response to the first event and an emotional response to the second.

Why, then, do certain events trigger an emotion? For the Stoics, the answer was that we are *taught* to respond in these ways. That is, society teaches us to fear the prospect of death or to feel love for another human being (Nussbaum 1994). Hence emotions are social constructions, and given what the ancients saw as the depravity of society, it is no surprise that emotions should be the source of so much human misery. Far from holding the key to our happiness, they are the basic obstacle we must overcome. And *given* their fundamental belief that happiness is what we all strive for, or will strive for if we are rational, it follows that we must learn to contain, and if possible, curtail this damaging element of our psyche.

As we shall see below, such an argument may not be all that far removed from current thinking about appraisal, although it represents a striking contrast with those modern theorists who see emotions as playing an important positive as well as negative role in cognition (Diamond & Aspinwall 2003). That is, while we might agree with the ancients as far as the negative consequences of catastrophic emotions are concerned, there is considerable interest today in the constructive role that emotions play in, e.g. motivating or focusing attention. But the Stoics had no such interest in exploring a positive side of emotions; for them, emotions were a negative phenomenon that, at a minimum, had to be controlled if not actually extirpated by learning how to view reality for what it is, shorn of social conditioning.

What came to be seen as the problem of *akrasia* – the question of why people behave in ways that are contrary to their own self-interest – dominated philosophical

thinking throughout the classical age. Indeed, even though the *Iliad* remained unknown during the Dark and Middle Ages, its view of the consequences for mental health if emotions are not held in check infused Christian thinking (Sorabji 2000). Over and over one encounters the basic theme that when emotion is not ruled by reason the result is mental pain and possibly madness. It is not surprising that a warrior culture should have placed so much importance on holding one's emotions in check – especially, one's fear of death. But, through his depictions of all the major characters (e.g. Agamemnon's greed and pusillanimity, Paris' vanity) Homer transformed this elemental theme into a meditation on the need to control all one's passions: be it anger, love, grief, or lust (whether for plunder or *kléos*).

5.   The prevention of mental illness

The question of whether or not Achilles was free to choose his own destiny is not one that could be asked until the first century BCE (see Sorabji 2000 Chapter 21) – at least, not in terms that we would recognize as similar to what we understand by *free will*. It is not at all clear, then, how Plato would respond to the question of whether or not Achilles was responsible for his own breakdown and subsequent actions. But it is certainly a question that is – or should be – uppermost in our own minds when we think about the reasons why young children have trouble regulating their behavior.

We saw in the preceding section how Plato placed great emphasis on the significance of the kinds of childhood experiences that Achilles had undergone as the source of his overweening thumoedic spirit; perhaps that might be taken to mean that Achilles was more a victim of his temperament rather than its author. Even in Homer, and certainly in Plato, there is a moral overtone to this argument. We frequently encounter the suggestion that when one allows oneself to be ruled by one's emotions and appetites one descends to the level of the beasts: a theme that is already present in the *Iliad*, with some of the censure that was to become so prominent in later writings. But ancient thinking seems primarily to have been that the reason why one should gain control over – or even, according to the Stoics, *eradicate* – one's emotions was in order to enjoy tranquility. If the fear of death causes much mental anguish then one must learn to be passive to its inevitability: e.g. to condition oneself, as Epictetus counseled, to the eventual loss of one's loved ones. Hence the widespread appeal of the story that, when told of his son's untimely death Anaxagoras replied: "I knew that I had begotten a mortal."

Does that mean that, just as the glutton was seen as responsible for his own dissolute condition, the mentally ill were also seen as somehow responsible for their "disease," and for that reason *deserved* to be treated harshly? Plato's remark that a family should seek to contain a mentally ill person "by whatever means they can improvise" would seem to sanction the barbaric practices that followed, such as binding the insane in

chains or forcing them to live amongst the household's animals. Yet Plato's primary reason for wishing to sequester the mad was in order to preserve social harmony. Far from seeing madness as the result of demonic forces, or as a sign of intrinsic guilt, he identified madness as "a disease of the *psuchē*" (Tim 86b). In fact, he distinguished between "several kinds of madness, brought on by several causes. [Some] are the result of illness, but there are some people with an unfortunate natural irritability, made worse by poor discipline (Laws xi.934.d).

Plato was the first to talk about the causes of mental illness, and how madness might be prevented. The upshot of his argument is that, regardless of whether an individual's madness is the result of illness or the wrong sorts of childhood experiences, Hippocratic medicine would be limited in its capacity to cure the adult's mental affliction, insofar as both types of psychopathology are ultimately due to "one or another corrupt condition of his body and an uneducated upbringing" (Tim 86e). But even "rational discourse" will have a limited impact on the truly mad. Hence the reason why there is so much emphasis in Plato's writings on the early years of life and the need to discover which kinds of experience will best cater to the temperament of a child and create the discipline needed to enjoy both mental and physical health.

It is an argument with a remarkably modern ring to it. But, apart from Posidonus, it was not an idea that was seriously pursued by ancient thinkers. Rather, their attention became increasingly fixed on the idea that the failure to control one's emotions was a sign of character weakness. To be sure, they continued to accept that a great many cases of mental illness were the result of physical disease; yet even these latter cases were traced back to the failure to inculcate the sorts of habits and attitudes that promote humoral balance. Thus Galen, who was to exercise more influence in the history of Western medicine than any other figure, stressed above all else the role of a proper regimen in the pursuit of physical and mental health. And given that we alone are responsible for what we eat and drink, or our work and exercise ethic, it follows that we alone are responsible for engaging in those sorts of actions that exacerbate humoral imbalances, resulting in physical and mental disease (Temkin 1991).

By the time we get to the early Christian thinkers, who, as Sorabji has shown (2000), were profoundly influenced by Stoic doctrine, we get an extremely close connection drawn between disease, whether physical or mental, and sin. This was seen as the direct result of Original Sin; for prior to the Fall Adam and Eve enjoyed perfect humoral balance, with reason in full control of their emotions, and thus, immunity from disease. By succumbing to the Devil's temptation, their reason weakened and their affects strengthened. Henceforward it became a constant struggle for humans to control their emotions, all of which have a corrupting influence on the body (i.e. on the humors). Mental illness was seen as clear proof of sin: i.e. of the failure to control one's emotions. Indeed, mental illness was regarded as perhaps the worst of all diseases, insofar as it represents the utter collapse of reason.

To this day there remains a tendency to stigmatize a child who has trouble regulating his emotions. If not the child himself who is seen as responsible for his externalizing or internalizing problems, then we lay the blame on some external cause: his genes perhaps, or his parents, or his peers, or the media. Unfortunately, the likelihood is that the child who is having self-regulating problems will be exposed to experiences that only serve to exacerbate those problems. The challenge that we face, if we are to overcome this archaic attitude, is only partly a matter of better understanding the developmental pathways involved in emotion-regulation; on a conceptual level, we also need to consider the limitations in the original Greek view of emotions.

6.   The positive role of emotions

There could be no more telling indication of the persisting influence of Stoic thought on modern sensibilities than the fact that we so often still speak of "emotion-*regulation*" full-stop, as if basic emotions constitute elemental forces – Plato's "wild horses" – that need to be reined in, without considering the regulating role of emotions (Lewis et al. in press). According to contemporary 'affect program' theorists (Ekman 1992), basic emotions are triggered by a selective range of stimuli, setting off a wave of physiological, behavioral and experiential responses that the child cannot regulate himself due to his under-developed Executive Functions. If, for example, a baby starts to become angry, the emotion will, if the child is left alone, keep escalating until sheer exhaustion forces the system to shut down.[8] The caregiver must thus exercise this regulating function until such time as the relevant prefrontal systems can support this function on their own (Fox & Calkins 2003).

On one line of thinking, then, it has taken us 2000 years to bring these ancient Greek insights to fruition; but on another line of thinking, it has taken us this long to overcome the moralism associated with emotion-regulation. It has also taken us this long to get to the point where we can recognize a deep tension running throughout Western thought between the idea that emotions are something that need to be regulated and the idea that through appropriate caregiving practices we can enhance the regulating role of emotions. The problem was that these caregiving practices were viewed as a means of controlling a disruptive element in the psyche rather than as

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8.   In fact, this is a strategy some parents use for hyper-active children who cannot calm down for bed: i.e. they just let them keep running until utter exhaustion kicks in, or they might let the child cry itself to sleep. See (Calkins & Hill 2007) on the long-term consequences of these strategies.

recruiting this very element of the psyche in the development of the capacities that enable one to enjoy a meaningful life.

We now possess abundant evidence showing how important it is for mental health that a child learns how to control her negative emotions (Bradley 2000). But the study of emotion-regulation is not just concerned with the control of fear, anxiety, anger, and frustration; equally important are goal selection, interest, motivation, curiosity, cognitive flexibility, effective decision-making, calmness, and contentment. In other words, positive emotions can play an energizing and even a regulating role, while negative emotions (anger, fear, anxiety, sadness) need to be controlled. Furthermore, there is a dynamic interplay between negative and positive emotion-regulation in different contexts: e.g. a transition between them, or a positive reframing of potentially embarrassing, frustrating or frightening circumstances (Diamond & Aspinwall 2003).

Developmental neuroscientists have gone still further and have looked at the crucial role of emotion in the consolidation of synaptic connections (Tucker et al. 2000) and in the integration of various parts of the brain involved in spontaneous cognitive activities of all kinds (Lewis 2004). Tucker and Lewis have proposed the metaphor of vertical integration along a "neuroaxis" as a way of understanding the sorts of top-down and bottom-up coordination involved in emotion-regulation (Tucker 2007; Lewis 2005). The *neuroaxis* is conceptualized as proceeding from the lowest or most primitive level of the brain (the brain stem) to the most advanced (i.e. phylogenetically newest) structures in the cerebral cortex. The idea here is that the oldest levels are the most structured at birth. These are the automatic perceptual and behavioral programs that flow up the neuroaxis: i.e. stimulus-response systems formed in our prehistory. At the upper end are the highly plastic structures that are shaped by the child's experiences (Tucker 2001; Lewis 2005; Lewis & Todd 2007).

The more there is 'synchrony' between these different levels of the neuroaxis the more stable and flexible is the brain's response to a stimulus. Equally important is the number of systems involved, their amplitude, and their processing efficiency. That is, some forms of regulation are more constricting than others, in terms of being in an optimal state for learning to occur (see Shanker 2010). This is especially true in the case of autism, where reactive self-regulating mechanisms strongly inhibit the child's capacity to engage in those early social experiences that are essential for the development of effortful self-control (see Shanker et al. in preparation). But the same point also applies to voluntary forms of self-regulation.

For example, if it requires a great deal of effort to remain calm, the child might have little remaining capacity to attend to what her caregiver is saying. Or if a child deals with her feelings of distress or anxiety by withdrawal, she might be cutting himself off from experiences that are necessary for the development of the 'social' brain network (Shanker et al. in preparation). Similarly, a child who regulates herself by, e.g.

self-stimming or perseverating might be able to maintain a feeling of relative calm, but such actions will significantly inhibit the child's capacity to attend to other aspects of her environment (Casenhiser in preparation; Casenhiser et al. in preparation).

It might be tempting to view the *neuroaxis* as exemplifying the view that emotion and reason reside at opposite poles. That is, emotions would occupy the lower levels of the neuroaxis, the source of automatic responses to stimuli, and the uppermost level would be the home of Executive Functions, where reason serves to tame the impulses surging up from below. But Lewis has repeatedly stressed that "in every part of the brain, from the cerebral cortex to the brain stem, it is usually impossible to assign either cognitive or emotional functions to any particular structure" (Lewis & Todd 2007). That is, all brain processes have cognitive aspects such as appraisal (i.e. interpretation of the world) or self-monitoring (i.e. appraisal of the self) and emotional response aspects (i.e. an urge to act in keeping with those interpretations; Lewis 2005).

What this argument amounts to is the claim that brain systems cannot be parsed into psychological categories: i.e. it is impossible to assign strictly cognitive or emotional functions to any particular structure, and even if one chose to do so, many structures become synchronized in all neural functions, so trying to distinguish between them is a bit like trying to separate the woodwinds from the strings in a melody. What we see are "whole brain" processes in which a stimulus ends up exciting everything in the brain, some systems more so than others, and cognition and emotion are both involved in every response.[9]

In one sense this conclusion has been known for some time: it goes back to a point that Anthony Kenny made famous in his classic paper on 'The Homunculus Fallacy' that, for strictly logical reasons, concepts that apply to a *person* cannot be applied to parts of that person (e.g. brain systems; see Kenny 1971). But there is a deeper issue at stake: one that relates to the Greek bifurcationist view of the mind. For the Greek model of emotion-regulation is grounded in their picture of emotions and reason as

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9.   For example, sensory input makes its way to the amygdala very quickly, and also to the frontal cortex, which has inhibitory (regulatory) connections back to the amygdala and the rest of the limbic system (and probably also back to the sensory cortex aiding it in its perceptual tasks). Young children have stronger reactions to stimulation (e.g. they are more easily frightened by loud noises, etc) either because the amygdala overreacts or because it is under-inhibited by the PFC. The PFC also regulates thalamic (n. reticularis) input to the cortex, so as it matures, the PFC becomes capable of reducing the effects of input: sort of shutting off the stimulation at the faucet. We call this habituation, or sensory gating, and this isn't as possible in those with damaged frontal lobes. Activation in the amygdala energizes the cortex by activating the stress responses, increasing cortical activation and increasing the likelihood that the PFC will typically shut down the stimulation cycle somewhat.

residing in different parts of the psyche; and it is precisely this picture that we need to transcend if we are to understand how self-regulation involves 'whole mind' as much as 'whole brain' processes.

7.   The critical role of affect signals in self-regulation

As touched on above, Marc Lewis, more than any other contemporary emotion theorist, has drawn attention to the fact that it is impossible to parse neural systems into separate cognitive and emotion functions (Lewis 2005). Lewis's point is that systems up and down the 'neuroaxis' are so tightly bound together, or involved in multiple functions, that it is impossible to assign strictly cognitive or emotion functions to any particular structure. But as Lewis has explained in his recent writings, this discovery should not be in the least surprising, given how tightly interwoven cognitive and emotional elements are at the psychological level (Lewis et al. in press).

It was precisely in order to explain how this interweaving comes about that we introduced the notion of *emotional transformations* in *The First Idea*: i.e. the idea that in the first two years of life emotional, cognitive, communicative and social processes become increasingly bound together as the result of infant-caregiver emotional interactions (Shanker & Greenspan 2007). To be sure, as Kagan showed early on in his career, some infants can be extremely sensitive to novel stimuli (Kagan 1989); but even here the caregiver's responses can play a critical role in the child's development of effortful control (Greenspan & Shanker 2004).

The crux of Lewis' neuroaxis hypothesis is that the more time there is between stimulus and response, the more opportunity to select the most beneficial action. But, of course, the big question is: how do a child's experiences help to stretch out the time between stimulus and response? The answer to this question, we argued, lies in these emotional interactions that the child experiences with her caregivers. What is involved here is not simply learning such things as strategies for reducing one's fear or anxiety, but the very meanings that a child comes to associate with a stimulus, which serve to stretch out the time between stimulus and response.

The critical role of the caregiver's subtle affect signals in this process is a point that is easily overlooked. Consider, for example, the famous example from LeDoux of a child who sees what looks like a snake on the path: the thalamus, which first receives the signal, interprets it as a snake and stimulates the amygdala to produce a fear response. On Ledoux' reading, the visual cortex, with its more refined perceptual discrimination, also receives the signal from the thalamus and, if it determines that the object is a stick and not a snake, sends a message to the amygdala that quells the fear or stress response (LeDoux 1996).

Neuroscientists have added considerably to the complexity of this story. Instead of a linear stimulus-response-reappraisal sequence, they argue for a complex interaction

between the limbic system and the outer layers of the cortex, in which limbic reso-
nance guides focused perception and reappraisal (Lewis et al. in press; Tucker 2001).
But what is the nature of the experience that leads to this complex dynamic process?

It could, of course, simply be trial-and-error: e.g. through repeated exposures to
snakes and sticks, the brain learns how to distinguish between the two. But note how
phrasing the argument in this manner runs the risk of succumbing to the mereo-
logical fallacy (Bennet & Hacker 2003). For it is the child who learns to distinguish
between snakes and sticks, not a part of the child's brain. And the reason why this
classic philosophical argument is so relevant here isn't simply because it clarifies the
logical grammar of *reappraisal* as a person-concept: it is because it draws attention
to the importance of viewing reappraisal as a higher-order, developmental outcome,
comparable to the sort of self-modifying algorithms used in pattern-recognition
systems.

That is, if it is the *child* who learns to distinguish between snakes and sticks, then
this raises the obvious question of *how*. Perhaps there are some children who carefully
scrutinize the various objects in their environment and thereby learn to differentiate;
but far more often it is how the caregiver responds to a stimulus, or to her infant's
response to a stimulus, that leads to the sort of reappraisal described by LeDoux. For
example, an anxious or startled response from the caregiver will often result in a simi-
lar behavior in the infant, as will utter indifference on the part of the caregiver. Indeed,
depending on how the caregiver responds, the infant might become terrified by the
sight of sticks (i.e. mom suffers from a form of hylophobia); fascinated by the sight
of sticks (is it suitable for termite-fishing); excited by the sight of sticks (kindling for
the cooking fire); aware of a stick's communicative significance (signifying "turn left
here"; Savage-Rumbaugh et al. 1986), and so on. It is through a caregiver's actions and
reactions that an infant is typically led to appraise or reappraise as the case might be.

What brought this particular example to mind was the fascinating new book by
Lynne Isbell documenting how our visual system evolved in an ecology that our pri-
mate ancestors shared with snakes (Isbell 2009). What she shows in convincing detail
is that there do appear to be human perceptual biases in the detection of evolution-
arily relevant threat stimuli (cf. LoBue & DeLoache 2008). The fascinating studies by
Cook and Minkea showed that monkeys quickly learn to be afraid of snakes if they see
another monkey react fearfully to the sight of a snake, yet display no such response
to the digitally-altered video of monkeys responding fearfully to the sight of flowers
(Cook & Mineka 1989). Yet as Clara Moskowitz has remarked, "babies and very young
children do not usually fear snakes" (LiveScience March 5, 2008).

In other words, the fact that we have these perceptual biases does not entail that
we are born with an innate fear of snakes, any more than we are born with an innate
fear of beach balls because we duck if one comes at our head. Rather, a child's cogni-
tive/emotional perceptual acts and appraisals are, as Lewis has argued, inextricably
bound together precisely because they are molded by a caregiver's (or another agent's)

responses. It is through her caregiver's affect cues that the child learns to *look* at the stick. Indeed, *looking*, on this argument, might *always* involve this sort of cognitive/emotional nexus (see Lewis et al. in press).

Such an argument is very much based on the sort of classic studies done by Sorce, Emde, Campos, & Klinnert (1985) showing that by 12 months babies use visual information from their caregiver's face to make sense of new or confusing situations. Indeed, Phillipe Rochat showed that as early as 9 months an infant will hesitate crossing the deep side of a visual cliff if their mother expresses fear (Rochat 2001), and that at 10 months infants begin to attend carefully to a caregiver's reactions to a novel stimulus (like Striano & Rochat's [2000] toy barking dog). But the argument is also more than just a bit reminiscent of the Stoic argument about 'first movements' that we looked at above, as indeed is the argument about emotional transformations that we shall examine in the next section.

8.   The emotional transformation of stimulus-response connections

The basic principle of the concept of emotional transformations that we described in *The First Idea* is that infants initially experience a limited number of global states, for example, stillness, excitement, distress (Fox & Calkins 2003). A caregiver's calming interactions enable the infant to experience soothing pleasure and interest in the caregiver's sounds and sights, and to form the sensory-affect-motor connections involved in, e.g. turning to look at the caregiver. In this way, certain emotional proclivities, such as pleasurable interest in soothing sounds, begin to differentiate from these global states. They also differentiate nonpositive states: puzzlement, hesitation, irritation, etc.[10]

As the child's nervous system develops, in part because of nurturing interactions, and the capacity to discriminate differences and organize patterns develops further, the infant begins to further differentiate and elaborate these global states. She does this through continuing interactive experiences with her caregivers. For example, as caregivers respond to their infants' interests with different types of smiles and joyful sounds, we often observe the infant expressing a range of pleasurable smiles and a deepening sense of joy and security.

Through continuing human interactions of this type, infants associate more and more specific subjective qualities with selective physical sensations. For example, the sound of the voice registers as a sensation, but it is also either pleasurable or aversive.

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10.   I am grateful to Marc Lewis for pointing this out; as he remarked in a personal communication, these nonpositive states also contribute significantly to elaborating the world.

Mother's touch is a tactile sensation that also may be soothing or overstimulating. Every experience that a child undergoes involves this form of association. Both aspects of a child's perceptions, the physical and the emotional, are bound together. Thus, a hug feels tight and *secure* or tight and *frightening;* a surface feels cold and *aversive* or cold and *pleasant,* a mobile looks colorful and *interesting* or colorful and *frightening.*

These emotional associations can have an almost infinite degree of subtle variation so that each child's sense of pleasure or security is unique and highly textured. A child's ability to choose between different goals is very much a function of these emotional associations. By the time an infant has begun to choose between goals she has gone through a series of progressively more complex emotional transformations, in which the affect patterns described above come to give rise to and then orchestrate a large range of cognitive, communicative and social processes.

As just noted, in the first stage the child begins to forge sensory-affect-motor connections (0–3 months). Pleasurable, affective experiences, along with growing motor control, enable a baby to begin to respond with actions, such as reaching towards a pleasurable touch and turning away from an unpleasant one. In this manner motor responses quickly move beyond reflexes and become part of a sensory-affect-motor pattern. That is, affect serves as a mediator between sensation and motor response, connecting the two together. This basic unit of sensory-affect-motor response becomes more and more established through infant-caregiver interactions.

In order to form these connections, a baby must experience positive emotions. For example, because she finds the stimulus pleasurable the baby turns towards the sound of her mother's voice or turns to look for her smiling face. If the experience is unpleasant, primitive neural systems trigger an automatic response to avoid the experience, thereby inhibiting the formation of the stimulus-affect-motor connections that will underpin the child's subsequent development of effortful control.

To forge the sensory-affect-motor connections, individual differences must be attended to. Infants vary considerably in how they attend to sounds, sights, touches, smells, and movements. Some are very sensitive and require more soothing, while others are under-reactive and require more energetic wooing. Some quickly turn towards the source of a sound while others take more time to develop this skill. Similarly, some infants begin to recognize visual or auditory patterns fairly quickly and others more slowly. Thus caregivers have to tailor their interactions to their baby's individual preferences and abilities. The better that caregivers can adjust their behaviors to the child's biological profile the better the dyad displays 'goodness-of-fit' in their interactions (Thomas & Chess 1984). Should a caregiver fail to recognize the child's negative reactions or respond appropriately to a child's overtures, the child may become subdued and withdrawn or adopt reactive defensive behaviors such as gaze aversion or arching his back and straining to turn away (Beebe & Jaffe 2008; Downing 2008; Spitz 1965; Tronick 1989).

By no means, then, is a child's ability to engage in shared gaze or to recognize social and communicative patterns simply a maturational phenomenon. Rather, the caregiver must engage in a variety of subtle affective behaviors, both soothing and arousing, that are finely tuned to the child's individual sensory proclivities, in order to promote the development of these capacities (Greenspan 1997). A baby must be enticed by the emotional rhythm of the caregiver's voice, big smiles and gleaming eyes, to look or listen to interesting sounds and sights if she is to progress beyond the very simple stimulus-response sequences that she displays at birth and begin to engage in shared gaze.

In the second stage of affective transformation, the child develops a more intimate relationship with her caregiver (2–5 months). With warm nurturing the baby becomes progressively more invested in and interested in her caregivers, whom she can now distinguish from other adults. Positive and often joyful emotions enable her to coordinate gaze, listening, and movement in synchronous and purposeful interactions. Through these affective interactions she begins to discern patterns in her caregivers' voices and affect signals. She begins to discriminate their emotional interests, such as joy, indifference, and annoyance, and to recognize the emotional significance of facial expressions or vocalizations.

In the third stage of affective transformation, the child begins to master the ability to engage in purposeful two-way interactions (4–10 months). For this to happen, caregivers need to read and respond to the baby's emotional signals and challenge the baby to read and respond to theirs. Through these interactions, the baby begins to engage in back-and forth emotional signaling. The 6-month-old smiles eagerly at her mother, gets a warm smile back, and then smiles again, even more expansively. Different motor gestures – facial expressions, vocalizations, arm movements – become part of this signaling, which now harnesses a broad range of emotions (pleasure, curiosity, assertiveness, fear, etc.), sensations (touch, taste, sights, sounds, odours), purposeful movements, and emerging social patterns.

By 8 months, many of these exchanges usually occur in a row. The infant is now using purposeful affective signaling to orchestrate the different components of her central nervous system in an integrated manner. She is beginning to use her purposeful activity in affective interactions to form higher-level cognitive, communicative and social skills: for example, searching in the caregiver's hand for her rattle, reciprocally exchanging a variety of sounds, and initiating facial expressions and gestures to achieve closeness, such as reaching out to be picked up.

Through these increasingly complex interactions, the child acquires implicit knowledge of the social and communicative patterns that will serve as a framework for her growing understanding of her world: what is felt, said, and done, and what is unacceptable, not said or not done. Through the endless smiles, head nods, friendly gestures, animated movements, etc. that she encounters in her countless interactions

with her caregivers, the child is learning to read and respond to the social and emotional cues of others as well as to communicate her own. These meaningful patterns involving the back-and-forth reading and responding to each other's emotional signals enable the toddler to begin forming for herself the social patterns, cultural norms, rules (including obligations) that characterize her family, community and culture.

In the fourth stage of affective transformation, which we call shared social problem-solving, the infant learns to sustain a continuous flow of back-and-forth affective communication in order to collaborate with a caregiver in solving affective, meaningful problems (9–18 months). For example, the 14-month-old infant takes the caregiver by the hand and, with a series of emotional gestures and vocalizations, gets the caregiver to go over to the toy area, points at and vocalizes about the desired toy up on the shelf, and manages to get the caregiver to pick her up to reach for the desired object. In these complex interactions, the infant is further developing the capacities outlined above – to read and respond to a broad range of emotional and social signals as a basis for forming patterns that include a growing sense of self and expectations from others as well as social and cultural norms.

9.   Developmental pathways

As was noted above, infants and children differ in their basic responses to sensations. Certain types of touch, sound, or smell, for example, may be soothing to one infant and overstimulating to another (i.e. an infant may be hyper- or hyporeactive to a given sensation). The same sound can be stimulating and pleasant for one child and piercing and shrill for another. These physical differences can be experienced with a near-infinite range of subjective affective coloring, depending on early caregiver-infant interactions. For example, how a caregiver soothes or overreacts to her infant's hypersensitivity to touch will influence her subjective experience of that sensation. Or they might vary for the individual child according to her arousal state, which itself can be highly variable.

As an infant constructs a subjective emotional world, "experience" and physiologic expression continuously influence one another. Subtle reading and responding to an infant's emotional cues as part of a reciprocal interaction keeps refining her physiologic and emotional experience and expression. Growing central nervous system organization serves to organize and facilitate the expression of ever more complex and refined interactive emotional experiences.

To be sure, basic properties of the child's neurobiology constrain the sorts of demands or challenges we might impose on a child; but it is the nature of the demands or challenges that we impose through our emotional interactions which dictate how that child's neurobiology is going to develop. It also goes without saying that an initial

biological deficit can have a powerful effect on the kinds of social experiences that a child is receptive to or seeks out, which may further reduce the input to certain neural systems whose development hinges on these social experiences. But that does not mean that it is impossible for the child to engage in the sorts of experiences that will provide these neural systems with the needed input.

For example, recent research has demonstrated that a shortage of dopamine – a neurohormone that supports the ability to wait for a reward – might be a critical factor in the development of attentional problems (Sagvolden et al. 2005). Sagvolden's model raises the question of whether, if a child is born with a short version of the genes involved in the production of dopamine, there is a heightened risk that in stressful conditions these might be turned off prematurely, with the result that the child has a shortage of dopamine and thus experiences delay as aversive (see Rueda et al. 2007). Such a child would then be prone to engage in behaviors that favour immediate reward.

If no effort is made to lengthen the time-frame in which a reward must be delivered in order for it to be associated with a behavior, or to help the child deal with distractions, or to help the child develop the capacity to self-organize and see a task through to completion, or even to choose between equally attractive goals, the child's craving for instant gratification could well result in a lack of input to the parts of the brain regulating inhibitory control. This outcome might be especially true in the case of a highly anxious caregiver who perhaps herself suffers from a shortage of dopamine and thus responds to her child's 'delay aversion' by constantly catering to the child's need for rapid gratification, thereby exacerbating the under-development of the parts of the brain that not only help regulate the time-window in which a behavior can be associated with a reward, but which enable the child to recognize and remember patterns.

Similarly, a sensory hyper-reactivity to visual stimuli might lead a child to avoid those face-to-face interactions with her caregiver that are crucial if the fusiform gyrus is to receive the inputs that it needs to become fully functioning in the recognition of facial expressions of emotion. Not surprisingly, when imaging studies were conducted on adult subjects with autism, it was discovered that there was a striking lack of activity in the fusiform gyrus. This led researchers to question whether autism was somehow the result of a genetic malfunction in the fusiform gyrus itself or some 'lower' system feeding into it (Baron-Cohen 1995). But a discovery by Morton Gernsbacher and her colleagues at the University of Minnesota revealed a more complex developmental picture (Gernsbacher et al. 2003).

Adults with autism were shown photographs of actors displaying happiness, anger or fear, half of the photographs with the agent's eyes looking straight ahead and half with their eyes averted. There was indeed a significant diminishment in the activation of their right fusiform gyrus, along with a significant increase in the

activation of centres involved in conflict monitoring and the detection of threat, when these subjects viewed the eyes-straight-ahead photographs. But there was no comparable effect when the subjects viewed the photographs in which the actors' eyes were averted. Thus, the Gernsbacher study suggests that subjects with autism avert their gaze in order to reduce the stress that is created in direct social encounters. That is, the explanation for this behaviour would indeed appear to lie in sensory over-reactivity to social/visual stimuli, not in a specific malfunction of a 'dedicated' face-processing system.

The upshot of this way of thinking, then, is that an initial neurological deficit constrains the child's dyadic interactions, which results in reduced social input and thence decreased activation of specialized systems for functions like face processing, reading emotions, social orienting, and social motivation, which in turn constrains the child's capacity to engage in these very social interactions and has other measurable effects on brain development. A neurobiological deficit at birth or in the early years that obstructs these interactive experiences can thus result in a reduction of the input on which the development of these systems depends. If these neural systems are deprived of the input needed for their development, this can further impinge on the child's willingness or ability to engage in the necessary social experiences, resulting in a further constriction in the network of capacities necessary for healthy development (Segalowitz & Shmidt 2007).

The developmental pathways model, as so stated, sounds like the most modern of theories, grounded as it is in contemporary theories of physiological reactivity and the integration of neural systems; and yet, as we have tried to show in this paper, the pathway on which Western thinkers have looked at the interaction between biology and emotion-regulation has been surprisingly constant. Far from construing this as a philosophical constraint, however, we see this as a tradition that has opened our minds to the possibilities of enhancing children's healthy mental development.

10.   A plea for philosophy

The title of this paper alludes to two different lenses for looking at emotion-regulation: one historical and the other developmental. On the one hand, emotion-regulation has operated as an archetypal, even a defining theme in the history of Western views about healthy mental functioning. On the other hand, it is a psychological lens for studying the development of this core capacity throughout the lifespan. Interestingly, the ancient Greeks were already aware of this ambiguity.

Being the great poet that he was, Homer provides us with all sorts of clues right from the outset of *The Iliad* that foreshadow Achilles' eventual collapse. Yet much of the drama of the poem derives from the fact that all of his peers are utterly

dumbfounded by his breakdown. It is a tension that we are all too familiar with at Milton and Ethel Harris Initiative in York University (see www.mehri.ca), given our interest in the early detection of autism. We know that, for many children with autism, things appear to be going well in the beginning but then the disorder suddenly emerges, often but not necessarily because of some precipitating event. Yet when we view early videos of cases of regressive autism it seems that we can, in fact, discern some subtle sign of the disorder (see Bayrami 2010).

The Achilles who has not been tested emotionally is really still an adolescent. It is only when he is subjected to stresses unlike anything he has hitherto experienced that his emotions become uncontrollable. When we look at the normative development of emotion-regulation we see an interesting parallel. When problems in emotion-regulation appear suddenly, out of blue as it were, it is typically at a major transition-point. It seems likely that what has happened is that the child was able to deal with the range of challenges or demands that she was exposed to until then but the sudden shift stretches her beyond her capacity to stay regulated.

For example, the Rimm-Kaufmann study, cited above, suggests that for many children the transition from a home or nurturing daycare environment to a classroom is quite difficult. This is not the first and certainly not the last of such critical transition-points the child will have to deal with. There is another one, from example, in the move from grade 6 to 7, or when they enter puberty or go to college. In other words, we need to take a longitudinal perspective on the ongoing development of emotion-regulation: a point that has been reinforced by developmental neuroscientists who have identified periods of extreme brain lability that occur at the same time as some of these 'transition-points'.

Jay Giedd's work has been especially influential in this respect (Giedd et al. 2004). Giedd has shown that, while a child enters kindergarten with 95% of her adult brain, her grey matter continues to thicken over the years of elementary schooling and there is a sharp growth spurt in the PFC just before puberty. At puberty there begins another critical phase of synaptic pruning, which appears to be pivotal for the individual's subsequent self-regulatory abilities over the course of their lifetime. The experiences that the adolescent engages in at this time turn out to critical for the wiring of the self-regulation network (Giedd 2002).[11] In a particularly memorable image, the adolescent brain has been likened to a race car without a skilled driver at the wheel (Steinberg 2005). It is clearly highly significant that adolescence marks the peak age of onset for many psychiatric disorders (see Paus, Keshavan & Giedd 2008).

In order for the child's emotion-regulation to continue to grow and strengthen over the school years, she must continue to undergo the types of experiences that

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11.   Giedd, J. Inside the teenage brain. Frontline, Jan 31, 2002

nurture these core capacities. It is highly important that by the time she enters school the child has developed a number of strategies for dealing with sensations or situations that render her anxious or frustrated. It is equally important that we consider sorts of experiences that will promote the development of her positive emotions, such as sports, music, art, drama, clubs. But at the top of this list – at least as far as concerns the young adult – Plato would have us consider the role of philosophy.

Plato's view of philosophy as a "medical art for the soul" – what Cicero was to call the *medicina mentis* – inspired a philosophical tradition that runs all the way from Arcesilaus, who took over as Head of the Academy in the third century B.C., to the present article. Just as Achilles serves an example of what happens to the thumoeidic individual when they are raised in the wrong way, so the stories about Socrates are supposed to represent an example of how *thumos* can be "relaxed" by "soothing stories" and made "gentle by means of harmony and rhythm" (Rep. 441e).

Plato's core idea was that philosophical reflection can enhance an individual's control over his or her emotions. A great deal of thought went into the stories that are told in the dialogues, which ebb and flow in much the way that conversations do, which balance off characters and ideas against one another, which endeavour to soothe the *psuchē* and to excite certain desires or appetites, such as for justice, or indeed, for health. Thus, the dialogues do not operate as instruction manuals for how to achieve *mental health* but rather, are meant to guide the reader to this result. Like a dramatic poet, the language that Plato uses and the structure of the story are critical factors in this healing process.

Whatever one might feel about the importance that Plato assigned to the written word,[12] what is of utmost importance is his emphasis on the need to understand the nature of *mental health* before one can consider the experiences that promote

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12. Plato's view of the power of the written word dates back to the ancient Greek shamans, according to whom the incantation of words, the manner in which they are expressed, have a special power to operate on the human mind These are the epôdai, the magic charms that, as Laín Entralgo showed in his classic The Therapy of the Word in Classical Antiquity, are crucial to Plato's view of philosophy (see also Nussbaum 1994: 49ff). This is the point that lies behind Socrates' argument in the Laches that medicine needs "to proceed beyond Hippocrates" (pros tô Hippocratei) if it is to treat disease effectively, whether it be mental or physical. The context for this argument is as follows: Socrates tells the young Charmides, who has asked for his help in treating a headache, that he learned a cure from a Thracian physician that involves administering a plant and uttering an epôdê. Socrates emphasizes that the important lesson here is that "one should not attempt to cure the body apart from the psuchē. And this … is the very reason why most diseases are beyond the Greek doctors, that they do not pay attention to the whole as they ought to do, since if the whole is not in good condition, it is impossible that the part should be. Because… the soul is the source both of bodily health and bodily disease for the whole man, and these flow from the psuchē" (Char 156de). And these epôdai "consist of

it. And what is fascinating is the extent to which Western thought has remained so heavily dominated by Plato's outlook: like Moliere's physician, we still look at emotion-regulation through Plato's lens, even if we are not fully aware of the fact.

To appreciate the significance of this point, just consider how the *Iliad* is ultimately a story about a monumental culture shift, one that deeply informs everything that we now take for granted when we study emotion-regulation. As his listeners would have fully realized, Homer was depicting the transition from an ancient ethos, in which warriors who would go beserk in battle were prized, to the dawning of a new culture that valued the importance of staying in control of one's emotions. Plato went to great lengths to make this theme explicit. He employs the figure of Achilles to shift our focus from a preoccupation with extrinsic rewards (e.g. the trappings of public status) to a meditation on the psychic well-being of the individual.

Over and over Plato compares *mental* with physical health so as to question what would constitute 'mental health' and how one would attain such a state (Gorgias 504). He argues that, just as someone who eats and exercises properly will experience what is termed "health," so someone who tempers their appetites and desires and is unafraid of death will flourish. This is very much the underlying theme in the long discussion on the nature of justice in the *Republic*. Plato argues that "just and unjust actions are no different for the *psuchē* than healthy and unhealthy things are for the body. … Virtue (*aretē*) seems, then, to be a kind of health, fine condition, and well-being of the *psuchē*, while vice is disease, shameful condition, and weakness" (Rep 444d).

Plato's most explicit statement on mental health occurs in the *Timaeus*, which, for historical reasons, is amongst the most important of all Plato's writings on the subject; for the *Timaeus* was the only one of his texts widely available in Latin in late antiquity and the Middle Ages. The *Timaeus* presents a comprehensive review of the Hippo-cratic theory of disease, which culminates in the critical claim that:

> diseases of the *psuchē* that result from a bodily condition come about in the following way. It must be granted, surely, that mindlessness is the disease of the *psuchē*, and of mindlessness there are two kinds. One is madness, and the other is ignorance. … The diseases that pose the gravest dangers for the *psuchē* are excessive pleasures and pains. When a man enjoys himself too much or, in the opposite case, when he suffers great pain, and he exerts himself to seize the one and avoid the other in opportune ways, he lacks the ability to see or hear anything right. He goes raving mad and is at that moment least capable of rational thought".   (Tim 86bc)

What Plato is arguing here is that the humoral theory of physical disease does not suf-fice to explain mental disease; for the problems that need to be explained for the latter

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beautiful words. It is a result of such words that sōphrosunē arises in the psuchē, and when the psuchē acquires and possess sōphrosunē, it is easy to provide health" (157a).

are *why* someone has trouble regulating his emotions, why he overindulges his appetites or fails to attend to his proper needs. And the latter dimension of human behavior cannot, he insisted, be reduced to biological causes.

There is an important argument in the *Phaedo* in which Socrates belittles Anaxagoras for failing to recognize the difference between reasons and causes.[13] Socrates' criticism of Anaxagoras represents the first attack on materialism in Western thought. Just as a man's actions cannot be explained by examining the operations of his bones and sinews, so a man's mental illness cannot be explained by measuring the levels of the four humours. That is, you cannot explain why Achilles behaves in the manner that he does by arguing that he has too much choler in his blood; for the question that concerns us is precisely why he has this overabundance of choler; and that, according to Plato, is not simply a matter of biology – i.e. not simply something he was born with – but rather, is a question that can only be explained by studying the development of his *psuchē*. Moreover, mental health occurs, not because there is a balance between the body's four humours, but rather, because reason is in control of the different components of the mind,[14] tempering and overseeing the individual's bodily and thumoeidic desires and thereby resulting in humoral balance.[15]

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13.   The term is Wittgenstein's but it was Plato who saw the problem first. Anaxogoras, Socrates scornfully insists, "would mention other such [physical] causes for my talking to you: sounds and air and hearing, and a thousand other such things, but he would neglect to mention the true causes, that, after the Athenians decided it was better to condemn me, for this reason it seemed best to me to sit here and more right to remain and to endure whatever penalty they ordered. … To call those things causes is too absurd. If someone said that without bones and sinews and all such things, I should not be able to do what I decided, he would be right, but surely to say that they are the cause of what I do, and not that I have chosen the best course, even though I act with my mind, is to speak very lazily and carelessly. Imagine not being able to distinguish the real cause from that without which the cause would not be able to act as a cause." (Phaedo 99)

14.   There has been much debate over whether Plato was being literal when he argued that the psuchē is composed of three elements (Rep. 580d): reason, thumos, and the appetites (corresponding to the three classes in his ideal state: the Rules, Auxiliaries, and the Producers). The point that concerns us here is Plato's emphasis on the need for harmony imposed from above between the different elements of the mind ("justice") if the individual is to enjoy a state of mental health. Essentially what he is saying is that we have different kinds of drives and desires, 'higher' and 'lower'. The 'lower' are innate; they are what we share with animals, what governs the actions of an infant. If these lower desires are given free reign this will lead to a life of vice; but the 'higher' desires – those that separate us from animals – can lead to a life of virtue and justice – i.e. mental health.

15.   "To produce mental health" the components of the psuchē have to be "in a relation of control and being controlled" (Rep 444d).

Achilles struck Plato as the perfect illustration of his point; for at the height of his frenzy when his primal emotions have been unleashed he descends to the level of a beast, totally out of control.[16] Yet what restores him to normalcy at the end of the poem is not a herculean act of rational self-control, but a point that is easily overlooked: it is a strong positive emotion, the compassion that Achilles feels for Priam. How different the history of studying emotion-regulation might have been if the importance of this point were grasped: i.e. if it were recognized that emotions are not simply an aspect of the mind that need to be controlled, or worse still, suppressed: that cultivating a child's positive and prosocial emotions is as important an aspect of emotion-regulation as learning how to control her negative ones. That is, that *emotions are not simply the object, but also the vehicle for strengthening the mind.*

The more we think about the importance of emotion-regulation for a child's long-term benefit, both physical and mental, the more we need to take this lesson to heart. Without a compensating emphasis on the importance of the affective interactions that nurture a child's curiosity and interest, her security and self-esteem, desires and attitudes, empathy and moral integrity, her overall happiness, we run the risk of reducing emotion-regulation to behavior management. In *The Modern Art of Taming Wild Horses* (1858), one of the classics on the importance of treating animals with kindness, John Solomon Rarey revealed how the secret to the extraordinary feats of the great Arab horsemen was that they never resorted to punishment or cruelty but rather, lovingly schooled their horses in a remarkably broad range of nonverbal signals, thereby enhancing the communication between horse and master immeasurably. It is a point every bit as relevant to Plato's constricting view of emotions as 'wild horses' that need to be controlled by a cold faculty of reason.

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16.   Achilles is the paradigm example of someone who can do "whatever he wishes, except what will free him from vice and injustice and make him acquire justice and virtue"; he thus illustrates the force of the point: "how can it be worth living when his psuchē – the very thing by which he lives – is ruined and in turmoil?" (Rep 445b)

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Moving others matters

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> *When I sing to make you dance I truly know why*
> *there is music in leaves…*
> (Rabindranath Tagore, Gitanjali, 62)

Being moved by others is central to social and cognitive development. This paper explores the other side of the phenomenon: that of wanting to move others. Within philosophy and psychotherapy several different terms have been used to refer to the importance of having an impact on others – being recognised, acknowledged, affirmed, etc. Implied in this process of moving another person to a reaction to oneself is being known by them in some way, allowing interpersonal openness and dialogue. The impact of failing to move others is evident in everyday life as well as in psychological research.

The central part of this paper traces the development of the desire and ability to move others in increasingly complex ways during the first year of human infancy. Starting from expectations of temporally and affectively contingent reactions to their actions, human infants become increasingly able to perform actions which are aimed directly at eliciting specific adult reactions. Clowning, showing-off and teasing in the second half of the first year reveal infants' awareness of the links between their actions and others' responses and a clear desire to repeatedly obtain some of these reactions. The paper ends by exploring the mutuality between being moved by others and wanting to move them: a mutuality which is developmentally central and maintains the moral bases of social relations.

Keywords: infancy; engagement; moving others; mutuality; contingency

1. Being moved and moving others

This chapter owes its existence to two papers, both published in 2007 and the titles of both beginning with the phrase: On Being Moved (Hobson 2007; Bråten 2007a). In both cases, the point being argued was that being moved by others – in posture, in attitude, in stance, in thought and in feeling, or in other words, being moved in one's own orientation – is an inborn human capacity fundamental to social life. In discussing a

range of instances – from Adam Smith's famous example of spectators unconsciously adopting the stance of the tightrope walker, to one-year-olds from different cultures opening their *own* mouths while trying to feed someone else – Stein Bråten talks of this capacity as emerging from the ability to be centered in another's body: "what is common here in the above instances is the manifestation of an intersubjective capacity for participant perception, entailing that the perceiver resonates with what the other is doing or trying to do or say as if the perceiver's frame of reference were bodily centered in the other. Hence the term 'alter-centric'" (Bråten 2007b: 117). In a similar vein, Peter Hobson speaks of the ability to identify with another – an ability that he argues is affected to different degrees in people with autism – as being fundamental to being able to be moved. Speaking of its importance he writes: "The central idea is that *being moved by others* – and here I am talking about movement in subjective orienta-tion, especially as these involve feelings and attitudes – is one of the most significant features of human social life. It is fundamental for experiencing people *as* people with their own subjective orientations to the world." (Hobson 2007, italics in the original). That the capacity to be moved by others is fundamental to 'typical' social and cogni-tive development is either implicitly accepted or explicitly supported by much recent research on imitation, joint attention, social referencing and so on. This paper explores the other side of this phenomenon: that of wanting to – and trying to – move *others*.

A number of philosophers have stressed the importance for human existence of moving others in some way. Hegel, for instance, speaks of being 'recognised' or 'acknowledged': "Self-consciousness exists … by the fact that it exists for another self-consciousness; that is to say, it *is* only by being acknowledged or 'recognised.'" (Hegel 1967: 104). Bakhtin speaks of the centrality of 'response': "for the word (and conse-quently for a human being) there is nothing more terrible than a lack of response" (Bakhtin 1986: 127). William James speaks of being 'noticed': "No more fiendish punishment could be devised, were such a thing physically possible, than that one should be turned loose in society and remain absolutely unnoticed by all the members thereof… (from this) the cruelest bodily tortures would be a relief; for these would make us feel that, however bad might be our plight, we had not sunk to such a depth as to be unworthy of attention at all." (James 1890/1950: 293–294).

These different terms – being acknowledged, recognised, responded to, noticed, attended to – are not synonymous. A fascinating dialogue between Martin Buber and Carl Rogers in 1957 illustrates this. Rogers suggests that his own term 'acceptance' means the same as Buber's term 'confirmation' (here are two more to add to the list); Buber disagrees. For Buber, the term confirmation means more than acceptance of the other as they are; it means accepting the other as they could be – or more precisely, see-ing the potential of the other for what they could be. To confirm another can include wanting them to *not* be as they are – provided the change that is sought is a change towards that which is potentially theirs (Kirschenbaum & Henderson 1990). Each of

these words seems to be relevant to slightly different situations. In some cases it is enough to be noticed that you are present in the room, in others it is your point of view that needs to be acknowledged or your feelings that need to be recognized, in yet others it is you in terms of your potential for developing that needs to be confirmed. The multiple words nonetheless converge on three common grounds: one, they all relate to *moving another person* (the other's attention, attitudes, feelings, beliefs, judgements, and so on) by something that one does, or by how one is; two, they are all closely bound up with the issue of *being known by another* in some way (being known to exist, to be present, to intend something, to be sincere, to be a person rather than a member of a category, and so on); and three, all of them are only possible if there is some kind of *openness in the other towards oneself* (in order for the other to see, notice, acknowledge, confirm, recognise, accept, etc. whatever aspect of us is relevant in a particular situation) – an openness which allows a real 'seeing' of the self and genuine dialogue rather than its scripted appearance.

In the sections below I first ask what we know of the consequences of moving others or failing to move others in ordinary everyday situations and in psychological studies. I then ask how wanting to or seeking to move others emerges and develops in infancy. Finally, I ask about the mutuality between being moved and moving others and why it matters.

2.   Moving others in everyday life

Moving others may be important for many reasons. The simplest of these reasons is that it is only if *you* move someone else – with your being or your actions or thoughts – that you have evidence that they are engaged with you. Their engagement can be of the most minimal kind, or the most subtle, but in order for you to be aware of this engagement it must always involve some evidence of your impact on them.

There is no doubt that in everyday life we are disturbed by the failure to make a difference to others. You walk into an open plan office and stand uncertainly while several people continue working at their desks, and nobody looks up. You are literally unseen. Or you go up to speak to someone at a conference and wait while they are talking with some other important people around them. You are within their visual field, but there is no sign of their having noticed you (no flickering of gaze or pause as it touches you) nor of any intention to turn to you in due course. You are visible but appear unnoticed. Or you are at a party and you stand at the edge, nobody actually ignores you, but nobody talks to you either, and any interactions with you are brief and either awkward or instrumental, of a different quality to those you perceive going on around you. Your existence is acknowledged, but almost as irrelevant. Or at a party, a neighbour has an odd discussion with you about 'your kind of people' – and you realize the depth of your anonymity to her, seen and

responded to, but not recognized as an individual, as *you*, assumed instead to be a member of a category, an *any*one. Or a child starts talking excitedly of his day at school and the parent corrects his grammar, not noticing his excitement. Or there is of course, the traditional doctor-patient-dialogue, noted for its monologic character in which the patient is heard only within strict limits. In all these cases there is a door shut in the engagement, someone or something else already scripted in there, the engagement closed rather than open.

Or there are deeper, more sinister ways of being unseen. Take this excerpt from Tolstoy's *Anna Karenina*, where Aleksei Karenin, described as a cold, ambitious and determinedly conservative man, is confronted with an insight into the consciousness of his unhappy wife, which he suppresses: "For the first time he vividly conjured up her personal life, her thoughts, her wishes; and the idea that she might, even must have a personal life all her own was so frightening that he hastened to drive it away. This was the chasm into which he dared not look" (Tolstoy 1995: 141). This denial of the other's consciousness may sound extreme, but may be common enough when we think of it as a defensive reaction. In fact, there may be many and more pernicious versions of denial around us. The wife who will not believe that her husband doesn't love her anymore, the husband who cannot accept the fact of a wife's depression, the father who cannot bear to acknowledge that his children do not admire him, the teacher who refuses to see his students' lack of respect for him and so on. The attachment to a particular vision of the world is so strong that the ideal blocks out the reality. A person who is confronted with a denial of this kind may suffer from its subtlety far more than the complete denial of person-ness that Aleksei had of Anna – which she, at least, could leave.

And the converse in each of these instances could serve as examples of recognition. You walk up to someone while they are talking to someone else and their body orients towards you slightly while they carry on talking; you go into a busy office and the receptionist glances up and smiles at you while she continues talking on the telephone; you make a joke in a meeting and someone stifles a laugh; you telephone an old friend, and on hearing your voice they laugh in recognition; your eyes fill during an argument with someone and they suddenly stop ranting, realising something new; or you ask someone a question in a formal interview and it stops them short – their hesitant thoughtful answer revealing their grasping of a thought previously unrecognized – and you know that you have literally moved the other to a different place.

3.   Moving others: Psychological research findings

Four strands of research attest to the importance for well-being of moving or not moving others (in specific ways). Research on the effects of being imitated by others shows that, at least in some situations, being imitated has remarkably beneficial effects on the

relation between the imitator and the imitated person. In effect, being imitated can be seen as one form of validation, of being affirmed for what you are through another person's adoption of the same action, posture, etc. (Although being imitated can also have exactly the opposite effect – of being mocked and ridiculed for what one is; see Zeedyk in preparation). Imitation can serve to open dialogue as is evident in meetings between people who don't speak the same language see, for example, Darwin's contact with Tierra del Fuegians (Darwin 1905) and between members of different species (Fossey 1983). It requires of course, that the person or animal imitated recognizes that they are being imitated – or at least recognises the similarity of the actions if not the imitative intention of the imitator. In other words, that it is *their* action or *their* posture that has provoked the other's act.

The pioneering work of Jacqueline Nadel and Phoebe Caldwell has shown that in children and young adults with autism, being imitated leads to dramatic increases in communicative attempts by the autistic person. Imitation aids communication. Nadel used a modified version of the still-face paradigm which involved holding the whole body still and unmoving. A first 'still' condition was followed by an imitation condition and then by a second 'still' condition. While in the first 'still' condition children with autism showed little interest in or concern about the silent behavior of the adult, after the rather odd condition in which their behavior was imitated, they showed marked interest in the other and reacted to the stillness in the second 'still' condition. Nadel's interpretation of the difference is that in the imitation condition the adult showed to the child that they were a human being, and that in the case of children with autism with few generalized social expectancies, this 'proof' was necessary for the absence of contingent responses to matter. In any case, the effect of seeing that someone is doing the same as oneself appears to have a dramatic influence on one's openness to dialogue with that person (Nadel & Fontaine 1989; Nadel & Peze 1993). Working with adults with severe communication problems Caldwell has shown the dramatic changes that can follow from the therapist's success in tuning into and repeating, their actions (Caldwell 2010; Zeedyk 2006). Perceiving the imitation of their actions by a sensitive other in such contexts seems to act to shift them from their isolation to connectedness and expressions of joy. In typical adults too, 'unconscious mimicry' (rather than apparently deliberate imitation) of another's posture can lead to various positive consequences for the mimicker – more tips, more help, more positive appraisals, more contracts signed. And more broadly, those who smile more and nod more in response to others seem to be perceived as more likeable (Chartrand & Bargh 1999; Zeedyk 2006).

On the negative side, the impact of being ignored, or excluded or neglected has been shown to be generally damaging. In the social psychological literature there is considerable evidence since the 1990s that being excluded in a triadic social situation such as two players throwing a ball exclusively to each other and leaving a third player standing by, leads to intense and immediate negative effects

(Williams 2007; Williams, Cheung & Choi 2000). Participants report feeling 'awful', and they appear to feel physically colder, as judged by their evaluations of room temperature and as judged by their choice of hot or cold drinks immediately after (Zhong & Leonardelli 2008). Further, the area of the brain that is activated during physical pain (the anterior cingulate cortex) is also activated during such social exclusion (Eisenberger, Lieberman & Williams 2003). What is particularly interesting is that this negative reaction to being 'ignored' is reported to occur even when the excluded person is aware of some other reason for the exclusion – such as the imminence of a particular sequence in the game, or that the other players have been instructed to play it in a certain way. Even when they know that the exclusion is unintentional and unmeant, it still, to put it simply, hurts.

Behaviourist training programmes which emphasise withdrawal of reinforcement – such as instructing children to go out of the room and sit on the 'naughty step' for ten minutes – appear to centre on this key effect. In that tradition, though, ignoring a person is seen to be effective in inhibiting specific behaviours and linked to the withdrawal of attention. Given the supposedly brief, occasional and circumscribed nature of the 'ignoring' in behaviourist training methods, there is no presumption of a more general deleterious effect on the well-being or interpersonal awareness of the person. Within parts of the psychoanalytic tradition, however, such treatment would be considered as emotionally damaging. The therapist's healing role depends squarely on relating to the patient as a person (Binder 2006; Rogers 1951), and on opening a dialogue which is genuine on both sides – a point strikingly illustrated by R. Hobson's description of a frustratingly unproductive therapeutic relationship with a young adolescent boy. Hobson describes how one particular session became a turning point. Hobson had been listening to a crucial cricket match and he could not switch out of this interest when the client came in: "For some minutes I spontaneously and unreservedly poured out my opinions and feelings about the game – an unprofessional piece of behavior. Then I asked him what he thought about the play and at that moment – this is the vital point – I really needed a response. Sam smiled. For the first time. Then we began to talk. Together." (Hobson 1988: 4). Ignoring can be effective in some ways, and interestingly seems to work in methods for training wild or disobedient animals; in the case of intensely social animals such as horses, the ignoring seems to function to attract the animal to the 'ignorer' (whether human or senior horse), rather than to inhibit any particular behaviour directly (Roberts 1996). Some therapies for people with communication disorders explicitly reject behaviourist therapies – partly because they involve a necessary de-personalisation of the 'patient', and partly because they portray the problem as one of 'behavior' ignoring motivations and anxieties and subjective orientation (Smith & Fluck 2000).

Evidence about the frightening effects of complete neglect in infancy and early childhood comes from recent studies of children in Romanian orphanages (Zeedyk

Davies, Parry & Caldwell in press). The consequences of the harshness with which children in Victorian work-houses were treated might be as nothing compared to the consequences of neglect. Oliver Twist may have suffered both a verbal and a physical whiplash in response to his request for 'more soup'. But he did at least *get* a response. Although detailed data about age-specific effects or the specific differences between near-complete neglect and abuse are still lacking, the overall picture is one of causing impoverished *being*. Spitz's term 'institutional autism' (Spitz 1945) or the related term 'quasi-autistic features' has been used to describe the effects of neglect on children – self-stimulating behaviours such as rocking, picking at themselves and head-banging, withdrawal, limited verbal expression and attachment to routines, features shown by 12% of the children in Romanian orphanages – have been described as a kind of 'learning to be autistic' (Rutter et al. 1999, 2001).

4. When and how do children begin to want to move others?

The literatures on which one can draw to address this developmental issue are vast and bedeviled with fundamentally different questions, assumptions and conclusions. In order to really answer the question we need to look not just at infants' differentiation between specific conditions, but at the way in which these conditions affect them differently. That is, we need to explore the emotional significance for infants of being noticed or not, of being addressed or not, of being responded to or not, of being emotionally 'felt' or not, and so on. In each of these cases the nature of the emotional responses of the infants can help to pull us away from sterile debates about whether the differentiation between conditions signifies a recognition of a 'mere' behaviour or a more intentional or psychological state in the other (see Reddy 2008 for a discussion). The answers to the developmental questions in this chapter are inevitably linked to the answers to questions about infants' knowledge of other minds. In order to perceive that one has affected the other's subjective orientation one has to be able to recognize the existence of subjective orientations – and this is an issue of considerable metaphysical as well as theoretical debate.

The answers we have available in the discipline, like the questions, are riddled with differences of assumption about the nature of mind and the possibility of its availability and are, therefore, complex and often messy. In general, however, they point to the earliest days after birth as revealing evidence of the significance of some sort of interpersonal recognition, a significance which changes in complexity and form through the first year. In the following sections I try to describe evidence of the ways in which and the extent to which infants seek to affect or move others in the first year of life, by focusing on how infants act in response to others' responses towards them. I divide the evidence into sub-sections entitled Engaging, Expecting and Exploring

others' movements; these are meant to be neither chronologically nor conceptually exclusive. They are not stages: engaging is necessarily present in expecting and in exploring. Exploring is often present in engaging, and expecting is certainly present in exploring even if not always there in the simplest engagements. The terms, therefore, while not mutually exclusive, are intended to capture something of the flavor of different interaction types which are more prominent at different ages.

4.1   Engaging with others' movements towards the self

In this section I will focus on studies exploring infants' awareness of the directedness of others' gaze and actions towards them, and of infants' attempts to get others to act towards them.

Noticing that someone else is aware of you can at the simplest level, be a question of noticing their perceptual directedness towards the self, the most obvious and distinct indicator of which is of course gaze. In human adults, the perception of gaze towards the self leads broadly to neural changes, often linked to specific brain regions – the paracingulate cortex and the temporal pole (Kampe, Frith & Frith 2003). We know that in other species, too, gaze towards the self is perceived as significant, albeit with different emotional meanings such as threat (Emery 2000). Perceiving others' gaze towards the self is also significant in human infants. Recent studies suggest strongly that the detection of gaze towards the self is not only extremely early in human infants, but that it enhances other perceptions and actions. In a remarkable study by Teresa Farroni and colleagues, newborn infants – between two and four days of age – were shown pairs of images. In each pair one face had gaze directly focused on the infants and one face had gaze randomly averted to the left or right. The infants looked significantly more frequently as well as longer at faces with direct than averted gaze (Farroni et al. 2002). In four-month-olds these authors also found that there was enhanced face processing in the infant brain when looking at faces with direct gaze than at faces with averted gaze. Further, by four months, following another's gaze to a distal location/target is enhanced (or primarily occurs) when it is preceded by a period of mutual gaze (Farroni et al. 2003). And again, by 4 or 5 months, direct rather than averted gaze allows the enhanced processing of facial expressions (Striano et al. 2006) and differently influences the perception of objects and the hearing of words (Parise et al. 2008). In all, it would seem that the detection of another person's gaze to self (as different from gaze to something else nearby) is present at birth, with, at least by 4 months, such detection leading to significant consequences for the awareness of persons and for learning about the world.

So it matters even at birth when someone looks at you. But in what way does it matter? There have been studies from the 1970s and 80s identifying mutual gaze as a

prompt for infant smiles. Peter Wolff's studies of two-month-olds showed that infants smiled more when they were being directly looked at by others than when they weren't (Wolff 1987). In this study, however, without further details of the exact moment of onset of the smile in relation to preceding events it isn't easy to know whether it was simply the fact of the gaze to themselves that mattered to the infants or perhaps also the fact that the gaze may have been a response to some prior action or invitation by the infant. Nonetheless it is significant that at least by two months of age, infants show emotional reactions to being noticed. These emotional reactions to gaze to self can be not only positive, as in this study, but also negative if attention cannot be disengaged (Brazelton 1986), indifferent, or ambivalent (Reddy 2000). It is also likely that in all these reactions, the *onset* of gaze is more powerfully emotional than gaze in continuing interaction. Findings from a study of coy smiles in two to four month-olds show that in interaction with a familiar adult partner the frequency of ordinary smiles as well as coy smiles was significantly higher in the first minute after renewal of interaction than in the second and third minutes (Reddy 2000). This suggests that it is the start of someone attending to them which matters more to the infants and leads to more (positive and coy) emotional reactions than continued interaction. The other's 'hello' or initial 'address' in other words, seems to matter at least as early as two months of age.

The huge literature on neonatal imitation presents another angle on newborn infants' interest in others' actions towards them. Although the arguments about the extent and socio-cognitive significance of neonatal imitation continue, there are several studies documenting neonates' responses to tongues protruded and mouths opened while an adult model gazes directly at the infant (Meltzoff & Moore 1977; Kugiumutzakis 1998). The imitative responses of neonates suggest at the very least a recognition of the directedness of the model's action towards themselves, a directedness which impels them to respond with similar actions. The other's actions directed towards the self, then, matter to the infant sufficiently to prompt the infant to respond. In neither of these sets of research, however (gaze to self, or actions towards the self) is it the infant's *action* that has moved the other. It is merely the infant's *presence* which has moved the other to act, and which in turn moves the infant to act or express something. Perceiving the directedness of such simple actions to the self, the other's movements towards her matter to the neonate: not as a response to her actions, rather as movements in response to the infant herself.

The only data suggesting that the neonate is not merely responding to but actually seeking to move others come from studies in the neonatal imitation literature. Looking not just at what happens in the short period after an adult model presents a facial or manual gesture to an infant, but at what happens when that same adult does *not* present this gesture, Meltzoff and Moore (1994) and Nagy and Molnar (2004) have both found (although looking at infants of different ages) that the infant appears to expect

the model to produce once again the gesture they had previously modeled and tries to provoke or re-elicit it. Meltzoff found that 24 hours after seeing an adult protrude their tongue, when they saw the adult again, six-week-old infants protruded their own tongues even though (or rather, because) the adult was not doing so. Nagy and Molnar looked at this phenomenon in neonates discovering (by accident during a pause in the experiment) that neonates themselves *initiated* this unusual gesture in the presence of the same adult, directing the gesture (with gaze) towards them. The 'provocative' finger raising was distinguished from 'imitative' finger raising by different heart rate patterns, decelerating rather than accelerating (Nagy & Molnar 2004). In other words, it seems that the neonates were not only responding to others' movements towards them but were trying to actually get them to move when they weren't moving. There is no data as yet on the emotional significance of these provocative attempts for the neonates: getting others moving appeared to matter to them but perhaps only as an act of curiosity or enquiry or 'polite' conversation rather than as an act of seeking recognition and validation of themselves. The question remains open for exploration.

4.2 Expecting to move others (and minding when you don't)

What happens when the adult does *not* get moved to a response by the infant's provocative invitation? What happens when the adult *stops* noticing the infant? Or stops responding? Does it matter *how* the adult is moved by the infant's actions? The answers to at least some of these questions, although fraught with contradictory interpretations and theoretical disagreements, are numerous and extremely rich.

4.2.1 *Recognising the absence of an expected response*

When a previously interactive communicative partner suddenly ceases to respond, freezing in the middle of a conversation, as it were, 2 month-olds show discomfort – decreased eye contact and increased frowns – and attempt to re-engage the partner with intermittent communicative initiatives (Tronick & Cohn 1989). The 'still-face effect' as this is called is limited to the unresponsiveness of a person and not to that of an object (Ellsworth, Muir & Hains 1993). In most 'still-face' studies the unresponsive partner looks directly at the infant, so it is not the withdrawal of gaze but the absence of response that is detected and causes distress. One key study found aspects of the still face effect even with gaze turned away from the infant (towards a wall, or towards another person), suggesting that it is the loss of communication that is in itself the 'problem' (Striano 2004) rather than the psychological cause of the loss. Most dramatically, at least some aspects of this effect are apparent in newborns as well. Nagy (2008) in a study in Hungary tested 33 newborn infants between 4 and 96 hours after birth using a still-face set-up with the experimenter looking directly at the infants with an expressionless face and found decreased eye contact, increased negative affect (actual

distress in some cases) and more sleepiness during the still face condition, although in another study the effect was not significant in newborns (Bertin & Striano 2006).

What does this withdrawal of response actually signify for the young infant? On the one hand, some studies suggest that it is not until about 4 months of age that infants recognize the significance of the still face in emotional or intentional terms. For instance, Rochat & colleagues (2002) found that while four month-olds showed the same patterns of distress to a 'happy' but unresponsive face as to a 'blank' and emotionless face, two month-olds did not – showing no behavioural differentiation (see also Rochat, Querido & Striano 1999). This would suggest that the two month-olds are seeking some sort of emotional *action* by the other – regardless of the relevance of the other's action to the infant's prior actions. On this account, for two month-olds, moving others does *not* matter (at least in this situation), it is receiving a happy face that matters. However, studies using the double video technique and presenting infants with a suddenly unresponsive but active partner (that is, replaying a positive segment of partner behaviour which had previously led to positive responses from the infant) have found that 2 month-olds respond in the replay condition with decreased eye contact, decreased smiles, increased frowns, closed mouth and negative affect (Murray & Trevarthen 1985; Nadel & Tremblay-Leveau 1999). The happy face of the partner is insufficient to stop negative effects on the infant at 2 months of age and it is strikingly the *response* to the infant, not the happy behaviour, that is crucial to the two-month-old.

4.2.2   *The 'mere' contingency argument*

Rochat and colleagues' conclusion is backed by a theory that it is only from around 4 months of age that infants can appreciate the timing patterns of the contingent social responses involved in social interaction. Gergely and Watson (1996, 1999) suggest that there is a contingency detection module from birth which allows the detection of all contingency violations (as in the still face and double video perturbations) and that receiving contingent responses is in itself a pleasant and rewarding experience. Within the predictions of this theory, it is not the loss of 'being recognized' or 'being noticed' or 'moving others' that leads to infant distress in either still face or video-replay and lag studies, but rather, the perturbation of effectiveness *per se*. In other words, the contingent responding of a nipple that does not respond to sucking and the contingent responding of a mother who smiles when the infant looks at her, would be seen in this theory as emotionally equivalent. They argue, further, that infants until after about three months of age prefer perfect contingencies – e.g. the simultaneity of mirror reflections – and only after that age do they prefer the imperfect contingencies necessary for social responses and interaction. Watson's early suggestion that infant goals involve attempts to maximize or elevate contingent responsiveness (because of the preference for the perfect contingency) is, however, challenged by two studies.

In one study two month-old infants were shown to prefer similar levels of contingent response (that is, similar to what they have become accustomed) rather than the highest levels (Bigelow 1998), suggesting that infant interactive goals may be to test and *maintain* rather than *maximize* contingencies even at two months (Watson 1994). At the very least, this suggests that responsiveness to levels of contingency means more to the infant than just obtaining 'effects' – if it was the latter then the greater the stranger's contingent responsiveness the greater should be the infant's. However, the infant appears to be learning meanings about responsiveness within the experience of contingent responsiveness she receives. This was also true at 2 months of age (Bigelow & Rochat 2006), particularly in relation to infant smiling responses to adult smiles, although the patterns of similarity were more variable at 2 months than at 4 months.

In another double video study contrasting live and replay face-to-face interactions with themselves (as if in a mirror) two month old infants were seen to differentiate the replay from the live conditions. One sub-group of infants actually preferred the non-contingent replay condition to the perfectly contingent live condition. In both sub-groups of infants, and in both types of conditions, however, there were attempts to provoke the 'partner' (i.e. the self in the monitor) by 'testing' with discrete movements such as waving an arm, nodding or shaking the head and protruding the tongue, suggesting strongly that checking a 'response' mattered (in both the Live and Replay conditions any 'response' was illusory of course, being either synchronous or accidental). Infants differed in the extent and manner of their testing behaviour and in the extent to which a lack of 'response' to their testing appeared to have a negative effect (Reddy et al. 2007). The lack of an overriding preference for high contingency is evident even in four to five week olds. Compared to natural interaction where the contingencies are temporally looser and responsive, imitative interactions have tighter temporal contingencies and closer identity of content, and ought, according to the contingency detection predictions (Gergely & Watson 1996, 1999), be preferred at this age. However, although this prediction was supported for infants whose mothers were deemed low in affect mirroring and responsiveness, it was not supported for infants whose mothers were high in affect mirroring and responsiveness (Legerstee 2005).

In sum, there is (as yet) no evidence for the prediction that infants begin life with a preference for the perfect contingency. It is likely that right from birth neonates are interested in both perfect and imperfect contingencies, as for instance in the non-perfect contingencies present in imitative, provocative and responsive interactions.

4.2.3   *Contingency or emotional responsiveness?*

So the question still remains: *what* is it that matters to the infant? The pure temporal contingency of the other's action? Or the confirmatory or recognitory content of the action? Two sets of studies offer some answers. One explores infants' differentiation between people and animated dolls and the other compares responses to the timing

of contingent responses versus to its emotional content. Infants as young as 5 weeks get upset when people refrain from responding to them, but not when physical objects remain immobile (Legerstee et al. 1987). It would seem that one month-olds expect or want responses from people but not from things. Contingent responding by people seems to subsequently make 3 month old babies happier (more cooing and smiling) and learn faster (higher speed of habituation) (Dunham et al. 1989; Finkelstein & Ramey 1977) but contingent responding by objects does not have the same effect; and non-contingent (random) reactions by objects does not upset babies at 3 months while random responding by people does (Legerstee 1997). These results suggest that not just *any* contingent reactivity matters, even very early in the lives of human infants. Perhaps not quite the torture that William James hinted at, but a degree of handicap, seems to depend upon *whom* the non-contingent responses come from, rather than merely from the fact.

Keller and colleagues suggest that temporal contingency may not only vary between different modalities of expression in the same individual, but be a dimension of maternal style separate from interactional quality (Keller et al. 1999). Attempting to separate the content of response from the level of contingency, Legerstee & Varghese (2001) found that infants' prior affective experience strongly influenced their reactions to contingency perturbations. At three months infants of mothers who showed high affective mirroring (i.e. sharing of emotional content) were not only more responsive to their mothers but also discriminated better between the Live and Replay conditions in a perturbation study. The infants of low affective mirroring mothers were, like the other infants, also sensitive to the contingency violation of the Replay condition. However, their responses differed emotionally: if they were first exposed to a contingent interaction they responded much the same as the other infants with a drop in gaze, etc. But if they were first exposed in the experiment to the Replay condition, it appeared that, unlike the other group, they did not bother to re-engage with a recovery in the subsequent Live condition. Infants' experience with *how* others respond to them – not just *whether* they receive contingent feedback – does seem to make a difference to their subsequent interpersonal interactions. In particular, the finding that affective mirroring may be the crucial differentiator suggests that infants by two and three months of age not only expect a response to their actions, but they appear to thrive better on a response which mirrors or 'confirms' their emotions (if not quite all their actions).

Differential vocal responsiveness to the mother versus to a female stranger is found in 3 month-old infants to be greater when the mothers are prone to showing more positive affect (Roe et al. 1985) and is less when mothers show more 'rejection' in their emotional expressions (Voelker 2005). Intriguingly, when infants at three months show differential vocal responding in favour of the stranger, they also show more mother avoidance at 12 months (Voelker 2005). Together with the research on maternal depression and its early effects on infants and the findings with neglected

orphans, this finding suggests that infants in the period of what Trevarthen calls 'primary intersubjectivity' are already influenced by much more than the contingency of their communications with their parents, and may look to others for their 'emotional needs' if these are not met by their primary caregivers. Of course, the assumption of a single primary caregiver can only be relevant for those infants whose early cultural experience supports this – although it is not clear as yet how infants in cultures with a genuine plurality of caregivers deal with strangers or indeed with 'rejection' by one of them at any particular time.

4.2.4   *Recognising being imitated*

Infant recognition of – and perhaps emotional appreciation of – *being* imitated might be another way to address the question of when and how infants know that they have moved others in some way. When do infants recognize that they are being imitated? The answer may be a graded one (Nadel 2002). On the one hand, there is the evidence above of the experience of affective mirroring by their mothers even at 4 or 5 weeks of age making a difference to infants' subsequent interactions (Legerstee & Varghese 2001). And there is evidence that at three and a half months imitation by their mothers led to more gaze to the mother than did spontaneous interaction or intense attention getting behavior (Field 1977) although it is unclear whether the greater gaze to mother was a factor merely of the lower maternal activity in the imitative condition rather than of the imitation *per se*. On the other hand, clear evidence of imitation recognition is only available as yet from the second year. Adult imitation of infant behavior has been shown to lead to intentional testing of adult behavior at 14 months (Meltzoff 1990) and to reciprocal imitative behavior at 18 months (Asendorpf, Werkentin & Baudonniere 1996) and at 24 months with peers (Eckerman 1993). Nadel's graded sequence of the emergence of imitation recognition suggests that initial imitation recognition occurs without any conscious awareness of the other's intention to imitate. Following the emergence of such awareness there might be a further third 'stage' at around 24 months, in which there is recognition of the intentional communicative intention of the imitator (i.e. as compliant with the intention of the child who is imitated, Nadel 2002).

4.2.5   *Minding being excluded from groups*

Somewhat comparable to the adult research on the irrepressibly negative effects of social exclusion are infant studies involving the interaction of triads. These studies typically use situations where a parent and infant 'dyad' are joined by either another infant or an infant-like doll whom the mother then starts to attend to, or situations involving three same-age infants where any exclusion is left to occur naturally. Typically, from around 4 to 5 months of age infants show signs of jealousy in the form of distress or discomfort at the parent's engagement with another infant or a doll (Draghi-Lorenz

2001, 2010; Hart et al. 2004.). Shortly after this age (in a triad of 6 to 9 month-olds) a much more subtle sense of infant loss is reported in infant triads when an infant 'deserts' one partner and turns to engage with the third infant for a few moments (Selby & Bradley 2003). Markova and colleagues showed that by 9 months of age the non-preferred infants in same age triads displayed less positive affect, showed fewer initiations and responses and less play (Markova, Stieben & Legerstee 2010). Adult emotional reactions to social exclusion (Williams 2007) would, therefore, appear to have its roots at least by 5 months in infant responses to exclusion by mothers or even peers, the early roots supporting the findings that the reaction is far from 'rational' in adults, occurring despite conscious knowledge of contrary intentions.

4.3   Exploring how one can move others

Why in the cases of the still-face and double video studies, are these attempts to re-engage made by infants? To re-establish communicative engagement, to re-establish a sense of a sane and responsive world, to feel liked and wanted? Or 'simply' from a desire to produce movement in someone else for its own sake? Is the desire to move someone else for 'its own sake' actually more indicative about interpersonal awareness or less?

A very odd argument is possible here. The skeptic could argue that in order to demonstrate that infant interest in others' emotional reactions is genuinely interpersonal (if not communicative) we would need to demonstrate that the infants' interest is in fact in the other's act as a *reaction* rather than in the act itself. For example, to show that I am interested in your response to my act, I would have to show that I am not interested in your act per se, but only in the fact that it is a response! In other words, we would have to establish that the infant wants the response as a response but has no interest in the content of the response. The oddness of this argument lies of course in the requirement that in order to demonstrate interpersonal significance we would need to establish interpersonal disinterest in all but mechanical terms!

Even if it were possible to clearly separate interest in reactions from the need for the actions in themselves, such a mechanical exploration might be more indicative of developmental psychopathology (as in bullying or in seeing the other as an object to test) than of developmental advance. It might be helpful, however, to conceptualise this separation as a matter of degree, as a dimension rather than as a categorical one. Infants do seem, in the second half of the first year, to be curiously interested in exploring others' reactions as reactions. Evidence from studies showing that infants look for others' emotional reactions to ambiguous events as in social referencing (Klinnert et al. 1982) or to pleasant events or their own accidental actions as in attentional referencing (Reddy 2005) suggest that infants are already well aware *that* others can or do respond to events in the world and to things that the infant does. In the phenomena of

clowning, showing-off and teasing, infants are actively exploring and then continuing to seek specific reactions by others to their own actions. It is often difficult but sometimes possible to separate out the specific reactions of laughter, attention, approval, surprise, annoyance that an infant seeks to re-elicit, using the recent histories of specific sequences, showing the range of reactions that infants are interested in exploring at various ages.

4.3.1   *Clowning*

Clowning often starts from accidental discovery – an infant may be exploring the feeling or sound or effect of some action for herself, and perhaps finds that 'significant others' are laughing at it. With an interested recognition of the others' reactions and its 'cause' the infant may then intentionally set out to repeat the action for this effect on others. Such sequences are common enough that their first occurrences, with infants' eyes widening at an unexpected audience reaction to an action by herself and repeating the action, are sometimes caught on video. They show an unfolding interest in a newly discovered reaction of the other rather than a pre-existing desire to gratify some already felt need through obtaining this reaction. In subsequent repetitions over the next days – sometimes until the audience is struggling to squeeze out the semblance of a laugh – the infant is showing evidence of a quickly developed desire for a specific reaction (Reddy 1991).

In one longitudinal study (Reddy 2001) seventy four percent of 8-month-olds were reported by parents to have shown some form of clowning (that is, a clear repetition of an action to re-elicit laughter from others at least once). The simplest early forms of clowning reported at 7 months (Reddy 1991) were things like splashing in the bath, discovering its effect on the other and immediately (or on the next occasion) repeating the splashing to re-elicit the laughter. Given that these studies did not begin before 7 months of age it is very likely that a focused study might uncover clowning even earlier. More complex than splashing are behaviours involving odd movements of the head (like shaking it rapidly from side to side, perhaps initially to explore the sensation of the movement), deliberately distorting a movement they have mastered (like walking in a funny way), imitating others' odd facial expressions (like a snoring face) or sounds (like coughing), using familiar objects or clothes in an unusual way (like putting the potty on the head or lifting up the frock to reveal the tummy) and so on (Reddy 2001).

4.3.2   *Showing-off*

Parents often spontaneously use the term 'showing-off' to describe infant efforts to try and attain, regain or retain others' attention by doing a variety of actions. Sometimes these actions involve the display of silly, boisterous behavior in specific contexts, sometimes motor skills or actions or words that they have just mastered, and

sometimes a display of a repertoire of tricks to an attentionally available (but often unsuspecting) audience. Parents often report situations like first visits to family or friends or work-places as eliciting such displays (Reddy 2008), where the key might lie with the 'new' audience's willingness to respond with enjoyment to tricks the family has already tired of.

Infants at this age also seem to use their knowledge of the social value of their newly developing motor skills to obtain appreciation – what might be called 'clever showing-off' to distinguish it from the 'anything that works' or 'silly showing-off'. The skills in question must generally have been already reacted to with appreciation in order for them to be marked out as having social value, although in some cases, the infant's own effort to achieving some difficult feat (such as struggling and then managing to hold two blocks in one hand) can lead her to look around for a reaction. Typical motor skills associated with family praise and often 'used' by infants in the second half of the first year are pulling themselves up to stand, crawling and walking. Interestingly, infants seem to be sensitive to the possibility of others' reactions (and interested in them) to actions they have done even when the actions were unintentional (as in an accidental noise followed by a shy look at the researcher). Incidents of seeking attention by defiant or negative acts (which are traditionally called negative attention-seeking in the psychological literature) might be better discussed in the context of provocative behavior or teasing.

4.3.3   *Teasing*

Somewhat more complex than showing-off and clowning are examples of teasing where infants appear to be deliberately violating some expectation or mutual understanding or shared convention in order primarily to provoke a reaction from the other. Teasing is a creative discourse which contributes to the dynamism of cultural processes. Ultimately, provocation has unpredictable consequences and the exploration of such unpredictability has itself to be unpredictable. Teasing is mainly successful when it involves surprise. The motivations in teasing are varied. It could involve a seeking to move the other which is intensely intimate and connected. Or it could involve a blind experimentation – such as might be the case with little boys trying to pull wings off butterflies. Or it could involve a colder, more bullying experimentation by prodding the other where you know it hurts to provoke a specific or explore a new reaction. The reactions sought through teasing are enormously varied.

Teasing is widespread before the end of the first year and seems to start blossoming (in a manner of speaking) from around 8 months. In one study clear signs of seeking a reaction with a playful or watchful look were reported in less than a quarter of 8 month olds and three quarters of the 11 month olds. But in a looser form of seeking some reaction from others to a disruptive or prohibited or tricky action, teasing was evident in half of the sample of 8 month olds and almost all 11 month olds.

At this age, before the end of the first year, the reactions sought appear to be primarily positive. Watchful looks while doing provocative acts do occur, but they are less frequently reported than the cheeky or more playful expressions that accompany teasing. In one study (Reddy 1991) there were only two instances of 'negative teasing' which involved repetition of provocations which had led to clear distress in the other. Both cases involved an intrusion into the actions or possessions of a very young older sibling (like pulling out the dummy and crawling away very fast). (Of course there is a circularity in judging the positiveness or negativeness of intention in teasing since the response of the other defines it.)

Before the end of the first year infant provocations take numerous forms: the most common forms are teasing with offer and withdrawal of an object (about 50% of infants have persisted in this at some point before the end of the first year), teasing with non-compliance (again not only a very prevalent form which almost all infants try to some extent, but a particularly salient one for parents if it becomes frequent) and teasing by disrupting the other's activity. Other forms include offer and withdrawal of the self, false requests for food or drink, false refusals, and so on.

5.   Mutuality

There are at least two ways in which being moved and moving others can be seen to involve mutuality. One is the circularities of effects (and lack of effects) that can be seen in both short-term interactions and long-term relationships. Another is the evidence of what happens when moving an other is attempted without mutuality.

Peter Hobson reports a wonderful example of the mutuality of a failure of movement in his study of the greeting and farewell responses of people with autism. He describes the case of one adolescent girl who gave the briefest glance at him as she entered the room, responding with another delayed glance and a toneless 'Unn' to an introduction, maintaining the lack of eye contact as she walked across the room, sat across him at the table, responded to the questions in the session and then got up to leave when it was over, responding with a minimal 'Bye' and a vague backward flap of the hand in response to Peter's insistent 'Goodbye'. What was most interesting from the point of view of a mutuality, however, is the way in which Peter behaved. In the presence of what seemed to be an awareness of his presence but little sense of him as a person, he had unintentionally become (as seen on the videotapes) stiff and forced in his gestures, with a loss of his otherwise fluent and spontaneous behaviour (Hobson & Hobson 2008). There is other evidence that people with autism show deficits in responsive movements – that is in being moved *by* others. For instance, head shaking, head nodding and smiling are 'unimpaired' in autism when averaged across a range of social interactions (Capps, Kehres & Sigman 1998; Tantam, Holmes & Cordess 1993).

However, when studied in closer detail, although there is indeed no deficit in interactive head nods and shakes overall, there appears to be an absence of head nodding or shaking while listening to the partner talking (Garcia-Perez, Lee & Hobson 2007). For the purpose of this paper the question is of the effects that this lack of responsive movement has on the *other*.

In a study comparing pre-school children with Down Syndrome and pre-school children with autism we found that the latter show less frequent attention to others' laughter during interactions in the home. They appear to be significantly less 'moved' by others' laughter to turn around, look, smile or laugh in response. There was no group difference overall in amounts of the children's own spontaneous laughter in everyday life, nor in the amounts of spontaneous laughter by the parents of both groups. However there was a difference in the amount of parent laughter directed to or involving the children: the parents of the children with autism showed significantly fewer laughter episodes directed to or involving their children (Reddy, Williams & Vaughan 2002). The lower amount of 'being moved' in the children could be argued to lead to a lower amount of 'seeking to move' in the parents. This diminishing of attempts to move (if they can be called that) is very likely to be outside of consciousness. In the head-nodding study an unexpected result of the lack of responsive movement in the participants with autism was an immediate decrease in the interviewer's own head nodding (while speaking, but not while listening) – an unintended lack of movement in response to the unmoved stance of the other (Hobson & Hobson 2008).

The feel of another consciousness engaging with you (this feeling of mutuality) is necessarily open-ended and 'indeterminate' (Auvray, Lenay, & Stewart 2009, citing Sartre). Neither you nor the other are fixed and objectively definable entities – a challenge to the 'objective' nature of conscious entities strongly argued by Mearleau-Ponty. It is something like an incompleteness of each person that allows what he calls 'co-extensive being' through dialogue and the creation of a common ground between persons. The shared world in which people act is a ground which provides a necessary logic to the actions of the people who act within it. Co-extension with another consciousness, then, would mean that the movement of one is logically involved with the movement of the other (which makes each transparent to the other) (Merleau-Ponty 1961). The fundamental circularity between being noticed and *being*, often asserted by theories of the dialogical self (Bakhtin 1975; Hermans 1996; Winnicott 1960; Fogel, de Koeyer, Bellagamba & Bell 2002), suggests that how one is noticed or not noticed is responsible for how one *is*, that is, for how one *needs* to be noticed or not noticed. To be and to move others must therefore be mutually constitutive. Such mutuality is profoundly impressive and, for anyone who works with people in any way, profoundly scary. This is not to say, however, that the self is *only* constituted by another consciousness; the self must also be constituted by its experience of moving *things* in the world.

The newborn infant could not act as an agent if she was not already constituted by her body and her experience in *utero* (see MacLaren 2008 & Zahavi 2005 for differing but not irreconcilable views on this issue). The mutuality is as relevant – even though in a much simpler way – to moving a world of physical things and forces.

The mutuality is also evident at a simpler level. You will not want to move others unless you are interested in them and are already moved in some way by them. To the extent and in the shape of your interest lies the extent and shape of the effect you seek in others. This can be seen in the way in which infants seek different kinds of reactions from their caregivers at different ages and in different situations. The face to face responses that move the two month-old to seek to elicit more of them are quite different from the laughter and attention that the 9 month-olds seek from others to their odd or clever actions. The testing for synchronous movement that is sought by the two-month-old in the mirror is different from the search for emotionally contingent response sought by them in interaction with others and different yet again from the teasing and testing of reactions and boundaries of the nine month-old. In each case, the interests, motives and perceptual capacities of the infant constrain and shape the reactions they seek from others.

A lack of mutuality can be deeply problematic. To seek to move others without being moved oneself can result in the kind of unethical experimentation that one hears of in boys tying crackers to dogs' tails or in the recent videos of American soldiers laughing and joking while torturing Iraqi prisoners. The problem in such cases is characterisable as an absence of empathy, but an absence which arises from an imbalance of power. This imbalance can allow – even encourage – attempts to act on others without openness to them as persons and attempts to seek reactions to fit an external agenda. To be sure, the little boys and the American soldiers appear to enjoy the reactions of their victims and to this extent their attempts to move match their ability to be moved. However, the interaction is profoundly non-reciprocal – they recognize the victim as one capable of specific reactions, the victim does not exist as a person who can be moved. A reciprocity of recognition is crucial, argues Merleau-Ponty, otherwise one or the other vanishes in the interaction. This recognition is something that occurs in inter-subjective relation. If it did not, if each withdrew into themselves and made their gaze 'inhuman', they would see each other as objects, each feeling that his actions were not "taken up and understood, but observed as if they were an insect's", something that happens when one "falls under the gaze of a stranger". This feeling of 'being observed' is unbearable, but only, he argues, "because it takes the place of possible communication" (p. 420). Writing about cases of abuse and the extreme neglect – even demonization – of children, Karsten Hundeide (2007) offers the idea of a 'zone of intimacy' within open and mutual communication. He suggests that the experience of being 'outside the zone' can be radically transformative – just as transformative as the experience of intimacy in cases of communicative disorder (Zeedyk 2006) or in psychotherapy (Stern 2004). Ultimately, we are caught within this necessary mutuality.

Moving others matters; it matters because it shows us to have been known by others, it matters because it shows us to have mattered to them, and it matters because within this mutual mattering we can develop in ways that we cannot yet know.

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Intersubjectivity

Neurons, neonates and narrative

From empathic resonance to empathic understanding*

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The problem I want to address is a classic one in the philosophy of mind. In that context it is called the problem of other minds, but it is a problem that is debated in and across a number of disciplines and approaches – the problem of intersubjectivity in phenomenology, empathy or understanding others in hermeneutics, social cognition or theory of mind (ToM) in cognitive sciences, psychology, and developmental studies, and most recently, under similar titles, we find discussions of motor resonance processes in the cognitive neurosciences. The basic question addressed under these different headings is: How are we able to understand other people – their intentions, their behaviors, their mental processes? All of these different titles for the problem, however, are themselves problematic and in some way beg the question. To cast the problem in terms of 'mind', 'inter-*subjectivity*', 'cognition', 'empathy', or 'motor resonance', already biases the way one is tempted to solve the problem. One strategy for balancing out, if not canceling out these different biases, is to take an interdisciplinary approach, and that is what I will do here. I will review several debates that are ongoing across these various disciplines, and, in contrast to certain standard views, I will map out an alternative position that will draw support from neuroscience, developmental psychology, phenomenology, and narrative theory.

Keywords: empathy; interaction theory; mirror neurons; motor resonance; narrative competence; simulation; theory of mind

1.   Two debates about empathy

In the past several years a debate on the question of how we understand others has taken shape, motivated by the discovery of mirror neurons and what is more generally referred to in the cognitive neurosciences as *resonance systems*. Briefly, mirror neurons are located in the premotor cortex and parietal areas and are activated in two conditions: (1) when the subject engages in intentional actions of a specific sort (e.g. actions that involve reaching and grasping) and (2) when the subject sees someone else engaging in the same kind of action.[1] More generally, it has been shown that there are overlapping neural areas (shared representations) in the brain that are activated when the subject intentionally *acts* in specific ways, *observes* the same kind of actions, or *imagines* such actions (Jeannerod 1997; Ruby & Decety 2001; Grezes & Decety 2001).

1.1   The early debate and some terminological strategies

The contemporary debate, which I will summarize shortly, was clearly prefigured by a similar one that took place at the beginning of the 20th century, based on behavioral and phenomenological observations which suggested that embodied, sensory-motor and action-related processes were important for explaining our understanding of others. Thus, Theodore Lipps, Max Scheler, Edmund Husserl, and others contested these issues in terms that involved concepts like analogy, projection, expression, and empathy. Lipps (1903), for example, discussed the concept of *Einfühlung*, which he equated with the Greek term *empatheia*, which in turn motivated Titchener's (1909) translation of the term as 'empathy'. Lipps attributed our capacity for empathy to a sensory-motor mirroring, an involuntary, "kinesthetic" inner imitation of the observed vital activity expressed by another person. Husserl, and other phenomenologists, including Scheler, and later, Heidegger, and Merleau-Ponty, developed phenomenological critiques of Lipps' account, contending that empathy is something more than these involuntary processes and that in some cases empathy happens as a solution or supplement to the breakdown or inadequacy of the more basic, automatic, perceptual understanding of others (see Zahavi 2001; 2005 for a good summary of these debates).

In light of this early discussion problems of terminology and definition become apparent. We noted that Lipps equated *Einfühlung* with *empatheia* which, in its use in late philosophical Greek, meant simply being in a state of passion, not necessarily a passion related to another person. *Hineinversetzen*, a term used by Dilthey (1926),

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1.   These neurons were originally discovered by single cell neuron recordings in the macaque monkey (Rizzollatti et al. 1999; 1996), and there is evidence that they exist in humans (Fadiga et al. 1995). See Dinstein et al. (2008) and Hickok (2009) for some critical limitations on claims about mirror neurons.

which literally means putting oneself in the place of the other, has also been translated into English as 'empathy'. Dilthey associated this term with *Nacherleben* – to relive something in our experience. Terminological and translation problems are also complicated by the fact that various authors make various differentiations among the concepts of empathy, sympathy, and compassion, and no two authors seem to agree on what is what, or if one is more basic than the other. Scheler (1954 [1923]), for example, prefers the term 'sympathy', which means to have an accordance of feeling, and seems intrinsically intersubjective. This term is also used by Hume, who suggests a more psychological sense: "The minds of men are mirrors to one another" (1739/1978: 365). The idea that the self naturally mirrors the other goes back at least as far as Aristotle and his analysis of friendship. Hume, however, regards sympathy not as an immediate feeling, but as the result of an inference we make about the emotional state of the other (1739/1978: 576).

Faced with this terminological difficulty, there are several strategies that one could take. First, one could simply abandon the term 'empathy' and opt for some other word. Second, one could stipulate one's use of the word 'empathy' to signify just the basic resonance processes that are described by the research on mirror systems. Third, one could limit the use of the term to whatever is needed for understanding others that is more than just those basic resonance processes. I will pursue a fourth (and more Wittgensteinian) option designed to short-circuit the terminological and conceptual issues, and suggest that the term 'empathy' has many different meanings depending on the context in which we use it. In effect, there are many different kinds of empathy – from those processes that involve basic resonance ("elementary empathy") to more sophisticated kinds that involve higher cognitive functions ("empathic understanding").[2] Rather than worry about how to define the term 'empathy', I want to look at what it takes, *in a full sense*, to understand others. What I mean by 'in a full sense' is what it takes for a mature adult to understand what another person intends. But to work out what it takes for a mature, adult human to understand another human, we cannot ignore how this ability develops and originates in early infancy, or what animal studies can tell us about the perception of intentional action.

1.2   The contemporary debate

The contemporary debate, motivated by the new data on mirror systems, shared representations and motor resonance, features proposals similar to Lipps' theory,

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2.   The distinction here follows Dilthey (1926), who suggested a distinction between elementary understanding and mature empathic understanding. As we'll see, regardless of the terminological dissensus, there is a building consensus over the idea that there are two processes at stake: an early, automatic process, and a more mature and controlled process.

associating empathy directly with motor resonance processes (e.g. Gallese 2001), and in contrast, proposals that suggest that empathy involves something more than motor resonance processes (e.g. Decety 2005). In light of these debates we want to ask: What is the relationship between resonance processes and empathy? And, what, if anything, is the "something extra" that is needed for empathy?

Neuroscience and developmental psychology inform the contemporary debate in ways that motivate a focus on two discussion areas. The first area concerns the operation of basic resonance processes, about which we have good science and good, although limited consensus; the second area concerns some kind of higher-order empathic understanding, about which we have no consensus. We can map out the terms of this debate by looking at representatives on either side of the major dividing line between these two areas. Vittorio Gallese (2001, 2003), for example, focuses his analysis of empathy on basic resonance processes. Jean Decety (2003, 2005) suggests that empathy involves a form of higher-order understanding.

Gallese is part of the neuroscientific team that discovered mirror neurons, and he builds his theory of empathy on the fact that

> when we observe goal-related behaviours … specific sectors of our pre-motor cortex become active. These cortical sectors are those same sectors that are active when we actually perform the same actions. In other words, when we observe actions performed by other individuals our motor system 'resonates' along with that of the observed agent. (Gallese 2001: 38)

For Gallese, our understanding of the other person's action relies on a neural mechanism that matches, in the same neuronal substrate, the observed behavior with a behavior that we (observers) could execute. This lived bodily motor equivalence between what we observe others doing, and the capabilities of our own motor system allows us to use our own system as a model for understanding the other's action. "Empathy is deeply grounded in the experience of our lived-body, and it is this experience that enables us to directly recognize others not as bodies endowed with a mind but as *persons* like us" (2001: 43). Thus Gallese uses action understanding as a framework to define empathy. In support of this he cites the work of Lipps: "When I am watching an acrobat walking on a suspended wire, Lipps (1903) notes, *I feel myself inside of him*" (2001: 43). Gallese's argument, however, is based on the neuroscience of mirror neurons. "I submit that the neural matching mechanism constituted by mirror neurons – or by equivalent neurons in humans – … is crucial to establish an empathic link between different individuals" (2001: 44). Gallese appeals to simulation theory to extend this model to include expressive aspects of movement that give us access to the emotional states of others (Gallese & Goldman 1998). I will return to the concept of simulation theory shortly.

Jean Decety (2002, 2003, 2004, 2005), in contrast, contends that empathy does not imply simply an action or emotion resonance initiated by the action or emotion

state of the other. It also requires a minimal comprehension of the *mental states* of this person. He does not deny the importance of resonance systems, especially in early infancy, and he accepts that we have an innate capacity to feel that other people are *"like us."* But we also quickly develop the capacity to put ourselves *mentally* in the place of others. He also emphasizes that in this process difference is just as important as similarity. Empathy is founded on our capacity to recognize that others are similar to ourselves, but to do so without confusing ourselves with the other.

According to Decety (2005; Decety & Jackson 2004; Jackson, Meltzoff & Decety 2005) then, three fundamental components interact to create empathy:

> a component of motor resonance (*resonance motrice*) whose release is generally automatic and nonintentional;
> insight into the subjective mental perspective of the other which may be controlled and intentional;
> the ability to differentiate between self and other.

The third component is satisfied at the same basic neuronal level of resonance, and specifically by Georgieff and Jeannerod's (1998) concept of a "who system." On this model, the shared representations (activated neuronal areas) for my action and the perception of the other person's action overlap and create the required resonance that enables the automatic recognition of the other's action as similar to action of which I am capable. But, as Georgieff and Jeannerod indicate, the overlap is not complete, so that different sets of neurons that are activated when I act are not activated when I see others act, and vice versa. This difference, they propose, allows for the differentiation between self and other (but see Legrand 2007, and Note 6 below).

Both Gallese and Decety agree that basic resonance systems are in place, not only in early infancy, but also in non-human primates. The major difference between the positions represented by Gallese and Decety concerns the second component. For Gallese, this component is not something *more* than what the resonance systems already deliver, automatically; for Decety, this is the "something extra" that is needed for empathic understanding. For a precise understanding of the difference between these two positions, however, and to specify what the "something extra" is that is allegedly needed for empathic understanding, we need to briefly review a third debate that falls under the heading "theory of mind" (ToM).

2.   The theory of mind debate

There are several strong candidate theories to be considered as solutions to the question of what more than resonance or mirror systems one needs in order to understand

others in the full sense. Under the general title of theory of mind (ToM), the established contenders are "theory theory" (TT) and simulation theory (ST).

2.1   Theory theory

TT claims that one must take a theoretical stance toward the other in order to infer or "mindread" their beliefs, desires, or intentions (e.g. Baron-Cohen 1995; Carruthers & Smith 1996; Premack & Woodruff 1979). That is, the ability to understand others is based on having a certain kind of knowledge, a theory (or folk psychology) of how people behave in general. According to some theory theorists, the folk psychology may be learned via experience; other theorists contend that it is based on innate capacities that emerge developmentally. There is also disagreement about whether we use the theory explicitly (consciously) or implicitly (non-consciously). All theory theorists, however, embrace three suppositions, although sometimes only implicitly.

> that we understand others to be other *minds* that are perceptually inaccessible, and that "mindreading" involves an attempt to *explain* or *predict* the behavior of the other person on the basis of what the subject infers to be the other person's beliefs or desires;
> that in our encounters with others we are primarily observers;[3] and
> at least for many theory theorists, use of folk psychological theory is our primary and pervasive way of understanding others, once we reach the age of 4 years.

This is the age that we begin to pass false-belief tests, and this is taken as evidence that we attain a theory of mind at this age (see below).

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3.   Peter Carruthers denies this is the case. "In particular, it is simply false that theory-theorists must or do) assume that mentalizing usually involves the adoption of a third-person, detached and observational, perspective on other people. On the contrary, theory theorists have always emphasized that the primary use of mindreading is in interaction with others (which Gallagher calls "second-personal") (2009b: 167). Yet the third-person observational stance is consistently implied throughout most of the literature on TT, and in most discussions of false-belief tasks, which are set up as third-person observational tasks. The observational stance is directly tied to the idea that the task in social cognition is to "explain and predict" the actions of others. To take up a task of theory-based explanation clearly implies a third-person process based on observations of the other person's actions. Even for Carruthers the task seems to be just this: "to provide fine-grained intentionalistic predictions and explanations" based on "inferences from observation" (1996). And he indicates that "we surely use our mind-reading system, for example, when processing a *description* of someone's state of mind as well as when observing their behavior" (Carruthers 2002: 666); and he characterizes mindreading as something done by "a third-party observer" (2009a: 134).

2.2   Simulation theory

In contrast to the knowledge-rich approach of TT, ST claims that in our attempt to understand others we do not need a folk psychology; rather, we employ our own mind as a model on which we simulate the other's mind by creating "as if" or pretend beliefs, desires, intentional states (e.g. Goldman 2006; Gordon 1996; Heal 1996). We then make inferences about the other person's mind on the basis of the simulation. As in TT, there is debate about whether our simulating ability is a product of experience or is an innate capacity activated by experience. Traditional ST suggests that simulation is explicit (conscious or introspective, involving imaginary enactments).[4] A more implicit version of ST suggests that simulation routines are non-conscious, and are performed automatically and sub-personally at the level of mirror neurons (e.g. Gallese & Goldman 1998; Goldman 2006). Similar to the suppositions that inform TT, many simulation theorists adopt the mentalizing supposition that we understand others as other minds that are perceptually inaccessible; that we primarily take the observational stance toward others; and that simulation is the primary and pervasive way in which we understand others.

Consider the claim about taking an observational stance. Both TT and ST are based on the idea that our attempts to understand others are always made in the mode of observation. Person A observes the behavior of person B and then resorts to either theory or simulation to predict or explain B's action. In TT this observational stance involves an explicit third-person perspective. As a third-person observer I consult the theory and infer what is in the other's mind and accordingly predict or explain the other's behavior. In ST this observational stance involves a first-person perspective in the sense that the simulation process is accomplished in a model of my own first-person thoughts, beliefs, desires, etc. I simulate from a first-person perspective, and then infer or project beliefs or desires to the other in order to predict or explain their behavior.

2.3   Interaction theory

In contrast to both of these approaches, I have argued elsewhere (Gallagher 2001a, 2004, 2005, 2007a&b) that our primary and pervasive way of encountering others is not characterized by observation, but by interaction. That is, the others we try to understand are usually people with whom we are interacting, engaged in some communicative act, or in some common task, or situated in some common setting.

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4.   Goldman, for example, describes it this way: "When a mindreader tries to predict or retrodict someone else's mental state by simulation, she uses pretense or imagination to put herself in the target's 'shoes' and generate the target state" (Goldman 2005; see Goldman 1989).

Our primary way of understanding others is worked out not via 3rd-person obser-vation or 1st-person simulation, but via real (2nd-person) interaction in pragmatic and social contexts. As an alternative to TT and ST, I've proposed interaction theory (IT) that appeals to evidence from phenomenology and developmental psychology. IT challenges the ToMistic models of TT and ST on each supposition.

1. It (or IT) rejects the mentalizing supposition, that is, the Cartesian idea that other minds are hidden away and inaccessible, and cites evidence that in many cases knowing the other person's intentions, emotions, and dispositions is simply a matter of perceiving their embodied behavior in the situation. In most cases of everyday interaction no inference is necessary.

2. IT rejects the spectatorial supposition that we are primarily observers of others' behaviors. Our normal everyday stance toward the other person is not third-person, detached observation; it is second-person interaction. For the most part we are interacting with them on some project, or in some communicative prac-tice, or in some pre-defined relation.

3. IT rejects the supposition of universality in regard to either theory or simula-tion. Rather, mindreading, as either TT or ST describes it, is at best a specialized activity that is relatively rarely employed. Our everyday understanding of others depends more on embodied and situated ways of perceiving and interacting with them, and is enhanced by narrative practices.

3.   The science of social cognition

Let us consider the evidence for and against these different approaches. First, there are a number of phenomenological problems with the *explicit* versions of TT and ST (see Gallagher 2005 for a full discussion). To put it most simply, taking a theo-retical stance or running a simulation routine is not the way it seems to happen in everyday interaction. If we take a close look at our experience as we encounter others, rather than consulting a theory or running a simulation, we seem rather to have a direct perception of how it is with others. In most cases we know what they mean or intend without consulting a theory or simulation model. The contrast to such everyday or ordinary encounters may be found in more difficult or puz-zling cases, where we may not know the person, or where we find their behavior strange. In such cases we may indeed revert to the observational mode and attempt to draw on a theory or simulation routine in order to figure out what is going on. But this is relatively rare in the larger context of everyday interaction. Furthermore, in our normal second-person interactions, we do not stand back in order to draw up an explanation. Rather, we engage with others in pragmatic activities or social

practices which may involve evaluative understandings of others (and of myself in light of how others view me).

To say that this is the way it seems, from a phenomenological perspective, however, does not necessarily rule out implicit versions of TT and ST. It may be the case that it does not seem that we appeal to theory, or that we run a simulation routine, but in fact we may be doing so non-consciously. Phenomenological evidence would not be able to show that this is or is not the case. Thus, we need to look at the empirical, scientific evidence offered in support of these implicit versions of TT and ST.

3.1   Theory theory and false-belief tasks

When theory theorists turn to science to find support they most frequently appeal to false-belief tests. For example, in a content change task, a child might be shown a box that appears from its packaging to contain sweets or candies. She is asked what she thinks is inside, and she naturally answers "candies." The box is then opened to reveal that something other than candies are inside, e.g. there may be pencils inside the box. The child is then asked to think about another person, X, who may walk into the room. When shown the box, what will the other person say the box contains? It turns out that the four-year old will correctly predict that X will say that there are candies in the box. On average, however, three-year olds will reply that X will say that there are pencils in the box. This seemingly demonstrates that on average, children who are three and younger do not have a developed theory of mind since they are not able to see that another person could have false beliefs.

This kind of experiment, and other variations of false-belief tests, set up a situation in which the child is seemingly forced to rely on an abstract and theoretical approach. Often times there is no other real person X. Sometimes a puppet is used; other times the test is based on a story about some fictitious child named Sally or Maxi. In such cases the child is not involved in any kind of real second person interaction with X. For example, there are no movements or facial gestures that X might present; there is no meaningful encounter with X, and to the extent that is the case, the test is more about problem solving than it is about social cognition. Moreover, while three-year olds might have problems passing the false-belief test,[5] and explaining or predicting the action of a third person, they seemingly have no problems understanding what the experimenter is asking, or understanding the scenario that is presented to them. That is, they seem to have little or no difficulty engaging in the second-person interaction that defines their relationship with the experimenter. Regardless of what

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5.   This claim has now been complicated by recent studies that show that infants as young as 15 months are capable of passing properly designed (non-verbal) false belief tests (Onishi & Baillargeon 2005).

we conclude about such issues, these kinds of false-belief tests can tell us nothing about an *implicit* use of theory, since the task that is set for the child is set at a conscious, and even metarepresentational level. It is not a test for some implicit process, since the child is asked explicitly to respond explicitly, and nothing rules out the possibility that the four-year old may be using an explicit logic to arrive at the correct answer. As far as I know, there is no scientific evidence that our normal encounters with others are characterized by implicit appeals to theory. Even those studies that examine implicit brain processes in the context of theory of mind tests propose only that such activity is the substrate of an explicit process of reasoning about mental processes (e.g. Saxe et al. 2004). False-belief tasks may have much to tell us about when children come to develop a concept of belief, but they tell us very little about social cognition, unless we already assume that our understanding of others is by way of a theoretical inference about beliefs that are hidden away in the other's mind – suppositions that clearly guide the design of such experiments.

3.2   Simulation theory and the neuroscience of mirror neurons

In contrast to TT and its appeal to false belief tests, it may seem that ST has more significant scientific support in the form of the recent neuroscience of motor resonance processes. If, as in ST's formulations of an implicit simulation, the claim is that the simulation is sub-personal, instantiated in the workings of mirror neurons, or more general resonance systems, and is therefore automatic and nonconscious, then it seems that phenomenological objections have no force since the scope of phenomenology is limited to conscious processes. But let's take a close look at what is claimed about implicit neural simulation.

The general claim is that one's motor system reverberates or resonates in one's encounters with others. Mirror neurons in my motor system are activated when I perceive another person performing an intentional action, for example. One claim that can be made by explicit simulation theorists is that these processes underpin (or are the neural correlates) of explicit acts of simulation (Goldman 2006; Ruby & Decety 2001). For the implicit simulation theorists, however, these subpersonal processes themselves just are a simulation of the other's intentions. Gallese captures it clearly in his claim that activation of mirror neurons involves "automatic, implicit, and nonreflexive simulation mechanisms …" (Gallese 2005, 117; also see Gallese 2007). On this hypothesis, at the explicit, phenomenological level, one is not explicitly simulating; rather one is experiencing an empathic sense of the other person, and this is the result of a simulation process that happens on the subpersonal level.

Implicit neural ST understood in these or in similar terms is the growing consensus. Thus, for example, Marc Jeannerod and Elizabeth Pacherie write:

> As far as the understanding of action is concerned, we regard simulation as the default procedure …. We also believe that simulation is the root form of interpersonal mentalization and that it is best conceived as a hybrid of explicit and implicit processes, with subpersonal neural simulation serving as a basis for explicit mental simulation.
>
> (Jeannerod & Pacherie 2004: 129; see Jeannerod 2001, 2003)

Goldman (2006) now distinguishes between simulation as a high-level (explicit) mind-reading and simulation as a low-level (implicit) mind-reading where the latter is "simple, primitive, automatic, and largely below the level of consciousness" (p. 113), and the prototype for which is "the mirroring type of simulation process" (147). The claim is that mirror neuron activation is a simulation not only of the goal of the observed action but of the intention of the acting individual, and is therefore a form of mind-reading. Mirror neurons discriminate identical movements according to the intentional action and contexts in which these movements are embedded (Fogassi et al. 2005; Iacoboni et al. 2005; Kaplan & Iacoboni 2006). Neural simulation has also been extended as an explanation of how we grasp emotions and pain in others (Avenanti & Aglioti 2006; Minio-Paluello, Avenanti & Aglioti 2006; Gallese, Eagle, Migone 2007). The idea that "simulator neurons" are responsible for understanding actions, thoughts, and emotions is taken up by Oberman & Ramachandran (2007) who provide evidence that the mirror neuron system as an internal simulation mechanism is dysfunctional in cases of autism.

In contrast to the claims of implicit neural ST, there are several reasons why mirror neuron activation should not be thought of as a form of simulation, and there is an alternative interpretation of the neuroscientific evidence about the mirror system that is more consistent with IT. First, let's consider the reasons for not considering mirror neuron activation an implicit simulation. The first reason concerns the meaning of 'simulation' as defined by ST. According to standard accounts of ST, (1) simulation involves pretense, and (2) has an instrumental character, i.e. it is characterized in terms of a mechanism or model that we manipulate or control in order to understand something to which we do not have direct access. These two aspects of simulation are ubiquitous in the ST literature, and are considered essential to the concept of simulation. Goldman (2002: 7), for example, explains that simulation involves "pretend states" where, "by pretend state I mean some sort of surrogate state, which is *deliberately adopted* for the sake of the attributor's task … In simulating practical reasoning, the attributor *feeds* pretend desires and beliefs into her own practical reasoning system." Both the instrumental and pretense character of simulation are reflected in this account. Dokic & Proust's (2002, viii) description reflects the instrumental character: simulation means "*using* one's own evaluation and reasoning mechanisms as a model for theirs." Gordon (2004: 1) locates this instrumentalism at the neuronal level by suggesting that on the "cognitive-scientific" model, "one's own behavior control

system is employed as a *manipulable model* of other such systems. (This is not to say that the "person" who is simulating is the model; rather, only that *one's brain can be manipulated to model other persons*)." Adams (2001:384) indicates that "it is a central feature of ST that one takes perceptual inputs off-line," that is, that simulation involves pretense. Bernier (2002:34) also takes both instrumental and pretense aspects to be essential elements of simulation.

> According to ST, a simulator who runs a simulation of a target would use the resources of her own decision making mechanism, in an "off-line" mode, and then the mechanism would be fed with the mental states she would have if she was in the target's situation.

The aspect of pretense is one of the things that distinguishes simulation from a theoretical model or a simple practice of reasoning (see Fisher 2006). This characterization also purportedly applies to the sub-personal processes of the motor system in iST: "our motor system becomes active *as if* we were executing that very same action that we are observing" (Gallese 2001:37). The neurons that respond when I see your intentional action, respond "*as if* I were carrying out the behavior …" (Gordon 2004:96). For ST, in all of its various forms, the concept of simulation clearly needs to meet these two conditions: it is a process that I control in an instrumental way (in the explicit version it is "deliberately adopted"), and it involves pretense (I put myself "as if" in the other person's shoes).

It seems clear, however, that neither of these conditions is met by mirror neurons. First, in regard to the instrumental aspect, if simulation is characterized as a process that I (or my brain) instrumentally use(s), manipulate(s), or control(s), then it seems clear that what is happening in the implicit processes of motor resonance is not simulation. At the personal level, I do not manipulate or control the activated brain areas – in fact, I have no instrumental access to neuronal activation. Nor does it make sense to say that at the subpersonal level the brain activates a model or methodology in order to generate an understanding of something else. Indeed, in precisely the intersubjective circumstances that we are considering, these neuronal systems do not take the initiative; they do not activate themselves. Rather, they are activated by the other person's action. The other person *has an effect on us* and *elicits* this activation. It is not us (or our brain) *initiating* a simulation; it's the other who does this to us. This is a case of perceptual elicitation rather than executive control.

Second, in regard to pretense, in sub-personal mirror processes there can be no pretense. This is obviously the case if we understand neurons as vehicles or mechanisms: neurons either fire or don't fire; they don't pretend to fire. More to the point, however, and to adopt the standard terminology, in regard to their representational function, what these neurons represent or register cannot involve pretense in the way required by ST. Since mirror neurons are activated both when I engage in intentional

action and when I see you engage in intentional action, the mirror system is neutral with respect to the agent; no first- or third-person specification is involved (de Vignemont 2004; Gallese 2005; Hurley 2005; Jeannerod & Pacherie 2004). In that case, it is not possible for them to register *my* intentions as pretending to be *your* intentions; there is no "as if" of the sort required by ST because there is no 'I' or 'you' represented.[6]

One could go against the standard characterization of simulation and argue for a more minimal conception. Goldman (2006; Goldman & Sripada 2005), for example, in reference to neural simulation, acknowledges a discrepancy between the ST definition of simulation and the working of subpersonal mirror processes. "Does [the neural simulation] model really fit the pattern of ST? Since the model posits unmediated resonance, it does not fit the usual examples of simulation in which pretend states are created and then operated upon by the attributor's own cognitive equipment (e.g. a decision-making mechanism), yielding an output that gets attributed to the target. …" To address this discrepancy Goldman and Sripida propose a generic definition of simulation:

> However, we do not regard the creation of pretend states, or the deployment of cognitive equipment to process such states, as essential to the generic idea of simulation. The general idea of simulation is that the simulating process should be similar, in relevant respects, to the simulated process. Applied to mindreading, a minimally necessary condition is that the state ascribed to the target is ascribed as a result of the attributor's instantiating, undergoing, or experiencing, that very state. In the case of successful simulation, the experienced state matches that of the target. This minimal condition for simulation is satisfied [in the neural model]. (Goldman & Sripada 2005: 208)

There is good reason to think, however, that matching, as a minimal condition for simulation, cannot be the pervasive or default way of attaining an understanding of others. There are many cases of encountering others in which we simply do not adopt, or find ourselves in, a matching state. Furthermore, with respect to implicit neural ST, if simulation were as automatic as mirror neurons firing, then it would seem that we

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6. I think this is the case even if there is some aspect of mirror neuron activation that differentiates between my action and the other's action, e.g. the frequency of the spiking activity, as Legrand (2007) suggests, or possibly the timing of activation relative to other sensory-motor processes (Gallagher 2005). This last point is especially important, as Legrand points out (personal communication), given that the brain functions in terms of neuronal assemblies which are "built" according to temporal constraints (synchrony of action potentials). The "same" neuronal activation slightly delayed may end up forming an entirely different assembly, and having a different function. Such differences would subtend a simple agent discrimination rather than a simulation.

would not be able to attribute a state different from our own to someone else. But we often do this in cases where we see someone acting in a way that actually motivates the opposite reaction in us, for example, if I see someone enjoying acting in a way that for me is disgusting (Gallagher 2007a). In such cases, neither my neural states, nor my motor actions (I may be retreating with gestures of disgust just as the other person is advancing with gestures of enthusiasm), nor my feelings/cognitions match his. Yet I understand his actions and emotions (which are completely different from mine), and I do this without even meeting the minimal necessary condition for simulation, that is, matching my state to his at any level.

Consider, in addition, the difficulties involved if we were interacting with more than one other person, or trying to understand others who are interacting with each other. Is it possible to enter into the same, or what are likely different states, and thereby simulate the neural/ motor/ mental/ emotional states of more than one person at the same time? Or can we alternate quickly enough, going back and forth from one person to the other, if in fact our simulations must be such that we instantiate, undergo, or experience, the states in question? How complicated does it get if there is a small crowd in the room? Would there not be an impossible amount of cognitive work, or subpersonal matching required to predict or to understand the interactions of several people if the task involves simulating their mental states, especially if in such interpersonal interactions the actions and intentions of each person are affected by the actions and intentions of the others (Morton 1996 makes a similar point).

Finally it should be noted that the scientific research on mirror neurons suggests good reasons to think mirror neuron activation does not involve a precise match between motor system execution and observed action. Between 21 and 45% of neurons identified as mirror neurons are sensitive to multiple types of action; of those activated by a single type of observed action, that action is not necessarily the same action defined by the motor properties of the neuron; furthermore, approximately 60% of mirror neurons are *broadly* congruent, which means there may be some relation between the observed action(s) and their associated executed action, but not an exact match. Only about one-third of mirror neurons show a one-to-one congruence (Csibra 2005). Activation of the broadly congruent mirror neurons, therefore, may represent a complementary action rather than a similar action (Newman-Norlund et al. 2007:55). In that case they could not be simulations.

In denying that mirror neurons are simulating or matching in such cases, I am not denying that mirror neurons may be involved in our interactions with others. Indeed, it is likely that they do contribute to our ability to understand others or to keep track of ongoing intersubjective relations. What I am denying is that they constitute simulations in any acceptable use of that term. There is a much more parsimonious

interpretation of mirror neuron activation which is consistent with the IT approach to social cognition.

3.3   Interaction theory, intersubjective enactive perception, and evidence from developmental psychology

The alternative interpretation of the mirror neuron data suggests that rather than simulation, mirror neuron activation is part of the neuronal processes that underlie a form of intersubjective enactive *perception*. That is, the articulated neuronal processes that include activation of mirror neurons or shared representations may underpin a non-articulated immediate perception of the other person's intentional actions, rather than a distinct process of simulating their intentions. On this view, perception is a temporally dynamic and enactive process.

We know that mirror neurons fire 30–100 milleseconds after appropriate visual stimulation. This short time scale motivates the question of precisely where to draw the line between perceptual processes and something that would count as a sub-personal simulation. Distinctions at the neuronal level between activation of the visual cortex and activation of the premotor cortex, do not constitute a distinction between processes that are perceptual *simpliciter* and processes that involve something more than perception (see Gallagher 2008). Even if neuronal processes that involve information-flow from sensory cortex to pre-motor cortex take some time (as much as 100 milliseconds) it is not clear that we should identify this dynamic flow as constituting a two-step process (perception plus simulation) rather than a temporally extended and enactive perceptual process. If we think of perception as an enactive process (Varela, Thompson & Rosch 1991), as involving sensory-motor skills rather than as just sensory input/processing – as an active, skillful, embodied engagement with the world rather than as the passive reception of information from the environment – then it may be more appropriate to think of mirror resonance processes as part of the structure of the perceptual process when it is a perception of another person's actions. Mirror activation, on this interpretation, is not the initiation of simulation; it's part of an enactive intersubjective perception of what the other is doing.

This interpretation of mirror neuron activation provides a tight fit with the interaction theory of social cognition, which can be further supported by developmental studies. On this account the capacities for human interaction and intersubjective understanding are already operative in infancy in embodied practices that are emotional, sensory-motor, perceptual, and nonconceptual. Evidence from developmental psychology suggests that infants much younger than three-years are able to perceive the intentions and feelings of others in their movements, gestures, and actions. Our access to others is based on certain innate or early developing capacities manifested at the level of *perceptual* experience. This is the notion of *primary intersubjectivity*

(Trevarthen 1979), a set of capacities that allow us to see, in the other person's bodily movements, facial gestures, eye direction, etc. what they intend and what they feel. Neonates less than an hour old, for example, are capable of imitating the facial gestures of another human (Meltzoff & Moore 1977, 1983; Gallagher & Meltzoff 1996). Although there is a debate about how precisely to characterize this behavior (see, e.g. the papers in Meltzoff & Prinz 2002) there is growing consensus that it involves the mirror resonance systems, even if they are not fully developed in the infant (see, e.g. Gallagher 2001b; Hurley 2005; Williams et al. 2001). Primary intersubjectivity also includes capacities for eye tracking, and for parsing various movements of the head, the mouth, the hands, and more general body movements as meaningful or goal-directed. Such perceptions are important for a non-mentalistic (pre-theoretical, non-conceptual) understanding of the intentions and dispositions of other persons, and they are operative by the end of the first year (Baldwin & Baird 2001; Baldwin et al. 2001; Johnson 2000; Johnson et al. 1998). This is not a form of "mindreading" in the sense of discerning mental states hiding behind observed behavior; rather, seeing the actions and expressive movements of the other person is already to see their meaning. No inference to a hidden set of mental states (beliefs, desires, etc.) is necessary.

The infant already has a pre-reflective sense of itself as an experiencing subject; it has a perceptual sense that certain kinds of entities (but not others) in the environment are indeed such subjects; it has a sense that in some way these entities are similar to and in other ways different from itself. This is a non-mentalising understanding of the intentions and dispositions of other persons, a perceptual grasp of emotional, embodied, enactive meaning. Moreover, it is part of what is primarily a second-person *interaction* rather than a third-person observation. One can see this in the timing and emotional mirroring of infants' behavior (Hobson 2002). Infants "vocalize and gesture in a way that seems [affectively and temporally] 'tuned' to the vocalizations and gestures of the other person" (Gopnik & Meltzoff 1997:131). In this regard, it is the interaction itself that contributes something that is not reducible to the actions of the individuals involved.

> [T]he intentionality in the mother-infant interaction does not reside in any individual mind; it emerges as a product of their social interaction. Thus, what is intentional about the mother-infant interaction cannot be explained simply in terms of the mother's and infant's intentions with respect to each other.
>
> (Gibbs 2001)

On average, around the age of 9 months to 1 year, when the capacity for joint attention begins, the infant goes beyond person-to-person immediacy and enters into the contexts of shared attention, interacting with others in a way that allows for learning about the surrounding world, what things mean and what they are for. This is the beginning of secondary intersubjectivity (Trevarthen & Hubley 1978).

> The defining feature of secondary intersubjectivity is that an object or event can become a focus *between* people. Objects and events can be communicated about. … the infant's interactions with another person begin to have reference to the things that surround them.   (Hobson 2002: 62)

Merleau-Ponty (1962: 353) put it this way: "No sooner has my gaze fallen upon a living body in the process of acting than the objects surrounding it immediately take on a fresh layer of significance." At 18 months infants can re-enact to completion the goal-directed behavior that an observed subject does not complete, showing that they recognize the unfulfilled intentions of others (Herrmann et al. 2007; Meltzoff 1995). Secondary intersubjectivity gives us the capacity for socially and pragmatically contextualized understanding, a more developed understanding of others in context. Through all of this the infant or young child is not trying to discover mental states in the other person's head; they are trying to discover meaning in the other person's world, which is the same world that they share and in which they interact with the other.

The evidence provided by these developmental studies is not ignored by theory theorists, but rather interpreted as indicative of some "precursors" to fully developed ToM (e.g. Baron-Cohen 1995; Currie 2008). Baron-Cohen identifies three basic mechanisms that contribute to this development: the intentionality detector (ID), the eye direction detector (EDD), and the shared attention mechanism (SAM), but, on his account, these mechanisms are inadequate for explaining the more mature ToM abilities that come online at around the age of four. Gopnik & Meltzoff (1998) cite much of the same evidence mentioned here, but they interpret this as already a form theorizing in practice. The infant is honing its theoretical skills, constantly making inferences about the behavior of others, and testing them out in quasi-experimental fashion. Infants are small scientists gradually building a folk psychology that will come to rule our more mature interpretations of others.

The capabilities and practices of primary and secondary intersubjectivity, however, are not stages that we pass through, and are not replaced by more sophisticated theory-governed interpretations, and in that sense cannot count as precursors to use of folk psychological theory. These capabilities do not disappear in adulthood; as studies of perception of emotional expression using simple point light displays demonstrate, they mature and become more subtle (Dittrich et al. 1996).[7] As adults, for example, when we see a smiling face (and other facial gestures) we automatically, involuntarily,

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7.   As Merleau-Ponty notes, through these early developing capabilities the child can appropriate objects and "learn to use them as others do, because the [motor resonance of the] body schema ensures the immediate correspondence of what he sees done and what he himself does … and the unsophisticated thinking of our earliest years remains as an indispensable acquisition underlying that of maturity" (Merleau-Ponty 1962: 354).

and non-consciously attune to it with an enactive, mimetic, response (Schilbach et al. 2008). Face perception includes an enactive element through which we engage with and respond to stimuli instead of a mere passive perception of face-based cues (Schilbach et al. 2008). Even as adults we frequently need to go no further than what is already the rich and complex comprehension that we gain through the perception of a situated agent – that is, of an agent who is situated in an environment which also tells us something about what that person is doing and thinking. If, through a perception that is already informed by my interaction with the other person, as well as by my previous situated experiences, my habitual ways of understanding, and by cultural norms and established practices, I see the situation and what the agent is doing in it, and how the agent is doing it, and what the agent is expressing (e.g. through her gestures and style of movement), then in our normal ordinary engagements the work of understanding is already sufficiently accomplished for most practical purposes, and I do not have to go any further. I do not have to start thinking about what might be going on in the other person's mind since everything I need for gaining some understanding of her is there in her action and in our shared world.

4.   Empathy and narrative competency

Primary and secondary intersubjective capacities do not rule out the possibility of misunderstanding, unresolved ambiguity, or that the other person may in some circumstances be a real puzzle. I may not have enough information perceptually or contextually (or otherwise) to make sense out of what the other person is doing. But in a broad range of normal circumstances enough meaning for our everyday intersubjective interactions is already available in the perception of movements, gestures, facial expressions, and so on, as well as in cues provided by pragmatic and social contexts. This, however, cannot be the complete story. Our mature ability for understanding (or misunderstanding) others, even if it does not leave primary and secondary intersubjective capabilities behind, is enhanced by a different kind of practice. In opposition to TT and ST, however, I want to argue that this enhancement is not a matter of theorizing or simulating; it involves communicative and narrative competency.[8]

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8.   It's important to note that a complete explanation of our intersubjective capabilities cannot be captured by any one of these aspects. The thought that primary intersubjectivity is the full explanation, for example, the basis for Carruthers (2009b) criticism. He focuses on what Buckner et al. (2009) happily call "a weakly integrated swarm of first-order [sensory-motor] mechanisms," i.e. those aspects that constitute primary intersubjectivity, and he claims that "Appealing just to sensorymotor skills (as Gallagher does) is plainly inadequate to account for the flexibility of the ways in which adults and infants can interact with others" (p. 167). IT does

4.1   The development of communicative and narrative competence

There is good evidence that sometime around the age of two years, a number of things happen that lead to a capacity for empathic understanding. Decety & Jackson (2004) note:

> It is around the 2nd year that empathy may be manifested in prosocial behaviors (e.g. helping, sharing, or comforting) indicative of concern for others. Studies of children in the 2nd year of life indicate that they have the requisite cognitive, affective, and behavioral capacities to display integrated patterns of concern for others in distress (Bretherton, Fritz, Zahn-Waxler & Ridgeway 1986). During this period of development, children increasingly experience emotional concern "on behalf of the victim," comprehend others' difficulties, and act constructively by providing comfort and help.
>
> (Zahn-Waxler, Radke-Yarrow, Wagner & Chapman 1992)

What does it take for this kind of empathy (empathic understanding) to emerge? We can point to a number of important developments in the child around this age. At 12–18 months we see the development of secondary intersubjectivity in which children start to see things in pragmatic contexts: objects start to get their meaning from the way people interact with them. Children begin to make sense of the world through their interaction with others – a process that de Jaegher and Di Paolo call "participatory sense-making" (2007). Just around the same time the ability for mirror self-recognition emerges, and this provides the child with a more objective sense of self, in contrast to an earlier, proprioceptively-based sense of self (Gallagher 2005). In addition, sometime between 15–24 months, children start to speak, or as Merleau-Ponty might put it, language starts to acquire them and advances their communicative capacities. Finally, between 18–24 months, children start to manifest an ability for autobiographical memory.

> By 18–24 months of age infants have a concept of themselves that is sufficiently viable to serve as a referent around which personally experienced events can be organized in memory…. The self at 18–24 months of age achieves whatever 'critical mass' is necessary to serve as an organizer and regulator of experience…. This achievement in self-awareness (recognition) is followed shortly by the onset of autobiographical memory…   (Howe 2000: 91–92)

Along with a developing communicative competence, autobiographical memory, and a more objective sense of self, comes the capacity for self-narrative. It may be that

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not limit the explanation of intersubjectivity, however, "just to" the sensory-motor processes found in primary intersubjectivity; rather, it in addition consistently points to the capacities involved in secondary intersubjectivity and narrative competency.

2-year olds work more from scripts than from full-fledged narratives; their autobiographical memories have to be elicited by questions and prompts (Howe 2000; Nelson 2003; 2009). But from 2–4 years, children fine-tune their narrative abilities by means of a further development of language ability, autobiographical memory, and the growing stability of their sense of self.

Through narratives we also learn from others and engage more fully in participatory sense-making. Katherine Nelson (2003: 31) suggests that, in Jerome Bruner's (1986) phrase, the "landscape of action" narrative emerges in 2-year olds, "with respect to the child's own experience, which is forecast and rehearsed with him or her by parents." Self-narrative requires building on our experiences of others and their narratives. Thus, "children of 2–4 years often 'appropriate' someone else's story as their own" (Nelson 2003: 31). As Dan Hutto (2008) has pointed out, the fact that in most cultures children grow up surrounded by stories that transmit cultural meanings and values initiates them into practices of understanding reasons for action. The pragmatic and social contexts of secondary intersubjectivity become semantically enriched with the development of this kind of narrative competency.

4.2   Narrative competency and empathic understanding

I want to argue that this development of communicative and narrative competency is a necessary component of empathic understanding. I don't mean that empathic understanding requires an occurrent or explicit story telling: but it does require the ability to frame the other person in a detailed pragmatic or social context, and to understand action in that context in a narrative way. My own action, and the actions of others have intelligibility and begin to make sense when we can place them in a narrative framework (see McIntyre 1981). This kind of narrative scaffolding is an extension of secondary intersubjectivity and an enhancement of participatory sense-making. Our understanding of others and their situations, and hence the possibility of empathizing with them, is not based on attempts to get into their heads in a mentalising fashion, since we already have access to their embodied actions and the rich worldly contexts within which they act – contexts that can be translated into narratives that operate to widen or make more specific the meaning/significance of actions and expressive movements.

Through narrative competency the more primary form of empathy based on the activation of resonance systems is brought to a more conceptual level. If, for example, I see someone crying, I may immediately, on the basis of resonance processes, empathize with him on a very concrete, but still ambiguous (non-valenced) level of concern. Only when I find out his story will I be able to move to a level of empathic understanding. If, however, his story is that he is crying because he lost the gun with which he was going to kill me, then it is unlikely that any sort of positive empathic

understanding will result, although I may still understand his intentions, his actions, and maybe even his motives. The story, the narrative, helps to fill in the circumstances, and for understanding of the empathic sort, one needs to understand the circumstances. Dilthey puts us on the right track.

> It is necessary to distinguish the state of mind which produced the action by which it is expressed from the circumstances of life by which it is conditioned. … [In some cases] action separates itself from the background of the context of life and, unless accompanied by an explanation of how circumstances, purposes, means and context of life are linked together in it, allows no comprehensive account of the inner life from which it arose.   (Dilthey 1926/1988: 153)

Dilthey's account, however, remains too mentalistic; it is not the inner life or the mental life that we attempt to access, but simply the other's life in its worldly/situational contexts, and that's what narrative can capture.

As de Waal (1996) points out, differentiation between self and other is important for distinguishing empathy from emotional contagion, which involves a complete identification with the other. This is also emphasized by Reed (1994: 288): "When one empathizes, one perceives a situation from another's point of view without losing track of one's own point of view." These different perspectives are worked out and stabilized through communicative and narrative practices. To occupy a position within a narrative, and to distinguish it from another, requires more than a minimal (pre-reflective, non-conceptual, proprioceptive/kinaesthetic) self-awareness – it requires a conceptual, objective, narrative self that is aware of itself as having a point of view that is different from others.

4.3   Narrative and ToM

One might think that this ability to distinguish different points of view, or to have this narrative competency depends on already having a theory of mind. Janet Astington (1990) argues in this way. She cites the distinction between the *landscape of action* (a narrative of simple actions) and the *landscape of consciousness* (a folk-psychological narrative which expresses "what those involved in the action know, think, or feel, or do not know, think, or feel" – Bruner 1986: 14). To understand narrative, and by extension, to empathize, she argues, we need access not only to the character's actions but also *to their minds*. We gain the latter either through folk psychological theory or simulation. Astington therefore suggests that children younger than 4 years prefer descriptive accounts of actions (the landscape of action) to folk-psychological narratives (the landscape of consciousness). Children at 4 years (when they acquire ToM) start to prefer narrative stories that include mental terms. In folk-psychological narratives we find verbs signifying mental states (thinking, remembering, desiring, believing, etc.) and attribute them to characters in the narrative: The character *believes* X; the character

desires Y; or the character *intends* to do Z. Once we can see things in this way, Astington proposes, then we can understand the characters and their different points of view.

We can find evidence against this prioritizing of ToM and folk-psychology from experiments conducted by Bruner himself. He offers good experimental evidence against the importance of mental or folk-psychological terms (and by implication, ToM) for understanding narratives. In a study of narrative comprehension in adults (Feldman, Bruner et al. 1990), two different versions of the same story are presented. One version has a rich language of consciousness; the characters are construed as having specific mental states. A second version of the same story is stripped of all such language and is reduced to a pure language of action. Different subjects are asked to read one of the versions and then to tell the gist the story; they are asked to recount the facts of the story, and to do so in the order they occurred in the story. The results showed no significant differences between landscape-of-action narratives and landscape-of-consciousness narratives, (1) when providing the gist; (2) in recounting the facts of the story; (3) in recounting the order of events; or even (4) in the use of reader-related mental verbs when they recount the landscape-of-consciousness narrative.

4.4   Narrative and resonance processes

While the presence of mental terms, or a folk psychological vocabulary, and by implication, ToM, may not make a difference for narrative understanding, the presence or absence of resonance processes, especially in the affective order, do seem to make a difference. Within the context of a narrative, affective resonance (as represented in expressive movements and gestures) needs to be consistent if empathic understanding is to emerge. This has been shown by Decety & Chaminade (2003). Subjects were presented with a series of video clips showing actors telling sad and neutral stories, as if they had personally experienced them. The stories were told with either congruent or incongruent motor expression of emotion. As a measure of empathy the subjects were then asked to rate the mood of the actor and how likable they found that person. When the subjects were exposed to sad stories (eliciting an empathic understanding) versus neutral stories, there was increased activity in emotion processing-related structures (including the amygdala and parieto-frontal areas) predominantly in the right hemisphere. But when the story-tellers showed incongruent facial expressions (happy gestures while telling a sad story, for example) these areas were not activated, indicating an absence of empathy. These areas of neural activation respond not simply to perceived features of action and expression (and the subjectivity of the other person) but also to the larger story, the represented scene, the narrative circumstances of the other person, and how features of action and expression match or fail to match those circumstances. The affective resonance that comes along with expressive movements

and gestures, and the pragmatic sense of the person's instrumental actions are not without relevance for empathic understanding. We have argued, however, that they are not enough; one needs to see these elements in the larger situation or in the context of the larger story.

5.　Conclusion

If we return to the contemporary debate about empathy, we are now in a position to get a clearer idea of the different positions on this question. First, on an account that is consistent with the neural or implicit simulation theory, empathy is automatically generated in the activation of the mirror system. Gallese, for example, equates empathy with the motor resonance processes that he also equates with an implicit simulation. Thus, in his "shared manifold hypothesis" he distinguishes three levels of analysis (see Gallese 2001: 45).

The *phenomenological level:* the sense of similarity with persons like us – the *empathic* level involving actions, emotions and sensations.

The *functional level:* simulation routines, *as if* processes enabling models of others to be created.

The *subpersonal level:* mirror matching neural circuits – resonating body schemas.

Accordingly he claims, "… sensations, pains and emotions displayed by others can be empathized, and therefore understood, through a mirror matching mechanism" (2001: 45).

In contrast to this, Decety suggests that basic resonance processes are not sufficient for empathy. For empathy one needs to have in place a more sophisticated theory of mind (perhaps in the form of an explicit simulation ability) in addition to the resonance processes. That is, something more than basic resonance activity is required for empathy.

Within these debates there is a growing consensus around the idea that infants are capable of very basic or elementary empathic behavior, although disputes remain whether we should explain this behavior in terms of a pre-curser to theory of mind (Baron-Cohen 1995; Gopnik & Meltzoff 1997; Meltzoff 2002), something that is already simulation (Gallese 2001), or something closer to intersubjective enactive perception, as in interaction theory (De Jaegher & Di Paolo 2007; Gallagher 2001a; 2004; 2008a&b; Reddy 2008; Rochat 2004; Zahavi 2008). There is also some agreement that something more subtle and sophisticated happens as part of human social maturity. The following table (Table 1) summarizes a variety of positions on this point.

Table 1. Different views of empathic behavior

Basic processes starting in infancy	"Something more"	
Elementary understanding	Empathic understanding	Dilthey (1926)
Percursor processes (ID, EDD, SAM)	Theory of mind (TT)	Baron-Cohen (1995)
Low-level simulation	High-level simulation	Goldman (2006)
Basic empathy (implicit simulation)	Reenactive empathy (explicit simulation)	Stueber (2006)
Primary and secondary intersubjectivity	Communicative and narrative competency	Gallagher (2006); Gallagher & Hutto (2008)

The consensus is that there are at least two parts to this story. There is, of course, no consensus on what constitutes either of the parts – elementary or empathic understanding – or what the "something more" is that constitutes the more advanced capacity. In most cases it is acknowledged that what starts in infancy does not end in infancy but continues and is perhaps transformed by the more developed processes. I have argued against theory and simulation accounts, and in place of ToM capabilities, I have suggested that the development of communicative and narrative competency provides the "something more" needed for empathic (or even non-empathic) understanding.[9]

In part, what I have attempted to map out here is a story about how we understand others, consistent with both phenomenological and scientific evidence. With respect to the basic capacities for understanding others, ToMistic approaches invest in either theory (folk psychology) or in simulation. These approaches have recently been trying to account for capacities that clearly develop in children younger than 4 years of age. ST has been helped by the recent advances in the neuroscience of resonance systems

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9. Here I remind the reader that we've adopted a Wittgensteinian strategy in regard to the terminological problem with the term 'empathy'. I'm using this term in a broad sense to encompass a variety of phenomena. Notwithstanding this strategy let me point out that uses of terms like 'empathic understanding' (Dilthey) or 'reenactive empathy' (Stueber) suggest that our normal and everyday understanding is always empathic, and that may be tied to the specific theory of understanding to which these theorists hold. For example, Stueber equates empathy with simulation and considers ST the "default position for our ability to understand rational agents within the folk-psychological context" (2006: 167). In that sense empathy is not a special way of understanding others; it is simply the way that we always understand others. Although I want to suggest that there is a variety of phenomena that might be called empathic, I want to stop short of equating empathy with any and all forms of intersubjective understanding.

that may offer some explanation for these earlier capacities for intersubjectivity. IT takes as its starting point just such capacities for primary and secondary intersubjectivity, and argues, in contrast to TT and ST, that these are embodied, sensory-motor capacities of enactive perception. But clearly this is not sufficient to explain our more developed capacity for empathic understanding.

One option would be to say that IT provides a good account of intersubjectivity up until the fourth year of life, at which time the child acquires a theory of mind – an ability to use folk psychology or simulation routines to make inferences about other people's mental states. The use of mentalising inferences, however, seems to be more the exception than the rule, and would make empathic understanding more a matter of observational logic than of being moved by the other's situation. Rather than pursuing some form of TT or ST, or some hybrid version of ToM, I've tried to make the case for the importance of communicative and narrative competency to address this issue. The capacities of primary and secondary intersubjectivity, which characterize our human interactions in early and late infancy, are not replaced by a cold theoretical logic, or a self-controlled simulation. They are extended through language and autobiographical memory into a narrative competency that allows us to recognize the other person's circumstance and to construct an appropriately nuanced narrative understanding.

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Intersubjectivity in the lifeworld

Meaning, cognition, and affect

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> "All relations with others, if deep enough, bring about a state of insecurity."
>
> Maurice Merleau-Ponty 1964

Adequate accounts of intersubjectivity must recognise that it is a social, cognitive, *and* affective phenomenon. I draw on Jürgen Habermas' formal-pragmatic theory of meaning and of the lifeworld as an alternative to phenomenological approaches. However, his conception of the lifeworld reflects a cognitivist bias. Intersubjectivity cannot be adequately conceptualised merely in terms of our mutual accountability and exchange or reasons; the affective dimension of our social interactions must also be recognised. I propose to redress this shortcoming by taking account of empirical research on intersubjectivity, joint attention, and attachment. This leads me to suggest supplementing the three Habermasian validity claims to truth, normative rightness, and sincerity with a fourth, a claim to *attachment*, which fits with understanding the earliest infant interactions in terms of altercentric participation. Since an adequate account of the social nature of linguistic communication must do justice not only to the lifeworld as a shared background of intelligibility, but also as a background against which differences in point of view are articulated, I conclude with a brief look at the ontogeny of perspective.

Keywords: lifeworld; intersubjectivity; validity claims; attachment; cognition; affect; perspective; J. Habermas; M. Merleau-Ponty

1. Introduction

Philosophers have long acknowledged the social aspects of language. Just how to conceptualize this social dimension, however, has been a matter of dispute. There is a trivial sense in which language is social: it is used for communication. Empiricists such as Hobbes and Locke understood language primarily, though not exclusively, as an

external medium for sharing internal thoughts or ideas with others. This understanding of language has been challenged, notably by Wittgenstein (1953), Quine (1960), and Davidson (1984) in philosophy's analytic tradition. The rule-following debate has brought to the forefront the idea that language is a social practice and that the very idea of linguistic meaning only makes sense in a social context.[1] Yet analytic philosophers have lacked adequate resources to conceptualize intersubjectivity and often cannot shake a persistent individualism. Davidson, for instance, (purportedly following in Wittgenstein's footsteps) has denied that knowing a language requires knowing a socially shared set of conventions (meanings) and has instead privileged idiolects (Davidson 1986). Even those most sympathetic to viewing language as social practice and intersubjectivity as constitutive of semantic content (e.g. Brandom 1994) fall short of fully doing justice to intersubjectivity – not least for lack of a social theory. Philosophers of language have also paid much less attention than might be expected to ontogeny, and they have all but neglected emotional aspects of meaning and the conative dimension of social interaction in general.

By contrast, the continental tradition's concept of the *lifeworld*, originally introduced by Husserl and developed by Heidegger, Schutz, and others, is a promising conceptual model for intersubjectivity. Whether one defends a phenomenological, hermeneutic, cultural, or communication-theoretic version, it is agreed that the lifeworld serves as a shared background of intelligibility against which communication takes place and which is maintained by communication. I shall here focus on Jürgen Habermas' communication-theoretic concept of the lifeworld because my main interest is in linguistic meaning and communication and because his especially richly structured notion of a background of intelligibility makes him a suitable candidate for dialogue with other, empirical disciplines. As I will argue, his theory of communicative action is very much consonant with much of the research approach that motivates the contributors to this volume. Yet he seems to be entirely overlooked in the literature. Shaun Gallagher, Evan Thompson and others who draw on continental philosophy, have tended to focus on phenomenology and embodiment (e.g. Gallagher 2005; Thompson 2007; Trevarthen 2005). These approaches could be argued to be less well suited to conceptualizations of intersubjectivity than the socio-cultural perspective so prominent in Habermas' work inasmuch as they tend to privilege embodiment over social interaction. In my view, however, the two are equally important.

Johanna Meehan (1995) argues that Habermas's intersubjective and relational account of moral agency presupposes "primary attachments marked by mutual

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1. This debate took centre stage in mainstream philosophy with the publication of Saul Kripke's *On Rules and Private Language* (1982). For an overview of the ensuing debate, see Miller and Wright (2002).

recognition." I extend this argument to communicative interaction and linguistic understanding in general by drawing not on psychoanalysis as she does, but on developmental psychology and cognitive science. Habermas' emphasis on learning in his epistemology as developed in *Truth and Justification* (2003) warrants this approach. The absence of considerations of developmental psychology is striking in Habermas's work on meaning, particularly in light of his interest in developmental moral psychology when he was developing discourse ethics in the 1980s. In extending Meehan's argument, I argue that Habermas's account of communicative action in general, not just of moral action, presupposes primary intersubjective relationships or attachments.

In this chapter I begin with a sketch of the lifeworld as a (back)ground of intelligibility for the theory of communicative action and show how the lifeworld, as a complement to communicative action, fits with Habermas' formal-pragmatic theory of meaning (Section 2). One of the short-comings of philosophical analyses of the social has been their almost exclusively conceptual or rational nature. Despite his best efforts to develop a balanced theoretical framework, I argue that Habermas provides an overly cognitivist account of the lifeworld (Section 3). I propose to redress this shortcoming by attending to structures of the lifeworld he himself introduces and by taking account of some recent empirical research on intersubjectivity and attachment (Section 4). I conclude with a very brief look at the ontogeny of perspective since an adequate account of the social dimension of linguistic communication must do justice not only to the lifeworld as shared background of intelligibility, but also as a background against which differences in point of view can be articulated (Section 5).

2.   From language to lifeworld

At the level of social theory, Habermas proposes conceiving societies simultaneously as systems and as lifeworlds. His theory of the evolution of society and of modernisation rests on the premise that there is increasing differentiation of systems (e.g. law, state bureaucracy, the economy, education) and increasing rationalization of the lifeworld. Indeed, Habermas argues that in modern societies, there is a tendency for systems to *colonise* the lifeworld (1987). Although the notion of lifeworld may be based on a spatial metaphor, it is not to be thought of as a container. In the context of the theory of communicative action, Habermas writes, "the structures of the lifeworld lay down the forms of the intersubjectivity of possible understanding;" (Habermas 1987: 126). Communicative action is embedded in the lifeworld (Habermas 1998: 238). Indeed, the two are "complementary" concepts (1987: 119) and the lifeworld is "the correlate of processes of reaching understanding" (1984: 70). Lifeworld and communicative action are mutually explanatory and presuppose one another. On the one hand, the fact that we share a lifeworld explains our ability as participants in communicative action to

mutually understand one another directly, i.e. without inferences on the basis of behavioural observation and appeals to hidden intentions. On the other hand, the lifeworld is *constituted* through communicative action (1998: 248). It is maintained, reproduced, and hence also transformed through communicative action. Its presuppositions are the product of communicative interactions among social actors. Thus it corresponds to what Arie Verhagen, following Anscombre and Ducrot, calls *topos* in a speech situation: a shared model for making sense of a situation and the objects encountered in it (Verhagen 2005: 12). Habermas would concur with Verhagen that linguistic communication is inherently "argumentative," though they may not mean quite the same by this. According to Verhagen, "engaging in cognitive coordination comes down to, for the speaker/writer, an attempt to *influence* someone else's thoughts, attitudes, or even immediate behavior. For the addressee it involves finding out what kind of influence it is that the speaker/writer is trying to exert, and deciding to go along with it or not" (Verhagen 2005: 10). By contrast, Habermas distinguishes between *persuading* another (making her believe something) and *convincing* her (by giving her *reasons* which are themselves criticisable). Linguistic communication, for Habermas, is inherently *rational* and not merely a strategic means of influencing others, of "managing and assessing their behavior," as Verhagen puts it. This may be a mere verbal dispute, inasmuch as Verhagen, too, endorses a version of inferentialism and accords communication the primary function of action coordination. Nevertheless, it is important to point out that merely influencing others need not involve genuine intersubjectivity. At minimum, "influencing others" rhetorically suggests an observer's third-person rather than an interlocutor's second-person perspective. In the lifeworld, interlocutors are engaged in joint activities; they interact with one another in the second person.

The theory of communicative action holds that when two interlocutors communicate, they are aiming to reach a mutual understanding about something in the world. It thus incorporates the objective, intersubjective, and subjective elements of communication from the outset. This triad of world, other, and self runs throughout Habermas' understanding of language and of the lifeworld (see Table 1). In performing a speech act, a speaker raises three types of *validity claims*: a claim to truth (that what she says is true), a claim to normative rightness (that what she says is context-appropriate), and a claim to sincerity (that she is not lying). Other formal-pragmatic presuppositions of communicative action that constitute communicative competence include the assumption that speakers' respective interpretations of the speech situation and of their diffuse environments largely coincide, that their diverging lifeworld perspectives converge, that interlocutors mean the same thing by their words, and that the validity claims they make are redeemed or at least in principle redeemable. In smoothly running communication, the validity claims interlocutors raise are intersubjectively recognized. Interlocutors take yes/no stances toward their

respective claims. That is, they either accept or reject these claims. Correlatively, to understand an utterance is to know its conditions of acceptability. In making a claim, a speaker takes on the warrant to vindicate it, if necessary, with reasons. This gives rise to an inferentialist semantics (cf. Brandom 1994), according to which language is understood as an inferential web and meanings are the result of making explicit the inferential relations between terms. The notion of the lifeworld serves as a crucial supplement to this account, for it functions as a background of intelligibility and a source for such reasons.

Table 1. World-other-self triad

	Objective	Intersubjective	Subjective
Speech/Action - Validity Claims	Truth	Normative Rightness	Sincerity
Objective, Social, Subjective "Worlds"	Objects, facts and states of affairs	Interpersonal relations (norms & values)	Experiences (mental states, feelings)
Lifeworld	Culture	Society	Personality

Consider the utterance "The oil in the pan is hot." (1) It has an explicit propositional content (that the oil in the pan is hot); Habermas dubs this "thematised" knowledge. (2) There is further information that is not explicitly stated, but nevertheless implicit in the utterance or, as Habermas puts it, "thematised along with the propositional content." "The oil in the pan is hot" may be uttered as a warning to someone. This kind of implicit or secondary thematization can easily be made explicit (e.g. "I'm warning you the oil is hot!"). (3) There is information that is neither explicit nor implicit in the utterance itself, but presupposed. The warning "The oil is hot!" presupposes facts about hot oil burning skin, about a person's reaction to touching the pan, about pans being containers, etc. Paul Grice (1989) was one of the first to draw the attention of philosophers of language to these presuppositions or, to use his term, conversational implicatures. "Presupposition" and "implicature" are suggestive of how this lifeworld background functions from the perspectives of the speaker and of the hearer respectively. On the one hand, the meaning of the utterance can only be grasped against the background of these presuppositions (Habermas 1998: 238). On the other hand, as Grice emphasized, utterances routinely communicate more than their explicit propositional and illocutionary content; thus what, for the speaker, may be a presupposition, can, for the hearer, be something understood by inference from what is explicitly said. In either case, what remains implicit is meaning-constitutive inasmuch as it determines the semantic content of the utterance (cf. Searle 1983: 145). Moreover, successful communication depends on this implicit background knowledge being shared.

This level of the background is fairly easily articulated or thematised. "If you spill it, you will burn yourself" follows straightforwardly from "The oil is hot." It represents a material inference grounded in practice (Brandom 1994). As Habermas points out, this kind of "unthematically concurrent" background information, on the one hand, "fosters the acceptability" of what is uttered explicitly. On the other hand, it can also be easily problematised. It is drawn on to justify one's utterances if challenged. Of course, one can only make good on one's claim if the reason cited is one the interlocutor accepts, i.e. shares. Finally, this unthematised information has three features that Habermas attributes to the lifeworld: It represents a set of taken-for-granted presuppositions of communication; it functions as a source of situation interpretations that allows us to cope with the world and others; and it shapes the horizon of everyday communication – points to which I'll return.

Habermas, however, believes there is a deeper kind of background knowledge that is not so readily accessible, but which is nonetheless connected to the more easily articulable information. To say that this kind of knowledge is deeper means, in the first instance, that it cannot be as easily (if at all) drawn into the game of giving and asking for reasons; it thus has a greater stability. Habermas calls the presuppositions of this "background knowledge of the lifeworld" *unavoidable*.

This lifeworld background is distinct from the formal-pragmatic conditions of communicative competence. Remember that the lifeworld *complements* rather than constitutes communicative action as such. It is "the concrete knowledge of language and the world that dwells persistently in the penumbra of the prepredicative and the precategorial and that forms the unproblematic ground for all thematized and concomitantly thematized knowledge" (Habermas 1998: 239). It is thus a concrete and particular form of knowledge covering the categories of *culture, society, and personality* (see below) and is characterised by the following. (1) The lifeworld background carries an *immediate certainty* for us in that it represents a set of taken-for-granted presuppositions. These are pregiven, prereflexive, and pretheoretical. Qua background presuppositions, they are unquestionably certain (at least in that particular speech situation). This means that the lifeworld performs what Habermas calls its grounding function: it ensures that everyday interactions are meaningful and acts as a bulwark against dissenting interpretations. This unquestioned preunderstanding is culturally ingrained; the lifeworld is "ours" before it is "mine" (Habermas 1984: 82–4). (2) The lifeworld has a center and a *horizon*: It is centered on a shared speech situation, but has indeterminate, shifting, yet non-transcendable boundaries. That is, interlocutors cannot step outside of the lifeworld, as it were, but always move within its horizon which delimits the possibilities available to agents in that situation. (3) The lifeworld is characterised by *holism*: Background knowledge forms a holistic "thicket" that prefigures the propositional contents, illocutionarily established interpersonal relations or speaker's intentions that can be articulated and

differentiated in language (Habermas 1998: 244). Insofar as they are undifferentiated, the lifeworld presuppositions are also somewhat indeterminate. (For further discussion, see Fultner 2001).

We might refer to the above as a *formal* description of the lifeworld. Habermas also identifies *culture*, *society,* and *personality* as structures of the lifeworld, and these can be seen as providing its *substantive* content.[2] By *culture* Habermas means the shared stock of knowledge that agents draw on to get around in the world. It allows them to interpret situations in which they find themselves, that is, to take them to be meaningful. *Society* refers to legitimately regulated interpersonal relations whereby group membership is established and solidarity is secured. *Personality* refers to the competencies of a speaking and acting subject that enable her to assert her own identity. Formally, these, too, correspond to the tripartite division between the objective, intersubjective, and subjective (cf. Table 1). All three are historically and culturally variable. A university president, for instance, does not stand in the same social relationship to the faculty as a medieval prince to knights; similarly, a "manic" personality only became possible in the late 19th century and meant something different then than it does now (Martin 2007). Communicative action not only enables interlocutors to reach mutual understanding, but effects cultural reproduction, social integration, and socialization: "the everyday communicative practices in which the lifeworld is centered are nourished by means of an *interplay* of cultural reproduction, social integration, and socialization that is in turn rooted in these practices" (Habermas 1998: 251; see also 1987: 142). Society, culture, and personality are theoretical abstractions that are intertwined in everyday language. That is, when communicating with others, as participants in interaction, subjects do not differentiate between these three aspects. This can be seen as a corollary of the lifeworld's holistic structure. People act as more or less responsible, more or less well-socialized and acculturated agents, and these actions maintain and transform their lifeworld to a greater or lesser degree.

3. Cognitivist bias

Following Habermas, I have been referring to the lifeworld background as knowledge or (pre-)understanding. Strictly speaking, however, it is not knowledge; it is

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2. Habermas (1987) differentiates between a formal-pragmatic conception of the lifeworld, which he develops based on a phenomenological conception, and a conception based on the "everyday" or "commonsense" notion of the lifeworld, which he claims to be more suitable (less limited) for empirical purposes. The relationship between these two conceptions requires further clarification.

certainly not justified true belief from the perspective of an individual participant in interaction. "Information" may be a better, more neutral term. Remember that the background is unquestionably certain, hence *infallible*. *Qua* background, it cannot become problematised and is hence not fallible (Habermas 1987: 130f.; 1998: 242). It becomes fallible only once articulated, but then, of course, it is no longer part of the background.[3] Habermas himself insists that he aims to develop a conception of the lifeworld that is not, as he puts it, "culturalistically abridged," one, that is, that does not consider only the cultural aspects of the lifeworld. Yet despite his recognition that the background presuppositions of the lifeworld do not constitute knowledge in the strict sense, he conceives the lifeworld in overly epistemic terms and pays insufficient attention to the structures of personality and society when discussing the lifeworld as background of intelligibility.

This is partly because he models his account of communicative *competence* on Chomsky's reconstruction of linguistic competence, i.e. linguistic *knowledge* (Habermas 1998: 28–41). It also reflects a certain cognitivist or rationalist conception of meaning. Recall that to understand an utterance is to know its conditions of acceptability. Someone who raises a validity claim takes on the warrant to support it with reasons if necessary. Rationality, however, is something Habermas associates with *culture*: Not only does he define culture as the stock of knowledge or interpretations that enables actors to cope with the worlds and others; he claims that "Continuity and coherence [of a tradition, society, or lifeworld] are measured by the *rationality* of the knowledge accepted as valid". Knowledge (or belief) is rational if it has undergone a process of justification. By contrast, "the coordination of actions and the *stabilization of group identities* are measured by the *solidarity* among members… [and] Interactive capacities and styles of life are measured by the *responsibility of persons*" (Habermas 1987: 140–141). Culture, as defined above, perhaps lines up most obviously or naturally with the lifeworld background inasmuch as it provides a font of situation interpretations. Yet once articulated, the other two spheres also take on cognitive features. That is, whether someone is responsible is a function of how well she can justify her actions, and even the "empathetic sensitivity" that lies at the core of solidarity boils down to "an understanding of the other sufficient to allow an insight into the *rationality* of the other's consent" (Rehg 1994: 108). This results in a configuration where the lifeworld functions as the background of intelligibility, while simultaneously two of its

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3.   Elsewhere I have argued that it cannot be knowledge because of its *presuppositional* status (Fultner 2001). There is, of course, the dialectical relationship between lifeworld background and communicative action. Accordingly, problematised claims may recede again into the background once justified.

structural components either fall outside the realm of our theory of meaning or are assimilated to the third.

A more detailed discussion of the conceptualisation of and relationship among culture, society, and personality lies beyond the scope of this chapter. Suffice it to say that it raises questions about what a theory of meaning ought to encompass – and what is meant by "semantics" and what the connections are between semantics and pragmatics. The former is widely defined in terms of the "factual" or in terms of referential relations between language and the world. This is consistent with the truth-conditional semantic programme in philosophy of language. Habermas (along with Wittgenstein and his heirs) has gone out of his way to emphasise that a theory of meaning that takes account only of the connection between language and objects or states of affairs is too narrow. He has emphasised the pragmatics of language use and expanded the theory of meaning to include not only truth – but also normative rightness and sincerity claims. However, our theoretical framework may need to be adjusted yet more radically than he suggests. Habermas is routinely criticized for being too rationalistic. The criticism levied here is of a somewhat different sort. I am not claiming that Habermas is naively overlooking the role of power or that all action is – really – strategic rather than communicative. My claim is that his analysis of meaning must be supplemented in accordance with his own understanding of the structures of the lifeworld. The analysis of solidarity and responsibility, for instance, must aim to do justice not only to the socio-cognitive accountability of agents to one another, but also to the affective bonds that bind them. One step in this direction, I'll suggest, is to add a new kind of claim to his framework.

4.   The intrusion of embodiment and affect

One way to try to redress the above cognitivist bias is by considering some connections between recent empirical research on intersubjectivity and the concept of the lifeworld. This will also provide a developmental perspective on intersubjectivity and the social aspects of language that is lacking in most approaches to the theory of meaning. Perhaps the main challenge posed by the considerations that follow lies in how a theory of meaning might incorporate affective aspects of intersubjectivity. If Trevarthen is right that – at least in part – "meaning is made by emotions" (2005: 63), then *not* incorporating them into one's theory of meaning is bound to produce a skewed or, at best, partial theory of meaning.

I began by noting that a Habermasian approach to social life fits with much of current research. In particular, Michael Tomasello's account of shared intentionality and the pivotal role he assigns to the emergence of first joint attention, and then language is consonant with Habermas's model of communicative action (Tomasello

1999; Tomasello, Carpenter, Call, Behne, & Moll 2005; Akhtar & Tomasello 1998). Tomasello maintains that children learn language not primarily through ostensive labelling but in a variety of pragmatic contexts which presupposes that they understand and can discriminate the intentions of their interlocutors. He argues that infants develop crucial abilities for interacting socially with others, starting at around 9 months (Tomasello 1999). They develop what is the defining feature of intersubjectivity for Tomasello, namely, the capacity of *joint attentional focus*. Although children clearly interact with others in affectively meaningful ways from birth, such interactions are not truly intersubjective according to Tomasello until infants begin to treat others as intentional agents. By about 18 months, they are capable of *intention-reading*, an ability that becomes increasingly fine-grained with the advent of language. Object-labelling studies indicate that children as young as 18 months can discriminate an adult's intentions. Twenty-four-month-olds will imitate actions even if only shown failed attempts and they can discriminate between intentional and accidental behaviour (Akhtar & Tomasello 1998; Tomasello 1993; also Meltzoff & Moore 1998).[4]

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4. Several object-labelling studies showed that children as young as 18 months are able discriminate an adult's intentions. The experimenter would say "Let's find a TOMA!" and look through several buckets, finding and rejecting one object before excitedly finding the target object. In subsequent studies, toddlers were also shown to be able to learn new verbs even if the referent of the target action was absent. The goal of the experiment was to teach children to predict which of several novel actions was impending by associating one of four toy characters with four novel actions ("Let's meek big bird!"), but in one group one of the actions was not performed (because the experimenter could not find the required action prop). "Learning the verb" here meant children knew the verb meant to refer to the intended action, even though they never saw it performed (319). Similarly, Meltzoff and Moore (1998) have shown that 18-month-old infants will imitate an action even if they've only been shown failed attempts at it. Infants will furthermore interpret the behaviour of persons (pulling apart a dumbbell-shaped object) as intentional and imitate it, but will not react this way to machines performing the same actions). Akhtar and Tomasello's studies with 24-month-olds had an experimenter announce her intention to PLUNK big bird, then performing the action intentionally and saying "there!", then perfoming another action accidentally and saying "oops!" Alternatively, the experimenter would perform the accidental action before the target action. Children associated PLUNKing with the intentional action in either case, indicating "their ability to enter into a joint attentional (intersubjective) state with the adult by determining her intended action, and by applying their knowledge that adults use new pieces of language to indicate intended, not accidental, actions" (Akhtar & Tomasello 1998:318). These children at 24 months were also shown to be able to discriminate whether an adult was labelling an action or an object. The main point in these studies, however, was that children learn language not so much in labelling situations but in situations where adults are using language to regulate or anticipate the ongoing social interaction (320).

Joint attentional focus (i.e. intersubjectivity) not only precedes language acquisition; it is also a precondition for "cultural learning," that is, learning to "comprehend and produce [a word] in conventionally appropriate contexts" (Akhtar & Tomasello 1998: 325). This can be extended to learning other culturally specific practices. In this way, joint attentional focus becomes a condition of possibility of acculturation and socialization in general.

Both intention reading and joint attentional focus require sharing a lifeworld with the other. Arguably, the capacity for joint attention is tantamount to having entered into a shared lifeworld. After all, joint attention and activity requires that all sorts of things are mutually presupposed by participants in interaction. Seen in that light, joint attention is no longer merely about two individuals' attention to the same object; it also has to do with the intersubjective meaningfulness of their context of interaction and the preunderstandings they bring to that situation. Tomasello thus identifies *true* intersubjectivity with what is sometimes termed secondary (vs. primary) intersubjectivity.[5] According to Tomasello, it emerges only once children are able to understand others as *intentional agents* and hence to participate in shared cultural activities including linguistic communication. He argues that this occurs around one year of age, i.e. before the emergence of language and symbolic communication – recently called "tertiary intersubjectivity", by Bråten and Trevarthen (2007) – and considerably before the four year-stage when "theory of mind" proper, the ability to attribute beliefs and desires that may or may not be true, emerges (Tomasello & Rakoczy 2003). This is theorized as a *cognitive* – albeit a social-cognitive – process; affect does not figure in the analysis.[6] The distinction between primary and secondary intersubjectivity on the one hand, and tertiary intesubjectivity on the other matches a sharp distinction Habermas draws in *The Theory of*

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5. This distinction was introduced by Trevarthen (1978) and Hubley and Trevarthen (1979). There is some disagreement as to when secondary intersubjectivity appears. Some researchers identify it around 9 months, others at 18. In some of his other work, Tomasello himself situates the emergence of secondary intersubjectivity at 9 rather than 18 months. (Thanks to Tim Racine for pointing this out). "Secondary" intersubjectivity has been used to refer to interactions once the infant can share in joint attention to some object with another subject. Fogel et al. however, place the onset of secondary intersubjectivity in the second half of the first year, i.e. prior to intention-reading: "Infants now become able to refer to distant objects and events and to their own feelings during communication frames… After 12 months of age, this form of intersubjectivity becomes increasingly symbolic (Fogel et al. 2001: 195). – Lots of other important developments occur around 18 months as well, such as self-recognition in mirrors, which has led some to attribute a concept of self to infants at this point.

6. Although Meltzoff and Moore are willing to say intersubjectivity is there from the earliest moments of life, the affective dimension is completely absent from their account.

Communicative Action between interaction in "a prelinguistic, instinctually bound mode" and a "language-dependent, culturally bound" one (Habermas 1987: 26).

Yet something is lost by seeing this fundamental change as transforming intersubjectivity into something social-cognitive rather than social-affective-cognitive. Understanding primary and secondary intersubjectivity as continuous helps to steer clear of the cognitivist bias discussed above. In other words, it will help avoid an overly epistemic conception of the lifeworld in terms of background knowledge and an excessive emphasis on rational justification in our conception of language and communication. Studies of imitation and of emotional development indicate that intersubjectivity develops on a continuum, and that linguistic – shared – knowledge develops in tandem with other social knowledge and empirical knowledge – even though it may not be possible to differentiate between them in early stages of development (Meltzoff & Moore 1998); Soussignan & Schaal 2005). Evidence of cognitive and affective processing and their interrelatedness in infants is mounting (Trevarthen 2005; Soussignan & Schaal 2005). True, the capacity to provide *reasons*, to justify one's claims, requires language. Nor do I wish to deny that language acquisition represents an important, perhaps essential developmental milestone for humans and introduces new possibilities of social interaction and cognition, including the ability to differentiate ourselves with increasing clarity from others – a point to which I shall return. Yet as a number of researchers have pointed out, the three dimensions of validity Habermas identifies (objective, subjective, and intersubjective) already structure – albeit inchoately – very early child development. Colwyn Trevarthen (2005), for example, speaks of the self, the communicative person, and the thing/object outside the body.[7] Moreover, the infant's interactions with the world are socio-culturally mediated from the very beginning (Fogel 1993). In this vein, mother-infant interactions at 2–3 months and earlier – before infants can effectively manipulate objects – have been described as "protoconversations" where infants respond in patterned ways to their mothers' vocalization. This research goes back to the late 60's and early 70's and suggests an "emotive foundation for language and learning of culture" (Trevarthen 1998, p. 23). Trevarthen emphasises this "intrinsic rhythmicity" and reads infant behaviour as far more organised and intersubjectively coordinated than had been thought. (This accords with, e.g. Rochat's [2001] findings regarding intermodal coordination in neonates.) Trevarthen argues against Stern (1985) that the "neonate's emergent self [is not] purely emotional," whereas Stern "does not allow the infant an intersubjective

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7. In some of his very early work and recently in a talk at the 2007 International Cognitive Linguistics Association conference in Krakow, Trevarthen has acknowledged (the early) Habermas as an influential figure on his thought.

self before 7–8 months" (Trevarthen 1998: 23f.). The turn-taking that character-izes this communication might be seen as a *proto-perspective-taking*. Early lan-guage development may also be a mechanism for developing a shared perspective with another. Thus Patricia Kuhl has interpreted the loss of infants' ability to dis-criminate foreign-language sounds by 12 months as a mechanism for producing shared perception, which she takes to be the precondition for intersubjectivity (Kuhl 1998: 314).[8]

It is becoming increasingly clear that even neonates engage in interactions that are not reducible to stimulus-response behavior, but involve primary intersubjectivity (Rochat 2001; Braten 1998; Kugiumutzakis 1998; Trevarthen 1998; Bloom 2001). Neo-natal imitation is claimed to be "non-reflexive, volitional, and intentional" (Meltzoff & Moore 1998).[9] Neonates identify themselves and others as interacting persons – since they seem to know how to take turns – and even have a sense of the experimenter's motivation (to get them to imitate) (Kugiumutzakis 1998). They must recognize their own face – which they have not yet seen as isomorphic to that of the experimenter.[10] The above evidence is compatible with a cognitivist or socio-cognitivists approach. However, there appears to be increasing and persuasive evidence that the same areas of the brain are involved in both cognitive and affective processing and integration of the mind (Damasio 1994; Siegel 1999). Furthermore, attachment theory stresses the importance of emotional attachments to cognitive development (Siegel 1999).

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8. There are several conceptual difficulties with Kuhl's theoretical position. The metaphor of warping or distortion she uses presupposes that there is such a thing as the way the world is independently of how we perceive it. In itself, that is a legitimate presupposition, but we need not conclude that all perception distorts that reality, thus making reality in effect inaccessible. She further argues that infants store representations of speech. In addition to being highly representationalist, her model also seems to be too deterministic. Obviously, our capacity to acquire other languages at a native level is not utterly compromised by 12 months.

9. They claim to demonstrate non-reflexivity by inserting a delay between the stimulus and the motor response; volition by the fact that infants imitate a gesture they saw the day before if the same person returns and, when confronted with two people, they may imitate the first when viewing the second person's gesture; intentionality or goal-directedness is evidenced by the fact that infants make mistakes and try to correct them when they imitate, "monitoring and modifying their own acts to bring them into congruence with others." Hence Meltzoff and Moore conclude that the most fundamental distinction in early infancy is not between animate and inanimate objects, but between human acts and other events (58). The precise interpretation and implications of their work are still under debate.

10. This recognition can be seen as a precondition of imitation rather than as the result of the imitation experience ("active intermodal matching" [Moore & Meltzoff 1998]). That is, this isomorphism is not learned, but a precondition of imitation. If that is correct, it is also, presumably, a precondition of learning in general.

Intersubjectivity therefore cannot be adequately conceptualized merely in cognitivist or epistemic terms as Habermas is liable to do with his model of the redemption of validity claims. What is called for is another look at the structures of society and personality. Moreover, I now want to suggest, perhaps an additional claim, a claim to *attachment*, must be added to the theory as a way of doing justice to the affective aspects of meaningful communication.

A paradigm example of earliest infant attachments is nursing. A nursing mother and infant are participants in a learning process that simultaneously establishes a profound social-affective bond. Nursing is emotionally charged and deeply intersubjective. Writing on the phenomenology of nursing, Eva Simms (2001) analyses breast milk as a "coexistential form," as the substance that bridges or rather blurs the gap between self and (m)other: "We begin life not as separate monads but as mingling presences, as aspects of significant wholes where the newborn's action finds its complement and completion in the actions of the (m)other… Implicit in the first cry, the first turning of the head toward the (m)other's voice, the first search for the breast is an intentionality, a directedness that presupposes that there is something to turn to…" (Simms 2001: 26–7).[11] The phrase "mingling presence" indicates a lack of differentiation in the neonate's world. What differentiation there is between self and (m)other is, as yet, inchoate. By the same token, there is *also* some lack of differentiation from the perspective of the mother. Her own bodily boundaries are blurred, as they already were in pregnancy (Young 2005). Importantly, the example illustrates what I propose to call a primary "claim to attachment". To be sure, neither infant nor caregiver "raises" any kind of *propositional* "validity" claim. Nor is the claim vindicated by reason-giving. (Either of these suggestions would amount to committing the "intellectualist fallacy" (Nelson 2005) of reading the rationalist-cognitivist bias back into infancy.) But each, as it were, "lays claim" to the other. The infant lays claim to the (m)other by virtue of its demand to be cared for. At the same time as the infant cries for the breast, it must respond to the "claim" of the mother: in rooting, it shapes its mouth around the mother's breast, it conforms to the mother's arms, etc. Thus nursing is a joint activity premised on mutual responsiveness. This is to deny neither that there are asymmetries in social competence, cognitive ability, or power between the two agents here, nor that we sometimes include infants in our practices by courtesy.[12]

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11.   Simms' account requires further discussion from a feminist perspective. While she allows for the possibility that fathers can create the "maternal milieu," the exhortation of the nursing mother juxtaposed with discussions of the uncared-for infant are surely problematic.

12.   For an excellent analysis of mother-child power relations, see Allen (2007).

Nonetheless, lack of responsiveness has negative consequences on both sides (lack of nourishment for infant, engorgement for mother). To be sure, this example forcefully illustrates the phenomenon of *embodied* intentionality (which is Simms' emphasis). Yet nursing is not only the first learning experience for the infant, it is a *mutual* learning process – a *joint* problem-solving activity – that establishes the ground for (embodied) intersubjectivity. It is also very much a culturally infused, even charged, process. This becomes evident as soon as we consider that nursing has gone in and out of fashion, that whether a mother breastfeeds is usually a matter of choice in this culture, that women who have difficulty nursing nowadays frequently resort to lactation consultants, that some may regard nursing as a "natural" rather than a learning process, that breastfeeding in our society is often assisted by technology (pumps), etc. Insofar as it is a deeply affectively infused process, intersubjectivity rests on the *affective* attachment between infant and caregiver. But this affective attachment, I submit, is always also culturally mediated.

While nursing is a paradigmatic example of the experience of primary intersubjectivity, an analogous case can be made for bottle feeding or for other interactions between caregivers, male or female, and infants. This is borne out in the discussion of Bråten's account of altercentric participation. He defines this as "ego's virtual participation in alter's act as if ego were a co-author of the act or being hand-guided from alter's stance" (Bråten 2007: 115). In infant-caregiver interactions, the infant's bodily self is complemented by an other, creating what he calls a "companion space" where infants participate "altercentrically" in another's actions. When infants imitate such actions, according to Bråten, they do so from an "e-motional" memory. He uses the term to "qualify the affective experience of bodily communion and the non-conscious remembrance of virtually moving with the other's movements" (Bråten 1998: 109) and highlights the continuity between these early e-motional memories and subsequent joint attention later in infancy. An intuitive illustration of altercentric participation is riding on a parent's back which allows the infant to "automatically share perceptions form (literally) the [parent's] point of view, without having to transcend its own" (123). The notion of "authorship" implies a strong sense of agency on the infant's part. Bråten is particularly struck by the fact that face-to-face encounters require that the infant reverse or invert what the model is doing in order to re-enact the model's actions. A paradigm example is reciprocating feeding (around 10 months, perhaps earlier). Bråten describes the infant as "virtual co-author" of the care-giver's spoon-feeding. Having learned feeding behaviour through altercentric participation, the child acquires 'e-motional' memory that subsequently enables her to reciprocate the care-giving behavior. As in nursing, the child must respond to the care-giver's behavior and, indeed, anticipate it; this, too, is a mutual learning process. Imitation plays a significant role since parents routinely open their own mouths in order to

get children to open theirs.[13] In addition, Bråten introduces the notion of the other's perspective or point of view: "The reciprocating infant's circular re-enactment of what they have experienced as recipients of spoon-feeding show that they must have been able to participate in the feeder's movements from the feeder's stance – the very reverse of what is seen from the outside, egocentric stance in such face-to-face situations" (Bråten 2007: 117–8).

On the one hand, Bråten thus begins with an other-centred starting point in human development, followed by a series of decenterings (Bråten 2007: 111).[14] This means that intersubjectivity plays a central role from the outset and is not something that has to be (re-)constructed. Moreover, although Bråten postulates an innate capacity to learn by altercentric participation, this is better understood as a learning mechanism, rather than as a form of innate knowledge. For one, his is not a representationalist model, but one founded on the notion of embodiment, counterveiling excessive cognitivism. Moreover, he speaks of a capacity. The notion of a capacity is a dispositional one. Nonetheless, it makes sense to speak of capacities not simply as being triggered by the environment, but as developed, fostered, and nurtured. They are thus shaped by the intersubjective relationships, cultural practices, etc. in which individuals find themselves.

Finally, thinking of Bråten's companion space as the lifeworld is a way to enrich our understanding of it; consider, for instance, that the caregiver enters the situation as a fully acculturated and socialized person. Her actions occur precisely against the backdrop of the lifeworld. Her responses to the infant depend on this background and are culturally (as well as individually) variable (e.g. Reebye et al. 2008). Simultaneously, the affective component in early altercentric participation helps us to appreciate the affective aspects of sharing a lifeworld even later in life (cf. Siegel 1999). While much more work would need to be done to support this hypothesis, altercentric participation and attachment may prefigure subsequent development of solidarity. Here I can merely suggest that a theoretical account of solidarity will require an affective foundation. De Waal similarly speculates that learning by observation also partly depends on having an emotional bond or identifying with those observed and that "the cultural transmission of habits and skills is based on conformism with those to whom one feels close" (De Waal 2007: 63). This research, thus, is liable to have

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13.   This mechanism seems to continue to operate well beyond infancy, as children learn to brush their teeth, for instance, and into adulthood (as Merleau-Ponty already pointed out).

14.   Bråten contrasts this with Piaget's "egocentric" starting point, but Zlatev (2007) points out that Piaget understands egocentrism as a failure to differentiate between ego and alter and between one's own and others' point of view. This fits with the discussion of differentiation in Merleau-Ponty below.

implications for fields like political theory, as well. This last suggestion, of course, indicates that understanding intersubjectivity requires a multi-pronged and multi-disciplinary approach such as the one fostered in this volume.

On the other hand, Bråten's model raises a number of questions for further investigation. For one, the counterfactual "as-if" characterization of altercentric participation seems to require further clarification. This point is tied to a second one regarding the elaboration of the perspective of the subject. Arguably, the infant barely if at all has a point of view of her own, let alone being able to take the point of view of another. The same kind of idealisation appears in Daniel Stern's description of early intersubjectivity and what he has dubbed "affect attunement": "we experience the other *as if* we were expecting the same action, or feeling the same emotion. This 'participation' in another's mental life creates a sense of feeling/sharing with/ understanding them, and in particular their intentions and feelings" (Stern 2007: 37, italics added). According to Stern, we have an innate sensitivity to the minds of others. But what sense can we make of quasi-participation in another's mental life? There appears to be a tension here between aiming to identify a primordial or primary intersubjectivity and being able to articulate it only in terms of a more developed, differentiated, secondary kind. Perhaps here, too, the notion of a claim to attachment is helpful as a kind of pure claim to intersubjectivity and shared experience, a connection with and openness to the other. I shall close by considering the ontogeny of a point of view.

5.   Multiple perspectives and intersubjectivity

I began with the suggestion that Habermas' conception of the lifeworld is better suited as a framework for theorising intersubjectivity than phenomenological conceptions. It may be thought that the examples of nursing, back-riding, and feeding I have cited point precisely to the primacy of embodiment that the latter sorts of conceptions champion. However, inasmuch as we are looking not merely for a corrective to excessively cognitivist conceptions of agency, but also for an appropriate conception of *intersubjectivity*, phenomenological accounts tend to fall short by prioritising embodiment over culture and sociality. Daniel Stern has recently written that "Intersubjectivity is not simply a capacity, it is a condition of humanness from the phenomenological point of view" (Stern 2007: 36). Yet even in as subtle and refined conception of the lifeworld as Merleau-Ponty's, the other enters the picture late. In *The Phenomenology of Perception*, the Other is thematised only in Part II, Chapter 4, after the body, after language, and after objects and nature. (An analogous claim can be made about Thompson's *Mind in Life* (2007.) To be sure, Merleau-Ponty acknowledges that we are part of and have incorporated not only a natural world, but, just as

importantly, a cultural one. Indeed, he rejects the nature-culture dichotomy, arguing in "On the Child's Relations With Others," that relations with others are not subordinate or secondary to our relations with nature (Merleau-Ponty 1964:98).[15] Nonetheless, it is first and foremost its *objects* that make us aware of the culture we inhabit and through which we first experience the Other. The first of these objects whereby we become aware of all the others is the Other's body, manifested through its behaviour (Merleau-Ponty 1962:399–400). Merleau-Ponty's analysis of this encounter with the Other radically undercuts the problem of other minds that has so plagued modern philosophy. He argues that children do not need to infer the existence of other minds since they experience them directly in the actions of others, which they imitate. There is much here that anticipates the work of Bråten with regard to reciprocity and how we experience the actions of another. Merleau-Ponty writes:

> This conduct which I am able only to see, I live somehow from a distance. I make it mine; I recover it or comprehend it. Reciprocally I know that the gestures I make myself can be the objects of another's intention. It is this transfer of my intentions to the others' body and of his intentions to my own, my alienation of the other and his alienation of me, that makes possible the perception of others.
>   (1964:118)

The emphasis on reciprocity means, *inter alia*, that imitation, as Merleau-Ponty understands it, is not a matter of mere copying, but involves intersubjectivity. Yet immediately following, we find a marked difference with Bråten:

> The perception of others is made comprehensible if one supposes that psychogenesis begins in a state where the child is unaware of himself and the other as different beings. We cannot say that in such a state the child has a genuine communication with others. In order that there be communication, there must be a sharp distinction between the one who communicates and the one with whom he communicates.   (1964:118)

In early childhood, in other words, the lack of differentiation of self means that there is at best "pre-communication," an anonymous collectivity and undifferentiated group life. The corresponding standard for genuine communication is thus high: it must take place between two different points of view and requires awareness of perspective. The

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15.   He refers to Frenkel-Brunswick's studies showing that the perception of sensory qualities and space is partly determined by the perceiver's personality and interpersonal relationships, writing that "we can never grasp a child's ways of perceiving purely, independently of his social conditioning" and "inversely, you can never say that the way in which the child structures his social enviornoment is unrelated to the hereditary or constitutional dispositions of his nervous system… What will be 'natural' in the individual and what will be acquired … are part and parcel of a single global phenomenon" (108).

point is clearly reminiscent of Tomasello's claims about genuine intersubjectivity, discussed in Section 3. Merleau-Ponty does provide a story of how differentiation develops. Again, it begins with the body and its objectification, leading to the stage when the child (recognising his image in the mirror) learns that "there can be a viewpoint taken on him" (1964: 136). The model of development involved might be termed Hegelian, based on Hegel's notion of mediation and increasing differentiation (Hegel 1977). Development transforms what is there, sometimes fundamentally. Hermeneutics has also long recognized the transformative power of articulation (interpretation). Moreover, it seems quite plausible that the fine-grained inferential structure of language is what is required for the full articulation of this difference. Psychologist Katherine Nelson has proposed a comparable account of how children learn to interact with others and to understand what they do and think, differentiating between imitating, understanding others' goals and intentions, and having a full-blown theory of mind that attributes beliefs about such goals (Nelson 2005).[16]

Merleau-Ponty's dichotomy between pre-communication and genuine communication seems too sharp. The examples of nursing and altercentric experience seem to be communicative interactions, even if what is communicated is not propositionally differentiated. By the same token, it is worth recalling that the lifeworld functions as a shared background of intelligibility against which communicative action and the articulation of difference take place. Along these lines, I already cited Kuhl's research indicating that very early language development already contributes to the emergence of a shared perspective. Yet as important as sharing a perspective is the recognition of perspectival difference. The development of a point of view is crucial to a Habermasian account of communication since interlocutors take yes/no positions with regard to one another's claims. Where does the sense of a point of view originate? Alan Fogel and his colleagues offer a plausible account. Fogel et al. examine the development of the "dialogical self" during the first two years of life, which they describe as "inherently multivocal, embodied and social" (Fogel, Koyer, Bellagamba & Bell 2002). In the first six months of life, the infant experiences how multiple sensory modalities compose

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16. Nelson argues that, during their first ten years of life, children enter "the community of minds" "through the use, comprehension, and production of language" (28). She is a neo-Piagetian who argues against the "theory-theory" view of cognitive development, in part because she rejects that assumption that children have basically the same intellectual resources as adults (operate with the same cognitive mechanisms). She stresses the importance of narrative in this process. Joining the community of minds, significantly, involves the recognition that other minds differ from one's own, that not everyone has the same knowledge (32). All of this presupposes that children must learn the language of the mind and be able to use language as a representational system.

her world.[17] Fogel et al. describe this as a dialogue between multiple I-positions. During the second half of the first year of life, the infant discovers that she has a unique perspective on the world that she can share with others (Fogel et al. 2002: 198). During the next stage, between twelve and eighteen months, the infant begins to differentiate between her own inner world, the external world, and the inner worlds of others at the level of both cognition and affect. The budding understanding that all of these as potential subjects of communication introduces new possibilities for interacting with others. Fogel et al. specifically name consensus and conflict as what I would call cognitive-affective points of negotiation and interaction. In the final stage of their longitudinal observational study, the creative frame is one where a girl and her mother play with a lion puppet. First, the mother "frightens" the girl with the lion, then the girl takes the puppet from her mother and reverses roles. This occurs at seventeen months and two weeks and thus fits with Tomasello's chronology of development of secondary intersubjectivity. The example beautifully illustrates the interrelatedness of cognition, affect, and the taking on of another's perspective. The girl is experimenting with being scared and scaring, but the role of the mother in facilitating this experimentation and modulating the emotional response is crucial. (The example also relies on the capacity of pretend play, which marks the beginning of counterfactual imagination and thought; cf. Rakoczy 2008). These presuppose a conception not only of intersubjectivity but also of normativity – and a developing understanding of reasons and reason-giving.

Thus the development of communicative action in the Habermasian sense – of aiming to reach mutual understanding with another about something in the world, of vindicating one's claims with reasons if necessary – hinges on intersubjective interactions with others in a lifeworld. Paying attention to this development allows us to see how children enter into the lifeworld through such interactions. It also allows us to recognise the ways in which intersubjectivity is a social, cognitive, *and* affective phenomenon. An account of linguistic meaning and communication that takes intersubjectivity seriously must therefore also aim to do justice to all three of these aspects of intersubjectivity.

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17.   Rochat ties this intermodal perception to the infant's developing sense of self. It underlies coordinated activity, such as mouth-opening in anticipation of contact with the hand, in neonates (2001: 50).

Acknowledgments

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Primates, motion and emotion

To what extent nonhuman primates are intersubjective and why

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Focussing on the capacity for joint attention and communication, we review research that demonstrates the important and often overlooked role that emotion and motion may play in intersubjectivity and consciousness of self and others. We discuss the source of the continuing belief that such skills are uniquely human and suggest that there are no good grounds to deny such capacities to the other great apes. We suggest that despite the recent resurgence of interest in intersubjectivity, emotion and the lived body, mainstream contemporary developmental and comparative theory may still be based on questionable assumptions about the relation between mind and behaviour and simplistic notions of mental and evolutionary causation.

Keywords: intersubjectivity; joint attention; non-human primates; Wittgenstein; evolution

1. Introduction

> Look at a stone and imagine it having sensations. – One says to oneself: how could one so much as get the idea of ascribing a *sensation* to a *thing*? One might as well ascribe it to a number! And now look at a wriggling fly and at once these difficulties vanish and pain seems to get a foothold here, where before everything was, so to speak, too smooth for it. (Wittgenstein 1958: §284, emphasis original)

The importance of intersubjectivity for development cannot be seriously disputed, but it is often overlooked and neglected. This volume joins other recent attempts to place intersubjectivity in the foreground (e.g. see chapters in Morganti, Carassa, & Riva 2008; Zlatev, Racine, Sinha, & Itkonen 2008) and endeavours to make linkages to other conceptually-related phenomena such as consciousness of self and other, the lived body and affectivity. Although consciousness and intersubjectivity are, in a very particular sense, internal properties of an organism, following Wittgenstein and

others, we will attempt to show in this chapter that the mind is not hidden, at least not in typical circumstances. Although we do not expect this to be a particularly radical hypothesis in a volume such as the present one, our arguments will turn out to have some potentially radical consequences for mainstream developmental and comparative theorizing concerning the intersubjectivity and consciousness of other primates. But as Dennett (1995: 283, his emphasis) has noted,

> There is a familiar trio of reactions by scientists to a purportedly radical hypothesis: (a) "You must be out of your mind!", (b) "What else is new? Everybody knows *that*!", and, later – if the hypothesis is still standing – (c) "Hmm. You *might* be on to something!"

Although we, and many others, have tried to demystify, or to put it more strongly demythologize, the development of an awareness of the mind for some years now, the phase in which such ideas fall in Dennett's typology is uncertain at this point. Although Dennett for one is unlikely to endorse the roughly Wittgensteinian conclusions of this chapter – hopefully not because we "just indulge in a sort of interminable logotherapy" (Dennett 1995: 141; see Dennett 2007 for a less polite expression of such views), the idea that attributes of mind are typically plain in view and made oddly mysterious in much psychological theorizing is seeming less radical to a growing number of contemporary researchers.

The interest in concepts such as intersubjectivity occurs at a time when a growing number of researchers in psychology, neuroscience, philosophy and AI are becoming increasing sceptical about explanations of behaviour that rely on centralized control and single-cause, often mentalistic or gene-centred, explanations of purposeful activity. An important aspect of what ties these apprehensions together is the conviction that the causal story is far more complicated than is often realized, with a suspicion that single, efficient cause, sorts of explanations of many phenomena may not only fail to give us full insight into the topic of concern but may even provide a quite distorted image of what we are trying to understand. In our view, the resurgence of interest in intersubjectivity and its relation to consciousness should be understood in part in the context of this much broader groundswell of related concerns.

Despite this potential shifting of ground, many developmental and comparative psychologists continue to claim that particular inner states or adaptations are causally responsible for differences between younger and older human infants and human infants and other primates (typically, captive common chimpanzees, *Pan troglodytes*) who manifestly perform similar, or in some cases, identical acts. For example, the debates between Tomasello, Povinvelli and their colleagues (e.g. Hare et al. 2000; Hare & Tomasello 2004; Povinelli & Vonk 2003, 2004; Tomasello et al. 2003) involve differences that are said to pivot in large part on the relative influence of such mechanisms, and putative methodological concerns as well (but see Andrews 2005). Although differences in the capabilities of older and younger humans and other apes

with respect to their capacity for intersubjectivity and self and other consciousness continue to merit serious sustained empirical attention, the extent to which any differences should be taken to be the *cause* of manifest performances is no simple matter. And the increasing interest of many researchers in concepts such as intersubjectivity, embodiment, distributed and/or situated cognition, and systems theory may herald a shift away from conceiving of mental capacities as private, individual, simple efficient causes of behaviour to something far more complicated and far less in-the-head that has often been theorized (e.g. Fogel 1993; Greenspan & Shanker 2004; Johnson 2001; Kaye 1982; Leavens et al. 2008; Leavens & Racine 2009; Leavens, Racine & Hopkins 2009; Lindblom & Ziemke 2006, 2008; Racine 2004; Racine & Carpendale 2007, 2008; Racine et al. 2008; Shanker & King 2002; Susswein & Racine 2008, 2009; Witherington 2007). In a complementary vein, population-genetic level explanations of psychological functions are being taken to task by evolutionary systems approaches, the latter of which is inherently systems oriented and critical of simple, single cause genetic explanations (Gottlieb 2002; Gottlieb & Lickliter 2007; Griffiths & Stotz 2000; Lickliter & Honeycutt 2003; Lickliter 2008; Oyama 1985, 2000; Wereha & Racine 2009a, 2009b). However, although contemporary comparative work has found that many capabilities that have historically been understood to be uniquely human are harder to separate from those of some other species, the conceptual nexus of these issues is rarely considered in psychological theory. But as we, and others, have previously suggested, conceptions of mind may be the wellspring for many of these debates.

Intersubjectivity seems a paradigm case of a not-just-in-the-head phenomenon since it necessarily involves other subjects (Susswein & Racine 2009) and although intersubjectivity is straightforward in the sense that we know it when we see it (Susswein & Racine 2008), its ontogenesis and phylogenesis are another matter (Racine & Carpendale 2008; Leavens et al. 2005, 2008; Leavens & Racine 2009; Racine et al. 2008). The promissory note of a focus on the role of emotion and bodily motion in the development of intersubjectivity and other forms of consciousness should presumably be that researchers will be able to have a clearer view of the relation between intersubjectivity and consciousness of self and other. However, in this chapter we will attempt to consider the potential influence of these factors while also paying careful attention to the relation between mind and behaviour and to recent developments in evolutionary developmental psychology. To do so, we will introduce the historical motivation for the use of related terms such as intersubjectivity and embodiment and discuss research concerning mirror neurons that seems to vindicate this motivation. This will lead to a discussion of the extent to which nonhuman primates might be said to communicate intentionally, a capacity that many feel involves a non-basic level of intersubjectivity and consciousness. We then locate and describe research conducted by Leavens, Hopkins and their colleagues that emphasizes the role of motion and emotion in the development of secondary intersubjectivity and consciousness and consider its implications for extant research and theory.

Then we focus on the relevance of the conceptualization of mind and body for this research and recent research in evolutionary developmental biology from a more systems perspective. We conclude by suggesting that giving emotion and bodily motion a seat at the table of intersubjectivity and consciousness is helpful to the extent that it continues to square with adequate conceptions of mind and causality.

2.   The resurgence of intersubjectivity, consciousness, motion and emotion

Husserl (1977), Merleau-Ponty (1962), Scheler (1954) and contemporary researchers who follow in and extend the phenomenological tradition (e.g. Gallagher 2005; Thompson 2001; Zahavi 2001) have done much to locate our relation to others in our natural, bodily-centred attitudes towards them. This way of thinking arose in contradistinction to the Cartesian ego and its radical separation of self and other. For our present purposes, the chief insight of phenomenology is that it draws attention to the primordial bond that may exist between others, for we apprehend their psychological states in our reaction to such states. And much as a chimpanzee need not have a concept of desire in order to respond to the wants of another, neither must a young infant. From a phenomenological point of view, another's actions evoke natural responses from oneself and strong categorical distinctions between inner and outer or mind and body become problematic:

> *in* the blush . . . we perceive shame, *in* the laughter joy. To say that 'our only initial datum is the body' is completely erroneous. This is true only for the doctor or the scientist, i.e. for man in so far he abstracts *artificially* from the expressive phenomena.   (Scheler 1954: 10, emphasis original)

Recent work in neuroscience seems to vindicate the primordial sharing of experience theorized by phenomenologists and, as we will see in the next section, in a related sense by Wittgenstein. The discovery of so-called mirror neurons in macaque monkeys in the 1990s provided a large part of the impetus for the birth of social cognitive neuroscience, under the umbrella of which mirror neuron systems are suggested to exist in humans (see Rizzolatti & Sinigaglia 2007 for a review). This system tracks the correspondences between observed actions onto an observer's own actions. And as Gallese and his colleagues note,

> the description by Merleau-Ponty of what it means to understand an action ('The sense of the act is not given, but understood, that is recaptured by an act on the spectator's part' [Merleau-Ponty 1962: 185]), expresses nicely the direct experiential understanding of the observed actions mediated by the mirror mechanism.   (Gallese, Keysers & Rizzolatti 2004: 397)

Gallese and colleagues and others have extended the functioning of mirror resonance systems to the understanding of not only action and by extension intention (but see Jacob 2008), but also emotion. Thus, although this will not be our goal in the present chapter, the functioning of mirror mechanisms could be a primary focus when discussing the role of motion and emotion in the intersubjectivity and consciousness. To be sure, such neural systems may be necessary for the development of intersubjectivity and consciousness, but given that humans share this system with monkeys, with whom we had a common ancestor some 30 million years ago, this is an ancient system (Hutto 2008). Also, the exact nature and role of such a system continues to be debated (Hickok 2008). Although apes might use this system to make sense of goal-directed behaviour, the simple presence of the mirror system cannot be sufficient for the attribution of intentions to others. It is even unclear whether it is the outcome of a developmental process or the source of one. As Meltzoff (2002: 22) notes, researchers do not know whether the system fires "the first time an animal sees an act executed, or … the mirror neuron is activated only after an observation/execution association is built up over time." In either case, Ramachandran's (2000) pronouncement that "mirror neurons will do for psychology what DNA did for biology" may be premature. For one thing, systems approaches are becoming increasingly popular in evolutionary and molecular biology. While DNA is a necessary part of the functioning of such systems, as we will discuss later in the chapter, it is increasingly seen as co-determinative rather than causal:

> Given that genes are but one component in a structured system of components across many levels, they cannot be offered as causes of development. They are necessary conditions for developmental outcomes, and they have codeterminative power, but genes in and of themselves have no direct causal power.
>
> (Lickliter & Honeycutt 2003: 828)

If there is a lesson to be learned here for psychology, pace Ramachandran (2000), it may be *don't* think of mirror mechanisms in the way that the biologists first thought about DNA.

At present, social cognitive neuroscience as a field seems to tilt in the direction of over-emphasizing the role of neural mechanisms – even those related to topics of interest to this volume such as action control and affectivity – in the development of intersubjectivity and consciousness. In our view, Gallese (2005: 197) typifies the field quite well when claiming that "Much of what we ascribe to the mind of others when witnessing their behaviour depends on the resonance mechanisms that their behaviour triggers in us." In one sense, this is a truism because without an intact brain one would not ascribe very much at all to the mind of another. But in another sense, it creates a potentially misleading view of how one develops an understanding of mind, for which a functioning mirror system is quite likely necessary but which is still a causally impotent part of a complex system of interacting components (see also Susswein &

Racine 2008; Racine et al. 2008). As we will discuss in more detail in subsequent sections, given that the meaning of a mental state is logically dependent upon behavioural activity in the situation in which it occurs, appropriate rearing experiences are also a necessarily crucial part of this system (Leavens et al. 2008, 2009; Leavens & Racine 2009; Racine et al. 2008; Racine & Carpendale 2007, 2008).

It is also telling that research on macaques has previously also demonstrated the presence of neural networks in the visual cortex (V5) that support the perception of colour (see e.g. Zeki 1993). But having a system that codes for colour is not tantamount to having an agent that is aware that the world is made up of hues of red, green or blue. Agents need to be taught how these concepts function in the many subtle ways in which they can be used in this human form of life (e.g. not only is this a green ball, but she is green with envy, he looks green after eating all that ice cream, and so on). So it also goes for neural networks in the premotor cortex (F5, and the inferior parietal lobule, IPL), which support the perception of intentions. Given this, it is not at all surprising that the mere presence of such a system does not sentence agents to see the world in intentional terms. Although the issue of what in addition to a mirror neuron system is precisely required to allow one to make sense of others in terms of their goals is a critical one upon which we shall elaborate in a later section, the point for now is that we should greet single-cause explanations with polite caution. Although social cognitive neuroscience is often explicitly anti-mentalist in its criticism of contemporary explanations of interpreting goal-directed behaviour (e.g. see Sinigaglia 2008: 18), it is not always clear that one putative efficient cause is not being exchanged for another.

A related source of theorizing regarding the primacy of the body and emotion in intersubjectivity and consciousness is a proliferation of concern about the embodiment of mental functions (e.g. Varela, Thompson & Rosch 1992). Although the impetus for this way of thinking was in part to point out the crucial dependence of the sorts of thoughts that agents have upon the form of their bodies, the discovery of mirror neurons seems to have moved us towards what should perhaps be more properly called *embrainment* than embodiment. But, ironically, the work of Varela and colleagues was one spur for the development of situated or distributed forms of cognition which in fact stretch our bodies into some particular physical and sociocultural surround. We believe that Wittgenstein can help to get us back on firmer footing.

3.   Wittgenstein, intersubjectivity and consciousness

Like the phenomenologists, Wittgenstein, upon whose work we rely to a large extent in this chapter, emphasizes the intrinsic logical relation between body and mind and inner and outer experiences (see also e.g. Overgaard 2006; Racine & Müller 2009; ter Hark 1990):

> 'We see emotion' – as opposed to what? – We do not see facial contortions and *make the inference* that he is feeling joy, grief, boredom. We describe the face immediately as sad, radiant, bored even when we are unable to give any other description of the features.   (Wittgenstein 1980, § 570, emphasis original)

Whether or not mirror circuits subserve action, Wittgenstein emphasizes the natural reactions we have toward others and how these reactions and our everyday behaviour form the ground for communication and language use:

> Being sure that someone is in pain, doubting whether he is and so on, are so many natural and instructive kinds of behaviour towards other human beings, and our language is merely an auxiliary to, and further extension of, this relation. Our language is an expression of primitive behaviour. (For our *language-game* is behaviour.) (Instinct.)   (Wittgenstein 1981, § 545, emphasis original)

Although the following remark by Wittgenstein is used to make a point about the justification of action, Wittgenstein's concerns about the non-inferential nature of many activities seem to apply equally across similar species: "The squirrel does not infer by induction that it is going to need stores next winter as well. And no more do we need a law of induction to justify our actions or our predictions" Wittgenstein (1969, § 287). However, given that nonhuman animals (and human infants for that matter) are bereft of a language with which to discuss the mental states of others, it might be protested that it is unclear whether babies or other primates could be said to *understand* the mental lives of others as opposed to just react to their conduct. In our view, Wittgenstein is questioning the very contrast being drawn here. That is, an agent's understanding of the emotional state of another is manifest in her particular reaction to it. Being able to have a conversation about your motivations for reacting the way that you did or thinking back on your reasons for acting and wishing you had acted differently are different matters. And although they may presuppose an understanding of intention, there are non-verbal criteria that would satisfy this rather basic concept. Furthermore, despite the fact that mainstream developmental and comparative theory seems to believe otherwise, understanding is not an experience (Racine et al. 2008; Susswein & Racine 2008). Thus, the fact that an agent may manifest, behaviourally, her understanding of another's intentions, desires or beliefs, this does not license one to talk about an agent necessarily *experiencing* such an understanding – let alone experiencing it in their cranium or some other location otherwise specified (Susswein & Racine 2009). However, although it is clear that Wittgenstein means that some human psychological states cannot be sensibly applied to nonhuman animals (understanding not being one of them – because it is not per se a mental state), his views on the mentality of nonhuman animals are subtle and require some care (see also Bavidge & Ground 2009; Canfield 1996; Glock 2000, 2006; Huemer 2006; Malcolm 1982; Pleasants 2006; Racine & Carpendale 2008; Savage-Rumbaugh & Fields 2000; Savage-Rumbaugh,

Fields & Taglialatela 2001; Savage-Rumbaugh, Fields, Segerdahl, & Rumbaugh 2005; Savage-Rumbaugh, Shanker & Taylor 1998; Shanker & King 2002; Susswein & Racine 2008).

Wittgenstein issued the following reminder:

> Only of a living human being and what resembles (behaves like) a living human being can one say: it has sensations; it sees; is blind; hears; is deaf; is conscious or unconscious.   (Wittgenstein 1958, § 281)

This clearly leaves open the door to ascribe at least certain psychological attributes to other animals. But as Wittgenstein (1958: 223) also remarked: "If a lion could talk, we would not understand him." And:

> A dog believes his master is at the door. But can he also believe his master will come the day after tomorrow? Can only those hope who can talk? Only those who have mastered the use of a language. That is to say, the phenomena of hope are modes of this complicated form of life.   (Wittgenstein 1958, § 174)

According to Wittgenstein, one does not attribute mental states like hope to other animals. But not because animals have a more limited imagination, which they surely do, but because the primary application of a concept like hope is tied up extensively with the human form of life. The point here is not about the mentality or lack thereof of other animals, but rather a logical point about the grammar of the concept hope; a lot of stage-setting needs to be in place before we can apply this concept to any agent. This stage-setting is not in the human mind or mirror system. In order to hope, one must have mastered many human abilities, customs and concepts:

> Language is the vehicle for the determinacy of sense that makes specifically human concept-use possible. But still, in the end, it is the myriad shapes of human life that fix sense and not some linguistic medium floating above life and running parallel to it.   (Bavidge & Ground 2009: 140)

At issue here is that some psychological concepts can be manifest behaviourally. For example, developmental and comparative researchers make a lot of the fact that an infant must understand another's attention when the infant points, follows gaze, socially references and so on – a phenomenon that researchers call joint attention (see Racine & Carpendale 2007 for a review; Susswein & Racine 2008 for further discussion). These actions are minimally constitutive of understanding another's attention and therefore it is illogical to claim that a baby who points understands joint attention but that a pointing chimpanzee does not. Now, although we have argued that such intersubjective skills that involve rudiments of consciousness of self and other are acquired though basic learning processes and that the capacities are likely common across the great apes, even if we are wrong about this and there is a more adequate causal story to be told – *this would not mean that other apes do not understand joint*

attention. These behaviours are minimally constituent of an understanding of another's attention, which the field describes as a secondary form of intersubjectivity, whether one is a prelinguistic child or an apparently non-linguistic ape. Although these pronouncements might seem counterintuitive or even problematic to some, in his later philosophy upon which we are drawing in the present chapter, Wittgenstein examines and rejects a psychologistic view of meaning. In such a view of meaning, the meaning of a psychologically-relevant action is assumed to be provided by the underlying mental state of the actor (see Racine 2004). However, discontinuous views of the social cognitive capabilities of human and nonhuman animals abound (e.g. Penn, Holyoak & Povinelli 2008; Tomasello, Carpenter, Call, Behne, & Moll 2005). The general form of this seemingly anti-Darwinian view is captured well by Bennett:

> It is common knowledge that there is a very large difference between the level of intellectual ability of humans and that of all other terrestrial creatures. It is commonly believed that this difference is in some important way one of kind rather than of degree: that between a genius and a stupid man there is a smooth slide while between a stupid man and an ape there is a sharp drop, not just in the sense that there are no creatures intellectually half-way between apes and stupid men, but in the sense that there could not be such creatures.   (Bennett 1964: 41)

If hope is an aspect of human life that would make little sense for other forms of life, it is notable that intersubjectivity and consciousness are on a different order of complexity. Like Wittgenstein, we would expect the latter phenomena and many related capacities to exist in species that are similar to ours. And on grounds of genetic and behavioural similarity, we would certainly expect for nonhuman primates to manifest intersubjectivity and consciousness. Indeed, some enculturated nonhuman primates could be argued to have mastered a rudimentary language in the sense that Wittgenstein means and have even been reared to different extents with human caregivers, and thereby afforded the opportunity to acquire some experience in this complicated form of life (see Savage-Rumbaugh & Fields 2000; Savage-Rumbaugh et al. 2005, 1998). Taking his cue from the talking lions, Gill (1997: 26) argues that such chimpanzees "do speak and we do understand them because, at least to a significant extent, we share a common 'form of life,' grounded as it is in gestural, reciprocal, and task-oriented embodiment." And in referring to primitive language-games to which he compares the communicative capacities of other animals, Wittgenstein (1972: 17) notes, "we recognize in these simple processes forms of language not separated by a break from our more complicated ones."

We agree with Wittgenstein's rejection of psychologism and are concerned with the ways that it has infected developmental and comparative theory and research. It has also wreaked havoc in our view in how many researchers conceive of the mental capacities of other animals. A focus on the common ground provided by early rearing

experience turns out to have considerable relevance for these issues. In the next section we review research conducted primarily by Leavens, Hopkins and their colleagues that discusses the role that bodily motion and emotion may play in the development in secondary forms of intersubjectivity and consciousness in young humans and other primates.

4. Emotional engagement, bodily motion and secondary intersubjectivity and consciousness

It is a truism that emotional experiences are a necessary aspect of development in many species. Part of how one learns about one's world, and the limits thereof, is through encounters with others who express particular emotional signals in their conduct. Despite the fact that such engagement is not the only factor implicated in research concerning the effects of early socioemotional deprivation on development, such studies have suggested that quite drastic effects result from such deprivation on a variety of capacities (e.g. Nelson, Zeanah, Fox, Marshall, Smyke, & Guthrie 2007; Rutter & the English and Romanian Adoptees (ERA) Study Team 1998), including quasi-autistic behaviours (Rutter & the English and Romanian Adoptees Study Team (ERA) Study Team 1999). Although it is not possible or possibly even desirable to separate out the emotional dimension of social interaction, it is uncontroversial to suggest that emotional engagement and affective signals in general might play a critical role in human development. For example, Hobson (2002) has argued that an inability to fully engage in such experiences is a key part of what is compromised in children who go on to be diagnosed with autism. Greenspan & Shanker (2004) have elaborated a phylogenetic and ontogenetic model of the origins of thought that gives the main impetus to emotional factors. On a related note, others have suggested that the standard theory-of-mind explanation of human action may better explain how children with autism, rather than typically-developing children, actually function (Gallagher 2004; Hobson 2009; Shanker 2004). Ironically, Shanker (2004: 220) has noted, "This is very much the view of social cognition introduced by Descartes in the *Second Meditation*."

It is also obvious, but perhaps not as well known, that affect plays a similar role in the typical early development of nonhuman primates (see e.g. Bard & Leavens 2009). However, what is less obvious is that the rearing experiences of other primates may play a role in the conclusions that many in the field draw about the social cognitive capabilities of nonhuman primates. We now turn to a brief review of research investigating the role of emotion and motion in the development of capacities that Trevarthen & Hubley (1978) have described as involving secondary intersubjectivity. As we will again demonstrate, the grounds for attributing an understanding of what has more recently become known as joint attention do apply equally to human

and nonhuman primates (see also Bard & Leavens 2009; Leavens et al. 2008, 2009; Leavens & Racine 2009; Racine 2004; Racine & Carpendale 2008; Racine et al. 2008; Susswein & Racine 2008).

We begin by introducing what Leavens and his colleagues have dubbed the Referential Problem Space (for more detail, see Leavens et al. 2008, 2009). Leavens and colleagues have argued that wild apes do not encounter the same problem space as do captive apes and human infants. Human infants who are able to intentionally signal their desires are subject to a variety of external and internal barriers to object retrieval – a situation that is also faced by captive apes. However, apes in the wild do not face this problem space because they achieve independent locomotion before they are able to engage in means-end reasoning. Thus, apes in the wild can simply retrieve a desired object without needing to engage the assistance of a conspecific (Leavens et al. 2008, 2009). On the other hand, because human infants are not able to retrieve objects without the intervention of a caregiver, these infants learn that they must manipulate the attention of their caregivers in order to retrieve objects. Captive apes learn that this is indeed the case for their actions as well. Leavens and colleagues have argued that this is why actions like manual pointing are frequently observed in caged apes, but are an exceedingly rare means of directing attention in apes in their natural habitats.

Of course, not only do human infants experience particular sorts of constraints in their rearing environments that other apes do not, human infants are also afforded the opportunity to direct attention in ways that some researchers claim show an interest in directing attention as an end in itself rather than a means to some other end. We have noted elsewhere that there are no grounds to suppose that anything of the sort is in fact happening because it is clear that infants find such actions emotionally rewarding whether or not they are taken to be an end in themselves (Leavens et al. 2009; Leaven & Racine 2009; Racine et al. 2008). However, even if so-called declarative pointing actually needed to be explained in a different way than did imperative pointing, as we noted earlier, either form manifests secondary intersubjectivity and signifies an understanding of the attention of another. In either case, it does not take much imagination to consider the possibility that if imperative pointing has its origins in basic patterns of human interaction (Racine & Carpendale 2007, 2008), then declarative pointing could easily as well. Tomasello (2003) also allows that it is possible for human infants to begin pointing by means of social shaping; he just does not think that this is the preferred route for humans. As we will subsequently discuss, perhaps if Tomasello were not attempting to explain intentional behaviour by recourse to causal mental states also called intentions, the distinction that he draws between these forms of pointing would cease to have the same meaning to him.

We have expanded this argument elsewhere to suggest that human infants *learn* to follow gaze, socially reference and point because of the Problem Space within which they are embedded and because of the reinforcing contingencies of infant-caregiver

interaction (Leavens et al. 2008, 2009; see also e.g. D'Entremont & Seamens 2007; Gómez 2007; Moore & Corkum 1994; Southgate, van Maanen & Csibra 2007). We have further argued that since the activities that demonstrate joint attention are exhibited in all great apes species, a capacity for joint attention seems to be relatively ancient. Although we are well aware that this is a controversial claim in the current mentalistic and adaptationist zeitgeist, we argue that it is more productive to understand the differences that exist between species in terms of differential capacities that are tied up with different, but not bifurcated, forms of life.

We surmise that there are at least two main reasons why this line of argument may have failed to capture the imagination of mainstream developmental and comparative researchers. The first is the ostensibly overwhelming evidence of social cognitive *discontinuity* across the human and nonhuman primate lines (e.g. Penn et al. 2008; Tomasello et al. 2005). However, as we have noted elsewhere, the rearing histories of experimental nonhuman primates are confounded with experiencing relatively impoverished enclosures and restricted opportunities for interaction with caregivers of their own species, let alone human caregivers. Conversely, the human children with whom their performances are often compared are sampled from typical human families (see Leavens et al. 2008, 2009; Racine et al. 2008). As Gardner (2008: 136) has recently remarked, captive apes are "lucky if they have a rubber tire to play with or a rope to swing from." Citing earlier work by Tomasello and Povinelli, Gardner points out that the more experience that chimpanzees have with being housed in cages, the lower are their scores on standard measures of cognitive functioning. Conversely, the more experience that chimpanzees have with humans, the higher are such scores (Carpenter, Tomasello & Savage-Rumbaugh 1995). This is directly consistent with the findings of Rutter and colleagues concerning the cognitive functioning of orphans who experience extreme socioemotional deprivation (Rutter & the ERA 1998, 1999).

The second reason that our arguments may have fallen on somewhat deaf ears, to this point, is not methodological, but rather, as we have implied earlier, conceptual. Simply put, in the main, the developmental and comparative literature seems to have one set of standards for human (infants) and another for nonhuman primates. Essentially, the prelinguistic skills of human infants are explained one way and what are taken to be the nonlinguistic skills of nonhuman animals are explained in quite another (see Canfield 1996; Racine & Carpendale 2008). For example, Tomasello (1999) has argued that social shaping (which he idiosyncratically calls ontogenetic ritualization) accounts for social cognitive skill development in nonhuman animals whereas identical skills in humans are explained by an infant recognition of the intentionality of others. Tomasello et al. (2005, Tomasello, Carpenter & Liszkowski 2007) take this further and claim to show that human infants have a natural motive for cooperating with others, whereas chimpanzees do not. Setting aside the extent to which any such motivation might be natural for children reared in typical families and unnatural for chimpanzees reared

in biomedical research facilities, Tomasello, Povinelli and many in the field seem to conceive of mental life as radically, and we can only surmise dualistically, distinct from the conduct and circumstances of everyday behaviour. We believe that this is tied up with an overly simplistic view of causation where internal states or adaptations of an organism function as efficient causes. We consider internal states in the following section and adaptations in the one that follows.

5.   Intersubjectivity, consciousness, emotion, motion, minds and behaviour

If we begin by noting that it is behaviour that is intentional, not mental states, we are likely to be misunderstood. But the fact remains, given that one is a living animal and not a robot (or one of Wittgenstein's smooth stones mentioned in the remark that opened this paper), creatures that possess a capacity for intentional behaviour manifest intentionality in their conduct in particular circumstances (Leavens et al. 2008, 2009; Leavens & Racine 2009; Racine 2004; Racine & Carpendale 2008; Racine et al. 2008; Susswein & Racine 2008). If one evokes Dennett (1995: 283) and exclaims, "What else is new? Everybody knows that!", this may be because the question that one immediately seems to ask is whether an agent *understands* that her behaviour is intentional. Surely *this* is a mental phenomenon that is independent of these sorts of considerations. Although there may be a certain sense in which this is true, we hope that it is sobering for the reader to realize that this is the sort of theorizing exhibited by Descartes some 400 years ago – the same Descartes who denied subjectivity to animals because they could only behave but not think. Much like the contemporary tendency for conceptions of mind to ramify through empirical and theoretical work, Descartes' own empirical anatomical research reconfirmed his metaphysical hypothesis:

> Examining the functions that might result in such a body, what I found were precisely those that may occur in us unconsciously, without any cooperation of the soul, that is to say of the element distinct from the body of which I said above that its nature is merely to be conscious; the very operations in which irrational animals resemble us; but I could find none of the operations that depend on consciousness and are alone proper to us as men.   (Descartes 1637: 41)

Most modern researchers probably chuckle at such obvious bias. However, conceptual biases are often only this obvious in a historical context. What are our modern biases? Isn't it conceivable that researchers in 400 years time will laugh at contemporary developmental and comparative researchers for how they used to think about mental life? If that is the case, then it is likely that what we are writing in this chapter may be a bit off as well. However, although most contemporary researchers – but not

at all (e.g. Chomsky 1966) – claim to not share Descartes' conceptions of mind and further feel that his claim that the pineal gland is the anatomical correlate for human uniqueness to be quite primitive, the debates that continue to play out in mainstream contemporary theory and research are thoroughly Cartesian in character.

Although the present authors do not believe that intentional behaviour works this way in typical circumstances, we certainly do not wish to deny that animals sometimes think about their intentions and sometimes actually sequence their behaviour in attempts to satisfy them (cf. Tomasello et al. 2005). It is clear to us that humans can intend to do things that other animals cannot – like write a chapter in a book concerning intersubjectivity and consciousness, which the first author has endeavoured to do for some months now despite his "best intentions." However, the fact that the respective forms of life of humans and other apes afford different opportunities for the expression of intentions and other mental states does not mean that other animals do not intend to do what they do and are often conscious that they do so – i.e. they are not sleep-walking, or the like. This only seems counterintuitive because researchers tend to think of intentions mentalistically: there is outer behaviour; there are inner intentions. But Wittgenstein's insight was that behaviour *expresses* intentions in particular circumstances. The two are logically, internally, related and to speak of an intention as a strictly mental event is to not understand an intention. Or a mind. The question becomes whether there are grounds for attributing such an understanding to an agent so described. But the grounds are not whether or not an agent has a mind *per se*; rather, *we think of an agent as having psychological properties because of the abilities and form of life that she possesses.* Even this statement is sure to be misunderstood by some. It might seem that we reject the mind but embrace the body. Although we reject the Cartesian theatre of mind and the conceptions of action with which it is tied up, it is possible and indeed often desirable to emphasize the inner over the outer. Our point, and indeed Wittgenstein's, is simply that inner and outer, body or behaviour, or brain and mind are different ways of describing the behavioural capacities of animals – as are intentions. However, intentions are precisely those sorts of properties that are easy to conceive of in misleadingly causal terms.

Wittgenstein (1958) demonstrated the socially constituted nature of an intention in a discussion of knowing moves in a chess game. If one does not know how to play chess, one cannot intend to play a game of chess; by parity, if one does not know how to play chess, one cannot understand that another intends to play a game of chess (see also Racine 2004; Racine & Carpendale 2007). Whatever neurological, genetic or psychological events might be necessary for an agent to behave intentionally, these are not sufficient – they are *external* to the meaning of the action. Importantly, children must be trained to learn the proper normative uses of such terms. As Huemer (2006) has recently clarified, what Wittgenstein meant by training is not teaching or the like but something more like conditioning:

> when Wittgenstein emphasizes that teaching language is training rather than explanation, he insists that the first steps of language acquisition can be fully explained by a setting up of stimulus-response patterns: they take place at the level of pattern-governed behaviour rather than rule-conforming behaviour. We condition children to occupy their first positions in the language game which, from the adult speakers', but not the children's point of view, contain an intrinsically normative element.   (Huemer 2006: 208)

This description again implies that nonhuman animals might enter into normative training in the same sort of manner given the appropriate opportunity and the sort of similarity in forms of life mentioned earlier (Savage-Rumbaugh & Fields 2000; Savage-Rumbaugh et al. 2001, 2005).

6. Intersubjectivity, consciousness, emotion, motion, genes and behaviour

The recent application of systems thinking to evolutionary theorizing has the potential to integrate the findings of Leavens and their colleagues and to provide a more suitable meta-theory of understanding the development of capacities such as intersubjectivity and consciousness. Thus, understanding the impetus for this theorizing may help to illuminate a way forward. Essentially, the problem faced by the more familiar adaptationist, population genetic, interpretation of evolutionary processes, was that its practitioners conceived of evolution strictly as changes in allele frequency in a population over time, thereby presupposing particular developmental processes rather than elucidating their nature. That is, development was assumed to be the outcome of genetic processes and in this sense, ironically, development became the junk DNA of evolution. By avoiding development or by at least assuming that it proceeded in a predictable, reliable manner, the only relevant factors in accounting for evolutionary influences were taken to be mutation and separation of genes. This is clearly captured in the so-called central dogma of biology where the genome is modelled as independent of influences above the genetic level and information flow proceeds in essentially a feed-forward manner. Genes are considered to contain the information required to construct or determine the organism's growth and form (Gottlieb 2002).

Research conducted in the past generation in genomic and developmental biology has undermined the ontogenetic determinism of genes and motivated many to question the adequacy of the population-genetic view (e.g. see reviews in Lickliter 2008; Lickliter & Honeycutt 2003). This has lead to careful rethinking of what have traditionally been seen as antinomies, e.g. proximate and ultimate causes and more fundamentally, development and evolution, nature and nurture. It is now understood that genetic processes are not strictly feed-forward, but are rather affected by events

in the neural, behavioural and external environment (see Gottlieb 2002). The classical central dogma and the set of dogmatic assumptions with which it is tied up is also inconsistent with the discovery that DNA is considerably less stable than has been assumed to be the case and might be more affected by non-Mendelian mechanisms of genetic turnover than base-base substitutions (Gottlieb & Lickliter 2007). The view that emerges out of these considerations is that the developmental functions are emergent and epigenetic in nature with multiple sources of bidirectional interactions occurring within and between different levels of analysis, including many factors other than genes (Gottlieb 2002). The strong implication of evolutionary systems approaches is that there are always developmental precursors to any new behaviour. In particular, according to this approach, in addition to DNA, organisms inherit numerous epigenetic resources (Johnston & Gottlieb 1990; Oyama 1985). Furthermore, as an illustrative example of a further implication of conceiving of evolution as occurring within a system, Johnston and Gottlieb (1990) report evidence that changes in primate jaw and tooth anatomy are mainly due the direct mechanical effects of dietary change and not natural selection. That is, dietary change can lead to specific anatomical adaptations that persist across generations and such phenotypic modifications occur in advance of any changes in gene frequency (see Lickliter 2008 for other examples of such Baldwin effects).

It may perhaps seem challenging to apply evolutionary systems principles to developmental and comparative psychology and, to our knowledge, few have systematically tried. But as Bard & Leavens (2009) have noted, the effects of rearing histories and the emotional contours with which such experiences are tied up, upon the development of intersubjectivity and consciousness in chimpanzees are predictable from an evolutionary systems point of view. To take this positive point further in the present chapter, the general thrust of work conducted both jointly and independently by Leavens, Racine and their colleagues is also predictable from such a perspective. However, to close on a more negative assessment, what is not consistent with an evolutionary systems point of view are the bulk of mainstream approaches to intersubjectivity and consciousness in the developmental and comparative literature.

Two salient examples, again, are Povinelli and Tomasello, both of whom apparently not only agree on the basic Cartesian character of mind but also programmatically on an adaptationist view of the evolution of such capacities. For his part, Tomasello (e.g. 1999) describes joint attention as an adaptation for human culture. Although Tomasello would not expect such an adaptation to "unfold" in a situation of extreme neglect, nowhere does he spell out a nuanced position that takes into account the foregoing. This may account for lack of emphasis of the effects of rearing history on social cognitive competence, despite contributing to the scholarship that supports such a view (Carpenter et al. 1995). On the other hand, Povinelli has proposed a reinterpretation hypothesis (see e.g. Penn et al. 2008 for a recent discussion of this view) by which our

hominid mental state skills reinterpret the meaning of the behavioural capacities that we share with other primates, thereby imbuing such behaviours with newfound intentionality that only humans can understand. To be consistent with such a metaphysics, Povinelli (e.g. Povinelli & Vonk 2004) has had to deny the strong evidence produced by Tomasello and his colleagues (e.g. Hare & Tomasello 2004) that suggests chimpanzees understand intentions in at least some contexts. And around we go.

7.   Conclusion

The bulk of contemporary research concerning the intersubjective capacities of human infants and great apes seems to show conceptual excesses in two directions: (a) excessive reliance on inner causal states, and (b) excessive reliance on simple linear adaptations. Although a thorough treatment of the relation between these two conceptions warrants serious attention, we leave that for another paper. But from the perspective presented in the present chapter, the inner life of a great ape is not radically different than our own, although it certainly admits of fewer degrees of freedom. However, our remarks, when properly understood, implicate a more limited form of life than a more limited mentality per se. And in an important sense, to speak about mental capacities *is* to speak about the behavioural capacities and forms of life with which they are tied up. Form of life, from an evolutionary systems point of view, leads away from a reaction-range conception of possibility to one in which rearing histories can change and otherwise amplify what is normative for a life form.

We have also described ways in which emotion and bodily motion impact on capacities for intersubjectivity and consciousness, particularly when explaining why humans naturally point but other apes do not. But it would not be very evolutionary systems to overstate the importance of any single factor in the origins of a given behaviour. For example, although we do not question the potential importance of this discovery, our discussion of mirror neurons may provide a telling case of placing far too emphasis on one mechanism. In the same way, care must be taken to ensure that emotion and motion are emphasized in the field (and, hopefully, in this volume) in a way that does not place undue weight upon their importance; it would not be helpful for the field if researchers were to replace one questionable metaphor with another.

Acknowledgements

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Reaching, requesting and reflecting

From interpersonal engagement to thinking

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From many contemporary theoretical perspectives, the body and emotions play little role in the development of thinking and consciousness. If emotions are given any part it is in biasing thinking, rather then contributing to cognitive development. This volume, in contrast, presents alternatives to that position. From our perspective, embodied engagement with others – necessarily involving emotions – has a role in structuring the interactional conditions in which the development of thinking occurs. Just the body and emotions, however, are insufficient; the mythical baby isolated on a desert island would have a body and emotions (or at least the potential for their further development), but would not go on to develop human forms of thinking. What is needed is a shared history of routine patterns of interpersonal engagement. The body and emotions are necessary for setting up these forms of interaction and routines in which communication can emerge and then thinking and consciousness. In this sense, the development of human forms of thinking requires a social environment. We draw from Mead the point that self-awareness arises from interacting with others, and thus, self-consciousness is inherently social (Farr 1980; Mead 1909, 1910a, 1910b, 1922, 1934; Morss 1985).

Keywords: Infant communication; gestures; social cognition; meaning; G.H. Mead

1. Introduction

Our goal in this chapter is to outline our view of the development of human forms of thinking, and social cognition in particular. We argue that such forms of thinking are closely linked to the nature and development of language. A more recent version of Mead's classic position is Levinson's claim that language is based on earlier forms of interaction: "*Language didn't make interactional intelligence possible, it is interactional intelligence that made language possible*" (Levinson 1995: 232, italics in original), and "we have been damagingly distracted from the interactional underpinnings that

make it possible" (Levinson 2006: 42). Levinson's term "interactional intelligence" may appear to emphasize the individual competence rather then the form of the interaction. Instead, it is this foundational form of interaction in which meaning arises that we wish to consider.

In accounting for the development of this form of interaction, we take an activity based, relational approach, according to which infants develop knowledge of the world in terms of their successful activity, including their interaction with other people (Carpendale & Lewis 2004, 2006, 2010). From the perspective of a relational meta-theoretical framework, accounting for the development of thinking and mind begins from relations (Jopling 1993; Overton 2006). Thinking, from this approach, is part of a continuum of an organism's adaptation to its environment, which does not exist pre-given before interaction can take place. Thinking is rooted in and emerges from activity, and human forms of thinking develop within social interaction. Sensorimotor, practical, or 'lived' knowledge – knowledge in action, or know-how – is not just about the physical world, it is also about infants' social interactive experiences. Thus, by facilitating forms of interaction within which thinking develops, the body and emotions create the medium in which particularly human forms of thinking can develop. These forms of interaction are intertwined with and make language possible. From this perspective, "all thought is a system of meanings" (Piaget 1977/1995: 223). And, thus, "Human beings can be said to live in a natural environment of meaning" (Hendriks-Jansen 1996: xi). Therefore, we have to explicate the processes through which such forms of meaning develop.

Relational approaches contrast with more individualistic or cognitivist perspectives according to which a split is assumed between the self and both the other and the world. The starting point in accounting for thinking for this latter view is the individual. This results in a focus on the individual cognitive development rather than the ways in which development is embedded in interpersonal engagement. With this starting point the problem becomes how does the individual come to learn about and communicate with other minds. In contrast to individualistic positions, from a relational perspective communication develops first and thinking later (Jopling 1993; Overton 2006).

2. Interaction and meaning

Views of thinking are grounded on assumptions about the nature of meaning. The cognitivist assumption is that thought is the manipulation of mental symbols which represent the world. We (Carpendale & Lewis 2004, 2006, 2010), and others, have criticized such views and have argued, for example, that the assumed connection between symbols in the mind and the world is problematic (e.g. Goldberg 1991; Heil 1981; Kenny 1991; McDonough 1989, 2004; Turnbull 2003; Wittgenstein 1968).

An alternative view of meaning can be drawn from Mead (1909, 1910a, 1922, 1934). He argued that communication develops first and then thinking emerges from this process, not the other way around – we develop the ability to speak before we develop the ability to think, in the reflective sense. From this perspective, we have to explain the emergence of the forms of interaction on which language is based. If communication emerges within interaction with others, then we need to account for the development of such forms of interaction within which meaning is conveyed. For example, we have to explain the transition in which an infant's extended index finger becomes a pointing gesture that is meaningfully used in interaction.

Attempts to answer these questions differ radically depending on one's episte-mological framework. As individualistic approaches take the individual mind as the starting point in development, this results in the problem of how individuals learn about and communicate with other minds. This approach is also tied to the code model of language as a means for communicating between minds, which is based on a mechanistic view of meaning. Mead (1934: 6) was clear that he was not proposing an approach that begins with isolated individuals, as if trapped in their own prison cells, who have to learn how to communicate with each other. This individualistic assump-tion was present in Saint Augustine's *Confessions*, where he views himself as an infant trapped within and attempting, unsuccessfully, to communicate to those without (for a more recent example of this mechanistic view of meaning see Pinker 1994). Such approaches already assume that the mind and thinking are given. Rather, for Mead it is communication that develops first and individual minds are differentiated out in this social process (Morss 1985).

Mead's account of how the form of meaning present in human interaction begins with his notion of a "conversations of gestures." Examples of this form of interaction include: a hen's cluck and her chick's response; a dog responding to another dog's growl; chicks opening their beaks when their parent bird returns to the nest and the parent responding by feeding the chicks; a human infant crying and a parent responding. "All of these gestures, to the intelligent observer, are significant symbols, but they are none of them significant to the form that make them" (Mead 1922: 160). These gestures function to communicate because they are meaningful to others; they are early indicators of the upcoming action, but the organism making the gesture does not understand this meaning for others. For example, a young infant crying communicates its distress to its parents because the crying is meaningful for the par-ents (usually!), but the infant has not yet learned how her parents typically respond and so has not organized her behaviour in order to take this expectable response into account. This is what we mean by understanding this meaning from the parents' perspective. In contrast, an older child may understand the meaning of crying for her parents and she may cry with the intention of attracting attention. This is a different

form of communication based on a form of meaning Mead (1934) referred to as significant or self-conscious gestures.

As another example, consider the "arms up" gesture, which many infants acquire early on in development (Lock, Service, Brito, & Chandler 1989; Service, Lock, & Chandler 1989). This begins as infants reach toward their parent and, over a history of interaction, they learn what to expect when they extend their arms toward their parent – they get picked up. This gesture begins from the infant's natural reaction of reaching toward a parent and, because the parent recognizes what the infant wants, the beginning of the act of reaching toward the parent begins to serve as a signal for the infant's desires. This is a form of interaction in which later forms of meaning can emerge. Other examples can be drawn from research on the development of chimpanzees' gestures (Plooij 1978; Tomasello 1999).

This is the social process that Vygotsky (1978) discussed in explaining the emergence of pointing, building on Wundt's suggestion from 1912 (in *Vokerpsychologie*, cited in Werner & Kaplan 1963: 78). That is, the infant reaches toward a desired object and their initially unsuccessful reach is completed by an adult who understands the infant's goal. The infant's initial action serves to indicate to the adult what the infant wants and this gradually becomes a request. This explanation, however, would require modification in order to account for the emergence of other forms of pointing gestures, like those that are used to direct attention or inform others, or ask questions. In Mead's (1934) terms there is an important transition from "conversations of gestures," in which the infant is not aware of their meaning for others, to what he referred to as "significant" or "self-conscious" gestures, which involves learning how others react to the gesture and thus the infant begins to understand the meaning of the gesture from the other's perspective. We return to this transition after first considering the conditions that set up the human social process.

3. Evolution and meaning

The human body and emotions play an important role in cognitive development because they set up the patterns of interaction in which human forms of thinking develop. For example, in humans, ironically, helplessness may be an long-term advantage because it may be one factor in setting up the conditions for certain forms of interaction that might not otherwise occur and in which human communication can emerge, and, then, later human forms of thinking. Other primates do not experience such an extended period of dependency in infancy (Bruner 1972; Gould 1977; Portmann 1944/1990). Gould focuses on head size and the limits of the human birth canal as factors requiring a birth about nine months earlier than similar mammals, perhaps in order to preserve bipedality in the mother, and thus resulting in an extended

period of immaturity in human infancy, but there may be potential beneficial side effects of this outcome. Portmann referred to human infancy as secondary altriciality because although humans are helpless at birth, their senses are fairly well developed compared to other species with similar motoric limitations. Chimpanzees do not experience the same problem space as human infants because they are able to get what they want earlier in development, unless they are held in captivity and cared for by humans. In captivity, chimpanzees often begin to use pointing gestures, whereas this gesture does not appear to be used in the wild (Leavens, Thomas, & Hopkins 2004; Leavens, Racine, & Hopkins 2009). For humans, a payoff for the high cost of a prolonged period of helplessness in infancy is that it enables a new way of being social. This sets up the need for making requests and the social context in which they can emerge.

Consider a subtle difference between the problem space for humans and other primates. Savage-Rumbaugh, Fields, Segerdahl & Rumbaugh (2005) discuss the differences in potential for interaction that arise as a result of the different rearing patterns evident when comparing a bonobo mother and a human caretaker interacting with a bonobo infant, Kanzi. Even the way the infant was carried illustrates differences. The bonobo mother carried Kanzi quadrupedally, which meant that the infant had to support himself and "attend to clinging and saw only the rushing panoply of green as they traversed the forest" (Savage-Rumbaugh et al. 2005: 16). Human infants lack the ability to hold on in this way. In contrast, the human caretaker carried Kanzi bipedally, the way human infants are often carried, which meant that he did not have to support his weight and could look around and manipulate things with his hands as they walked. In addition, Kanzi's interests and desires to move toward certain things would be obvious to the caretaker from his shifting weight and his extended arms. This simple difference results in a situation in which the infant's desires become evident and, thus, the potential for the development of requests emerges. That is, the environment in which Kanzi developed changed; his social environment become more responsive to his interests, and thus the potential for him to learn how to manipulate his social environment emerged.

From this way of thinking of infancy, immaturity is not simply some obstacle to be overcome but rather produces the expectable social environment in which human development typically occurs. Although it might appear that human infants' helplessness does not make them well suited for survival, in fact, it may be just these limitations that result in the particular environment in which they develop, and which foster the development of thinking. Not only do motor limitations structure human infants' social environment, sensory limitations may also play a similar role. An organism's sensitivities determine its environment. For human infants objects about 20 cm away are most clearly in focus, and it is only large objects or large features that are resolvable. This reduces the amount of visual information the infant must deal with, and this sensory limitation coupled with the fact that mothers tend to hold their babies

at about this distance away might explain the early development of interest in faces and may result in the facilitation of early face-to-face dyadic interaction (Turkewitz & Kenny 1982).

Other factors, such as emotional reactivity, are also important in setting up the interactive system between parent and infant (see Reddy 2008, for a discussion). We acknowledge that referring to emotions raises many complex problems concerning how we define and classify emotions and conceptualize emotion regulation and other aspects of emotion. One of Darwin's (1872) insights was that the expression of early emotions serves the function of communication between infant and parent. This sets up the human forms of interaction which provide the foundation for language, and within which emotions and their regulation develop further. More complex emotions such as guilt and shame develop that are linked to the social structure and further development of awareness of others' typical reactions to the self. We also acknowledge that in speculating about the role of emotional reactivity in parent-infant interaction we do not know the extent of the role of rearing on such development. In chimpanzees there is evidence that the type of rearing history is linked to general emotional responsiveness (Bard & Leavens 2009).

As well as these factors that are involved in setting up forms of interaction in which attention is coordinated, a second group of neurological factors may be required for a species to profit from such forms of interaction to take them to another level, through the development of neurological pathways. The extended period of helplessness in human infancy and the forms of interaction resulting from this cannot completely explain human social skills, because children with particular disorders like autism experience infancy and form attachments to their care-givers (Rogers & Ozanoff 1993), yet such attachments are not clearly related to joint attention skills (Naber et al. 2007) and they go on to have difficulties in social development. Children differ in ways that hinder or facilitate their entrance into typical forms of interaction with their caregivers, or their ability to profit from such interaction, resulting in different forms of developmental difficulties. There are many possibilities here including differences in attention or interest and emotional reactivity (e.g. Shanker 2004, this volume). For example, individuals with autism differ in the things they pay attention to in social scenes compared to typically developing individuals (Klin, Jones, Schultz, & Volkmar 2003).

4.   The emergence of triadic forms of interaction

The development of infants' earlier social expectations can be seen in the "still face" experimental procedure. Four- to 5-month-old infants whose mothers interact with them contingently during a two minute interactive phase of this procedure tend to

make more social bids (i.e. they look at their mother and smile, as if attempting to re-engage her in interaction), during the one minute phase in which their mother has been instructed to present a still face, when compared to infants whose mothers did not interact in such a contingent manner (Mcquaid, Bibok, & Carpendale 2009). These infants appear to have learned about what happens in this form of social interaction. That is, they have learned what works in interaction; e.g. their mother responds when they smile. In Piagetian terms, this is a scheme – an action pattern – with their mother that is linked with positive experience – their mother smiles and engages with them in response. This is a learned pattern of interaction to do with other people which results in a response. Therefore, these infants may try it out in the still face phase, presumably with the expectation that it will elicit a response from their mother. Infants' actions manifest their early social knowledge or expectations they have developed about social interaction, their practical know-how about interacting with others. Another source of evidence of the emerging social skills acquired by infants of this age is that they attend more to a stranger who had interacted contingently with them six days before then to a stranger who interacted noncontingently (Bigelow & Birch 1999).

The baby and parent are parts of an evolved interactive system. It is important to emphasize that these are not pre-existing entities which exert their effect when given minimal environmental priming, but rather each participant draws out responses from the other, so the focus should be on the relations between them and the process of further development. What is required for this system to function? This form of inter-action is enjoyable for the adult – babies are cute and we are drawn to care for them – and gradually the interaction becomes engaging for the infant. Of course, during early interactions parents do most of the work; anything the infant does is responded to and brought into the interaction (Hopkins 1983) and parents build an apparent con-versation on the basis of the most minimal reactions from their infant (Stern 1977). Parents treat their infant's actions as intentional, as a contribution to the interaction (Newson & Newson 1975), building an interactive routine around anything the baby can do. Within such responsive interaction the baby begins to learn about what hap-pens through this history of shared social interaction. These expectations, practical knowledge, or patterns of activity to do with other people are what Piaget (1945/1962) referred to as personal or affective schemes. This is similar to Bowlby's (1958) notion of the beginning of an internal working model, and may have been derived from Piaget. All of this presupposes bodily and emotional interaction with the physical and social world. And this interaction may be constrained in ways if the infant lacks senses such as sight. The development of joint attention is delayed in children with congenital visual impairment (Minter, Hobson, & Bishop 1998).

In dyadic interaction, interaction involves responses to the other's response, but not yet to aspects of the world beyond the dyad. However, the child comes to understand him or herself as the object of attention, which Reddy (2008) argues

is a cornerstone in the development of triadic interaction. Gradually objects may be introduced into this dyadic interaction, stretching it into the beginnings of triadic interaction. As early as four months infants show some ability to follow another person's line of gaze (e.g. Scaife & Bruner 1975; Striano & Reid 2006). At first this may not yet be simultaneously triadic. That is, early forms of triadic interaction may be formed from sequences of the infant being engaged with the other, then the object, and then the other. With older infants this sequence becomes more fluid and rapid. Older infants show greater interest in the world beyond the dyad. Being drawn into others' responses to objects and the coordination of the infant's own attitude and the other's attitude result in the emergence of the "epistemic" (Chapman 1991) or "relational" triangle (Hobson 1994). This involves the infant, the other and aspects of the world. It is a form of lived experience involving components from self as well as other about an aspect of the world, although these components may not yet be clearly distinguished. Various factors might be associated with this transition such as increased ability to focus on objects farther away.

Parent-infant interaction involves what Hobson (2002/2004) describes as being 'moved' or influenced by others' attitudes toward things. For Mead, someone's perspective or attitude is directly manifest in their bodily attitude, their directedness toward an aspect of the world is evident to others. Another person's perspective is right there in the actual interaction. No "mindreading" or telepathy is required. This way of thinking about attitudes is not common, except in the work of a few scholars such as Hobson (2002/2004) and Reddy (2008, this volume). With experience within particular forms of interaction a child becomes increasingly sophisticated in learning about how others will react. This is what is involved in the development of the ability to take another's role.

To address these issues further we need to review the many forms of interaction such as gaze-following and pointing which grouped together are referred to as joint attention. Even by about 3 months some infants may tend to follow others' head turns and thus end up looking in the same general direction (e.g. Scaife & Bruner 1975). This could be thought of as cuing of attention (Moore 1999). This initial tendency gradually becomes more fine-tuned and sophisticated. At 6 months infants follow others' gaze but tend to stop at the first interesting thing they see. By 12 months infants are better at locating the object the adult is actually looking at, and further skills at following gaze in more complex situations continue to develop up to 18 months (Butterworth & Jarrett 1991). So gaze following may begin with looking at the same thing but without explicit awareness that both are attending (Moore & Corkum 1994). During these months infants develop more skill in interacting with others. Part of this involves greater awareness or understanding of the other as attending. The other's attentiveness is manifest in their bodily orientation toward the object or event – their attitude is evident in their engagement (Mead 1934). This is an aspect

of the experience of coordinating attention, i.e. the emotional exchange with the other. Reddy (2008:57) stresses the role of 'relational knowledge' in dyadic interaction. Face to face interactions scaffold development and provide the medium through which infants become more skilled in their interaction with others. This is referred to as learning to take others' perspectives.

There are many different social situations involving the gradual coordination of attention between infant and adult. Infants become aware of more subtle aspects of gaze following of increasing complexity, using and understanding pointing gestures of different types, and games in which infant and adult take reciprocal roles (Carpendale & Lewis 2006), as well as giving and taking routines (Hay & Murray 1982; Rheingold, Hay, & West 1976), We (Bibok, Carpendale, & Lewis 2008) argue that infants develop skills in all of these common social routines. We would argue that their ability to engage in these different forms of interaction is not based on one underlying insight about others as intentional agents, as Tomasello (1995) argued. Rather, as infants develop and coordinate these various social skills their activity begins to appear to be based an underlying insight. There is evidence that individual skills have particular developmental outcomes. As an example, consider Brune & Woodward's (2007) research with 9- to 11-month-old infants showing that those infants who used more pointing gestures were more successful at understanding such gestures compared to infants who used fewer pointing gestures. Those infants who engaged in more shared attention in social interaction than their age mates were also better at understanding shared attention in an experimental procedure.

5.   The roots of language and the emergence of meaning

In accounting for meaning, language and thinking, we contend that the body and emotions, although required, are not sufficient in themselves. An infant's extended index finger is not enough to convey meaning; the ability to follow gaze or pointing gestures is not sufficient to achieve understanding. Consider, for example, Moll & Tomasello's (2007a) story of walking down the aisle of a hardware store and encountering a stranger who looks at you and points to a bucket. Although joint attention coordinated on the bucket would be achieved, meaning would not be conveyed. What is needed is what Moll and Tomasello refer to as a "joint attentional frame." For example, two friends might be looking for a particular type of bucket for a certain purpose. That is, some shared framework, some history of interaction, is required in order for a pointing gesture to do any work, to convey any meaning.

The need for such shared experience is evident in Hare & Tomasello's (2004) research in which they show that chimpanzees can follow an experimenter's direction of gaze or pointing gesture to locate which of two buckets the experimenter

is indicating. The chimpanzees do not, however, understand that the meaning the experimenter is attempting to convey is that food is hidden under that bucket. What is the difficulty here? It seems so obvious to us, and it is even clear to young children. What is needed in addition to gaze following is some experience with such a form of cooperative activity in which someone indicates food to them. The chimpanzees in this study apparently did not typically experience this form of activity. They did, however, experience competitive interaction around food, so that if the situation was changed into competition with the experimenter and the experimenter reached toward the bucket, the chimpanzee knew where to find the food. That is, conveying meaning requires some routine of shared interaction (Racine & Carpendale 2007a, 2007b, 2008). The role of social experience is shown in a study comparing differently reared groups of chimpanzees and bonobos (Lyn, Russell, & Hopkins 2010). Lyn et al. found that the groups of apes reared in a sociolinguistically complex environment showed better performance in understanding declarative communication compared to the standard-reared group.

In an experimental exploration of the need for shared interaction in order to understand others, Liebal, Behne, Carpenter & Tomasello (2009) found that 18-month-old infants could understand the different meanings conveyed by a pointing gesture to the same object but made by different experimenters with which the infants had shared different experiences. In a second study 14-month-old infants were successful on a somewhat simpler procedure. Another series of studies can be interpreted in this light (Moll & Tomasello 2007b; Moll, Carpenter & Tomasello 2007). These studies were designed to investigate what young infants know about what others have experienced. Fourteen- and 18-month-old infants interacted with an experimenter with two new objects, then when this first experimenter left the room the infants interacted with a second experimenter and a third object. The first experimenter returned and excitedly said, "Wow! Look! Look at that one!" and then asked, ambiguously, for the infant to hand "it" to her. The infants tended to respond by giving the third object, which, although not new for them, was new for the first experimenter. That is, the infants made sense of, or understood, the utterance as requesting the object that was new to the experimenter. But they were not successful in a condition in which the adult was merely on-looking from across the room. This evidence that such indirect interaction was insufficient fits with a view of knowledge as first rooted in practical interaction. As well as being able to understand an adult's ambiguous request in the case of an object that the adult had not experienced, 14-month-olds can also understand ambiguous requests when an experimenter has experienced 3 objects with the infant but has experienced one of the objects in a special way (Moll, Richter, Carpenter, & Tomasello 2008).

This sort of research exemplifies Wittgenstein's claim that language is an extension of action. "An extension, that is, of certain action patterns that underlie the earliest uses of language" (Canfield 1995: 197). From this perspective, language is a

collection of conceptually isolable language-games – mini-customs in which words play a role. To see what language is, examine – observe – language-games. To do that, begin by observing the simplest ones the child comes to master. This agenda leads to the roots of language – to certain presymbolic interaction patterns, ones that come to light also in studies of ape language.

(Canfield 1995: 197)

An example of a form of interaction on which an early language-game can come to be based

consists in a mutual recognition of child and mother or other primary group member, and a subsequent mutual engagement of the two…. The mother may be 'greeted' by smiles and happy excitement, strangers by cries and fear…. Such actions and reactions arises from the cellular depths of human nature. Clams don't behave that way. So sustaining language-games of greetings is a proto language-game of mutual recognition and concern. It is indubitable that the child recognizes the mother, and obvious that we could not have a language-game of greeting if we were organisms incapable of such recognition.

(Canfield 1995: 198)

From this perspective, language is based on, or is an extension of, such patterns of activity. The body and emotions are involved in setting up these action patterns or social routines, and it is these patterns of routine shared activity that are essential in infants coming to develop expectations/understandings of particular social situations, like greeting, requesting, feeding, washing, playing, or directing attention. Gestures, or words, can then come to refer to such activities and can be used to direct others' attention based on these "proto language games". We could still say that the body and emotions are important because they may structure or require the various sorts of shared activity or constrain these activities, but the focus must come back from the individual or individuals interacting, to the shared practices, their history of interaction. It is experience within the various roles of such shared practices that make gestures reciprocal; that is, experience in taking the different roles in shared social routines allows children to understand the gesture from multiple perspectives. (Mead 1922, 1934).

6.   From conversations of gestures to significant gestures

Mead made a distinction between conversations of gestures and "significant" or self-conscious gestures. This means that the gestures have the same meaning for the self as they do for the other. Mead's explanation is that the self has the same tendency to respond as the other. Mead stresses that the vocal dimension is important because the individual making the gesture can hear a vocalization, and thus can respond to it as the individual receiving it would. He suggests that this is particularly the case with vocal

gestures, although he acknowledges that, "this is also true in a less degree of those of one's own gestures that he can see or feel" (Mead 1922: 160).

Mead describes the transition to significant gestures and how it might be explained. But we suggest that there are several issues with his proposed solution. First, some animals, such as birds singing duets or even dogs growling, also use vocal gestures and yet it is not clear that they develop significant or reciprocal gestures. So it seems that vocal gestures cannot be sufficient for the development of self-conscious awareness. Also, infants acquire gestures such as pointing that are not in the vocal dimension. These may at first be one-sided – not reciprocal – but gradually these gestures do become reciprocal and significant. Thus, perhaps the vocal dimension is also not necessary.

Another issue with Mead's approach, and another way in which he attempts to qualify his claims, is by saying that the first animal tends to respond as the second animal would. If a dog growls the meaning of this action for the second dog, or the response, may be to run away, particularly if this second dog is smaller. If it is bigger, however, it might growl back. But retreating is not the way that the first dog does react when growling at another dog. When a person makes or utters a threat he knows it is a threat but he does not react to his own threat in that way. For Mead (1910b: 178), "To cry out in fear is an immediate instinctive act, but to scream with an image of another individual turning an attentive ear, taking on a sympathetic expression and an attitude of coming to help, is at least a favorable condition for the development of a consciousness of meaning." That is, the second example involves some anticipation of how the other will respond to the gesture.

Mead recognized the problem of explaining the emergence of human forms of self-conscious meaning, and this is an essential transition that must be accounted for. We could call a gesture significant or self-conscious if the first organism knows – that is, has an expectation or can anticipate – how the other organism will, or is likely to, respond to the gesture. How, then, do significant gestures develop? What seems necessary is enough experience within that pattern of interaction and the capacity to learn about others' typically responses. Further, how is it that children acquire reciprocal or double-ended understandings of gestures and words so that they can both produce as well as comprehend them? One possibility is that infants learn both halves separately and then gradually combine them or coordinate them. In Piagetian terms this would involve acquiring various action schemes, personal schemes or practical knowledge of what happens in interaction with other people, and then combining this knowledge of such patterns of interactivity. This is Piaget's notion of the reciprocal assimilation of schemes. The way this works in the context of infants' knowledge of physical objects, is that an infant goes through a process of developing various schemes or patterns of activity to do with an object such as grasping, sucking, dropping, squeezing, etc. These are all potential actions on the object. They are all centered on the object and constitute knowledge of the object – i.e. things that can be done with it. Examples in the area of social cognition include taking the different roles in giving and taking, or being able

to produce pointing gestures versus being able to understand such gestures. A gesture becomes significant or self-conscious for infants when they can incorporate their parent's typical response to their gesture into an action.

7.   Conclusion

With the goal of explicating the roles of the body and emotions in the development of human forms of thinking and consciousness we have argued that this development occurs within social interaction. The body and emotions structure and make possible regularities in the forms of interaction in which communication and then thinking can emerge. This, then, has required tracing out the gradual development of such forms of interaction in infant development. This progression is reflected in our title, "reaching, requesting and reflecting: From interpersonal engagement to thinking." Reaching begins as an individual action or bodily movement – an attempt to obtain a desired object. For human infants, though, such action tends to be embedded in activity with others because they are relatively helpless and must be cared for. The infant's action has meaning for her parents because it indicates her interests and desires, and parents may respond to this action. Through a history of such responding the infant will learn about the way her parent typically responds. When this sequence of interactions becomes integrated into the infant's behavioural repertoire others see it as a request. This interaction is a way in which the social act of making a request might arise from individual action. What is clear is that the development of this form of meaning requires the reactions of other people (Carpendale & Carpendale 2010).

   The ground on which language can be built requires these patterns of activity or microcosms of interaction that we could refer to as proto language games, shared practices, traditions, or mini customs (Canfield 2007). Within these situations infants understand others' actions, and then words can be added. Thus, the "locus of the mind is not in the individual. Mental processes are fragments of the complex conduct of the individual in and on his environment" (Mead 1977: 100). The human body and emotions are necessary for setting up the regularities in the social process through which mind and thinking emerges. Language then makes other forms of thinking possible. After becoming competent at communicative interaction children can then imagine such interaction as a form of thinking.

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Intuitive meaning

Supporting impulses for interpersonal life in the sociosphere of human knowledge, practice and language

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What is the foundation of social meanings, the cultivation of motives and beliefs in a community of human minds? How does meaning and collaborative intentionality emerge in intimate human relationships of early childhood and how does it grow in society? This article begins with an account of the origins of shared intentionality and intersubjective cooperation of feelings and ideas in infancy and early childhood. Then, the enquiry extends to the concepts of the social sciences, drawing ideas from the relational sociology of Pierre Bourdieu and the social philosophy of Jürgen Habermas. It attempts to elaborate the transition between the primary psychobiology of human sympathy, of proto-conversation and early intersubjective play and cooperation, and more abstract socio-philosophical concepts of the articulate and technically complex adult world. An important conclusion is that the same motives that make the creation and propagation of meaning possible in early childhood and the successful mastery of adult competence can be responsible for social marginalization or exclusion when the experiences of individuals or communities diverge from those of the larger society. We attempt to indicate how a recovery of the original intimate motives by sympathetic intervention can assist a deviant individual to gain a more meaningful place in the social group.

Keywords: intersubjectivity; motives; emotions; sympathy; meaning; habitus; culture; marginalization; special education; therapy

We live, work, learn and talk in a sphere of meaning made by persons sharing actions and experiences, passing on knowledge, techniques and beliefs about the world in ritual and symbolic ways. Our fates as individuals, our unique 'personal narrative histories', depend upon the health and pride of this sharing, on the affections and poetry or 'making' of life – how our families and communities appreciate and support us

through all stages of development, and what we give to them in return (Trevarthen 2006). Human beings are intuitive collaborators.

The life of culture requires sympathetic response to hopes and fears and eager transfer of ideas, methods and explanations. It is not just a commerce of *products* in the form of objective information in texts and material objects of technology. Nothing meaningful can be achieved or sustained without human sympathy for the *process* of psychological states and narrations – without us taking part in the relating of stories that give shared purpose to what we do, and common value to what we perceive. In this chapter we develop this idea that all of practical and realistic meaning in human communities, and all cultural rituals, rules of conduct and languages, depend upon intimacy in action and experience – on the kind of trust, mutual affection, pride an appreciation shown in Figure 1. And we consider the consequences of marginalization or exclusion from intimacy of understanding.

Figure 1. A family in an affectionate and meaningful world about to undergo transformation; one culture confronting another much larger one with pride in itself. Sampson and Leah Beaver with their daughter Frances Louise in the year 1907 in Canada. As Blackfoot Indians they lived with little technology, not even using canoes. They are close to nature, rich in art, and well in trustful relationship, as they are recorded by an alien photographic machine (Kipp 1996)

1.   The psychobiology of culture in infancy and early childhood

1.1   The contribution of a natural science of infancy

Research on the behaviours of infants recorded in near natural circumstances, where their actions are spontaneous and adaptive to surrounding events, has demonstrated that humans are motivated from birth to act and learn as persons who intend to relate to other human beings (Trevarthen 1977, 1979, 1998, 2010). Innate impulses to move as coherent intentional and conscious selves in emotional engagement with the sensitive responses to the intentions of other persons in inter-subjectivity, eventually lead the child to learn the socially accepted meanings that constitute a 'culture' with its traditional practices and language (Trevarthen 1988, 1992).

The intentions and emotions of infants are entirely expressed in how their bodies move in self-centred time and space, and how they willfully assimilate external 'affordances' for future action by orienting their attention (Gibson 1977). The rhythmic prospective control that equips infants with this self-awareness of moving makes their intentions, interests and feelings 'public', such that sufficiently attentive other persons may experience what the infant intends, experiences and feels by a process of 'sympathetic resonance' or 'attunement' in mutual awareness (Stern 1984; Thompson 2001; Bråten 2009; Bradley 2009). They have a productive *self-other-awareness,* knowing other minds 'intuitively', and with feelings that rest the quality of intimacy, needing no 'theory of mind' (Reddy 2008). This interpersonal awareness of 'significant others' who give emotional support (Lüdtke, this volume) has priority in development, actively guiding growth of experience, even from before birth as the foetus can hear and learn to identify the prosody of the mother's voice, and taking the lead over any 'objective' engagement with physical objects or events.

To prove this theory of the innate personality and cooperative awareness of infants, and to understand its implications, developmental psychologists have, in the past 40 years, found that it is not sufficient to observe only what the infant and child *learns*. Nor is enough to demonstrate the construction by the child of cognitive procedures and schematic models of objects and of their potentials for use (Piaget 1954). A new genetic epistemology seeks evidence that the *process* of human knowing, as distinct from the *content* of knowledge, presupposes actively motivated human sympathy and intersubjective collaboration. An innate *prefunctional morphog*enesis builds the adaptive anatomy of the body and brain of the embryo and foetus in human form, with the special sensory and motor organs adapted for communication. Within the embryo brain stem the emotion defining Affective Nervous System (Panksepp 1998), which will regulate actions throughout life, develops before the cognitive mechanism of the cerebral cortex, and its neurons guide the growth and differentiation of cortical circuits (Trevarthen & Aitken 1994; Trevarthen 2001) (Figure 2).
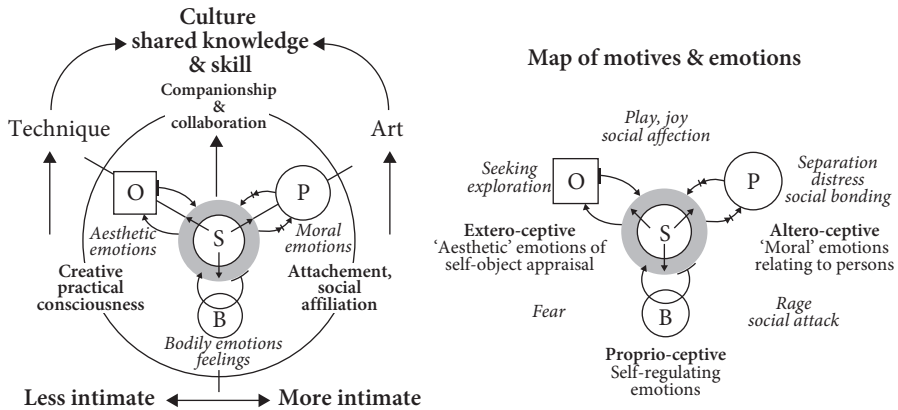
Figure 2. The innate anatomy of human motives, anticipating a life in communication.
Left: The Intrinsic Motive Formation in the core of the brain (Trevarthen & Aitken 1994) coordinates the vital states of a human being, directs engagements of the embodied Self (S) with the environment, and regulates collaborative cultural learning of technical and artistic skills. (Trevarthen 1998).
Right: The basic emotions systems (Panksepp 1998; Panksepp & Trevarthen 2009) are indicated as they relate to the body, to the experience of physical objects or to communication with other subjects. Three systems of emotion regulate movements and perceptions: *proprio-ceptive* for feelings of the well-being of the body (B); *extero-ceptive* for feelings of engagement with the objects (O) of the physical world; and *altero-ceptive* for sympathetic feelings for the intentions and emotions of other persons (P)

1.2   Agency and cooperation: How animal individuals move and communicate

A psychobiology of human consciousness in infancy and it cultural elaboration requires a grounding in the physiology or neuroscience of intentional animal movement, the science that attempts to explain how the integrated central nervous system of an animal may, with 'extero-ceptive' awareness, command coordinated and regulated animation of the complex somatic sensory-motor system of a mobile body with its vitality-sustaining internal visceral processes. In addition, a scientific account of the cooperative intersubjective powers of communicating animals has to accept that there is a process of transmission, or 'resonating with', the rhythmic energetics of self-regulation between individuals. These powers, evident even in social coordinations of primitive forms of animal life, require an 'altero-ceptive' sensitivity for the 'proprio-ceptive' and 'viscero-ceptive' regulations made apparent in other individuals – by how they move to seek and choose objects, how they make themselves comfortable, how they act to maintain internal well-being through selective appropriation of what the environment affords as essential sustenance, and how their bodies may be sensed to change when they self-regulate physiologically (Figure 2).

A core principle for both effective action and sustained vitality of any animal is *prospective control* of movement with *self-assessment* by an integrated brain. One hundred years ago Charles Sherrington, the founder of modern neurophysiology, proved, by systematic experimentation with the functions of peripheral nerves that link body and brain, a comprehensive theory of 'the integrative action of the nervous system' (Sherrington 1906). He explained conscious voluntary action as the product of extero-ceptive 'projicience' that perceives the location and form of objects and 'knows' what they are good for – the anticipation by 'distance receptors' of the satisfaction of vital needs. What eyes or ears detect may guide motor activity of a body made united in its biomechanical powers by an intense and constantly tuned proprio-ception of muscular forces in dynamic postural or kinematic equilibrium. Furthermore, both exteroceptive and proprioceptive sensory realms of the integrated self are guided by the 'affective appraisals' of viscero-ceptive senses, which measure the *values* of objects taken up by the body.

Subsequently others, notably Nikolai Bernstein (1896–1966; Bernstein 1967), Karl Lashley (1890–1958; Lashley 1951), Eric von Holst (1908–1962; von Holst 1936; von Holst & Mittelstaedt 1950) and Roger Sperry (1913–1994; Sperry 1952), adduced evidence for the capacity of the brain to predict the consequences of movement with 'images' of the internal effects and the eventual engagements with environmental media and objects. David Lee has extended James Gibson's theory of prospective perceptual control with a precise mathematical formulation of how the brain 'models' the course of every unit movement by controlling the speeds and accelerations of action to close the body on goals with elegant precision, and Lee's 'tauG' guide process has been detected in the brain activity that formulates a movement (Lee 1998; Lee & Schögler 2009).

Animal intentions evolve and grow, from the start, with potentialities for inter-subjective social collaboration, making their intelligence communal. The brain-generated dynamic 'motor images' (Bernstein 1967), which define cadences and transformations of movements in specific rhythmic ways, can be read by another subject as expressing the conscious expectations of the mind that forms them. They can serve to communicate mental actions and emotional states. This is how one animal can 'get inside the skin' of another and engage in willful cooperation or competition with their intentions. The evolution of social signaling has been the subject matter of ethology from its beginnings early last century (von Frisch 1923; Lorenz 1966; Tinbergen 1951). Physiologists' demonstrations in recent decades that brain actions predictive of the consequences of moving can be used not only to guide movements of the self, but also to detect and evaluate the motivation of another individual's movement, has revolutionized psychological theory of both subjective and inter-subjective regulations (Gallese 2003; Jeannerod 2006).

In the course of animal evolution, actions of the brain within the body to regulate its purposeful movements, the 'ergo-tropic' actions that are projected to displace and navigate the body in engagement with the environment, or the 'tropho-tropic' ones that regulate the well-being, comfort or appetites of the body, are made more 'explicit' or 'ritualised' for purposes of social communication (Tinbergen 1951; Hess 1954; MacLean 1958). Efferent commands that evolved to move the organs of the body in self-regulating functions of breathing, circulation of the blood, feeding and selective attending have become elaborated to make social signals that 'tell' to other individuals what an animal feels, needs, wants, or will do, and with what urgency or care (Porges 1997; Panksepp 1998; Trevarthen 2001). Inner emotional states of any kind become transmissible to sympathetic partners; that is, other subjects may experience and engage with one's emotions, positive or negative, by what, in humans, we recognize as 'moral sentiments' (Smith 1759).

1.3   Intersubjectivity with newborns

Newborn infants, contrary to the classical reductive assumption that they lack subjective coherence of movement and an integrated awareness, have been proved, by detailed analysis of their actions, to have *extero-ceptive*, *proprio-ceptive* and *viscero-ceptive* prospective control of their movements, which are highly efficient and variable in force and form (Trevarthen 1984). The orientations of their receptors are guided by interest that can direct them to select nearby objects located outside their bodies. They show, by this psychological control of activity, *primary subjectivity* (Trevarthen 1979, 1998).

Infants also have well-differentiated manifestations of emotions that relate either to the regulation of their attempts to focus on environmental events of a physical kind, or, and most conspicuously, to their interactions with other persons, and these emotions powerfully influence the affective responses of their parents (Trevarthen 1979 1993, 1998, 2001). Most obviously infants express the four different poles of emotion that define 'pleasure in sharing' or 'fear and anger of opposition', and 'interested focus on a task in hand' that may become 'anxiety' if the task is too difficult, or irritable 'boredom' if it is too easy – that is, if the 'flow' of effort is not optimal (Csikszentmihalyi 1990). Piaget, with exclusive interest in the formation of cognitive schemas for coping with the objective world, distinguished in infants expressions of *pleasure in mastery*, when experience is 'assimilated' in 'play' onto a strong and clearly conceived schema, and *serious intent* when the schema is in need of 'accommodation' by 'imitation' (Piaget 1962). Papoušek (1967) made the important observation that infants, when trying to anticipate and engage with a series of events triggered by their movements in an experimental set-up, show pleasure when they predict correctly and concern or sadness when they fail. Such expressions have obvious potential to coordinate the actions and experiences of different subjects.

Laughter in humans is an expression of excitement stimulated by sharing physical or expressive play, and it has powerfully beneficial effects on individuals' states of mind, and on affiliation or liking between them, especially in childhood. Panksepp, who observes that, "laughter is the clearest signal that natural play urges are being engaged" (Panksepp 2007: 58), has demonstrated that similar vocal displays of enjoyment by juvenile rats have an affiliative function (Panksepp & Burgdorf 2003). Moreover, he claims that hyperactivity in young children may be regulated by playful activity that stimulates energetic social enjoyment, and relieves frustration from lack of adventurous companionship (Panksepp 2007).

Sympathetic engagement, 'in time' with the dynamics of another person's movements and feelings, sensing their 'vitality dynamics', has a strong innate foundation enabling transfer of intentions and feelings (Stern 2004, 2010). Newborns' movements exhibit both the same basic rhythmic 'musical' parameters of adult movement, and a capacity to engage, by eye contact, facial expressions, vocalizations and body attitudes and gestures, in reciprocal 'dialogue' with the expressive actions of another person in an intimate playful exchange in which new expressive acts are learned and used as mutually known conventions (Osborne 2009a; Trevarthen 2008, 2010). They also show the beginnings of immediate responsiveness to other person's expressions of affectionate interest, and interest in sharing experiences. Newborn hands, especially, express states of arousal and moods, thoughts, sympathy for others' thoughts, and are ready to share adventures in imagination and memory with attention to another person's hands moving in sympathy (Trevarthen et al. 2010) (Figure 3).

The readiness with which some newborns imitate expressions of another person's face (Maratos 1973, 1982; Meltzoff & Moore 1977, 1983; Field et al. 1983; Field 1985; Kugiumutzakis 1998, 1999) is evidence that they have what Stein Bråten (1998; 2009) has defined as a "virtual other" in their cerebral system for communication. Following a period in which neonatal imitation was pronounced impossible, experiments have led to the idea that newborns imitate to test their similarity to other persons, by matching the form of demonstrated body movements, perhaps to identify with them (Meltzoff & Moore 1999). However, this imitative 'matching' is not, as widely assumed, merely a detection or feeling of similarity between the body of a Self and that of an Other. In natural spontaneous interactions between infants and attentive adults, the imitative behaviour of each of them is fundamentally a test of *the purpose and affective quality of dynamic states of mind in the other*, which may or may not be reflected upon consciously (Damasio 1999; Gallagher 2008). It enables the generating and exchange or 'dialogue' of expressions and mutual intention and affection in 'felt immediacy' (Bråten 2009). It is from the outset inter-subjective in this sense (Trevarthen 2010). Experimental tests of the capacity of newborns to imitate formally presented gestures, vocalizations and oral and facial actions generally do not allow estimation of the infant's motivation and emotions, and they can easily fail
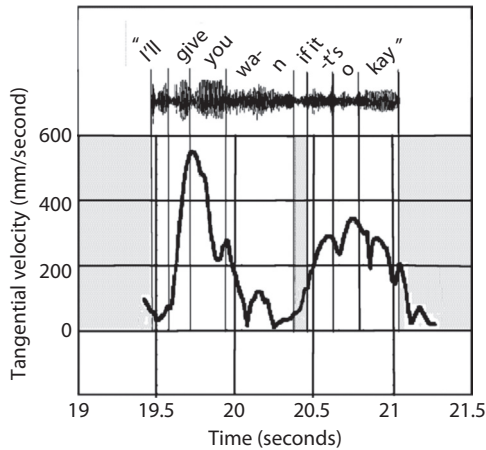
Figure 3. **Above**: Newborns less that an hour after birth in a clinic in India, participating in imitation of tongue protrusion, and reciprocal 'demonstrations' of hand gestures. (Photos by Kevan Bundell)
Below: An infant, recorded by a motion capture camera in the hospital about 36 hours after birth, regulates her arm movement (measured as the tangential velocity of the wrist) to synchronise with the pattern of syllables in an adult voice. The infant's arm lies at rest before and after the adult moved toward the table to say, "I'll give you one... if it's okay". The two phrases make up a complete sentence with a 'relaxed' conclusion. The infant extended her left hand from an at-rest flexed position with the hand close to the head, down toward her waist, and then back again to a flexed resting position. The outward stretch matched the first phrase, "I'll give you one." There was a slight pause in the arm movement anticipating one in the speech (shaded) near 20.5 seconds before the conclusion, 'if it's okay", when the arm was brought back to flexion. Syllabic boundaries are marked by vertical lines to show their correspondence with velocity shifts (the dark curve). The stresses in speech on 'give', 'one' and 'kay' are separated by approximately 500 milliseconds, which corresponds to *allegro moderato*. (Trevarthen et al. 2010)

to support an engagement – hence the reports of 'failure to replicate' (e. g. Anisfeld 1979). More descriptive and 'permissive' approaches with less regulated observation lead to a much richer conception of the process and purpose of the 'copying'. The infant acts *with* the adult to provoke and co-regulate an interpersonal interaction, and the act of making the imitated action is accompanied by emotions of interest and pleasure (Nagy & Molnàr 2004). The infant and adult play an imitative 'game'.

1.4   Protoconversations with two-month olds

Micro-analysis of face-to-face communication between mothers and two-month-old infants has revealed the following important features of behaviours motivated for interpersonal communication: they are composed of rhythmic elements or steps that are combined in phrases; they express affective melodies of a 'courteous' emotional 'attunement'; and they are regulated over longer intervals by 'narrative envelopes' or energy cycles (Bateson 1975, 1979; Stern 1985, 2010, Trevarthen 1977, 1979, 1988, 1999; Jaffe et al. 2001). These forms of infant expressive activity and engagement (Trevarthen 1986, 1999) are the same as characterize all human body movement, thought and speech with gesture (Langer 1953; Key 1980; Fonagy 2001; Kühl 2007). They prepare the way for learning language in live communication (Ryan 1974).

In a protoconversation, the 2 month old and mother both act to make a "dialogue" of visible and audible expressions (Figure 4, and Malloch & Trevarthen 2009). The mother's vocalizations and other expressions show the coherence and emotive dynamics of "intuitive motherese", a register of speaking that is immediately responsive to the infant's equally coherent and emotive dynamic expressions – of face movements, coos or frets, hand gestures and body movements. The physiognomic and kinematic patterns of this motherese, like its reception, are universal and unlearned (Fernald & Simon 1984; Fernald 1989; Papoušek 1994; Grieser & Kuhl 1988).

Comparison of the behaviours of infants and mothers with the elements of song and performances with musical instruments makes clear that there are fundamental temporal and affective principles at work in music and protoconversation, and that the infant shares expectations of how these principles should be shared to make a dialogue or duet (Papoušek & Papoušek 1981; Papoušek 1994; Stern 1984, 1985). A common rhythmic sense or 'Intrinsic Motive Pulse' (Trevarthen 1999; Osborne 2009a), the appreciation of a scale of pitch, and sensitivity to the timbre or quality of vocalizations are all shared by infant and adult (Malloch 1999: Malloch & Trevarthen 2009; Marwick & Murray 2009; Powers & Trevarthen 2009). Further observation shows that the dynamics of vocal expression are reflected in hand gestures as well, so the infant can 'dance' with hand gestures to accompany a mother's song or share performance of an action game such as clapping song (Trevarthen 1999; Trevarthen et al. 2010).
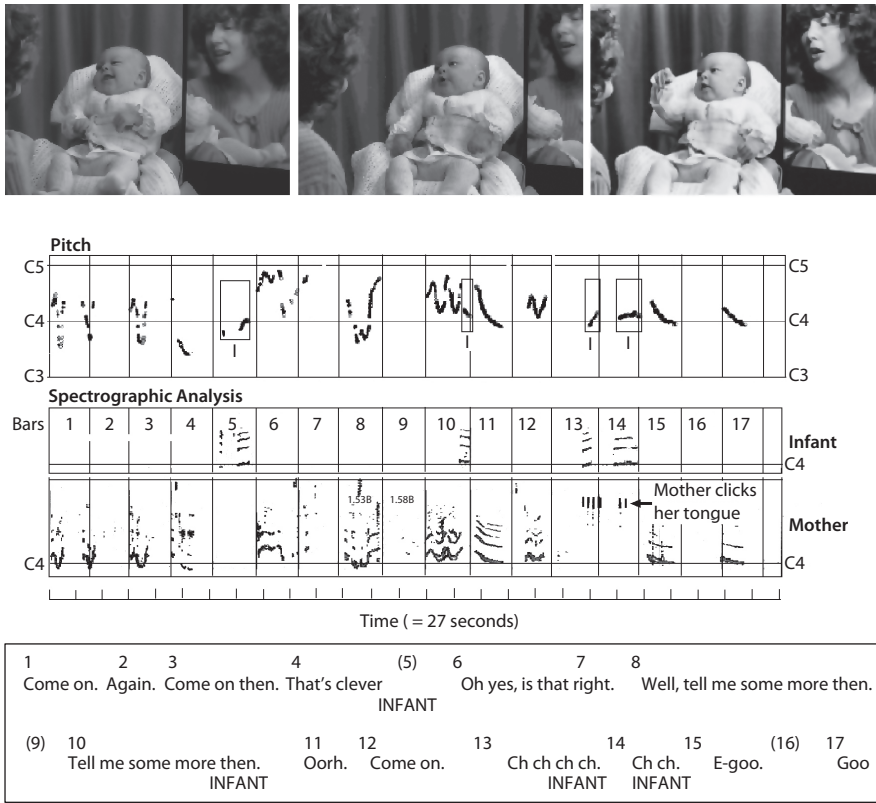
Figure 4. Protoconversation with a six-week-old. (Malloch & Trevarthen 2009).
Above - She looks at her mother speaking and smiles; she coos; and she gestures with her right hand.
Centre - Pitch plot and spectrographic analysis made by Stephen Malloch (1999), showing the melody of the mother's voice and vocalizations of the infant, both based on Middle C (C4). The regular bars lasting approximately 1.5 seconds are numbered. They are marked by accented components of the mother's speech and serve to give timing to the infant's utterances. <u>Below</u> - The text of the mother's speech with the bar numbers placed in relation to the consonants that define them

Adults giving care for infants use rhythmic body movements, chants and songs to regulate or share the mood of an infant, varying the energy to excite or calm. Action songs and lullabies show similar dynamic and melodic features in different cultures with different languages (Trainor 1996; Trehub 1990; Trehub et al. 1997). A young infant is responsive to and influenced by the mother's emotional state. Depressed mothers fail to engage their infants and cause them to be depressed. Two-month-olds are sensitive to the immediate 'contingent' responsiveness of a partner. Perturbation experiments, such as the 'blank' or 'still' face test, or replay of a video of the mother

communicating, demonstrate that the infant is motivated to participate in a mutually responsive exchange, live (Tronick et al. 1978; Murray & Trevarthen 1985; Trevarthen 1998; Marwick & Murray 2009). The infant's responses are not simple reactions to stimulation. As with neonatal imitation, they are seeking reciprocal communication with two-way exchange of expressions.

Even though the infant has no comprehension of the words a mother may use, the melodic/gestural narrative is appreciated in the way she combines phrases of a song or poetic recitation in stanzas or verses that last several tens of seconds (Trevarthen 1999). Evidently the patterns of expressive sound stimulate expectations in the infant's mind and attract their participation at particularly marked moments, such as rhyming syllables. Finally, infants show rapid learning of the ritual of a repeated song or action game with recitation, and become highly motivated participants.

1.5   Increased playfulness, teasing and the performance of rituals and jokes for others' appreciation: Making imitative art

As the infant's body becomes stronger and the head and trunk are more self-supported around 3 and 4 months, they become more playful and seek more lively exchanges with strong emotions. With this increasing self-other-aware liveliness comes a capacity to engage in intensely sympathetic positive and negative engagements not only with the mother or other adult, but with unfamiliar infants, in groups (Bradley 2009). The infant is not merely capable of conversational play in a dyad, with a single partner – he or she is 'sociable' and can participate in the exchange of feelings and making of meaning in 'concert'. In games with persons of any age they negotiate at the boundaries of shared purpose and creativity, 'teasing' the other or others by varying timing and form of actions in exchange with powerfully expressed emotions of joy, surprise, and 'mock' annoyance and aggression (Reddy 2008). They can compose celebratory events, or learn the provocative rituals of traditional body games and songs and delight in repeating them, watching others' reactions closely (Eckerdal & Merker 2009; Powers & Trevarthen 2009). They make a communicative art of "ceremonial ritual" (Dissanayake, 2000, 2009; Miall & Dissanayake 2003).

Tests of reactions to mirrors and playful teasing prove that infants of this age have a strong self-awareness, and this 'self-consciousness' comes with sensitivity to the appraisal of others for actions they perform (Reddy 2008). By six months an infant who is well-supported by affectionate parents has a performer's personality or 'identity', which demonstrates *pride* and is sensitive to the identity of any person who attempts to share play, showing shyness with intrusive approach of a stranger, and *shame,* when unable to sustain a familiar performance to elicit approval (Trevarthen 1998, 2005).
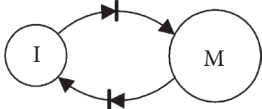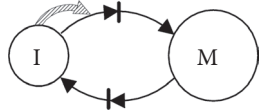
At the same time as these social abilities are showing increased subtlety and power, around four months, infants also gain in manipulative dexterity and in interest in objects of manipulation (Trevarthen 1984). With increased control of their limbs they begin rhythmic banging of objects with their hands, and jumping, and they also start babbling with the same rhythms. At this age they may become intensely occupied with their investigations of objects of movements of their body, and while concentrating on the task they will close off their responses to persons who seek communication (Trevarthen & Hubley 1978; Trevarthen 1998).

1.6 Sharing tasks with person-person-object awareness or secondary intersubjectivity

At 9 months the interest in objects for individual interest and manipulation becomes open to direction by another person's intentions and emotional appraisals, and this new cooperative awareness leads to performance of shared tasks regulated by compliance with requests, directives, and instructions and demonstrating affective control of compliance or refusal (Trevarthen & Hubley 1978; Hubley & Trevarthen 1979; Trevarthen 1998). The infant can combine gestures and vocalizations to perform 'acts of meaning' in a 'protolanguage' (Halliday 1975, 1979). At this age games involving objects may become more serious or 'business like', more concentrated 'cognitively' and methodical or, as Halliday puts it, more 'mathetic'.

Habits for use of mannerisms, objects and situations become part of a cultural 'proto-habitus' with familiar playmates – parents, siblings etc. This prepares the way for learning of a many new symbolic gestures and words to name agents, actions and objects of shared interest in the growing culture and language of the home community.

Table 1. How motives of infant change in the course of infancy

Developmental stages in inter subjectivity with infants	
Months 1–2 Primary intersubjectivity: Direct sensitivity to the expressions of feeling in intimate contact with an other. "Dialogic closure" in protoconversation sustained by two-way transmission of emotions. Identification of familiar affectionate partners.	**(1) PROTOCONVERSATIONS**
Months 3–6 Games I: Exploration of surroundings and manipulation of objects. Pleasure in body-action and in object manipulation is shared, and imitated, in play, including musical-poetic play. Laughter, mirror self-awareness and "showing off" as a "social Me" appear.	**(2) GAMES & JOKES**

<div align="right">(Continued)</div>

Table 1. Continued

Months 6–9 Games 11:	(3) GAMES & JOKES WITH OBJECTS
Lively socio-dramatic play and self-confident presentation with family increase, as does fear of strangers. The first ritualized 'protosigns' are learned in play. First "emotional referencing" and joint orientation to a locus of interest aided by pointing. Increased social awareness and self-consciousness as 'knower'.	
Months 9–14 Secondary Intersubjectivity: Shared interest in tasks and the uses of objects; infant produces "protolanguage". Learning of the conventional meanings of things. Use of objects to whch others have given value "recreatively", in fantasy play.	
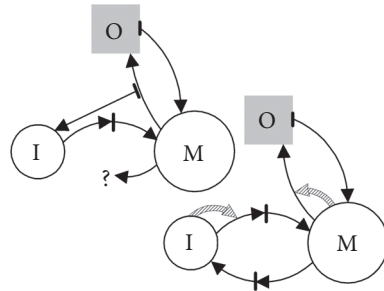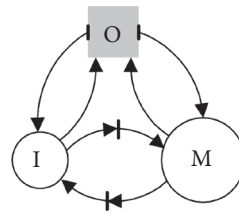
The diagrams summarise the changes communication and expressions of play-ful enjoyment or interest in objects described above. I = Infant, M = Mother, O = Object. Plain arrows indicate intentional movements or expressions. Arrows with a bar at the beginning indicate active perception of an object, or of a person's expres-sions or actions. Shaded arrows are 'meta-communicative' expressive ways of moving that convey joy, tease or make a 'joke'. The question mark indicates a request made by the mother as the infant observes her action toward an object, to elicit a cooperative response.

1.7 Narrative awareness of infants and toddlers leading to imaginative culture and its inventions

The inter-subjective and mimetic powers of infants prove that, before there are any words or propositions that refer to objects, agents or events in the world, the human mind in the human body is inherently ready for a 'story telling' society, imagining and remembering events and experiences for and with others beyond the psychologi-cal present (Bruner 1983, 1990; Donaldson 1992; Gratier & Trevarthen 2008). The rhythms and expressions of an infant's voice and gesture seeking sympathetic response engage with the purposes and concerns of a parent in intrinsically motivated narrative cycles of enthusiasm, anticipation and satisfaction. The child is motivated to learn and practice approved rituals of performance. Their experiences are regulated by aesthetic

and moral emotions that evaluate the quality of messages sent and received and the 'courtesy' or 'respect' of the response from the other. Thus messages come to be stories that are believed, exchanged, imagined and recalled, and valued, in traditional forms, linking those that tell or receive them in imaginative as well as affectionate companionship (Trevarthen 1992, 1994, 2008).

Rigorous analysis by musical acoustic techniques of the sound patterns created when an affectionate and responsive adult evokes infant calls proves that even a premature newborn has the time sense and emotional appraisal required to meet the adult as a partner in an improvised 'proto-conversation' (Trevarthen 2008). This has led musician Stephen Malloch (1999; Malloch & Trevarthen 2009) to formulate a theory of innate 'Communicative Musicality', to explain how non-verbal narratives are shared. In the first weeks after birth infant-adult communication coordinates all the expressive organs; eyes, face, mouth and voice, head and hands, in rhythmic patterns modulated by emotions.

Thereafter baby songs and action games build dramatic cooperation within traditional rituals with properties of music, poetry and dance. The young child's mastery of meaning in this play is regulated by the moral emotions of pride and shame, which evaluate how acquired knowledge and skill are appreciated by known others, and how misunderstandings can arise (Trevarthen 1999, 2008).

Near the end of the first year the child turns his or her confidence in sharing purposes to invite interpretations from others of the usefulness of objects and the accepted meanings of actions. This co-operative 'secondary inter-subjectivity' or 'person-person-object' awareness, finding other's goals to have compelling interest, lays the foundation for cultural learning, and for all sorts of symbolic ways of acting and believing language. It also animates new play with meanings in toddlers that can be shared with peers in 'imaginative play' (Nadel & Pezé 1993; Nadel, et al. 1999) which is intensely creative, poetically and musically, opening the door to 'children's musical culture' (Bjørkvold 1992). It is more than the acquisition of joint attention to objects in a 'common ground' of experience and the imitation of intentions towards signified goals (Tomasello, Kruger & Ratner 1993).

Infants lack all external knowledge of special or artificial things, but have internal or 'intuitive' knowledge which they can share as a 'universal language' with other humans – they sense tastes and odours that please or offend, see brightness and colour in light or radiant substance, hear pitch, loudness and timbre, feel soft or hard, hot or cold. They perceive form and space and measure change in time. All these perceptions are most sensitive to the qualities that identify the animate presence and sympathetic responsiveness of a person. This leads to intimate sharing of thoughts, imaginative experiences and memories, before these are put into words, by appreciation of their expressions in action.

1.8   First steps to proficiency in meaning need good company in a community

In the second year a toddler is highly expressive and intensely interested in the traffic of meanings for and with others (Trevarthen & Marwick 1986). When observed with the mother in a new place, he or she does not take interest in objects just as accessories to sensory-motor schemata; they have creative symbolic attributes that are evaluated in transactions with the mother who also knows what the objects are usually for. His or her attention is caught quickly by any thing that makes this shared kind of sense. Dolls, toy animals, cars, cups, hats, books, food, etc. are noticed because they are living company or used to do something. Though the actual objects may have never been seen before, they are quickly recognized as representing beings or tools in daily life. This 'representation' is a product of shared and remembered intentions and emotions. It precedes a symbolic verbal code acquired by imitation, and the capacity to respond correctly to verbal interrogations (Ryan 1974; Halliday 1975).

It is obvious that the sociability of the toddler's curiosity depends on who is present. Even though 18 month olds exhibited strong-willed independence, often refusing to take advice or directions, they are guided by what is brought to their attention by a trusted companion and they understand many words used to name objects, as well as those that convey interpersonal attitudes. If the mother leaves, or if some event in the unfamiliar place frightens the child, play stops and the mother is sought. With a stranger the play is desultory, uninspired and uninventive. Many of the seemingly avoidant or 'disobedient' responses to the mother take the form of playful showing-off jokes that both infant and mother recognise as such. The child boldly asserts a right to choose how to act in a meaningful way, showing an independent pride in this confidence, but does so under the assumption that the mother is there and approving, or at least condoning what is going on.

Thus there are two sides to this relationship between child and mother. Usually it guides and supports the child's use of meanings, but it can weaken it. The negative aspect, called maternal insensitivity, has received examination by the attachment theorists. Mary Ainsworth's technique of watching the behaviour of children at one year when with their mother or alone in a strange room with toys, and watching what they do when the mother returns after absence, or when a stranger appears in her place, has shown that a good affective quality of the relationship is positively linked to the child's motivation to "explore" objects (Ainsworth & Bell 1970). In the normal, happy life of a mother with a child of this age, the meaningfulness of surroundings and actions is continuously shared. This is as much part of the relationship as the emotional quality of their communication under stress; indeed it explains the role of 'companionship' in meaning in the child's mental growth (Hubley & Trevarthen 1979; Trevarthen 2005).

There is increasing evidence that the ability to communicate about experience requires an intuitive response from affectionate caretakers that will give specific emotional reinforcement or "attunement" (Stern 1984, 1985, 2010) to initiatives and interests of the infant, and to expressions of self-consciousness and self-confidence.

At this stage, corresponding to Halliday's Phases I and 2 of language development (Halliday 1975), there is an great increase in a securely attached child's competence for dealing with the mini-culture of life at home, or in the well-known social contexts of the community (such as church, the garden, a park, a supermarket, a friend's house), places that are frequented by the child with the familiar caretaker, who may now, in many cultures, be an older sibling (Weisner & Gallimore 2008). Cross-cultural studies show that even with very different styles of "mothering" and domestic life, this same rapid development in curiosity about the meaningful world is manifest in the second year.

In the transition between language Phases 1 and 2, at 18–20 months, there is an increase of the attachment to the caretaker as well as a peculiar awareness of oddness or defects in things that will have been given emotional evaluation by the significant adults, and a heightening of fear of a stranger who will not comprehend the protolanguage level of discourse, and who cannot grasp the significance of favourite "games" or "performances" (Kagan 1982). This increase of emotionality compares with an earlier increase of sensitivity to the threat posed by a stranger who cannot share meanings, at 7–8 months, just before the start of Phase 1 and secondary intersubjectivity (Trevarthen 1998; Trevarthen & Aitken 2003). Cross cultural studies show evidence for a change in children's motives and abilities at 5 to 7 years, when there is increased structure and discipline with expectation that the child will have more 'sense' and be able to take responsibility for care of others (Rogoff et al. 2008). This is when schooling in intellectual and social 'skills' starts in complex industrial cultures, and the sociolinguistics of imaginative peer culture is very rich and passionate (Blum-Kulka 2005).

'Critical periods' in development, and including adolescence, where the young person's temper seems most vulnerable and most demanding of support from familiar companions, give evidence of major transformations of motives that are being produced from inside the growing mind (Trevarthen & Aitken 2003). They are, as Brazelton says, 'touch points' important in the changing relations with parents (Brazelton 1993). Each "emotional" phase is followed by a new level of mental integration, new friendships, and a new power in "meaning". Gradually the child is gaining freedom from particular relationships, but only by depending upon those relationships to give the required "leg up" when this is needed. The mastery of meanings is by an interpersonal symbiosis, regulated by feelings of affection. When relationships are stressed and caretaking is unsympathetic of the child's needs, mastery of meanings and of the language that communicates them will suffer.

The early language of a child is clearly sensitive to the habits and beliefs of the human environment. Both cultural and social class differences in children's speech

give evidence of the dependence of this learning on the style of cooperation that the children find. There are also marked differences that appear to relate to intrinsic temperamental characteristics of the children themselves, and psychologists are finding consistencies between the features of early mother-infant communication and the speech of three and four-year-olds (Bruner 1983; Locke 1993; Nelson 1981, 1996). Now it is clear that such correlations cannot be explained just as consequences of differences in "mothering". The active contribution of the child to early prelinguistic communication, the fact that infants exhibit differences in expressiveness and self-sufficiency in exploration of their surroundings and the marked differences children show in their taking of roles as toddlers, all testify to a source of individuality that is in the child's own constitution, as well as in the accidents of experience and the guidance of companions. Study of early language offers valuable evidence for both sides of the control in relations with caregivers. For example, as infants in different social worlds begin to grasp acts of meaning in the second six months of life, they may receive different responses from their mothers.

Trevarthen and Marwick compared two working class and five upper-middle class mothers in Edinburgh over the period from 16 to 41 weeks when their infants were gaining the capacity to share a task (Trevarthen & Marwick 1986). Between the 30th and 40th weeks, when the infants became more cooperative, mothers increased their directive or command forms of utterance, reduced their statements and asked fewer questions about what the infant was interested. The change in illocutionary acts showed the mothers' communicative intentions, or intuitions, were getting more specific in response to the changing motives of the child. Mothers varied widely in playfulness, as infants varied in liveliness, and some were more oriented to the objects while others made more references to feelings, interests or intentions of the infant. Working class mothers were much more ready to praise or criticise their infants than were middle-class mothers, but middle-class mothers made many more Statements of Fact and they asked more Questions, especially Tag Questions that mask declarative or imperative statemens. Thus, in Halliday's terms, working-class mothers were being more active and "interpersonal", middle-class mothers were more "ideational", encouraging experiences of the environment.

In their second year, individual toddlers show different orientations towards expression of their interests in words, some referring to interpersonal engagements and personal feelings, others tending to refer more to objects (Barrett 1981; Nelson 1981; Dore 1983). It seems evident that such differences and how they relate to the social or human environment prove that the child as a seeker after meanings by engaging with what other human beings offer in the way of interest and appreciation. Social roles, artifacts, instruments, rituals and occasions offer so many possibilities for specialization. It would appear likely, also, that there are inherited mechanisms in human beings that would favour growth of individual differences in knowing how to mean.

Language and its acquisition is most comprehensively understood, not from a systematic analysis of the rules for skilled use of text, but in terms of functions that regulate of mutual awareness and cooperative action in human society (Mead 1934; Vygotsky 1962; Rommetveit 1968; Searle 1969; Habermas 1970; Bruner 1990; Brandt 2009). The motives for intersubjectivity evident in the behaviours of infants question a traditional bias to explain mental activities in terms only of the facts of individual experience, or rational systems that "process" information about reality outside the mind. They offer a better understanding of culture and how it is transmitted, and of the part language plays (Reddy 2008; Bråten 2009).

1.9   The human brain is motivated for relational interpersonal life, and for cultural learning

The behavioural evidence of the infant's motivation for entry into meaningful communication is supported by remarkable findings from neurophysiology and functional brain imaging, which require a new map of the cerebral systems adapted for inter-subjective contact between humans, and new interpretations of the intentional, perceptual and emotional foundations for the learning of cultural conventions and language. Now we know there is a rich resonance of intentions and consciousness of acting between minds by entirely intuitive 'mirroring' of cerebral processes evident in movements, which includes an emotional evaluation of the effort and satisfactions associated with prospects of acting, all in the natural time of moving (Jeannerod 2006). This physiology of intersubjectivity and the evidence of its power in infancy make together a new *psychobiology of human sympathy* – the harmonisation between persons of conscious intentional states of moving, and of thinking about moving (Varela et al. 1991; Clark 1997; Gallese & Lakoff 2005; Gallese 2003; Schilbach et al. 2006; Rizzolatti et al. 2006). The theory of 'communicative musicality', which offers an account of the primary temporal and affective dimensions of human sympathy (Malloch 1999; Malloch & Trevarthen 2009), is changing concepts of how information is exchanged by means of body movement (Sacks 2007; Brandt 2009; Panksepp & Trevarthen 2009; Turner & Ioannides 2009).

However, the discovery of 'mirror neurons' that transfer instrumental intentions between minds illuminates only a part of the problem of how a young infant can enter so efficiently into an experience of moving in playful sympathy with an adult partner, exchanging and compounding motives, and sharing consciousness of meaning in activity with different companions. The perception and action of communication is richly active before language (Tzourio-Mazoyer et al. 2002). Cultural learning depends on interpersonal 'moral' communication, for which infants show powerful adaptations, as well as on the sharing of intentions to use objects in cooperative ways (Adolphs 2003; Decety & Chaminade 2003). It is essentially intersubjective (Bråten 2009).

2. The socio-sphere: The emergence of mature intimate and responsible cooperation

2.1 The collaborative life as the acquired habitus of meaning and identity

> "Moreover, they involved in their structuring at every moment and phase not simply *thought* structuring, but the whole human vital repertoire of thinking, willing, desiring, and feeling, subtly and varyingly interpenetrating on many levels" (The anthropologist Victor Turner discussing Wilhelm Diltheys distinction between 'experience' and 'having an experience'. Turner 1986: 35)

To understand what the 'meaning of life' of a person is, how it emerges from sympathetic human interaction, and how the languages and other "tools of meaning" can grow in society, is to enquire into the intricate relationship between "common sense" (Reid 1764/1997) and "habitu*s*" (Bourdieu 1990) and how they are already present in the "field of interaction" or "proto-habitus" between mother and infant. This original interpersonal awareness is grounded in turn on an innate "field of emotions", by which the actions and intentions of human contact are regulated (Macmurray 1959, 1961; Kellerman 1980; Trevarthen 1993) (Figure 2). The proto-habitus, the developmental source of habitus, can be defined as the awareness of a mutual level of knowing evident when babies are smiling, recognising songs or playful routines, or collaborating in creative tasks with their parents (Trevarthen 1994; Gratier & Trevarthen 2008, Gratier & Apter-Danon 2009).

'Habitus' is a term used by the French sociologist Pierre Bourdieu for a certain kind of "embodied attitude" to the affordances of the social surroundings, rooted in the structure of what Bourdieu calls *"space of social dispositions"* (Bourdieu 1998). He defines it as a generative principle of 'distinct and distinctive practices', for example practices of eating, doing sports, and especially the way these practices are done, the socially aware manner of their performance and display, or their grace and skill. Habitus is an intricate part of a social "structuring of structured structures", which has influence on itself, sustaining the social structure (Bourdieu 1998). These practices are different between persons living in various ways of life, in distinct positions of social stratification among shared activities and roles: "Life-styles are thus the systematic products of habitus, which, perceived in their mutual relations through the schemes of the habitus, become sign systems that are socially qualified (as 'distinguished', 'vulgar' etc.)" (Bourdieu 1992). Habitus is a classificatory scheme for social status and social tasks. It contains "principles of vision and division", of different tastes and responsibilities (Bourdieu 1998). For the owner of a certain position or level within the social stratification, habitus makes distinctions between what is 'good' and 'what' is bad for this person in this position, and ideas are given authority in laws and rules of procedure (Bruner 2002).

To explain how a culture or society develops through time we must seek for the emotional and *motivational preconditions* of human intersubjectivity, which are evident in *early intersubjectivity* when relationships and states of responsibility are naive and inarticulate (Trevarthen 1993, 1998). Human collective understanding has its intrinsic source in the sympathetic impulses of human brains in human bodies interacting, imitating and complementing one another's experience and capacity to act. Stein Bråten identifies the essential foundation for human intersubjectivity, all communication between persons who relate through their 'virtual others' in 'felt immediacy', with processes that are innate and already complex in the earliest phases of postnatal life (Bråten 1998, 2009). By this basic sympathy or resonance of purposes and feelings we may feel in relationship to another person, an intimate connection similar to the critical 'present moment' in psychotherapy described by Daniel Stern: "…when people move synchronously or in temporal coordination, they are participating in an aspect of the other's experience. They are partially living from the other's center" (Stern 2004: 81) and elsewhere he says: "Intersubjectivity is not simply a capacity, it is a condition of humanness from the phenomenological point of view." (Stern 2007: 36). It is also the process by which a person's identity and personality are established in relationships.

Figure 5. Three degrees of family intimacy. At home in Edinburgh, Scotland, in1979, three months old Laura attends to her mother, Kay, in 'proto-conversation'. Her three-year-old sister Louise wishes to join in and seeks contact with Laura. Father, Ben, is a proud onlooker. Laura and Kay are the subjects of the recording shown in Figure 4, which was made in Edinburgh University two months previously. (Photo by Penelope and John Hubley)

A complete theory of human intersubjectivity and of its growth and elaboration must explain not only the transitory events of immediate human relating, but how they are sustained to become the emotional and political forces of society in their full

complexity (Trevarthen 1992). Any human society and its field of social relations is structured by conventional practices and productive forces, that make up the "lifeworld", or *Lebenswelt,* as defined by the German sociologist Jürgen Habermas (1987). In all levels of this creation of a human social world, emotions are not only psychological effects of stimuli from encounters with the reality of objects and events, as they are seen to be in a rationalists perspective. They are the regulators of all kinds of human discovery and learning in social activities from their earliest beginnings (Trevarthen 1993).

Intimacy in families, and the negotiation of affections in relationships between children and their parents and siblings, has many implications for understanding how the *lifeworld* or *social sphere* of cultural practices is structured in the adult community (Figures 1 and 6).

> "To understand how the family turns from a nominal fiction into a real group whose members are united by intense affective bonds, one has to take account of all the practical and symbolic work that transforms the obligation to love into a loving disposition and tends to endow each member of the family with 'family feeling' that generates devotion, generosity, and solidarity. This means both the countless ordinary and continuous exchanges of daily existence - exchange of gifts, services, assistance, visits, attention, kindnesses - and the extraordinary and solemn exchanges of family occasions, often sanctioned and memorialized by photographs consecrating the integration of the assembled family.... The structures of kinship and family as *bodies* can be perpetuated only through a continuous creation of family feeling, a cognitive principle of vision and division that is at the same time an affective principle of *cohesion*, that is, the adhesion that is vital to the existence of a family group and its interests."   (Bourdieu 1998: 68)

The *social sphere* of cultural and intercultural activities embraces and accompanies all initiatives and experiences we can have with objects and other humans, whether cooperative or competitive. Its narratives begin in adult-infant interactions with the 'dynamic contours' of Daniel Stern's *proto-narratives envelopes* (Stern 2010). Developmental science demonstrates that every narrative or story-telling structure that is eventually adopted as a grammatical convention in language and literature is "inherent in the praxis of social interaction before it achieves linguistic expression." (Bruner 1990).

Human experience includes not a mere "stark confrontation" of then and now, between "collective then and existential personal now" (Turner 1986: 34). At every stage of cultural social and political practice inherent motives and feelings transmitted between persons are structuring the whole "human vital repertoire of thinking, willing, desiring, and feeling, subtly and varyingly inter-penetrating on many levels" (Turner 1986: 35). The present, past and future, and the meanings they carry, flow at different paces and intermingle in the 'stream of consciousness' (James 1890/1981).

The habits of society bring separate consciousnesses into productive relationships and cooperative works.

2.2 How semiosphere and sociosphere interact

The signs and symbols of communication sustain and shape cultural practices. What Lotman calls the "semiosphere" (Lotman 1984; also see Lüdtke in this volume) is the subject matter of "sociosemiotics", the natural science of the intersubjectivity of language (Halliday 1978; Trevarthen 1992, 1994; Thornborrow & Coates 2005; Zlatev et al. 2008; Brandt 2009). For Lotman the *semiosphere* is inseparable from the *social sphere* which has a real practical and historical structure. He studies *dialogue* as a generator of meaning, and, with Bakhtin (1986), presumes thought to be dialogic in nature. The semiotic mechanisms of "art and, more broadly, culture, which are meaning generators, fulfil a function for the social body that is analogous to the brain's functioning in the individual." (Lotman 1984: 41).

But, the *sociosphere* includes all the real and conceptual 'tools' or 'toys' of the collective human enterprise, not just language and other coded systems of signalling. It results from all the dispositional forces and experiences that connect members of a society, both stemming from and reflectively influencing the many intersubjective and interpersonal relations within it. It is, therefore, both the dynamic origin and the product of habitus and proto-habitus, of the 'trajectory of the dynamic change' of emotion, affect and meaning within that what Bourdieu calls the *space of social dispositions*. "The social space is indeed the first and last reality, since it still commands the representations that the social agent can have of it." (Bourdieu 1998: 13). It is the living field of interpersonal relations that configures a particular community. It includes the truth value of what Habermas calls the **trans-subjective claim of validity**, referring not only to the objective aspect of reality, but more fundamentally to the ideas or beliefs that arise from *intersubjective negotiation,* in which 'feelings' about what social reality is, and what are the 'identities' or 'personalities' of individual players are always important.

The sociosphere of a child and the first mastery of language should be perceived as that sphere of intimate relationship in which guiding regulations or the encouraging influences of the adult 'significant other' (see Lüdtke, this volume) can aid development within the 'zone of proximal development' of the child's own will and experiences and urgent desire to speak (Vygotsky 1962, 1967, 1978). It is the 'playground' of discovery where the 'companion', be they parent, teacher or therapist, 'scaffolds' the efforts of the child to move, and climb and manipulate – in reality, in imaginative conceptions, and in speaking (Bruner 1983; Wood et al. 1976), making learning in 'intent participation' with others (Rogoff 1990). It is the synonym for a field of shared intentions called *meaning* that creates culture. And it is also a synonym for that what Mead named 'the generalized other'. (Mead 1964, see also Habermas 1987: 37)

Taking a perspective on human speech from the evolution of vocal communication in birds and mammals, Bjorn Merker, a neuroscientist, explains how the ability to make language emerged as a development, unique to humans among primates, in the intentional and intersubjective parts of the brains – the ability for vocal learning. This evolutionary change "…turns the cerebral territories centered on Wernicke's and Broca's areas from their non-language uses in other primates to the service of human language by recruiting them to *the generative production and intergenerational transmission of culturally learned vocal lore.* To it we owe not only our developmental trajectory for language learning, infant babbling included, but our propensity for imitation and ritual culture more generally." (Merker 2009a: 461, emphasis added). This is the cerebral key to the semiosphere, the sociosphere of language.

2.3   Language and interpersonal life

Affect and emotion give the innate driving force to early language and grammar development. But the affects and emotions of this early stage are also shaped by the acceptance of social standards and norms. With attention to acceptable ways of communicating by 'correct' signs, symbols and grammatical rules, and to their cognitive mastery, the importance of the core capacity of early emotional-affective connectedness, the roots of innate human sympathy, may be obscured, and then language learning is not understood.

The socio-linguist Michael Halliday has put it this way:

> The important issue at the moment is not so much the particular intellectual model we choose to impose on the language learning process, as the search for a greater understanding of the nature of early infancy, as we try to interpret the ontogenesis of language: how children begin to exchange meanings,. to make sense of their experience and organize it into a picture of the world that is likewise shared with the others. In understanding this we also begin to see more deeply into the nature of language itself, since ultimately language has been shaped by the functions it has to serve in the actions and reflections on reality by a child.
> (Halliday 1979: 181)

Halliday explains the semiotic process as a consequence of adaptive processes in language use, and these are tightly interwoven with the structure und conditions on the social level. In short: "The system of natural language can best be explained in the light of the social functions which language has evolved to serve" (Kress 1976: 17; see also Halliday 1978).

Human social functions, including language, depend on how persons perceive one another (Bråten 2009). In studies of early mother-infant interaction it has been shown, that the motivating processes for emotional and sympathetic interaction are innate and may be active in the first day of life. Newborn babies not only *imitate* in

interaction with other persons, by mimesis of the face, hands or voice; they able to *provoke* their partner to engage in a reciprocal dialogue (Nagy & Molnar 2004). A core ability that makes this intuitive sympathy of expressions is the sensitivity for dynamic features of movement that Stern names 'vitally affects'. The "grammatical" structure inherent in early human transactions, later elaborated in speech and language, has its basis in sympathetic affective response to emotionally expressive movement. The grammatical structure of a language itself has no meaning and no function without this evaluation of intimate responsiveness, be it positive (pride) or negative (shame) (Trevarthen 1992).

This 'human sense' (Donaldson 1978, 1992) emerges in every-day life and is created within every interaction and accompanies the generation of every meaning. For Habermas, humans are using "dialogue-constitutive universals" for regulating interpersonal *contracts* and necessary requirement of a speaker's capacity to communicate (Habermas 1970, 1987) There are different views of these constitutive universals: must they have a "formal quality" (in a more rationalists perspective) or are they more deeply grounded in the origins of intimate sympathetic human relationship?

The role and moral value of interpersonal feelings in sharing purposes and interests is made clear from the way infants "offer" learned "signs" in two situations where human contact is broken or strained. If the mother of an infant 6 months old or older, who has been behaving as the familiar loved playmate, is asked to keep still, compose an inexpressive face and cease to engage in response to the baby, her infant will often put on a "performance", repeating a learned trick or a funny expression with insistence and looking hard at the mother as if expecting to excite some reaction, thereby making it very difficult for the mother to keep sober and unresponsive. She averts her gaze and struggles not to laugh. Similar challenging performances or displays may also appear when the baby is with a stranger, the "showing off" being made as a brief impulsive emission of friendliness in the course of an awkward, embarrassed or fearful contact with the stranger, who is usually puzzled and uncomfortable. Almost always the infant's brave challenges or "jokes" receive a mixed, amused or sarcastic response that tends to decrease, rather than increase, their mutual confidence and pleasure.

The above learned fragments of behaviour, offered to others to motivate a shared understanding as well as to invite appreciative response, thus have the motive and function of "protosigns" (Trevarthen 1994; Trevarthen et al. 2010). They are conventional in the mini-society of the family where they confirm a bond of understanding. Their use with strangers, while inappropriate, is particularly interesting, because it demonstrates that these acts are, for the baby, something that may be exchanged in a wider social context. The presentation of these "messages" or "offerings" in a difficult social encounter with an unfamiliar person, or as "jokes" to tempt an unresponsive mother reveals that they possess a special psychological character. They are oriented towards the partner and they tend to capture the partner's interest and feelings (see

Trevarthen 1992: 114–115). They prove that the infants are sociable, culture seek-ing, human beings who want meaningful engagement of purposes and pleasures with other persons (Reddy 2008; Merker 2009b). This is an essential foundation for learning language.

2.4 Genesis of sociosemiosis in intimate, affect-rich interaction: Concentration and marginalisation of meaning

There is an endless circulation of meaning, of relationships, and of social status or validity between persons in society, between more 'orthodox' and 'regulated', 'ratio-nal and reasonable' codes and practices, and more spontaneous and 'instinctive' forces of sympathy, or 'moral sentiments' (Smith 1759). The totality of all meaning-transmitting signs of body language, the visual and musical arts as well as verbal lan-guage, constitutes a trans-individual semiotic space – the "semiosphere" (Lotman 1984), in which manifold communicative structures and processes are generated, shown and regulated. This dynamic space or process of meaning in society may be conceived to have a hierarchical, concentric organisation – consisting of a centre, a periphery and an intermediate or transitional zone (see Lüdtke this volume, and Fig-ure 6). In the education of language and advanced social skills or tools of meaning (Lüdtke & Frank 2007), the purely cognitive and "affect-free" conventionalised semi-otic structures, e.g. grammars and norms, become active and validated in the cen-tre. The primary "affect-loaded" relational systems of embodied social life, with their inhomogeneous, amorphous motivated organization, are relegated to the periphery.

Consider, for example, the slang of marginalized social groups with their insecure affective configurations, loyalties and conflicts, which can be the result of longstand-ing traumatizing processes – the so-called "relational traumata" (Schore 2003). The permanently ongoing fractures, experiments and violations of semiotic and linguistic norms, conventions and grammars generate accelerated, dynamic and creative pro-cesses of communication in 'felt immediacy' (Bråten 2009). The linguistic discourses of marginalized youth can be defined socio-linguistically as an ensemble of specific registers and styles, which display their 'post-modern' character, for example by inject-ing sampled fragments of the centre in a diffuse, eclectic way, which in turn act as a catalyst for the de- and re-construction of linguistic centre-structures. Between border and centre in every society exists a kind of *bilingual or multilingual area of transition* in which the agents (e.g. teachers, pedagogues, therapists, systems of social care) are mediating between the domains of the semiosphere, between practical and interper-sonal realities and the ideal rules of legality and governance (Keeffe 2003).

Building on this general socio-semiotic concept and considering the *rela-tional development of speech and abilities for communication of a child,* it becomes increasingly clear in research on speech and language development that the

intuitive socio-semiotic forces – attitudes, habitus, the need for *trans-subjective claim of validity* as an *organizing force* within a given social situation – can have effects at all stages of a person's development (Trevarthen et al. 2006). They can influence the foetus of pregnant women who occupy low socioeconomic levels in the hierarchy of a institution, and this influence may persist in varying manner through the whole of the child's development. If a mother suffers from postnatal depression, which is often related to a difficult pregnancy, this is likely to affect the progress of the child in early infancy and through school years (Murray & Cooper 1997; Gratier & Apter-Danon 2009)
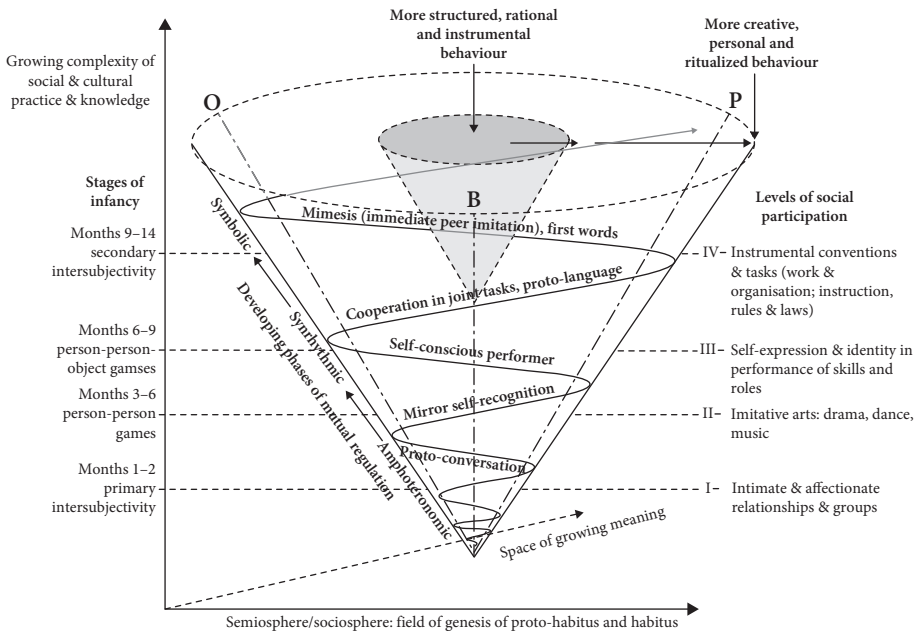
Figure 6. The developmental stages of the Self in early intersubjectivity, through infancy (Left), and in the life-time socio-semiosis of human interaction in society (Right), generate cultural forms. The motives of a person in an increasingly complex social world are closely interwoven with manifold influences from this world. Shared meaning grows and proliferates, first with *amphoteronomic* regulations (mutual physiological or autonomic state control as between mother and foetus), then through *synrhythmic* engagement (joint dynamic control of the rhythm of moving in 'mind time') to the mastery of *symbolic* communication and the mastery of words to describe the shared cultural world (Trevarthen et al. 2006). It is a development from an intimate the *proto-habitus* to individual forms of *habitus* within what Bourdieu (1998) calls the *space of social dispositions*. The more ritualized behaviours of each particular cultural practice ensure the interactional background for each *trans-subjective claim of validity* (Merker 2009b; Habermas 1987) giving rise to the *intersubjective qualities of overlapping* lifeworlds (see Table 2 on Levels of Intimacy and 'Structure': Practices and Rules)

The main sociosemiotic processes described in Lotman's terms are *marginaliza-tion* towards the exterior regions (e.g. as the consequence of speech and language-disorder, or mental handicap) and *integration* towards the interior region (as in the effects of adequate and compensatory education or therapy). Processes of marginal-ization take place e.g. in immigration situation of mothers living in foreign countries and disconnected from society or community: the very often have serious problems to create the *kind of belonging for their child which is necessary for normal psychological development* (see Gratier 2003).

Table 2. Developmental stages of the *social human mind*, see also Table 1 and Figure 6

Intersubjectivity in Human Society Levels of Intimacy and 'Structure' (Practices and Rules) (Trevarthen 1992)

Level One: In **Intimate Intersubjectivity,** self-related emotions of persons interact directly. The inherent "self-other" duality of the individual's affect and motivation shown at birth remains as a foundation for later intimate relationships: in family life, in direct emotional and physical attachment or conflict, when changes occur in close attachments, and when the sick or weak are given sympathetic care.

Level Two: **Playful intersubjectivity and Ritual Performance** In secure trust, a humorous testing of interaction, communicated by teasing with affection, creates "communitas" (Turner 1986) in art, drama and ritual, strengthening and defining the bonds of community. Awareness of the body in play, leads to expression of the rhythms and accents of gymnastics, dance and music. Attention to the sharing of control of contingencies in action on physical objects and events generates competitive sport. Infants show the beginning of playful ritual performance with 'musicality' from the second month (Malloch 1999; Malloch & Trevarthen 2009).

Level Three: **Socially Conscious Self-Presentation.** Human beings learn a social "me" (James 1890; Mead 1934), and perceive others as "personalities" with identity and character. Self-referred expressions and initiatives present a personal identity and define "roles" and "offices" in society. Each self creates a 'personal narrative history' by 'auto-noesis' (Tulving 2005). Regulated pretence and deception, separate one's own consciousness from others. Difficulties in presentation cause timidity, shame or guilt, unstable, painful and potentially destructive emotions most acute with unfamiliar persons. Artists explore their own experience and creations, making "aesthetic objects", representations that appeal to others' feelings of their experience. In the culture of art, beauty and aesthetic excitement are recognized collectively, negotiated and codified. Self-conscious mannerisms and sensitivity to their appreciation are evident in infancy after 4 months (Reddy 2008).

Level Four: **World-Knowledge and Material Culture** depend on pragmatic communication about reality and how to act on it. This peculiarly human kind of *person-person-object communication, or secondary intersubjectivity*, appears at the end of an infant's first year. Cooperation in action, seeking to understand the interests and evaluations others are giving to objects, and learning how instruments and practices are to be used require an enquiry into all kinds of motive in other people, including those whose lives are in other places and other generations. It is enriched by language that can refer accurately to aspects of reality not present, and that can define possible actions and the effects they will have. It leads to the proliferation of structures of culture that may limit individual freedom by conformity of actions in work and beliefs in educated society.

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3.   Reduced social and cultural development, loss of belonging and how companionship of the generalized other may be discovered

As an example of what it means to belong to a habitus or sociosphere of meaningful relationships and activities, and particularly what it means to lose this 'validity', studies of immigrant mothers and of mothers diagnosed with borderline personality disorder have shown that the experience of *loss of belonging* causes a woman to be unresponsive and highly predictable end repetitive in her interactions with her baby. In both cases the mothers' communication is 'devitalised' and they have the feeling of living in a 'disconnected world' with a 'confused perception of self' (Gratier & Apter-Danon 2009). This causes a type of dysfunctional 'proto-habitus' or weakened 'narrative of living together' to emerge, generated by mother and baby together, and this carries an "implicit relation" to the larger social world. "A sense of belonging, or of sharing implicit and embodied ways-of-being-together, constitutes the springboard from which creative variations can take form; and at the same time, it is through new and efficient forms of expression that belonging and what we have called 'protohabitus' are dynamically renewed." (Gratier & Apter-Danon 2009: 322).

To inquire for the origins for the feelings a person may have of living in a "disconnected world" in which social and cultural development are more and more restricted we consult the "Critique of Functionalist Reason" (Habermas 1987) to see how Habermas delineates the 'decoupling' of a social and political system and the "implicit and embodied ways-of-being-together" in the time of a lifeworld.

Habermas understands social evolution as "second-order-process of differentiation" in which "lifeworld" and "system" grow in different ways. Lifeworld, the sphere of more immediate human relations, responsibilities, of actions in every-day-life, becomes more and more complex as the "rationality" of the social and political system, the "system" that sustains society and that includes *institutional forces,* is constructed.

> "It has become conventional for sociologists to distinguish the stages of social evolution as tribal societies, traditional societies or societies organized around a state, and modern societies (where the economic system has been differentiated out). From the system perspective, these stages are marked by the appearance of new systemic mechanisms and corresponding levels of complexity. On this plane of analysis, the uncoupling of 'system' and 'lifeworld' is depicted in such a way that the lifeworld, which is at first coextensive with a scarcely differentiated social system, gets cut down more and more to one subsystem among others. In the process, *system mechanisms get further and further detached from the social structures through which social integration takes place.*"
> (Habermas 1987: 153 f.; italics added)

With this analysis, reasons for the *disconnection lifeworlds* described above become apparent. The problem for modern societies is that they are attaining a "level of system

differentiation" in which "increasingly autonomous organizations are connected with another via delinguistified media of communication": the system mechanics are more and more constituting a social intercourse "that has been largely disconnected from norms and values" (Habermas 1987: 154) thus constituting a social intercourse that has reduced the possibilities of human interaction based on *moral feelings.* But at the same time the lifeworld remains, "the subsystem that defines the pattern of a social system as a whole. Thus, system mechanics need to be anchored in the lifeworld: they have to be institutionalized" (Habermas 1987: ib.). Institutionalizing is based on authority that has the power to define rules for *multiple connected lifeworlds.* This raises the question of the *directional quality* of institutional forces.

This institutionalization of "new levels of system differentiation", which can also be perceived from the "internal perspective of the lifeworld" (Habermas 1987: ib.), includes conditions and pre-conditions of social dispositions, of *habitus,* and they have influences down to the emerging *proto-habitus* in intimate mother-infant-dyads. There is an institutional side to the problem of belonging in immigrant mother-infant-interaction. As institutions grow social process in the *lifeworld,* reducing of the negative effects of institutionalization requires attention to the question of the moral quality of human activity to help combat *social desintegration*, for example in immigrant populations, or of youths traumatized by war where life situations disconnected from the surrounding world lose dynamic coherence or 'narrative musicality' (Osborne 2009b).

3.1 Disorders of action and awareness in infancy may disturb the learning of meaning

Observations of the development of very early signs of autism (Trevarthen & Daniel 2005; St. Clair et al. 2007), of the effects of deafness and blindness, of neglect and abuse, or of severe atrophy or malfunction of the brain (Dawson & Fisher 1994; Trevarthen & Aitken 1994; Merker 2007), as well as studies of the effects of emotional illness that limits communication of a mother with her infant (Murray & Cooper 1997), lead to two complementary conclusions. First, the rapidly growing brain of an infant can be changed by a deficient or toxic environment, as well as 'genetic' faults in regulation of development and differentiation, and early changes can lead to permanent weakness or disorder. Secondly, the intrinsic 'epigenetic' self-organising and developmental powers of the young brain, even that of a premature infant (Als 1995), have remarkable power to respond to benefits that compensate for deficiencies or insults. Most important are benefits that result from human care that seeks to sustain the affective 'moral quality' of communication in spite of handicaps. Attempts to stimulate or train compensatory behaviours as desirable 'structures' for living may have negative effects. The best therapy or treatment acts to find ways that release motives of the child, or adult, to

share experience and achieve sympathetic engagement with other persons in creative activity. Remarkable results can result from such practice (Hughes 2006; Trevarthen & Aitken 2001; Trevarthen et al. 2006; Caldwell 2008; Zeedyk 2008).

3.2 Intersubjective therapies

What we have learned about the interpersonal talents of infants can be applied to help children with developmental disorders. However, many regimes for professional intervention with psycho-affective problems of children do not directly or overtly address the interpersonal and expressive functions. They rely more on the traditional medical concept of treatment for organic disease by medication to a patient, or educational models of instruction to the child as a pupil. In statistical assessment required by clinical trials, data on many individuals is grouped to provide a description of a population based on what are inevitably rather limited measures of psychological status and performance. At the same time, it is the experience of practitioners and families that benefits may be obtained by directly addressing, for each child and for their particular condition, the quality and receptivity of immediate and direct communication in treatment or teaching, and its management in the family or school. Adherence to 'regulations' may not suffice (Keeffe 2003).

Cognitive or behavioural therapies are aimed to control behaviour and establish acceptable routines or 'structure' to benefit the child's physical and emotional health and to facilitate easier relations with family caregivers, teachers and school partners. It is recognised that learning in such regimes depends on positive motivations, but the range of pleasurable rewards is generally not sensed from the 'patient's' position. Appreciation of emotive 'subjective' experiences of communication requires specialised methods of continuous and repeated observation and qualitative assessment that are capable of identifying what characterises most effective practice, and that is responsive or **'respectful'** (Selby & Bradley 2003; Zeedyk 2008). The theory of nonverbal communication with emotionally disturbed or cognitively disorganised children is not explicit. We believe that evidence from the study of how infants enter communication and progress to language has given valuable pointers to the kind of models and techniques required.

There is considerable disagreement concerning the efficacy of therapies for autism, and differences in the estimation of the improvement which can be generated (Howlin 1997; Trevarthen, et al. 1998). Nevertheless, it is accepted that earlier interventions are likely to produce greater improvement than the same approaches used at a later stage. The Lovaas method of behavioural training (Lovaas 1987) has been demonstrated to have beneficial effects in a number of independent studies (e.g. Fenske, et al. 1985; Harris et al. 1991; Birnbauer & Leach 1993), but there is uncertainty concerning in what way it is effective, and how general and lasting the benefits

are. It is also not clear how far the expressive manner of communicating reinforcements and negotiating routine procedures is critical to success, though 'high affect' speech by therapists is encouraged. A wide range of other approaches focus more specifically on early aspects of interaction (Alvarez 1996; Trevarthen, et al. 1998; Waterhouse 2000). Most of these have not received controlled assessment. Their operation is not captured by measurements of performance on pre-defined measures of intelligence, rational beliefs or cognitive flexibility. In the study of special education for autism, instruction in speech and language is naturally given great importance. However, speech therapy is not, by itself, generally effective, except for high-functioning cases who need assistance with semantic and pragmatic difficulties (Jordan 1993).

For children with greater problems in communication, an approach that addresses the underlying interpersonal problems is more effective. Emotional engagement and joint attention appear to have a more fundamental role in furthering language development in autism than instrumental use of language (Rollins 1999), and this approach may be applied for clinical intervention to enhance communication skills in autistic children more effectively than any training in thinking or beliefs (Rollins et al. 1998; Astington & Jenkins 1999). Improvisation music therapy is gaining acceptance as a remarkably effective way of gaining and regulating communication with even the most recalcitrant autistic youngsters (Robarts 1998; see also Robarts 2009). It employs techniques of mirroring and enhancement or modulation of expression with the benefit of a trained musician's sensitivity for pulse and expression in gestures made by the patient. Imitative responses are found to be attractive to autistic children and can act as a bridge to collaborative play or communication, and improving the child's access to language (Tiergerman & Primavera 1981, 1984; Dawson & Galpert 1990; Nadel & Pezé, 1993). The intensive training of parents by the Option method in responsive care and education of autistic children, which has proved of great benefit to many families, employs systematic imitation to achieve joint attention and motivation to learn collaboratively (Kaufman 1994)

Play means interaction with any impulses for adventurous and enjoyable movement and experience. It means sharing expressions of joy and surprise (Panksepp & Burgdorf 2003). It taps a basic emotion in social sharing, on that is close to a supportive of the basic emotions for pleasure in attachment. As the ethologists have discovered by studying the instinctive movements of young animals casing and 'pretend fighting', play is affiliative (Bekoff & Byers 1998). It strengthens and develops social bonds while sorting out social hierarchies. Play therapy draws on these psychobiological principles in a systematic way (Jernberg & Booth 2001). For a troubled child making happy and trusting friendships in playful and intimately affectionate responsive ways is a key to positive learning and emotional security. The play is creative by means of an interpersonal improvisation in which partners are at the same time free to be expressive in

themselves and instantly reactive to what others do, and therefore open to guidance and learning. Real intuitive engagement is necessary for the emotions between them to flourish, as with infants (Reddy & Trevarthen 2004).

Specific memories and verbal explanations guide awareness and direct interests. In normal life, these cognitive components, built up through experiences in established relationships, strengthen the prospective control of attentions and intentions and lead to more knowledgeable and skilful action. In psychopathology, the cognitive contents of memory intrude in imagination and carry affective material that blocks effective consciousness and action. Therapy for adults requires work with these contents. At the same time, engaging with the emotions and a clear focus on the interpersonal motives that direct movements in the present can regulate disturbing or inhibiting material from memory and imagination, finding a path to more rewarding and creative purposes in relationships that are affectionate and trusting (Kohut 1984; Kerr 2005).

A therapist aiming to help a child with developmental psychopathology by inter-subjective or interpersonal means has responsibility to stay with the child through periods of resistance or rejection to find this path (Archer & Burnell 2003), he or she has responsibility to find a path to create the "generalized other"[1] anew, to change the conditions of and for a changed "shared lifeworld".

3.3 An example of sympathetic engagement for autism: Re-Discovering the 'generalized other'

Berusz is a young man with autism who has had severe problems living in a institution for mental handicapped people in Germany. He seemed to be isolated from the world, frequently showing highly stereotypic behaviour, and sometimes destroying what took his attention. Berusz often sat on the floor of the corridor or in his chamber ripping paper with slow movements. He seems to be in a trance, recognizing nothing in his immediate surroundings but the paper, making no reaction to communication offered by the staff. After a couple of hours a pile of paper lies about him with no apparent meaning for him or for any other person.

When I (B.F.) placed myself on the floor next to him, Berusz did not notice me at first and he continued tearing paper. After trying to gain eye contact with him, I turned attention to the paper and did the same as he was doing, attempting to match my posture and movements to his. After around 30 minutes Berusz paid some attention to my imitative actions. I was sitting very close to him, and 10 and 20 minutes later he touched the piece of paper I was holding in my hands intending to put on my own pile

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1. See also Lüdtkes therapeutic concept of the "significant other" in this book.

of paper. He did this several times, then, instead of just touching my piece of paper, he grasped it and put it on his pile.

Then I *touched* the hand in which he held the piece of paper taken from me, before he threw it on his pile. I repeated this, trying to mirror the shape of his movements as he took each piece of paper from me. He paused for a moment and slowly gave back to me the piece he had just taken out of my hands, and I then placed it on my pile…

We can suggest that in the circumscribed socio-sphere of intimate interaction with Berusz, making a kind of *intersubjective claim of validity* for the shared moment, a social event was created in which objects gained new meaning. It was a validity not just for the actions of one subject, but of actions validated by both of us in this situation. After this event Berusz stopped tearing paper. He made a transition into the "world of meaning" of the staff members and the other handicapped persons in the institution, *broadening step by step his claim of validity.*

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Relational emotions in semiotic and linguistic development

Towards an intersubjective theory of language learning and language therapy

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This chapter explores the crucial role of relational emotions in children's language learning and argues for an intersubjective theory of language development. To demonstrate the need for this approach, first a review of different classical theories of language acquisition as well as of more recent emergentist approaches is given. From this it is obvious that in all discussions about the opposition or the interplay between nature, nurture and culture and therefore the primary motives for children's language development, no prominent theory explicitly focuses on the importance of emotions in language or in prelinguistic and linguistic development. Only in the interactionist and psychoanalytic models do we find implicit concepts about affective influences on language constitution. In response to this lack, evidence is given for the semiogenetic power of emotions from recent semiolinguistic and neuropsychological research, both of which employ the concept of 'intersubjectivity'. The findings from these two fields of investigation are summarized in an application to children's semiolinguistic development. Four major milestones of affect and meaning attunement in the child's trajectory from emotional regulation of interpersonal contact and cooperation to cognitive mastery of experience in the intersubjective construction of signs are described. The chapter concludes with an outline of the concept of 'Relational Language Therapy' – a therapeutic approach to language learning, which views as central the emotion-based influence of a 'Significant Other' in both parental and professional support of children's semiolinguistic development. Finally as a vision for future theorizing, these paradigm shifts are taken to pave the way for fully incorporating the concept of intersubjectivity into linguistic theory and its various fields of application.

Keywords: relational emotions; neurobiology of early communication; infant intersubjectivity; sign development; language development; meaning-attunement; mirror-mechanisms; Relational Language Therapy

1. Cognition or emotion: What drives children's language development?

Do emotions play an important role in the language development of a child? Though most mothers and fathers would definitely say "yes", we have not found any prominent theory of language acquisition that focuses explicitly on the prelinguistic and linguistic importance of emotions. In reviewing well-known classical theories of language acquisition it becomes obvious that they answer the question about the primary driving force of children's language development quite differently. According to their epistemological background – e.g. 'internalist mentalism' (Chomsky 1965, 1966) versus 'externalist materialism' (Vygotsky 1986 [1934], 1996) –, or according to their preferred view of language function – e.g. 'rational referentiality' (Bühler 1990[1934]) versus 'subjective expression' (Bloom 2002) – they focus either on individual cognition or on inter-individual social exchange. Discussions about the primacy of nature vs. nurture or culture take therefore two diametrically opposed positions.[1]

On one side we have the individual-centred or cognition-centred view of the 'nativistic' (e.g. Chomsky 1965, 1966, 1968, 1986; Lenneberg 1967), 'cognitivistic' (e.g. Piaget 1929, 1963 [1936], 2001 [1963]; Nelson 1974; Clark 1975; Sinclair 1975; Slobin 1985) and 'neo-nativistic' (e.g. Clahsen 1996; Pinker 1985, 1995, 1999) theories. Their internalist view is obvious in their shared idea of building up *individual mental representations* (R^1) during the process of language acquisition. As information-processing individual cognition is here considered as the primary organiser of development, the central concept of this 'nature' position on the process of language learning is '*autoregulation*' (Klann-Delius 2008: 136) (see Figure 1a).

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1. Although the emergentist position tries to integrate conflicting approaches and taken as well into account that some internalist positions have moved in time towards more interpersonal approaches (e.g. Nelson (1996) & Clark (1996)) I stick here to the classical polarity to clearly distinguish between the underlying fundamental difference between 'autoregulation' and 'reciprocal interpersonal regulation'.
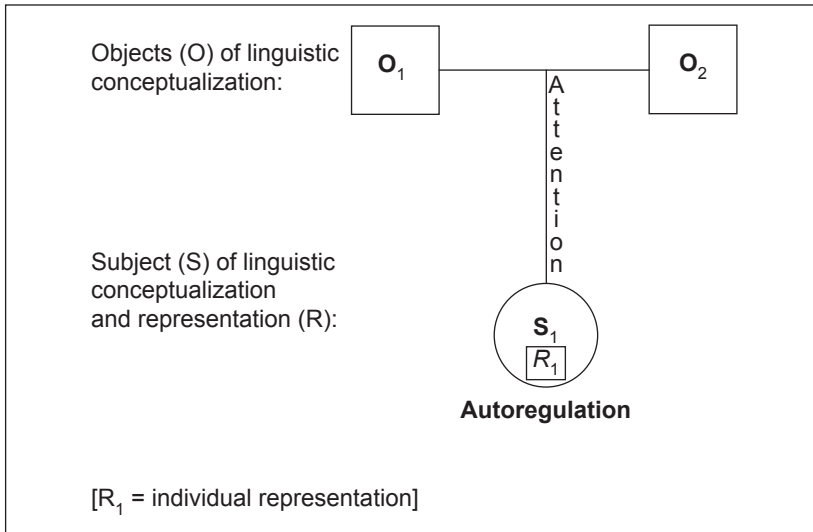
Figure 1a. Autoregulation: Individual cognition as the primary organiser of language acquisition in the nativistic, cognitivistic, and neo-nativistic theories (modified from Verhagen 2005, Figure 1.1)

On the other side we find a group of more inter-individual or social approaches, which accept that other individuals and therefore nurture and culture have a major influence – e.g. the 'behaviouristic' (Skinner 1957; Osgood 1957), 'interactionist' (e.g. Bruner 1983, 1990; Bloom/Capatides, 1987; Bloom/Beckwith, 1989; Bloom 2002; Papoušek/Papoušek 1987; Papoušek et al. 1990; Papoušek 1992; Tomasello 1992, 2006) and 'psychoanalytic' (Winnicott 1965; Spitz 1966; Klein 1998 [1932]; Lacan 1990; Kristeva 1998, 2002a, b) theories. Though there are clear differences between these three approaches, and to some degree also between the individual theories within them,[2] they basically all share the view that social exchange and thus *reciprocal interpersonal regulation* is the primary organiser of language learning.[3] Such reciprocity influences also the view of the linguistic representation: the individual representation ($R_{1/2}$) implies in different ways constitutive traces of the other individuum, which are created e.g. during the process of meaning attunement (see Figure 1b).

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2. The very complex theoretical position of the culture-historical school of language acquisition (e.g. Vygotsky, Luria, Leont'ev) cannot be described here in detail. But it should be acknowledged that while cognition-centred aspects are emphasized, this school must be accepted as preparing the way for the more recent interactionist theories (see Klann-Delius 2008).

3. I use the term 'interpersonal' here, because these approaches lack fundamental concepts necessary for being 'intersubjective', as here understood.
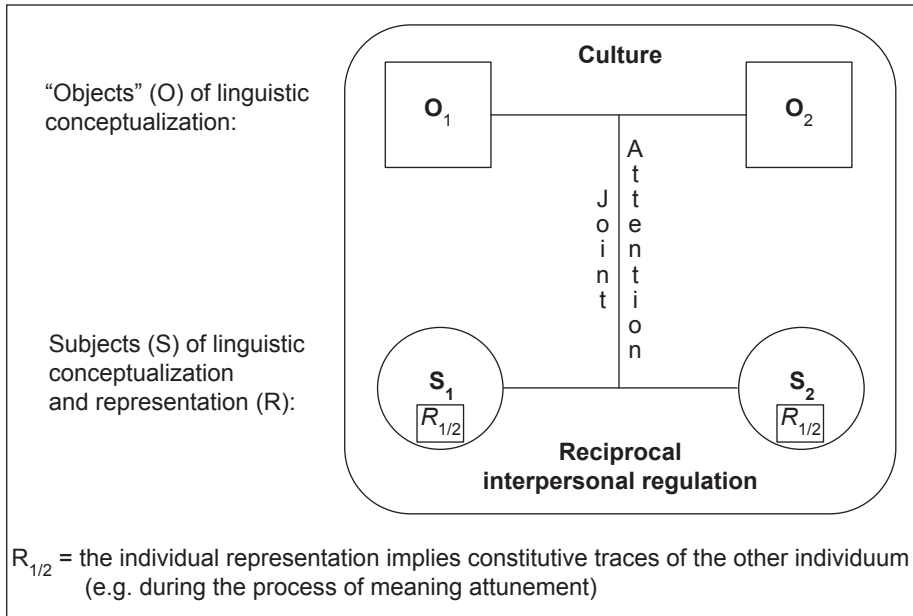
Figure 1b. Reciprocal, interpersonal regulation: Interindividual, social exchange as the primary organiser of language learning in the behaviouristic, interactionist and psychoanalytic models (modified from Verhagen 2005, Figure 1.2)

Though the more recent emergentist approaches (e.g. Hollich et al. 2000) try to overcome this classical polarity, still no prominent concept of the emotional turn in linguistics is here taken into account (Lüdtke 2010, 2012). As will be shown next only the interactionist and psychoanalytic models give some more or less explicit hint to the specific developmental importance of emotions, and they could be considered as precursors towards a genuine emotion-centred theory of language acquisition.

2.   Theoretical precursors: Implicit emotional concepts in classical models of language acquisition

Familiar keywords employed by interactionist and psychoanalytic theorists, such as 'attachment', 'bonding', 'intentionality', 'mutuality' and 'attunement', as well as the terms 'subject in process', 'signifying practice', 'displacement' and 'drives discharged in representation', imply in varying degrees emotional aspects of infant communication. But even in these selected interindividual approaches the role given to emotion in language learning and development seems still to be peripheral and somehow 'hidden'. Accordingly, in the following analysis, all underlying implicit emotional concepts shall be extracted

in crystallized form from each of these quite divergent language acquisition models, to assess what is missing from a coherent interpretation of the work of emotions.

2.1 The emotional nourishment of the mother-child dyad in the interactionist theories

The interactionist theories that dominated in the 1980s and 1990s focused on the social interaction between mother and child as the indispensable base for language learning. Though this approach, with its refined attachment and bonding concepts (e.g. Brazelton et al. 1974; Bowlby 1978; Grossmann 1999; Thompson et al. 2005) was not specifically linguistic in the sense of setting out to explain the development of semantic or morpho-syntactic structures, the following aspects surely indicate a theoretical connection between the socio-emotional support in the caretaker-infant dyad and (semio)linguistic development.

2.1.1 *Intentionality*

Mental representations, coloured with communicative motives, purposes and aims, are always part of the 'intentional state' of an individual (Bloom 2002: 6). Emotions, as part of any intentions to relate to other persons, must be a factor in the motivation of language learning, because the child is always constructing anew those communicative signs, which are able to be transformed into verbal signifiers that will transport intentional meaning from him– or herself to the other (e.g. Bruner 1990). In strong opposition to the behaviouristic focus on passive or automatic imitation as the primary means of language acquisition, the concept of intentionality emphasizes the very active self-organization of the child's learning – a competence for intelligent agency which Nagy & Molnár (2004) have lately emphasized by empirically proving the existence of provocative communicative acts even in newborns.[4]

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4. Nagy & Molnar (2004) show how the searching for the mechanism of neonatal imitation resulted in the discovery of an innate neonatal *initiative capacity*, called 'Provocation'. Under controlled conditions newborns (3–54 h) spontaneously produced previously imitated gestures, waiting for the experimenter's response. A psychophysiological analysis revealed that imitation was accompanied by heart rate increase, while gesture initiation or provocation by heart rate deceleration, suggesting different underlying mechanisms: Heart rate acceleration is associated with preparatory arousal for the imitative act; heart rate deceleration is an index of orientation, attention and expectation of the 'provoked' response. Results imply that besides imitative capacity, newborns also have the capacity to provoke a communicative response, thus sustaining interaction and communication. From our point of view these findings and the notion of 'provocation' in reciprocal dialogues with newborns deeply enriches the theory of the Virtual Other, giving the real other the developmental responsibility to fulfill the innate need of the newborn for matching emotional and communicative responses to sustain

2.1.2 *Expressive function*

For some, the emotionally coloured intentionality evident from birth is the driving force, which animates and regulates the basic human need for both nonverbal and verbal expression (e.g. Bloom & Capatides 1987; Bloom & Beckwith 1989). According to Bloom (2002), not Bühler's (1990 [1934]) 'referential function', but the 'expressive function' in language development is not just one out of many linguistic functions, but *the primary one*, underlying all others. The need to share emotionally important meanings, not the function of referential, denotative description, is the first goal of communication (Bloom 2002: 6).

2.1.3 *Iconic origin*

In opposition to the cognitivist models – for which language development is identified with verbal development and starts with the acquisition and mastering of the denotative, emotion-free symbolic linguistic signs[5] – interactionist models locate the origin of language in the nonverbal, pre-linguistic competences for communication by means of signs of affectively loaded 'meaning' (Bateson 1979; Papoušek 1992). The nonverbal competence of the infant depends on the inherent capacity of multimodal communicative displays – of facial expressions, gestures, voice and other sounds of moving – all of which convey emotive states. As semiotic behaviours they have an iconic-analogous character, resembling the form of the referent immediately and apprehended as such, and they are especially adapted for the transfer of affective information and emotion-charged meaning. This capacity of movements to specify a rich display of feelings which are a core part of mental life is emphasised by Daniel Stern's theory of 'Vitality Dynamics' (Stern 1985, 2010).

2.1.4 *The Virtual Other*

Within a broader range of the interactionist theories, recent approaches hypothesize the existence of a reciprocal representation of a 'virtual self' and a 'virtual other' in each partner of a communicating pair (Bråten 2002, 2009) – and these may be discerned in rudimentary form within the provocating newborn who is participating in an imitative exchange. On the one hand this concept of 'altercentric perception' recognises

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an ongoing rich dialogue (see Section 5, for further application of the virtual other into the concept of the 'Significant Other' in Relational Language Therapy).

5. I refer here and in the following mainly to a Peircean classicication of signs according to their degree of emotional markedness of the signifier: the signifiers of 'icons' are very strongly emotionally marked, those of 'indexes' are moderately marked, and 'symbols' almost not marked by emotion (see in detail 3.1). For the learning child the ability to comprehend and use them is dependent on the degree of emotional markedness (see Figure 15).

that, especially within the caretaker-infant dyad, successful communication is dependent on an emotionally positive representation of the real other: from the child's point of view its lovingly responding mother or father. But on the other hand it also implies that in difficult developmental contexts – e.g. in conditions of psychopathology, abuse, migration or poverty – there could be a disturbed reciprocity between the representations of the child and its partner(s) in dialogue (Aitken & Trevarthen 1997), which may lead to impairments of the infant's cognitive development and learning, as has been demonstrated, for example, following maternal postnatal depression (Murray & Cooper 1996; Gratier & Apter-Danon 2010).

2.1.5   *Mutual representations*

In further refinement of this train of thought, we consider not only that the general self-other representations are reciprocal, but the intersubjectively constructed meanings as well. Bloom, from an interactionist perspective (2002: 9), posits 'mutual representations'. Verhagen (2005: 1–27) – though from a more cognitivist perspective – supports this view by describing 'mutual management of cognitive states' (see Figure 1b); and Ruthrof (2000) proposes in his 'Corporeal Semantics' meaning as a combination of an arbitrary signifier with a pre-linguistic concept made up of iconic mental materials (with sensory and emotional ingredients) under the community guidance of 'sufficient semiosis', such that 'at the level of the signified we are iconic beings'. All these authors emphasize that each and every act of communication – in body movement, verbal expression or written language – is primarily an act of intersubjective creation of meanings, which are mutually developed via intersubjective construction, negotiation and validation, grounded in the body and multimodal perception of the world.

2.2   The inscription of affect in psychoanalytic theories

Within the last century, different theories of language, which also imply concepts of language development, have been derived from psychoanalysis. Explicitly turning away from the structuralist (Saussure 1916) and nativistic (Chomsky 1965, 1966) theories such models recognized the role of drives and affect in language learning (e.g. Klein 1998 [1932]; Spitz 1966; Lacan 1990).

Most prominently Kristeva (1998, 2002a, b) opposes the rationalistic Cartesian conception of language by emphasizing that all the interdependent constituents of language – mainly the speaker (the 'subject'), his or her verbal productions (the 'text') and their inner 'meaning' – are influenced and processed by affects and are therefore permanently "in process" (see Figure 2).

2.2.1   *Subject-in-process*

In Kristeva's (1986a) complex theoretical approach, the 'speaking subject' is defined as constituted through emotion by first introducing the concepts of *body* and *time* (t).

By understanding drives and affects as temporal and corporeal processes the lifeless 'transcendental ego' (1986a: 27) of the Cartesian conception of language is freed from its 'paralysed numbness', and a continuously changing 'subject-in-process' is born. With this processually conceptualised subject the predominant orientation of synchronic linguistics in preoccupation with the static forms of the language system is replaced by a focus on the live generation of language driven by affective dynamics – a focus especially concerned with the role of 'signifying practices' and their disruption and repair in the establishment of language forms and norms.

2.2.2   *Text-in-process*
By introducing a second theoretical concept of *space* in the affect-integrating perspective, Kristeva (1986b) makes the verbal production or 'text' of a speaking subject take a processual function. As emotions develop in a time-space-continuum words are no longer static fixed points, and sentences are no longer linear additive chains lacking a flow through time and space. A verbal enunciation becomes instead an indefinite signifying process permeated and transformed by dynamic emotions. This so-called 'textual productivity' does not mean the output of the subject in form of a material text, but the affectively generated productivity of the text-making itself as an independent generator of new texts – produced in playful permutation through unconscious processes of condensation (metonymy) and displacement (metaphor) of the signified.[6]

2.2.3   *Meaning-in-process*
Last but not least also the third constituent of language – the inherent meaning – is also constituted 'in process' by addition of the concept of *context*. Either understood as the inner affective state of the subject, or the external socio-emotional set or relationships of the subject, the actual or historic context is able to change the relation of signifier to the signified, by 'contextualization' of the signified. This perspective strictly opposes the theoretical denial of emotion in the mentalist or isolationist conceptions of meaning of Saussure or Chomsky with their de-spatialization and de-temporalization. Drawing on Bakhtin's concept of language as 'dialogicity' vs. 'monologism' (1965, 1981), Kristeva (1986b) proposes that a signifier of a word or sentence is no longer to be conceived as a passive arbitrary 'container' for a fixed, objective and denotative affect-free meaning, which can be decoded from the subject independent of its actual or historic context. For the decoding subject words, sentences or pre-linguistic signifiers such as gestures are not any longer 'Aristotelic chains' (Kristeva 1986a) but are instead treated as significant, meaningful 'nodes

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6.   Sometimes I have to come back to Saussurean terminology as the European poststructuralist positions mostly refer to that and not to the Peircean.

within a network' (Foucault 1966) of relational ('Self-Other' as well as 'Virtual Self [VS]-Virtual Other [VO]') and fluctuating constructions of meaning, and are in this sense, inevitably emotionally contextualized.
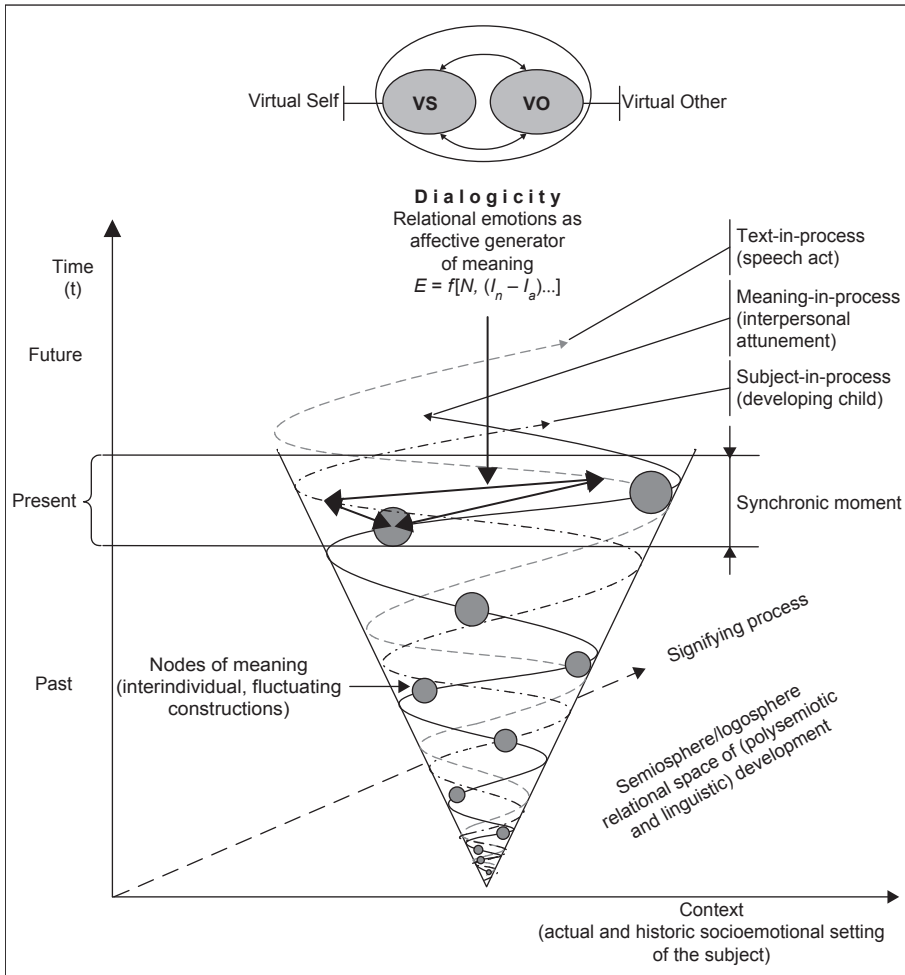
Figure 2. Temporalisation, spatialisation and materialisation ('embodiment'): Re-conceptualising language as dialogue by focussing its emotional generation[7] and processing (mediation, regulation) (following Kristeva 1986a/b, 1998, 2002a/b)

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7.   For further explanation of Simonov's (1986) 'emotion formula' see Figure 6.

2.2.4 *Materiality: Inscribing drives in symbols*

One more concept introduced by Kristeva (2002b) – the concept of body-based *materiality* (here especially the *maternal* body) – underlines the importance that this general affective constitution of the speaking subject, its textual productions and their meaning in a socio-emotional context has for a specific psychoanalytic model of language acquisition.

Within her material approach Kristeva assumes with her genuine concept of the affect-loaded *semiotic "chora"*, as opposed to the realm of the *affect-free symbolic*, the origin of linguistic development very early in the 'pre-oedipal' period, where mother and child live in bodily, affective and polysemiotic communion.[8] Referring to Melanie Klein (1998 [1932]) she further strengthens with that the importance of the mother for the child's semiolinguistic development. This opposes the classical Freudian and Lacanian psychoanalytic theories which associate language development with the establishment of a rational 'symbolic function' controlled by the *father*.

According to Lacan (1990) the child masters the symbolic function during the oedipal period by learning to suppress natural affects and to subdue expressive impulses to the paternal law of a purely rational symbolic order.

Kristeva instead hypothesises, referring to the Freudian concepts of 'orality' and 'anality', that these two basic bodily processes of 'incorporation' and 'rejection' may be associated with analogous linguistic processes of 'identification' and 'differentiation', which are essential for every signification. With this reference she is emphasizing the maternal and not the paternal law, as both these body processes of the child are embedded in the corporeal, affective and vocal unity with the mother, as she becomes involved in assisting the regulation of the anal and glottal sphincters of the infant.

Within this an important milestone of further linguistic development, according to Kristeva, is the 'thetic' phase in which the child separates the signifier (Sn) from the signified (Sd) by means of the thetic act of dissection (/):

$$\text{Sign} = \text{Sn/Sd}.$$

By freeing the sign from the material object and by repression (displacement) of unwanted affects this 'thesis' or proposition, by establishing a fixed 'abstract' meaning, enables the creation of a pure emotion-free signifier: the *symbol*. But unlike Lacan, Kristeva regards this thesis as never fully established, as the affective dynamic of the inner semiotic space, the 'chora', in which communication comes to life, is always able to inscribe traces of the generative or nurturing emotion into the signifier. Because the affective semiotic and the emotion-free symbolic realm continue,

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8.   From my understanding the idea of the semiotic chora could go hand in hand with Trevarthen's concept of amphoteronomic (physiological) and synrhythmic (psychic) regulation between mother and child in early multimodal dialogues (see Trevarthen 2010).

due to unconscious powers (the subject-in-process as a so called 'unary split subject'), to oscillate in each speaking subject as the two inseparable modalities of the signifying process, the affective (maternal) foundation of language is not lost in later steps of language development.

Thus, in sum, meaning occurs when the affect dynamic of a subject linked with others is inscribed as an emotional marker from the unconscious into the linguistic surface structures: "That is, the semiotic element makes symbols matter; by discharging drives in symbols, it makes them significant." (Oliver 2002: xv).

For further discussions, a comparable theory, less tied to primitive body functions and their regulation by maternal care than in psychoanalytic theory, is proposed by Susan Langer (1942, 1953) in her analysis of the 'art' of philosophy, music and language (see Kühl 2007), which could enrich an emotion integrating approach of language learning.

3.   Intersubjectivity: The crucial role of relational emotions in infant semiogenesis

After analysing how the connection between emotions and language development has been conceptualised in the nurture/culture pole of language acquisition theory, where emotional factors are given more importance, let us now consider what kind of support there is for the impact of emotions on the infant's semiogenesis from recent semiolinguistic (see 3.1) and neuropsychological (see 3.2) research (Lüdtke 2005, 2006 a/b). By summarizing and combining evidence from these complementary directions of research, I will propose that the concept of 'intersubjectivity' seems to be the frame that best bridges them (see Section 4).

3.1   Support from semiolinguistic research

Historically, developmental literature is well developed in the field of linguistic studies, whereas little published work has focused on semiotic development. Outstanding exceptions are Trevarthen's early "Signs before speech" (1990) and "Infant semiosis" (1994), as well as Zlatev and Andrén's recent "Stages and transitions in children's semiotic development" (2009). They all point at directions for future theoretical, as well as empirical based work.

3.1.1   *Two linguistic modes of emotion representation in early communication: Internal state language and infant directed speech*

From either a semiotic or a general linguistic perspective, feelings of communicating subjects can be represented as the immediately perceivable surface of signification in

two different linguistic modes (following Konstantinidou's (1997) terminology): in an *emotional* mode, in which emotions are explicitly denoted e.g. as by the words 'sad', 'happy' or 'pleasure', and in an *emotive* mode, in which they are implicitly connoted by association e.g. as in 'September 11th' (see overview in Foolen et al. 2012).
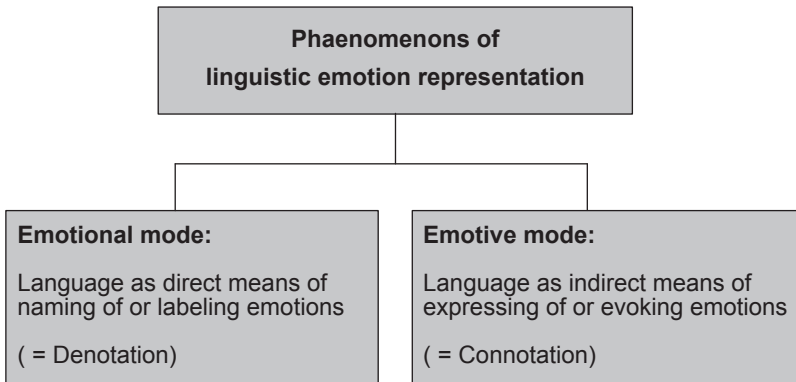
Figure 3. The two linguistic modes of emotion representation

Focussing on the developmental impact of emotions these two modi can be clearly identified in early communication.

The first emotional mode has been recently analysed by research of the so-called 'internal state language' (e.g. Kauschke & Klann-Delius 1997) (see Figure 4), which focuses on two aspects. First, identifying the stages of acquisition of lexical-emotional categories in children between 18–36 months, which start from very body-based categories, such as feeling unwell or physiologically stressed or weak, moving towards denotation of volition, affects and capability and finally moral feelings and judgements. Second, the functional stages of acquisition become more and more clear: in the beginning the simple but clear denoting of own, other und relational emotions (e.g. 'I am *angry*'; 'you are *sad*'), followed by talking about past and future emotions and then about triggers and consequences of emotions (e.g. 'I am *happy*, *because* this afternoon we are having ice-cream') and finally referring to emotions to change someone else's feelings and pretending of emotions in play (e.g. talking, *as if* I'm *anxious*).

Furthermore, psycholinguistics, referring to classical rhethoric mechanisms, provide many insights into implicitly inscribed emotional traces[9]: the second emotive mode (see Figure 5). In the early dialogues between mother and child these traces can become obvious at all linguistic levels of the mother's infant directed speech, 'motherese'. For example, at the phonetic level through specific intonation combined with

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9.   For early works on this issue see e.g. Jakobson (1960), Starobinski (1971).

Emotional mode: 'internal state language'	
Stages of acquisition of lexical-emotional categories (18–36 months):	**Functional stages of acquisition (18–36 months):**
– Internal perception/physiology – Volition – Affect – Capability – Moral	− Denoting of own, other und relational emotions − Talking about past and future emotions − Talking about triggers and consequences of emotions − Refering to emotions to change someone else's feelings − Pretending of emotions in play

Figure 4. Emotional mode: Lexical and functional stages of acquisition of 'internal state language' (ISL)

Emotive mode: 'infant directed speech'		
	Rhetoric mechanism	**Motherese examples**
Phonetic/ phonological level	– Onomatopoeia – Alliteration – Vowel stretching	→ Splash, buzz → Beddy-bye (go to bed, bedtime), din-din (dinner) → Peek-a-boo
Morphological level	– Diminutive suffixes – Reinforcing prefixes – Abbreviations – Rhyming	→ Jammies (pajamas) → Super–… → Nana (banana) → Humpty dumpty
Lexical/ semantic level	– De-personification – Metaphors	→ Pigs, dogs, cows → The crayon is blue like the sea.
Syntactic level	– Repetition, perseveration – Exclamation – Pausing	→ Oh yeah… oh yeah that's right! → Oopsie–daisy! → One ….– two ….– three …. –
Pragmatic level	– Teasing, playful provoking – Dialect, sociolect – Rhetoric questions – Bilingual code-mixing	→ I don't think you can do it! → I ain't done that. Why you say that? → Are we hungry? → Now it's time for your siesta, mi amor!

Figure 5. Emotive mode: Emotional traces on different linguistic levels of infant directed speech (IDS)

onomatopoeia in phonetic mimesis (e.g. '*splash*', '*buzz*'), alliteration (e.g. '*beddy-bye*', '*din-din*') or vowel stretching (e.g. '*peek-a-boo*'), at the morphological level by use of diminutive suffixes (e.g. '*jammies*'), reinforcing prefixes (e.g. '*super-…*'), abbreviations (e.g. '*nana*') or rhyming (e.g. '*humpty dumpty*'), at the lexical/semantic level through

use of de-personification (e.g. '*pigs*', '*dogs*', '*cows*') and metaphors (e.g. 'The crayon is blue *like the sea.*'), at the 'syntactic' level through repetitions (e.g. '*Oh yeah… oh yeah that's right!*') or even perseverations, exclamations (e.g. '*Oopsie-daisy!*'), and pausing (e.g. '*one …. – two ….– three ….–*') and at the pragmatic level by teasing or playful provoking (e.g. '*I don't think you can do it!*'), dialect or sociolect (e.g. '*I ain't done that*', '*Why you say that?*'), rhetorical questions (e.g. '*Are we hungry?*') or bilingual code-mixing (e.g. '*Now it's time for your siesta, mi amor!*').

3.1.2   *Emotional regulation of the signifying process*

By applying Simonov's (1986, 1991) model of the emotional regulation of behavioural activity to analyse the act of signification or the speech act we can examine how these implicit emotive signs can become manifest at the surface, since every part of the invisible signifying process is processed and regulated in depth by relational emotions: by the need and the motive to communicate meaning, the emotionally coloured memory of previous means and acts of signification, and of course the overall goal of communication to share something meaningful to somebody meaningful and to receive contingent and stimulating responses (see Figure 6).

In general the category of 'emotion'[10] is defined by Simonov as the hypothetical positive or negative result of evaluating how necessary and available information may satisfy a need at the given moment in a given context. In the case of the 'relational emotions' within a communicative dyad, the emotional monitoring and evaluation of the real other in communication plays a particularly important governing role as the result is reflected in the virtual other (VO) and the underlying 'meaning' or 'sense'. Maintenance or disturbance of the signifying process with any person is strongly dependent on a positive or negative representation of the virtual other who is to receive and accept it.

This model with its deeply intersubjective character shows how the meaningful emotional relationship with the communicative other can become manifest in verbally

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10.   In his book *The Emotional Brain: Physiology, Neuroanatomy, Psychology, and Emotion* Simonov (1986, 20–21) outlines the "reflective-evaluative" and therefore social and interpersonal functions of emotions by giving the following definition and formula:

> "In its most general form, the rule for the development of emotions can be represesnted in the form of a structural equation:

$$E = f[N, (I_n - I_a)…]$$

> Where E is emotion, its degree, quality and sign; N is the magnitude and quality of actual need; $(I_n - I_a)$ is the evaluation of probability (possibility) of satisfying the need on the basis of innate and ontogenetic experience; I_n is information on means predictably necessary for satisfying the need; I_a is information on means that the subject has available to him at the given moment."

or pre-verbally materialized signs and it gives clues how a child's negative representations of the virtual other, e.g. in the developmental context of a mother with borderline symptoms and her idiosyncratic sign production, can disturb the signifying process of the child on deep emotional levels due to non-contingent and non-satisfying responses (see Trevarthen 2010, see figure 13).
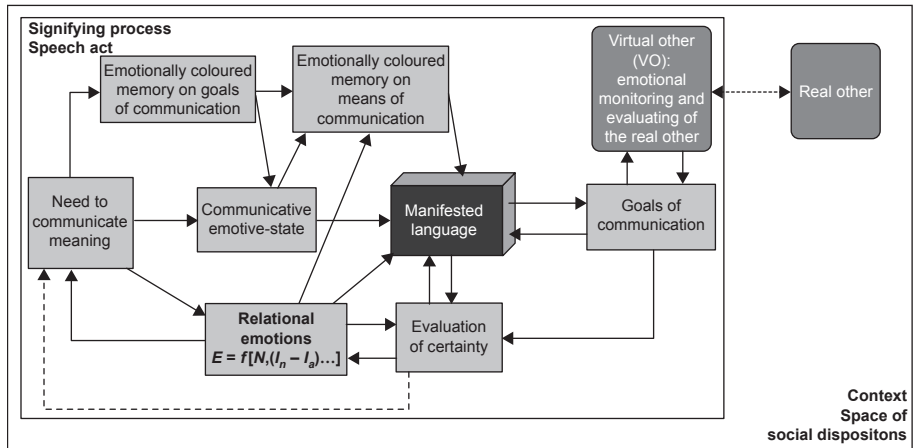
Figure 6. Emotional regulation of the deep levels of the signifying process (modified from Simonov 1986, Figure 4)

3.1.3 *Emotion in the three constituents of the child's signs*
If we consider any sign the child may manifest as a product of an emotionally regulated signifying process addressed to an other person, whether coded in body gesture, aesthetic or moral expression, or in spoken or written language, we must take into account that in all three constituents of the sign emotion can be present in varying ways and degrees (see Figure 7):

1. the manifested *material form*, either as a phone, a morph, a whole word or a letter, can be emotionally marked in various ways, e.g. in the emotional or the emotive modus on different linguistic levels (see Figure 4, 5);
2. the *used* object(s) referred to, can be embedded in shared more or less intense emotionally coloured virtual or real narratives;
3. and the *meaning*, an abstract entity either as phoneme, morpheme, lexeme, grapheme, can contain meaningful intersubjective emotional traces related to the communicative other(s) and dependent on the emotional quality of their Virtual Other (VO) representation, with whom this meaning was intersubjectively constructed (see Figure 11a–d).
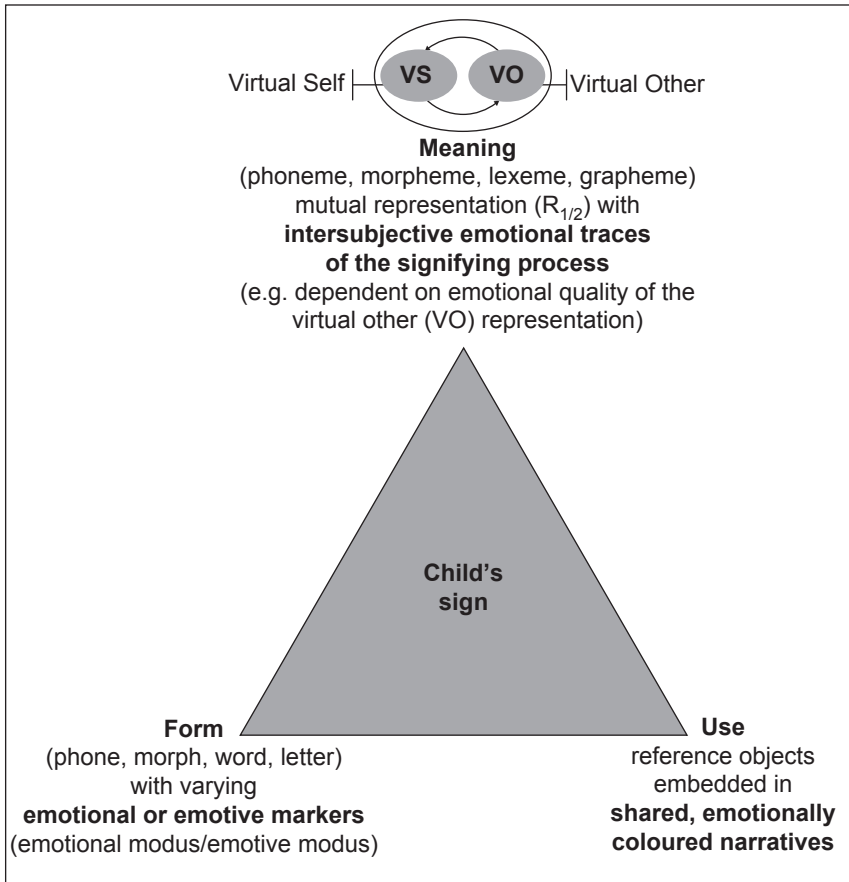
Figure 7. Presence of emotion in the three constituents of a child's sign

3.1.4   *Developmental primacy of intersubjective meaning*

In a deeper emotion-related analysis of how the meaning of signs emerges in early child-hood we can see that in the reciprocal processes of negotiation and validation by which intersubjective meaning-attunement is achieved, there is a 'meaningful' mutual virtual self-other-representation inherent, and this representation is emotionally charged for each subject in quantitatively and qualitatively varying degrees (see Figure 8).

If we take as an example mother and child or a child and a speech-language ther-apist playing with a doll, whose name to be learned is <Katy>, then the joint attention of both interacting and communicating partners is the reference object "Katy", which is nonverbally and verbally embedded in a shared emotionally coloured narrative. In the learning process neither the abstract meaning of/kati/nor the material articulative form of [kati] is learned by an instant and static cognitive 'intake' (R1, see figure 1a) of the presented auditive 'input' into the individual phonemic and/or lexemic repertoire of the child. Instead this process can rather be conceptualised as a slow and

dynamic process of meaning constitution by intersubjective construction, negotiation and validation, where polyphonic starting models are transformed step by step into mutual phonemic and lexemic representations (R1/2, see figure 1b) with intersubjective traces of the signifying process during play.

Signs as a whole seem therefore to be body-, perception-, interaction- and emotion-based. And as the ultimate goal of a growing child's communication is not only to mean something but to be 'meaningful to someone meaningful' (Trevarthen 2004a) we conclude that the intersubjective construction of signs within the mother-child-dyad is led by the *sharing* of intersubjective meaning, because only in this constituent is the emotionally important other present.

Meaning, form and use are closely interrelated in constituting a sign, semiogenesis, and hence language development starts with establishing the contextual inner inter-personal 'feeling of meaningfulness' before the correct outer form of either linguistic level (e.g. phonetics) is accepted by convention. As we will see later (see Section 5)
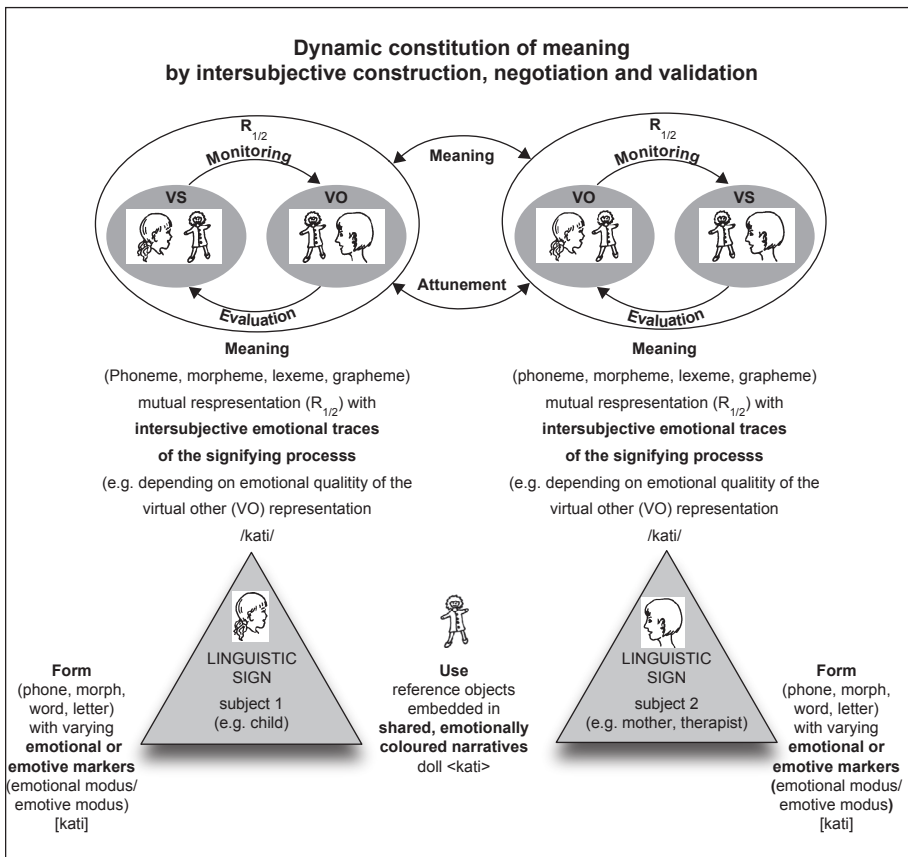
Figure 8. Developmental primacy of intersubjective meaning due to mutual representation of the emotionally important other

this fact is very relevant for early language intervention, as in those developmental disorders where a disturbance of relational emotions is at its heart this developmental primacy has to become a therapeutic primacy. Only then language intervention for developmental communicative and/or language disorders is able to start at the intersubjective core and not remain at the periphery of training formal linguistic correctness (e.g. training of correct articulation or sentence patterns).

3.1.5 *Decreasing emotional markedness of the child's "signifiers"*

If we turn away from meaning or the "signified" and move instead towards an analysis of the sign's material form or the "signifier" then we can make the very important observation that even though the developmental primacy of meaning stays throughout the whole period of language acquisition (see Section 4), the emotional markedness of the child's signifiers gradually decreases in course of time, along with its 'disembodiment' (Ruthrof 2000) and, I would add, with its 'de-emotionalisation'. This developmental journey of the signifying child can be described as a trajectory from embodied and emotionally charged iconicity to disembodied and purely informative and rational symbolicity (see Figure 9a–c). According to Ruthrof, though, natural language meaning as never fully symbolic (Ruthrof 2010).

In a more detailed semiogenetic analysis, which includes the model of the emotionally regulated signifying process (see Figure 6), we imagine a child who has a need and a motive to communicate and who wants to express and share meaning via verbal and nonverbal signs. Following Peirce (1931–58) we can define and classify these signs according to their degree of emotional markedness of the signifier: the signifiers of 'icons' are very strongly marked, those of 'indexes' are moderately marked, and 'symbols' almost not marked by emotion.

– In an *iconic mode* the child realizes its need to communicate with analogical signs, which represent their objects by means of '*similarity*' in the form or amplitude of often strongly emotionally marked or 'value laden' signifiers – for instance, very open, wide and expanding facial, gestural, vocal and phonetic expressions, which *resemble,* as an outer expression, the equivalent quality and emotional properties of the inner sensations of 'open', 'wide' and 'expanding' psychophysiological sensations of 'joy'. Or they portray, in aesthetic form or 'shape', the object in mind, as in the drawing of a 'sun' that looks like the sun in the sky with its rays radiating from a centre (see Figure 9a). It can be seen in these two examples that icons facilitate communication by conveying similarity; they have universal comprehensibility by immediate direct reciprocal meaning-attunement (see Figure 15).

– In an *indexical mode* the child chooses certain signs as 'expressions of intention' to communicate a certain meaning – for instance making a specific vocal gesture to indicate hunger, a specific manual gesture to indicate the urge to have and hold
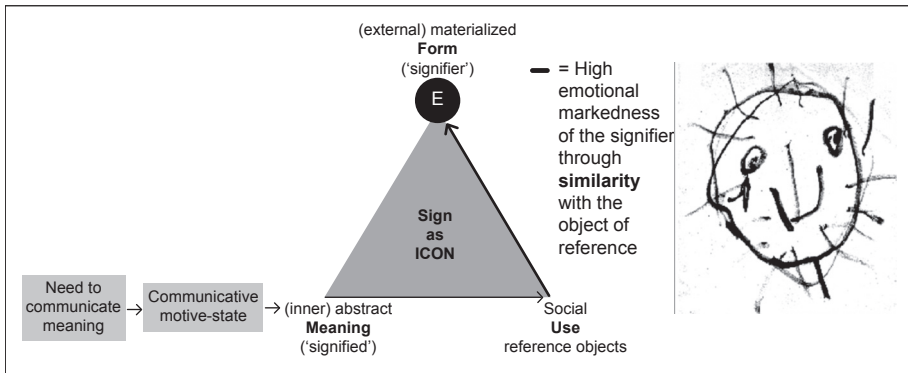
Figure 9a. The sign as *icon*: High emotional markedness of the signifier due to similarity with the reference objects
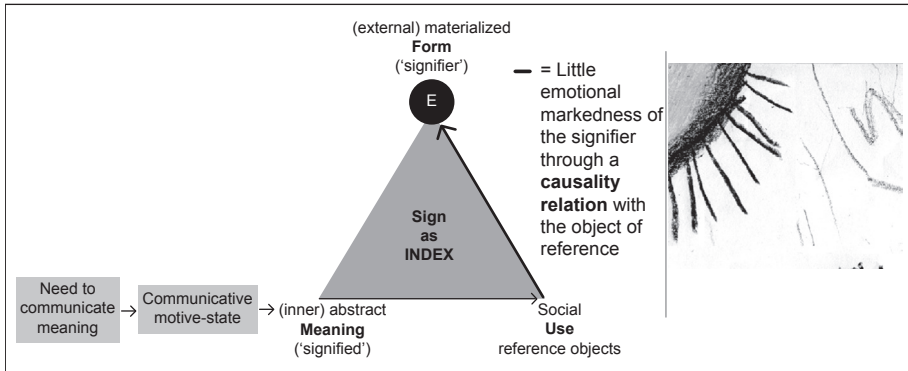
Figure 9b. The sign as *index*: Little emotional markedness of the signifier due to a causality relation with the reference objects

a ball or a doll, or a drawing of a sequence of dots, lines and curves on a piece of paper to indicate a sun or house (see Figure 9b). Though in Figure 9b the sun has some iconic features – it is rounded – and it has aesthetic ones – as the rays are spike-like – this representation is abbreviated and has more synoptic coding that depends on sharing of 'conventions' or 'habits. Child and mother "know" those ways of showing the sun from many previous communicating contexts.

The index *indicates* something by intending a direct physical or causal connection of the signifier with the signified – an intentional link that can be observed or inferred by the decoding subject. As the emotional qualities of the signified are conveyed via a causal association by *contiguity* the signifier is here only moderately emotionally marked. In all these examples it is obvious that the comprehensibility of indexes becomes much more difficult, because the meaning can only be grasped due to inference combined with previous or contextual experience so that

the mother might understand and respond to the child's signs in the expected way but an accidental visitor or somebody from another cultural context could not (see Figure 15).[11]

–   If a child articulates his/her first words or verbal phrases or if he or she draws his/her first letters of the alphabet to spell a word (see Figure 9c) then they are able to use the *symbolic mode* to convey meaning. These signifiers in the form of symbolic signs have almost none of the emotional markers, because they represent the signified object by pure *arbitrarity,* learned convention, which may lack all analogue emotional properties and, as Ruthrof (2000) points out, are disembodied signifiers which lack as well their perceptual grounding. Signs become symbols by being 'abstracted' from what can be perceived from or felt in the 'concrete present'. The use and the comprehension of symbols is a skill that must be learned 'properly' – the link between signifier and signified is established in a certain language community by *conventional* law alone. Due to this purely *indirect cognitive mediation,* symbols in spoken or written language are highly culture specific as both encoding and decoding subjects need to share the relevant normative knowledge, i.e. the child who speaks or writes a word like 'sun' has to have learned the specific phoneme-grapheme-correspondence of his or her community (see Figure 15).
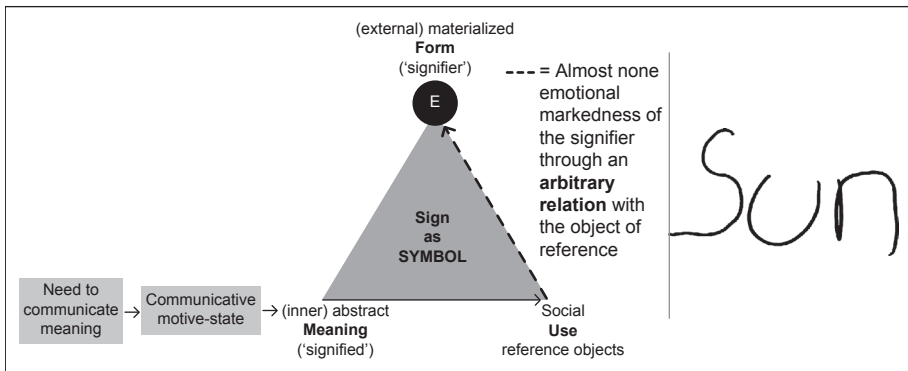
Figure 9c. The sign as *symbol*: Almost none emotional markedness of the signifier due to an arbitrary relation with the reference objects

In summarizing this trajectory within the language continuum we recall that (following Peirce) symbols do not come into existence *de novo* – they develop from 'icons'.

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11.   In future discussions Halliday's (1975) account of the development of 'acts of meaning' in 'proto-language', especially his definition of the functions of vocal expressions of feelings in combination with intentions to act expressed in gesture should be considered as well.

This important conclusion clarifies two complementary developmental tendencies in semiolinguistic development (see Figures 10 and 12):

–   In the course of development, the emotional markedness and the corporeality of the signifiers decreases as their degree of abstraction increases.
–   At the same time the initial inter-semiotic and multimodal means of communication – the parallel existence and merging of vocal language, body language and aesthetic/emotional language decreases and becomes focused and concentrated in an entirely oral or written linguistic medium.

Figure 10. Developmental trajectory: The decreasing semiogenetic impact of relational emotions during language acquisition

The initial overflowing of communication with a wealth of emotional markers on all levels leading to the final mastery of the symbolic function by the child might be explained as due to growing cognitive control, an explanation in terms of shared intentions and emotional evaluations of actions which is complementary to the previously described psychoanalytic interpretation based on a reduced theory of basic bodily functions or drives.

3.2   Support from neuropsychological research

The primary importance of relational emotions in children's semiogenesis has become clearer with the advent of new findings from neuroscience. A fundamental shift of understanding of the innate foundations for communication has come from the

insight that cognition and emotion are not isolated but closely integrated within the functional organization of the brain (e.g. LeDoux 1998, 2000; Borod 2000; Lane/Nadel, 2002; Nelson/Luciana, 2001). This insight has not been recognized by the Cartesian mainstream of Western science of the mind: Descartes argued for the existence of 'pure reason' (see Damasio 2005) and Chomsky (e.g. 1966) urged to view language primarily as a 'mirror of [rational] mind'.

3.2.1   *Emotional influence on cortical differentiation and the child's cognitive-linguistic skills*

Direct evidence for the interplay between emotion and cognition may be found in neuroscientific research on the development of cognitive and emotional systems in the brain of a child (Trevarthen 1998, 2001). Trevarthen & Aitken (1994) for instance, reviewing the psychophysiological foundations of learning, propose the existence of emotion generating structures, the so-called 'Intrinsic Motive Formation' (IMF), in which motive states direct the process of development of actions and awareness to eventually communicate relational emotions such as affection, love, pride or anxiety. The neural organization of this formation can already be detected among the first growing connections in the core of the central nervous system of seven weeks old embryos, and these primordia of affective neural systems influence early brain differentiation via neurochemical projections into the neo-cortical regions (Joseph 1999; Cicchetti 2002; Nadel/Tremblay-Leveau, 1999; Lane/Nadel, 2002; DiPietro 2004; Tucker 2001; Tucker et al. 2000). As this emotional influence on the brain's plasticity and capacity for cognitive learning is confirmed for later stages of development (e.g. Cicchetti 2002) many neuroscientists have come to the conclusion that the cultural learning that finally results in elaborate cognitive skills – including language – is fundamentally dependent on a socio-emotional context set up in how the brain grows (Panksepp 1998, 2003; Damasio 2000, 2005; Freeman 2001; Porges 2001).

3.2.2   *Communicative mother-child dyad as psychobiological dyad*

The primary socio-emotional context in early development is usually the mother-child-dyad. According to Schore (1994*), Panksepp (1998, 2003) and Trevarthen (2001, 2010), this dyad should be conceptualised as a psychobiological dyad constituted by reciprocal neurochemical parameters of function. Based on the prenatal psychobiological dispositions, the intersubjective communication of relational emotions between mother and child manifests itself even before birth and becomes rapidly more elaborate after birth (see Figure 11a/b). This happens via the co-construction of manifold narrative[12] rhythms, patterns and structures, which are merged with equivalent

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12.   For further discussion of the concept of „narrative" see e.g. Bruner's (1983, 1990) statement that we are 'story-making creatures', Stern's (1985, 2010) 'protonarrative envelopes' of vitality and Malloch's (1999) definition of 'musical narrative'.

psychobiological rhythms, patterns and structures, so that in the course of postnatal development an emotional-narrative dyad is established which regulates both development of the intentional self and a psycho-social awareness of action in relationships. In extension of the attachment theory of Bowlby (1978), this shared space – established by 'brain-brain-conversation' mediated through body movements and their perception (Trevarthen 2012) – is found to be not only a space of affective bonding adapted to secure the protection, comfort and nurturing of the infant, but a developmental space that provides the socio-emotional background for the child's cultural learning, and in particular the learning of conventions in pre-linguistic and linguistic communication.

3.2.3 *Communicative function of mirror neurons and mirror systems in early childhood development*

In the 1980s the research group of Rizzolatti discovered, in monkeys, the so-called 'mirror neurons', and then systems of homologous neurone assemblies were identified in the human brain (Rizzolatti et al. 1996, 2002). These neuronal systems are active not only when a monkey or a human being performs a certain action by themselves, but also when they merely observe how another subject performs an action with that intention. Building on this discovery, Rizzolatti and Arbib (1998) proposed the original thesis[13] that, given the ability to mirror actions as a prerequisite for the intersubjective construction of communicative signs, 'mirroring' of such intentional actions as manual gestures could be the phylogenetic and ontogenetic origin of language development (see also in Li/Hombert 2002; Stamenov/Gallese 2002; Vihman 2002; Studdert-Kennedy 2002; Gallese et al. 2004; Hari/Nishitani 2004*).*

Trevarthen (e.g. 2004b, 2001), applying the knowledge gained by detailed observation of the reciprocal imitation in proto-conversations between mothers and young infants (e.g. Akhtar & Tomasello 1998; Kugiumutzakis 1998; Malloch 1999; Bråten 1998, 2002, 2009; Gratier 2003; Oster 2005; Reddy 2005), extends this socio-motor approach by integrating the subcortical socio-emotional aspect. His thesis is that not just the mirroring of manual or oral gestures but the mirroring of emotions must be the primary organizer in the brain of a child's semiolinguistic development. To understand this we have to go back to the IMF-concept and connect it with a second concept: the 'emotional motor system' (EMS), which consists of the fibres and nuclei of the cranial nerves I-XII and their associated sensor-motor areas 1–12, which generate and regulate the expressive movements of mouth, face and eyes (Trevarthen 2012).

In the communicative process the EMS has the function to transform information about internal self-sustaining motive states generated by the IMF and their associated affective regulations into externally perceivable emotional expressions of the EMF,

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13. For further discussion it should be taken into account that this brief original paper has since been criticized, defended and extended.

for instance via facial, gestural and vocal expressions. These signal internal states and intentions to others enabling 'co-regulation' of both emotional and cognitive/intentional states of mind (Tronick 2005; Trevarthen 1993, 1994, 2001, 2009).

3.2.4   *Innate intersubjectivity as psychophysiological anticipation of an emotionally responding other*

Though Trevarthen's model describes in detail the inherent competence of even a newborn to mirror, express and share relational motives and emotions with a sympathetic partner, this is not the main purpose of his research. Rather his 'Innate Intersubjectivity Theory' attempts to explain the psychophysiological predisposition of the child to be a *social* and *relational* human being or 'person', who not only needs a communicative other for cultural learning, but who can anticipate his or her emotional responses intuitively, from birth (Trevarthen 2010, 2012 and Frank/Trevarthen in this book*).*

4.   Meaning-attunement: Children's trajectory from emotional to cognitive dominance in the intersubjective constructions of signs

The previous section argued for the crucial role of relational emotions in infant semiogenesis with support from recent semiotic and neuropsychological research. Here I show how these ideas can be combined in the analysis of children's semiolinguistic development. In describing four major milestones in the interpersonal attunement of affect and meaning I present a model of the children's trajectory from emotional regulation to cognitive dominance in the intersubjective construction of signs.

4.1   The intrauterine stage: Primordial intersubjectivity

Already during the intrauterine stage the foetus appears to have the capacity and motivation to 'communicate' with the mother actively by means of body movements that can stimulate her and with growing proprioceptive awareness by self-touching and posture changes that may engage with the actions and feelings of her body (see Figure 11a) (Piontelli 2002, 2010). The intersubjective exchange of emotionally important proto-narratives in this earliest stage of the development of communication, which operates here as a 'primordial intersubjectivity', is constituted by means of a shared inner 'object of reference': the individual, but shared, psychophysiological, 'proprioceptive' and 'autonomic' self. The mode of communication of motive impulses and self-feelings is iconic, because the child's movements, in so far as they may function as semiotic 'signifiers' conveying similarity in communication with the mother's body activities, are permeated by archaic manifestations of bodily discomfort and stress or well-being in mutual 'amphoteronomic' (shared autonomic) regulation (Schore 1994;

Trevarthen et al. 2006). Meaning attunement from the mother's side takes place via permanent monitoring- and evaluating-processes between the real or 'felt' and virtual or 'imagined' infant and herself.
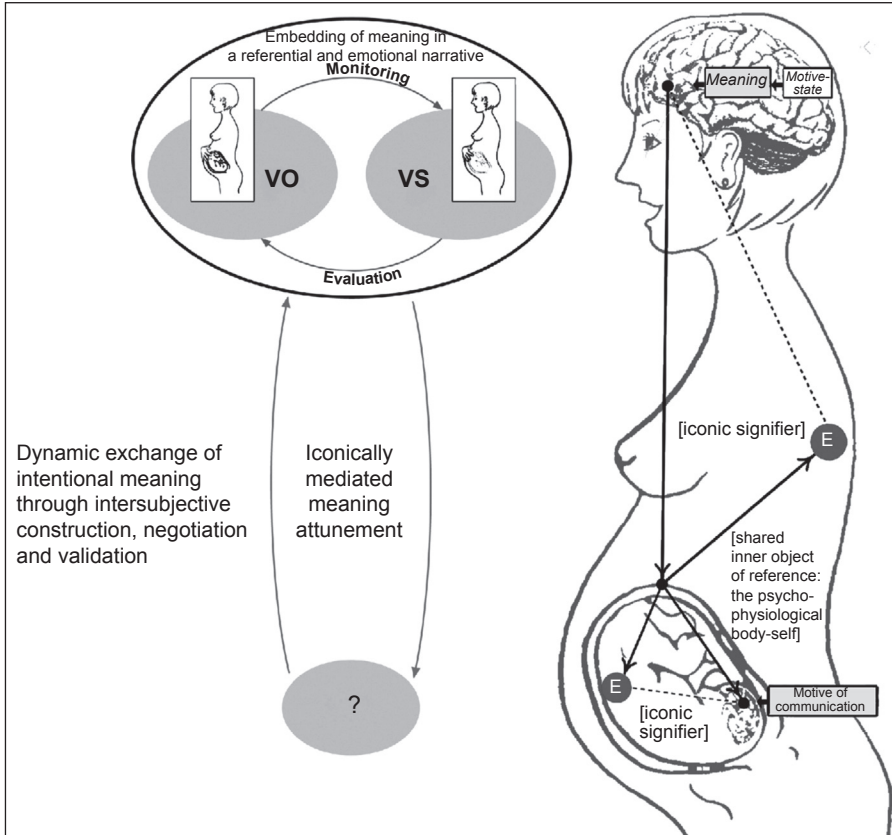
Figure 11a. The intrauterine stage: Iconically mediated meaning attunement

4.2 The infant stage: Primary intersubjectivity

After birth the neonate expands this intentional communication as action and awareness, open to a much bigger and potentially more 'intelligent' sign repertoire mediated by auditory, visual and tactile 'distance receptors'. The intersubjective exchange of emotionally important narratives,[14] in 'primary intersubjectivity' (Trevarthen 2001) is now mediated by a shared 'object of reference' at the interface between the inner

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14. 'Narrative' here has the 'aboutness' of a cycle of animation and emotional regulation as in a musical or poetic verse or stanza. The neonatal mind has these cycles and they may engage

and outer worlds, with a human partner: the quality and timing of every expressive gesture/vocalisation/expression and their 'narrative sequencing' in the mutual inter-semiotic display of facial, manual, vocal and eye expressions between mother and infant (see Figure 11b). Meaning attunement between mother and child is now a process of iconic and indexical referring within an inter-semiotic display. Each response to the expressed form ('signifier') of the other can either be 'similar', as in the case of the mimetic imitation (see e.g. Kugiumutzakis 1998; Meltzoff/Moore 1997; Nagy/Molnár 2004; Reddy 2005) of a smile, or 'indicating', as by looking at the other in a questioning or challenging way.
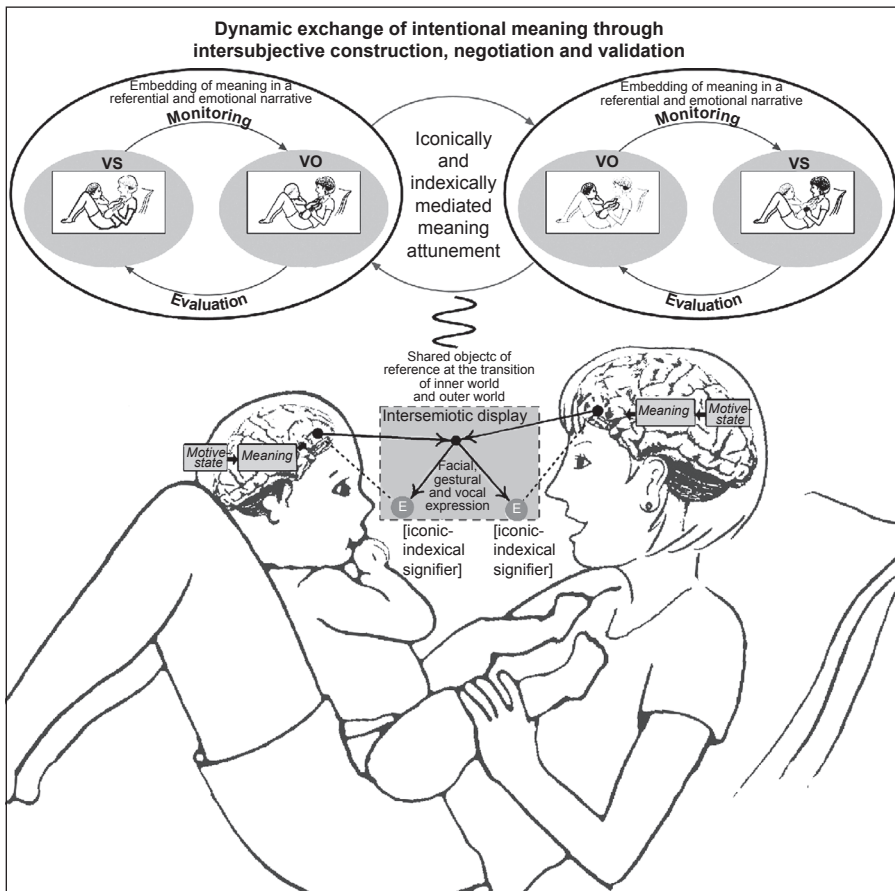
Figure 11b. The infant stage: Iconically and indexically mediated meaning attunement

with homologous and rhythmically commensurate of the adult motivations, without reference to outside specifics (as described by Kühl 2007 & by Malloch 1999; Malloch/Trevarthen 2010).

4.3   The toddler stage: Secondary intersubjectivity

Around the first year with the emergence of the first proto-words, such as "mama" or "dada", the transition from the prelinguistic-semiotic towards the protolinguistic stage takes place with new cognitive control. The intersubjective exchange that comes about in the development of 'secondary intersubjectivity' (Trevarthen 1977; Trevarthen & Hubley 1978) leads to a shared concrete and real object of reference, such as a doll or other 'toy', which is attended to in a complex and emotionally animated playful narrative (see Figure 11c). Meaning attunement between toddler and caretaker may now be mediated symbolically (see Halliday 1975; Trevarthen 1990; Reddy 2005), if a linguistic 'signifier', such as the word 'doll' is used to name the object of shared interest. Disregarding any accompanying indexical signs of eveluation of mutual attunement, it is arbitrary, accepted as a social convention that may claim meaning without subjective emotional markers connected with the reference object.
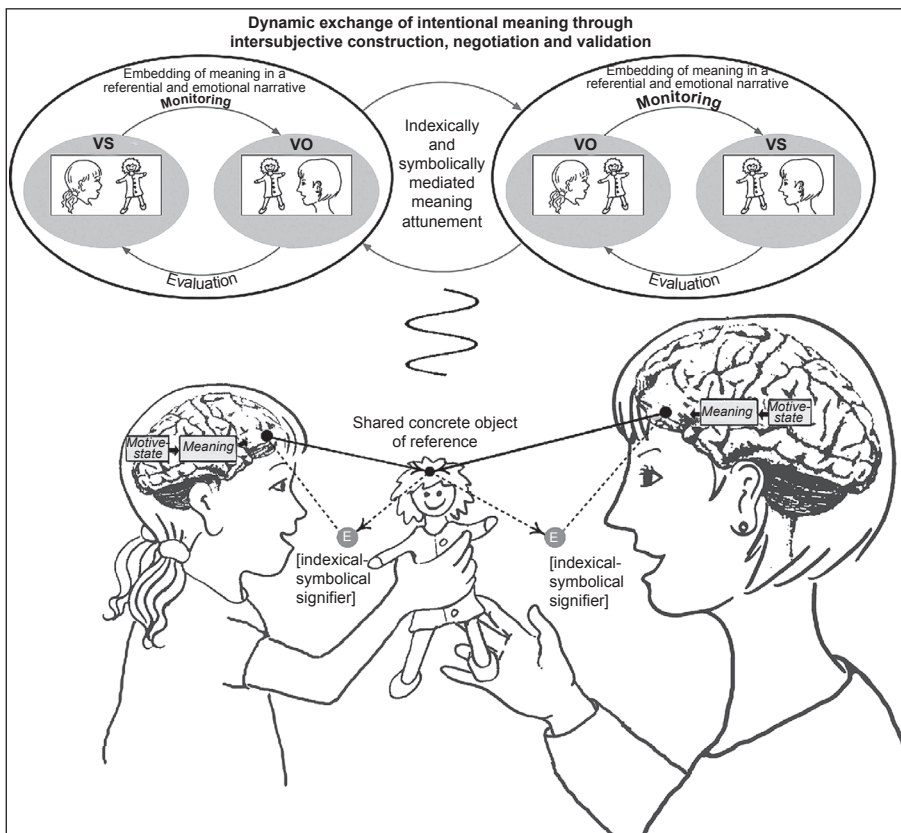
Figure 11c. The toddler stage: Indexically and symbolically mediated meaning attunement

4.4   Primary school children: Tertiary intersubjectivity

The completion of basic linguistic development is reached around the age of 4 when cognitive control has been more or less firmly established in culturally accepted forms. The intersubjective exchange may now be distinguished as 'tertiary intersubjectivity', which requires the construction of complete linguistic enunciations constituted to describe a shared abstract object of reference – e.g. the concept of 'tidiness' or 'punctuality' (see Figure 11d). Meaning attunement is here entirely symbolic, as the verbal linguistic 'signifier', for example the uttered word 'tidiness' is made up of complex morpho-syntactical structures, all of which are entirely arbitrary without any necessary emotional traces (though the signified *concept* of tidiness, perhaps applied to the 'bedroom', is of course individually, interpersonally and even culturally marked and will have emotional connotation).
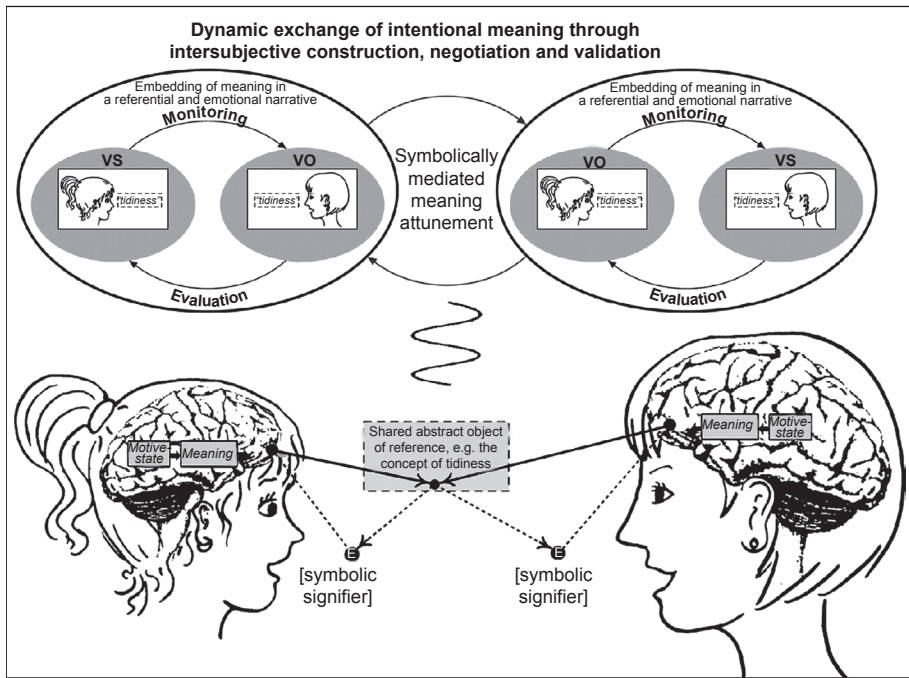
Figure 11d.   Primary school children: Symbolically mediated meaning attunement

4.5   Summary: Intersubjectivity and relational emotions as the primary organiser of children's semiolinguistic development

If we summarize both the models arising from the findings of semiolinguistic and neuropsychological research, as well as our considerations regarding the four different

stages of meaning attunement in childhood, then we can come to the conclusion that the concept of 'intersubjectivity' with its underlying relational emotions and motive changes could be considered as the primary organiser of language learning and language development (see Figure 12).

Hence we propose a distinct intersubjective theory of language development, which focuses primarily on the semiogenetic potential of relational emotions. Two theoretical innovations which are implied in this new intersubjective attempt to explain language development should be mentioned briefly: First, in opposition to the nativist and cognitivist theories of language development we perceive language development as a trajectory within a semiolinguistic continuum which does not reduce language to a logocentric system of arbitrary linguistic symbols; second neither birth nor the utterance of first words are regarded as the beginning of symbolic communication, but, in accord with the psychoanalytic perspective and Kristeva's concept of the thetic separation, the affective and embodied roots of signification are from that decisive point onwards subdued to the cognitive control of the 'symbolic order', but can still be seen in the phenotext as inscribed emotive traces from the genotext (Kristeva 2002b).
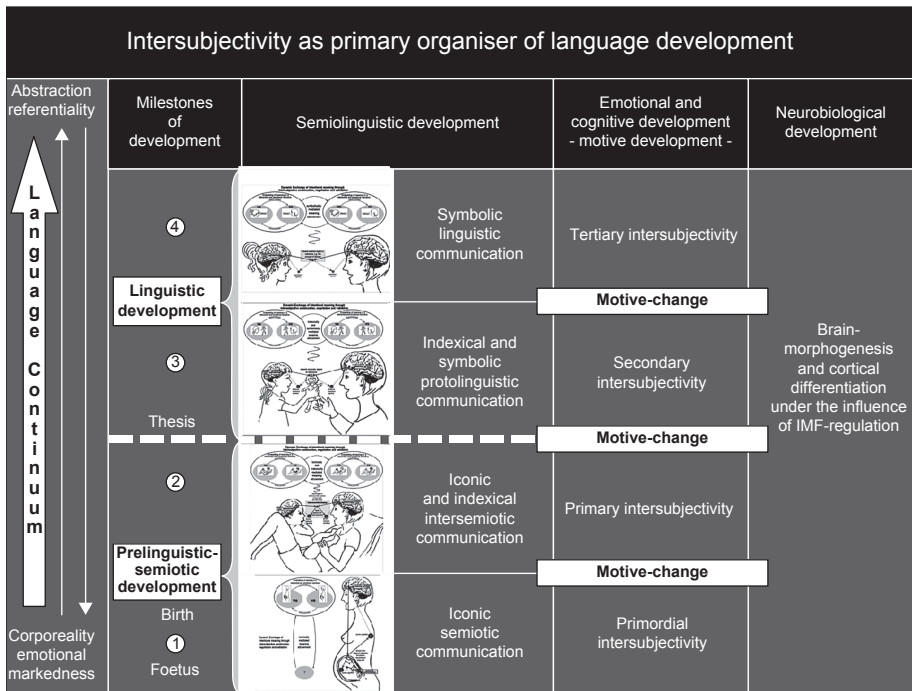
Figure 12. Intersubjectivity and relational emotions as the primary organiser of language learning

5.   The 'Significant Other': From relational emotions to 'Relational Language Therapy'

> Infant semiosis is emotional, not just representational or referential. It is fundamentally "self-with-other-referred" […]. Cultural exploitation of the environment is entirely dependent on the innate mirroring mechanisms that link human minds which have different age, experience, and skill. Educational practices depend on this intersubjective system and the collaborative learning it makes possible.   (Trevarthen & Aitken 2001: 16–25)

I wish to conclude by outlining the concept of 'Relational Language Therapy'– a therapeutic language learning approach, which views the relational emotions and especially the emotion based impact of a 'Significant Other' as central for the professional support of children's semiolinguistic development.

5.1   Definition and aim of a Relational Language Therapy

Relational Language Therapy can be defined as a therapeutic approach which focuses on the relevance of relational emotions because it views children's semiolinguistic development and therefore many developmental communication and/or language disorders (e.g. parts of autism spectrum disorders or severe deprivation) as based on or influenced by emotionally imbalanced intersubjective developmental contexts (e.g. influenced by poverty, migration or severe illnesses of the mother or important caretakers).

As dialogue can be defined as the intersubjective co-construction of information bearing and meaningful verbal and non-verbal signs, generated, regulated and processed by affects, and their exchange in all codes and modalities the focus is on building or improving the dialogue capacity through intersubjective constitution of mutual representations within emotionally important narratives.

The general aim is the transformation of idiosyncratic signs (e.g. multimodal autostimulation, unintelligable verbal neologisms) into conventional semiotic and/or linguistic signs.

5.2   Relational roots of developmental communication and/or language disorders

Referring to Trevarthen's (Aitken & Trevarthen 1997) considerations about imbalanced Self-Other-representations in mother-infant-dyads (e.g. children with Autism Spectrum Disorders, Williams-Beuren-Syndrome, Down-Syndrome, Rett-Syndrome and ADHD, or mothers with Borderline-Syndrome, Postnatal Depression or Posttraumatic Stress Disorder) we would like to explain and illustrate with an example (see Figure 13) the relational roots of a distorted semiolinguistic development which may lead to different developmental communication and/or language disorders.

For instance in Postnatal Depression the Self-Other-representation of both communicative partners may be affected and can lead to a distortion of dialogicity.

On the mother's side, her internal model of Self and self-expression (CS) may be distorted, and the caregiver's experience of the infant (cs/i) is both indistinct from the Self and distorted (Figure 15, left). This emotional context can lead to idiosyncratic changes in one or all three constituents of the signs the mother is communicating towards her child:

–   The transmitted *meaning* can be shifted towards emotionally altered contents (e.g. *emotional regression, broken taboos, violated norms*); therefore the mutual representation of meanings can be shadowed by negative emotions due to traces of a distorted Virtual Self and an indistinct Virtual Other within.
–   The manifested outer *form* of the mother's communicated signs can be affected by an altered display in one ore several codes (facial expressions, gestures, voice, verbal language) either through a huge emotional markedness, which can show up as *being 'flooded' by negative markers* or as *perseverations* and *stereotypes*, or as well through an emotional '*blankness*', '*emptiness*' or '*coldness*'.
–   Finally also the shared *use* of the reference object(s) can be negatively altered through the *absence of joined playful activities* and/or *missing joint attention*; furthermore existing play activities could be embedded in *narratives* emotionally negatively coloured by *sorrow*, *depression*, *lethargy* or *heaviness*.

Consequently, the infant's experience does not fit well the natural model or 'Virtual Caregiver/Companion' and is thus confused (IC?). This will weaken the infant's Expressed Self (IS) (Figure 15, right). On the child's side this can lead as well to idiosyncratic changes in one or all three constituents of the signs it is transmitting in return towards the mother:

–   The *meaning* transmitted by the child can be shifted as well towards reciprocally emotionally altered contents (e.g. *repulsion* or *neediness*) and therefore the mutual representation of meanings can be shadowed accordingly by negative emotions due to traces of a distorted Virtual Other and a weakened Virtual Self.
–   The manifested outer *form* of the child's communicated signs can display as well in one ore several codes (facial expressions, gestures, voice, verbal language) a huge emotional markedness, which could be expressed on one hand side *as loud crying* or *screaming* maybe accompanied by *heavy banging*, on the other side gradually as a 'mirrored' or 'copied' emotional *blankness* or *emptiness*.
–   Finally also on the child's side the shared *use* of the reference object(s) can be negatively altered e.g. through withdrawal from the negatively coloured *narratives*, *increasing nervousness combined with decreasing joint attention* or by *developing autocentric, isolated, non-dyadic, monologous play activities* and *narratives* with

idiosyncratic or *aggressive* and *destroying* acts which *discharge the accumulated negative relational emotions.*
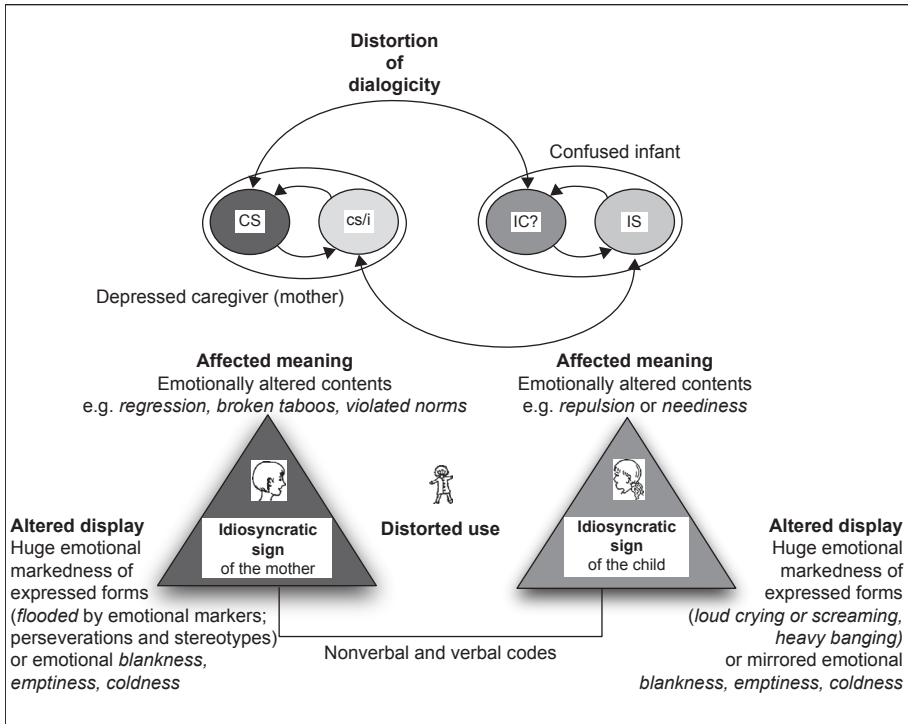
Figure 13. Relational roots of a distorted semiolinguistic development eventually followed by Relational Communication and/or Language Disorders (upper part of the figure modified from Aitken & Trevarthen 1997, Figure 6/I)

5.2   From the 'Virtual Other' to the 'Significant Other'

To re-balance such distortions of dialogicity a rebalancing of the relational emotions has utmost priority. We propose that in therapeutic processes the Virtual Other has to become a 'Significant Other' (see the 'Generalised Other' Frank & Trevarthen, this volume) – referring here to our outlined concept of signification, where primarily the affective traces of signs makes them significant. The Significant Other has to become the embodiment of a dialogic partner who helps to restore dialogicity by creating and offering the relational emotional bases for the intersubjective construction, negotiation and validation of meaning and their verbal and nonverbal expression.

5.3   Didactic relevance of relational emotions and the Significant Other

To succeed in the transformation of idiosyncratic signs (e.g. multimodal autostimulation, unintelligible verbal neologisms) into conventional semiotic and/or linguistic
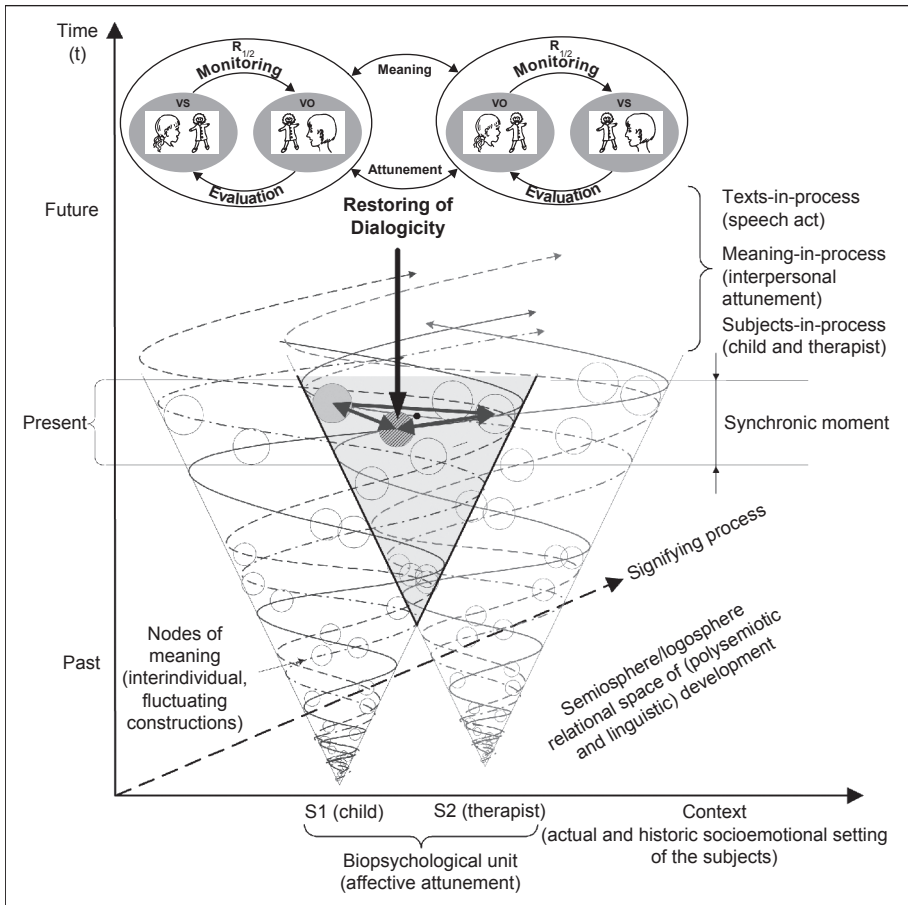
Figure 14. The restoring of dialogicity by the 'Significant Other'

signs, which was identified as the overall aim of Relational Language Therapy, the most important decision is to diagnose on which level of semiolinguistic development the child is stuck or led astray and where it needs to be met to be supported towards his or her zone of proximal development (Vygotsky 1986 [1934]).

All of the earlier described and analyzed semiotic features of communicative signs, e.g. motivatedness, emotional markedness, enculturation, mutual construction, variability of interpretation, in their appearance as icons, indexes or symbols have high didactic relevance (see Figure 15). In contrast to many other therapies decisions about therapeutic materials, such as sensory stimuli, picture books, talker or word cards, are here viewed as secondary, because they are deeply interrelated or even dependant on the Significant Other:

– Work on the *iconic level* of the child is highly dependant on the Significant Other as the learning of iconic signs is embedded into the communicative dyad and their
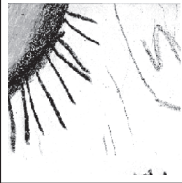
Didactic relevance of semiolinguistic development in relational communication and language disorders			
Semiolinguistic development	Emotional regulation → Cognitive control Multimodality of body- and affect-based codes → Focussing of the abstract verbal code		
Classification of the sign	**ICON**	**INDEX**	**SYMBOL**
Semiotic features with didactic relevance			
Motivation and relation to the reference objects	Highly motivated due to similarity	Little motivated due to causality	„Empty" without any object motivation due to arbitraity (convention)
Emotional markedness of the, signifier'	High amount of emotional markers	Few emotional traces	Abstract
Enculturationl and socialisation of emotional expression	Archaic universal	Shaped by socio-cultural ex-periences	Conventionalized fixed „display" -rules
Emotional quality of intersubjective meaning construction	Direct psycho-physiological sympathy, mirroring	Indirect reacting	Purely cognitively mediated
Variability of interpretation	High	Medium	Low
Medium (and material) to teach and learn the sign	**Communicative dyad** Joined sensory perception (to be seen or felt) and contingent replies	**Shared experience** Combined with inferrence, deduction	**Individual cognition** Mentally acquired knowledge
Dependency from the significant other	**High**	**Medium**	**Low**
Decision on which level of semiolinguistic development the child needs to be met and further supported (zone of proximal development)			

Figure 15. Didactic relevance of relational emotions and the Significant Other for supporting the semiolinguistic development in relational communication and language disorders

multimodal body- and affect-based generation, construction, transmission and interpretation processes. The core medium is therefore joined sensory stimulation and perception with contingent responses.

– Work on the *indexical level* of the child is not so dependant anymore on the Significant Other as the learning of indexical signs is still based on shared experience, but now combined with inference and deduction. Teaching therefore must imply socio-cultural shaping.

– On the *symbolic level* the Significant Other becomes less and less important because now the individual cognition leads the way to mentally acquire knowledge. In final stages of language development the communicative partner can even be replaced for short teaching sequences by a computer and computer-based language learning programs as far as a good relational bases is there.

In general, in therapies with relationally based or influenced communication and language disorders the role of the therapist as the important Significant Other always needs to be the focus during planning, working and evaluation – the more as we meet and support the child on a very early stage of his or her semiolinguistic development which is emotionally regulated. In this way, merely treating superficial semiotic or linguistic symptoms can be avoided.

6. Conclusions

We may conclude by proposing that paradigm shifts need to be initiated and completed on three recursive levels, if a sustainable implementation of the theoretical 'emotional turn' and the concept of intersubjectivity into the field of applied linguistics can take place:

1. on the level of *epistemiology* (research methodology),
2. on the level of *semiotics* and *linguistics* (theory)
3. on the level of *applied linguistics* and *speech and language pathology* (application, didactics, therapy).

As a vision for future theorizing as well as daily practice we would like to emphasize that the described role and impact of relational emotions in semiotic and linguistic development, supported by many findings from semiolinguistic and neuropsychological research, could help to pave the way for fully incorporating the concept of intersubjectivity into linguistic theory and its various fields of application.

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PART III

Language

The relevance of emotion for language and linguistics

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The relevance of emotion for language and linguistics is considered from three perspectives: (a) the conceptualization of emotions, (b) the expression of emotions and (c) the grounding of language. As to the conceptualization perspective, research on the emotional lexicon is discussed. Not only content words (N, V, A), but also prepositions are relevant (*to long for, hate against*). From the expression perspective, it is claimed that the expression of emotions takes place on all linguistic levels: phonological, morphological, lexical, syntactic, and on the level of figurative language use (metaphor and metonymy). 'Grounding' of language in emotion means that emotion is one of the preconditions for the functioning of language (emotion is part of the embodied grounding) and for its coming into existence, both ontogenetically and phylogenetically.

Keywords: language; emotion; conceptualization; expression; figurative language; grounding; embodiment

1. Introduction

In Cognitive Linguistics, it is a basic assumption that language and cognition interact. The way human cognition works has an influence on the structure of human language, and language influences human cognition. How strong the latter relation holds, is a question that dominates discussions concerning research in linguistic relativity, see, for example, Slobin (1996), Pinker (1997), Majid et al. (2004), and Casasanto (2008). Cognition, in its turn, interacts with emotion (Damasio 1994). If cognition is strongly connected to both language and emotion, how should we see, then, the relation between language and emotion? There are four possibilities:

–   There is no direct connection between language and emotion: cognition stands as an intermediate between them (emotion is conceptualized in cognition and cognition is reflected in language, for example in the lexical differentiation between emotions),

–   Language has a direct connection to emotion (emotion can be expressed in a direct way in verbal utterances),
–   Language has both a direct and an indirect link to emotion (language reflects conceptualization of emotion *and* expresses emotion),
–   The relation between language and emotion varies, depending on the types of emotion. For example: A belief-dependent emotion like surprise is typically expressed in language, whereas anger or fear is only conceptualized in language but expressed in non-verbal ways.

In previous work (Foolen 1997), I proposed that the third option holds: People have the ability to *conceptualize* emotions, not only their own, but also those of others, and in this respect cognition serves as intermediate between language and emotion. But a speaker also has the possibility of expressing his/her own emotions directly via language, resulting in expressive (also called emotive or affective) language. To illustrate the difference: One can become aware of one's emotions and say *I find that food disgusting* or one can express the same emotion directly by uttering *yuk!* These two different ways of communicating the same feeling differ semiotically in a fundamental way: the first one is symbolic, using words with relatively context-independent meaning (the indexicals *I* and *that* need of course context to be interpreted), and the second is a 'symptom', a reflex, showing that the speaker in the here-and-now has a specific emotion (disgust). Emotional interjections are prototypical cases of emotive/expressive language, but there are many other forms, for example exclamative sentence types or constructions like 'an N of an N' (*a bear of a man*, *a castle of a house,* etc. cf. Foolen 2004).

In the present chapter, the distinction between conceptualization and expression is taken as a point of departure. It will be argued that not only the conceptualization of emotion (Section 2) but also expression of emotion (section 3) is a natural function of language. In Section 4, special attention will be paid to figurative speech in relation to emotion. I will argue that the expressive function of emotional figurative speech (*I nearly exploded*) is as important as its conceptualizing function. In Section 5, the foundational role that emotion plays in processing language and in its ontogenetic and phylogenetic development will be discussed, and Section 6 contains some concluding remarks.

2.   Conceptualization of emotions: Fluidity and relational properties

With nouns like *love, anger, surprise*, we can talk about emotions. But other parts of speech also contain words that pertain to emotions, in particular verbs (*to love, hate, fear*) and adjectives (*happy, sad, angry*). In what follows, we will have a look at nouns and verbs, leaving out adjectives, but we will add prepositions, as they

play a role in the relational (*love for something*) aspects of the conceptualization of emotions.

2.1   Nouns

Wierzbicka (1999) and others have shown that languages differ in the way they cut up the emotional field. German distinguishes between *Eifersucht* and *Neid* where Dutch uses *jaloezie* ('jealousy, envy') for both. The difference in German has to do with what the other person has that the experiencer of the emotion would also like to have: a relation with someone else (*Eifersucht*) or a certain material possession (*Neid*). Greek seems to lack an expression for 'frustration' (Pavlenko 2008) and the African language Dholuo (Nilo-Saharan, Nilotic) has a word *maof*, which is "the feeling of desiring to see relatives and friends that have not been seen for too long and is by extension transferred to other things" (Omondi 1997: 97). Do such differences between languages have an effect on how speakers perceive or experience their own and other's feelings? Yes, according to Lindquist (2009), who calls this view a 'constructivist view on emotion'. And Colombetti (2009: 20) defends this view as follows: "Labels for emotions have causal force. They can act as catalysts for a complex of feelings that may otherwise go unnoticed. Also, they can channel and structure expressive resources towards a specific type of experience".

It might very well be that there is more lexical variation between languages in the emotional field than in the field of concrete objects, as the distinctions between emotions are less clearly given in advance (more fluid) then, say, in the field of animals or artifacts. As Daneš (2004: 31) states it: "Perhaps it would be more adequate to use the metaphor of a field or space of fluctuating fuzzy elementary emotional states, i.e. a 'diffused continuum' … with relatively 'condensed islands', more or less different in various cultures and identified by them by means of particular labels." This opens up interesting possibilities to compare the emotional vocabularies of languages, cf. Dem'jankov et al. (2004) and Dziwirek & Lewandowska-Tomaszczyk (2010), who found, for example, that in English, the distinction between positive and negative emotions is salient, whereas in Polish the inside-outside distinction plays an important role in categorizing emotions.

Within one language, the conceptualization of emotions can develop through time (cf. Bloem this volume). An early diachronic study (on anger) is Geeraerts & Grondelaers (1995). More recently, Fabiszak & Hebda (2010) looked at pride in medieval English, Trim (2010) studied the degree of salience of different metaphorical models for love in English, and Tissari (2010) looked at word pairs like happiness-sadness, love-hate, hope-fear, pride-shame, calmness-anxiety, and excitement-respect in Early Modern (ca. 1500–1700) and Present-Day English. Such linguistic studies are a prerequisite for interdisciplinary studies on the impact of language on the (varied) experience of feelings.

2.2   Verbs

Emotions may share with snow and colors the lack of sharp distinctions, but one clear difference has to do with temporal complexity: Emotions are processes, they begin, get stronger and fade away (cf. Zlatev et al. this volume), and this aspect is conceptualized in a natural way with verbs, being 'process words'. In emotion verbs, four different 'roles' are involved: Causes ('that noise' in *that noise irritates me*), Experiencers (the person who experiences the emotion, like *me* in the example just given), Targets, like *that sound* in *I hate that sound*, and (bodily) Effects (trembling in *he trembled with fear*).

There is a whole line of research on mental verbs (psych verbs) (cf. Croft 1993; Jackendoff 2007: Chapter 7), in which the central question is how we can explain the variable distribution of the semantic roles of Cause, Experiencer, and Effect over the syntactic subject, object, and predicate. West-Germanic languages have at least 3 classes of mental verbs: (1) Causative verbs: *That noise irritates / frightens me*, where the Cause is subject and the Experiencer is direct object; a passive paraphrase is possible (*I am frightened by that noise*), (2) Unaccusative verbs, which don't allow a causative paraphrase or a passive. The Experiencer object has the syntactic role of indirect object. German has a dative here (*Das gefällt mir*, 'that pleases me'), whereas it has accusative in combination with verbs mentioned under 1 (*Das beängstigt mich*, 'that frightens me'), and (3) Experiencer-subject verbs: *I like/hate/fear that sound*.

Three questions are relevant here:

i.   Can we predict which feelings are conceptualized by which pattern? If there is a pattern, it is not absolute, as some feelings can occur in two patterns: *That animal frightens me* versus *I fear that animal*; *that pleases me* versus *I like that.* Moreover, we see changes through time with the same verb, where the Experiencer shifts position from object to subject, cf. the Dutch examples in (1) and (2).

(1)   a.   *Dat   irriteert   mij*
            That   irritates   me
            'That irritates me'

      b.   *Ik   irriteer   mij   daaraan*
            I   irritate   me   thereon
            'That irritates me'

(2)   Behalve aan de regels rond tijdelijke aanstellingen irriteren docenten uit het wetenschappelijk onderwijs zich aan regels over urenregistratie.

(Vox 15:9, April 2, 2009, p. 6)

'Besides about regulations concerning temporary appointments academic teachers are annoyed [literally: 'irritate themselves'] about rules dealing with the administration of working hours.'

ii.   Can we say that the emotional relation is conceptualized differently in the three different verb-argument patterns? Can we say, for example, that if the Experiencer is positioned in the subject position, the construction implies some control of the Experiencer over the emotion? There is no empirical evidence available, however, pro or contra such claims.

iii.   Do different ways of conceptualizing emotional processes have an impact on the way the emotions are experienced? If one believes in the constructivist view on emotion, the answer is 'yes'. But empirical proof of this position will be hard to provide.

2.3   Prepositions

NPs that refer to emotions often occur together with a preposition: P + emotion (*in love*) or emotion + P (*love for something*). The prepositions link the emotion to a Cause or a Target, or they indicate that the Experiencer is in the state of that emotion (cf. Dirven 1997; Osmond 1997; Radden 1998).

Vardi (2008) analyzed the use of prepositions in relation to emotion words, comparing Dutch and Hebrew prepositions. One of her findings was that Dutch emotions are more often conceptualized as companions, using the preposition *met* 'with': *met blijdschap*, 'with joy', where Hebrew used *in*, *be-simxa*, 'in gladness', where the emotion is conceptualized as a container. When we compare Dutch with English, however, we see cases where English conceptualizes the emotional cause as a 'companion', as implied by the preposition *with*: *to tremble with fear, pale with fear* whereas Dutch uses the 'source'-like preposition *van*: *bleek van angst,* lit. 'pale from fear', *trillen van woede* lit. 'tremble from anger'. It thus seems that languages differ in their construal of the relation between emotions and their Cause.

Besides nouns, verbs, and prepositions, languages use adjectives (*sad, happy, angry*, etc.) and adverbs (*luckily, sadly,* etc.) in the lexicalization of emotions. Only on the basis of a full description of the vocabulary of specific languages (cf. Vainik 2004 on the Estonian emotion vocabulary) may a balanced comparison between languages be possible in the future. Such descriptions should preferably be based on real language use, i.e. corpus data, as has been done, for example, in Oster's (2010) study on fear in English.

3.   Expressive linguistic forms

In linguistics, expressive linguistic forms have been studied less intensively than the conceptual-descriptive emotional vocabulary. This is probably due to the rational orientation of traditional linguistics, elegantly formulated in Sapir (1921: 38–39): "Ideation reigns supreme in language, (…) volition and emotion come in as distinctly

secondary factors". And Sapir (1921: 217) repeats his position by the end of the book: "[T]he emotional aspect of our psychic life is but meagerly expressed in the build of language".

However, when one starts to look for expressive forms in language structure, one quickly discovers that there is more than what Sapir and the linguistic tradition assumed. I mentioned already emotional interjections and the construction exemplified by the phrase *a bear of a man*. Expressive linguistic forms can be found on all linguistic levels, as the following short overview shows.

– Prosody, see for example Wendt (2007) and Hancil (2009).
– There is expressive morphology, for example diminutives. Taylor (1989: 144 ff.) analyzes the different connotations of the diminutive in Italian and in other languages (cf. also Steriopolo 2008 on Russian diminutives). In Dutch, the suffix – *sel* often implies a negative evaluation (*schrijf-sel*, 'a bad piece of writing').
– Interjections like *wow*, and intensifiers like *terribly, horribly,* etc. often have an emotive effect (cf. Jing-Schmidt 2007).
– On the lexical level there is connotation (emotion-laden words): a word with referential meaning evokes, at the same time, certain feelings (*cancer*, *death*). With euphemism, we try to save the referential meaning and get rid of the (negative) feelings: *Afro-American, rest in peace*, etc.
– Many constructions have expressive meaning, like the *a bear of a man*-construction, the 'Incredulity response construction': Dutch *Hij en lezen*?, 'He and read?' (cf. Lambrecht 1990), the *nandao*-interrogation in Chinese (Jing-Schmidt 2008), dependent clauses used independently (cf. Evans 2007, who called this phenomenon 'insubordination'), like *To think that I once was a millionaire!* and the Dutch examples in (5).

(5)   a.   *Vui*l   *dat   het   was!*
          dirty   that   it   was
          'It was terribly dirty!'

      b.   *Dat   je   dat   durf*!
          That   you   that   dare
          'I am amazed that you dare to do that!'

      c.   *En   of ik het durf*!
          And   whether I it dare
          'For sure I dare to do that!!'

To the extent that expressive linguistic forms have been studied at all, this was mainly based on constructed examples and intuitive judgments. More recently, however, the study of expressive language forms has found a stronger empirical basis in

conversational analysis, cf. Selting (2010), who studied how affectivity is managed in interaction by using swear words, short utterances, and specific vocal phonetic-prosodic cues. Whereas conversational analysis uses a qualitative method, taking an in-depth look at limited data, corpus analysis prefers a quantifying approach, see for example Bednarek (2008) and Potts & Schwarz (2008). In this latter study, a corpus of 100,000 reviews was put together; half were book reviews on Amazon.com and half were hotel reviews taken from the website Tripadvisor.com. In each review, the book or hotel was graded (from 1 to 5 "stars"). Potts & Schwarz checked the distribution of the exclamative '*what a …*' across the reviews. The distribution showed a nice U-curve: high for the 5 star reviews, going down for the middle values and going up again for the low values. In a second step, they let the computer search for expressions that correlated with '*what a …*', in order to detect other expressive forms. Correlations were found with universal quantifiers like *ever, absolutely, all*, and interjections like *wow*. Potts & Schwarz also searched for forms with a reversed U-shape distribution, forms that were typically used in the reviews with average ratings (3 stars). Potts & Schwarz called these 'Unexclamatives'. Here, they found forms like *pretty, some, decent, mostly, quite,* and *basic*.

Cultures vary in the degree of emotional expressivity, verbally and non-verbally, as anthropological research has shown (cf. Wilce 2009). This raises the question of the impact of behavior on 'inner life', a Whorfian-type of question, now applied to language use in relation to emotion. Wilce (2009:9) proposes to "historicize our treatment of the language-culture-emotion nexus. … [H]istorians of emotion have quite exclusively focused on macroforces … to the neglect of fine-grained analyses of language deployed in real-time interaction."

With respect to expressive linguistic forms, there is still a lot of descriptive work to do. The more descriptive results become available, the more interesting questions of a general character can be raised, such as the following.

1. How specific are the emotions that are connected with expressive linguistic forms? Do we have love- or fear-constructions, or only constructions which indicate 'emotional involvement', leaving it to the context to determine which emotion is intended. A possible answer could be that interjections and lexical connotations imply specific emotions (disgust, love, fear), and that morphological and syntactic means convey schematic aspects of emotions: positive or negative attitude, or still more general: involvement, without positive or negative polarity.

2. Are there formal characteristics that differentiate expressive from non-expressive forms? Here the notion of 'markedness' seems useful (see Battistella 1996). At least some of the expressive forms are marked in relation to the unmarked non-expressive forms. Take, for example the *a bear of a man*-construction. Normally,

in NPs of the form *a N of a N*, the first noun is the head of the construction, like in *a wheel of a car*, which is about a wheel. But *a bear of a man* is about a man. Another example of marked language use is insubordination (Evans 2007). Normally, subordinate clauses are dependent on a main clause, but in the examples given in (5), they are used independently.

In the end, we would like to embed the descriptive work on expressive forms and the more general questions just stated in a theoretical framework. In Cognitive Grammar, a few remarks have been made that could be expanded into an integrated part of the theory. As to connotation, Taylor (2002: 202) states that "[o]n the Cognitive Grammar view, 'connotation' is not a distinct (and secondary) level of meaning, but is fully incorporated into the semantic structure of a word". He illustrates this with a comparison of the connotations of *bachelor* and *spinster*. The derogatory connotation of the latter word can be explained against the domain-specific knowledge against which *bachelor* and *spinster* are understood.

Langacker (2008) devotes a short Section (13.2.4, p. 475–477) to, what he calls, 'Expressives'. He uses 'expressives' as a cover term for interactive routine formulas like *hi, thanks, yes*, and expressive forms like *damn, wow*. They all involve, in Langacker's model, subjective construal (p. 476):

> What do expressives profile? Perhaps nothing, at least in a narrow sense of the term. An expression's profile is the onstage focus of attention, objectively construed by definition. But at least from the standpoint of the speaker, expressives are not about viewing and describing onstage content. In using one, the speaker is either performing a social action or vocally manifesting an experience – rather than *describing* a scenario, he *enacts a role* in it. For the speaker, then, the action or experience is subjectively construed.

The distinction between objective and subjective construal is also relevant for other linguistic phenomena like descriptive versus performative use of speech act verbs, indirect versus direct speech, and modal auxiliaries (see Verstraete 2001). In performative utterances, direct speech, and utterances with subjective modal auxiliaries, the speaker is personally involved or committed, like in emotion-based expressive ways of speaking. Following this line of research, expressive language use could be studied in the broader perspective of subjectification and intersubjectification in language (cf. Davidse, Vandelanotte & Cuyckens 2010).

4.   Abstractness of emotions in relation to figurative speech

Besides fluid boundaries between different emotions (i.e. more color-like than object-like), and besides more relational complexity than in colors or animals (there are Causes, Experiencers, Targets and Effects involved), there is a third property that

makes emotion a favored object of cognitive linguistic study, namely the often claimed "abstractness" of emotions. Lakoff & Johnson (1980) have argued that abstract entities are often conceptualized with the help of metaphor. Abstractness is, however, a controversial notion. One possible view is that something is abstract if it cannot be perceived by one of the five senses with which we perceive 'the outer world'. In this perspective, emotions are indeed abstract: We perceive them 'within', not with the eyes, ears, etc. although an emotion can have effects in the body which then become perceivable by the senses.

It has been claimed (Kövecses 1990) that the property of abstractness explains the abundant use of figurative speech (in particular metaphor) in discourse about emotions. In this view, we need the figurative descriptions because otherwise it would be difficult to talk about such abstract phenomena like emotions. This would explain the use of expressions like *He exploded*, where anger is seen as a fluid in a container, Dutch *hij was in de wolken*, lit. 'he was in the clouds' ('he was very happy'), etc. And as emotions are strongly linked with the body, it comes as no surprise that many of the figurative expressions for emotions are metonymical in character, using body parts and inner organs to refer to emotions: *My knees trembled*, *his eyes narrowed, my heart sank into my boots*, Dutch *mijn haar stond recht overeind* 'my hair stood straight'. These are cases of 'effect for cause' metonymy.

A special group of 'somatisms' (bodily based figurative language) is related to the fact that feelings are typically seen as located in an inner organ, for example the (inner) ear, the heart, the bladder, cf. (3), and the liver (Malay *hati*), cf. (4).

(3) *Ik voel het aan mijn water*   (Dutch)
     I   feel it   in   my   water [i.e. urine in the bladder]
     'I have an intuition about this'

(4) a. *Sakit   hati*   (Malay)
         Aches   liver ('It hurts')

     b. *Bagai hempedu lekat di hati*
         'As the spleen stick to the liver' (referring to deep affection)

In many languages the heart is a rich source of semiosis, in particular for emotions (cf. Foolen 2008): *my heart pounded in my throat,* Dutch *m'n hart zonk me in de schoenen*, lit. 'my heart sank into my shoes', *mijn hart sloeg over van vreugde*, lit. 'my heart missed a beat out of joy' ('my heart missed a beat'), etc. Again: the physiological effect stands metonymically for the emotional cause.

But is it really the case, that we *need* these figures of speech to talk about emotions because, due to their abstractness, we don't have direct language for the emotions? We have nouns, like *fear, hate, love*, etc. and verbs and prepositions to conceptualize emotional processes. So why use the figurative ways of talking about emotions?

Barsalou & Wiemer-Hastings (2005: 133) raise this question with respect to abstract concepts in general:

> Some theorists have argued that the meanings of abstract concepts are grounded in concrete domains (…). For example, the abstract concept ANGER is grounded in concrete phenomena, such as boiling water exploding out of a closed pot. We agree that metaphors often augment the meanings of abstract concepts, and make certain aspects of their conceptual content salient (…). Nevertheless, direct experience of abstract concepts appears central to their content. (…) One reason is that people have considerable amounts of direct experience with abstract concepts (…). Direct experience of abstract concepts is important for another reason. A concrete metaphor can not be mapped into an abstract concept, if the abstract concept doesn't have its own structure (…). If an abstract concept has no structure based on direct experience, the concrete metaphor would have nothing to map into.

In the same perspective, Crawford (2009) argues against Lakoff & Johnson (1980)'s claim that the use of the physical domain to conceptualize the emotional domain is motivated by the concreteness of the former and the abstractness of the latter. According to Crawford (2009: 136)

> [O]ur cognition about affect seems to be on firmer ground than our cognition about its source domains, such as space. For example, people are remarkably good at remembering the affective tone of their experiences, even when many details of those experiences have been forgotten. In addition, perception of location, brightness and size is subject to a variety of biases and context effects, which suggests that these may not be such a stable foundation for grounding affect.

I agree with Crawford when she concludes (p. 137) that "[g]iven the qualitative difference between affect and the physical domain used to describe it, to order them in terms of which is more or less abstract, primary, or sharply delineated, is to oversimplify. A more promising approach might be to consider what advantages these source domains offer the representation of affect".

What are then, in Crawford's view, the advantages of the physical source domains to represent affect? "Affect may capitalize on source domains such as space and brightness because they provide powerful ways to represent and manipulate information for the self and for others (…). Spatial cognition in particular is often recruited to support reasoning about non-spatial information. (…) Thus we may think of affect in terms of other physical dimensions not because affect is abstract or poorly delineated and has no clear representation of its own, but because doing so allows us to exploit advantages that these dimensions have for reasoning and communicating". A similar function of "motion-emotion" metaphors is suggested by Zlatev et al. (this volume).

Crawford's functional explanation of the use of figurative speech to conceptualize affect and communicate about it might be right or partly right, but in my view, there is another functional explanation which might even have more explanatory value, namely the need for expressivity. Emotions are typically not a neutral topic of conversation. When we talk about emotions, in particular when we talk about our own emotions that we have felt in critical situations, we are emotionally involved, and this stimulates the use of expressive language. Crawford (2009: 130), referring to Ortony & Fainsilber (1989), states: "Metaphors are used in discourse about any topic, but they appear to be especially frequent when the topic is emotional, and their frequency increases with emotional intensity".

If it is true that involved speech contains much figurative language, then we may infer that figurative speech has expressive value. Why does figurative speech have this property? Here, my answer would be: Strong images, like that of an explosion, evoke emotions because part of the representation of explosions in memory is strongly emotional. When there is an explosion, we typically get scared. So via the image (of an explosion), we become conscious of the emotion, with the consequence that physical reactions are stimulated: the word *explosion* →image of an explosion →feeling of fear → impulse to run away.

With *somatic* figurative (metonymic) speech, like trembling knees or cold feet, the link to emotional consciousness might be even more direct: when emotion correlates with certain physical symptoms, then talking about those physical symptoms stimulates the motor image of trembling knees and this, in its turn, stimulates the conscious perception of the emotion. This is a kind of James-Lange reasoning (proposed by William James & Carl Lange): bodily experience is primary and the mental feeling is caused by it.

The view defended here, namely that the use of figurative speech contributes to expressive language has already been hinted at by Fussell & Moss (1998) and more recently by Cameron (2008: 13): "Affect is fundamental to why and how people use metaphor (…). This being so, the affective cannot be just added on to the conceptual but should be seen as a driving force in the use and evolution of metaphors through real-time talk."

Simone Schnall (2005), discussing this issue, refers to Gibbs et al. (2002), when she writes: "Gibbs and colleagues (2002) noted that figurative expressions such as *I totally exploded* are understood differently than literal expressions such as *I was totally angry*. One reason why metaphors are so powerful in emotion language is because they have the potential to evoke vivid accounts that tap into actual physical experience, such as the experience of emotion. (…) Figurative expressions of specific emotions reflect aspects of the bodily experience of those emotions."

The general argument of this section is, then: Figurative speech is often used in relation to emotions. It has been claimed that we do this because emotions are

"abstract" and hard to talk about without metaphor and metonymy. Without deny-
ing the role of figurative speech in the conceptualization of emotions, I would like to
stress its expressive function here. Emotions belong to the class of non-neutral refer-
ents, about which one often talks in an involved way. Figurative speech contributes to
involvement. Types of language use that aim at emotional effects, such as literature or
product advertisement, will typically contain figurative speech in a higher frequency
than texts that have purely rational purposes (news reports, academic lectures, or
instructions for the use of a machine, for example).

5.   Language and emotion in the perspective of grounded cognition

In its first years, Cognitive Linguistics was inspired by studies in cognitive psychology
like those of Rosch (1973) on prototype effects in categorization processes. These ideas
proved to be productive for the analysis of linguistic meaning. It seems that Cogni-
tive Linguistics has to face, for a second time, a development in cognitive psychology,
namely the new ideas about embodied cognition, cf. Lakoff & Johnson (1999) for a
contribution from linguistics to this new line of research. What is embodied cogni-
tion, or grounded cognition, as Barsalou (2008) calls it? In Barsalou's view, cognitive
processing of conceptual knowledge does not take place in a separate conceptual part
of the brain, dealing with 'abstract knowledge'. Neuro-imaging studies show that when
people process knowledge about animals, visual areas are especially active, and when
people process artifacts, motor areas become active (as if one wants to use the ball,
knife, bike, or other artifact in an activity). "Similarly, when people process foods con-
ceptually, gustatory areas become active." (Barsalou 2008: 627).

In recent years, embodiment views on processing information have been extended
to the processing of linguistic information. Words are not processed in a nicely encapsu-
lated mental lexicon. When participants simply read the word for an action, the motor
system becomes active to represent its meaning (cf. Pulvermüller 2005; Pulvermüller &
Fadiga 2010). Thus, not only areas in the brain are stimulated, the stimulation continues
outside of the brain, in the body. When you hear a description of a good meal, some-
times your saliva glands are activated, cf. the Dutch expression *het water loopt me in de
mond*, lit. 'the water runs in my mouth' ('I would like to eat it'). And when you hear about
'walking', one can measure activation in your feet, which is, luckily, 'deactivated' by the
brain, otherwise we would act out everything we say and hear. Speech-accompanying
gestures embody (part of) the content that supports successful communication.

Embodied grounding also takes place when words with *emotional* meaning are
used. Psycholinguistic research has shown that processing emotion-laden words dif-
fers from processing 'neutral' words (cf. Scott 2009). Emotion-laden words activate
the limbic system, the complex of emotional centers in the brain, in particular in the

right hemisphere, which is strong in processing prosody, gesture, and emotion words (words with a connotation). Landis (2006) performed experiments with emotion-laden words (*fear, kill, pain, dead, love, hate, rage, weep, slap, stab, rape, nude*) versus non-emotional words (*time, view, form, half, fact, main, pile, unit, span, core, dual, gist*). When presented in the left visual field, and thus processed in the right hemisphere, there was an advantage for emotion-laden words: they were processed (recognized) more quickly than non-emotional words. This shows that the right hemisphere plays a role in the processing of emotional words. Apparently, the resonance between the connotation of the word and the emotional part of the brain speeds up the processing. Landis also reports that aphasic patients with lesions in the left hemisphere displayed a characteristic pattern: "When shown a non-emotional word, patients often struggled when trying with effort to articulate the word. (…) When emotional words were presented the reaction was very different, patients frequently smiled, leant back and pronounced the word without the slightest hesitation" (p. 824).

Another ingenious experiment on processing emotional language is that of Glenberg et al. (2005). They showed that the positive or negative emotional state of a subject plays a role when processing sentences with emotional content. Subjects had to read pleasant and unpleasant sentences on a computer screen. Sentences with pleasant content were, for example: "The college president announces your name, and you proudly step onto the stage", and "You and your lover embrace after a long separation". Unpleasant sentences were "The police car rapidly pulls up behind you, siren blaring" and "Your supervisor frowns as he hands you the sealed envelope". Subjects had to judge whether the sentence was pleasant or unpleasant by pressing a button for pleasant or the one for unpleasant.

But how to induce a positive or negative emotional state in the subjects? Here the experimenters used embodiment theory in an ingenious way. The reasoning is as follows: When a person is happy, he will smile, when he is unhappy, he will frown. As emotions are strongly connected with bodily posture and facial expression, the causing chain might also work the other way around ("facial feedback hypothesis"). As Darwin (1872/2009: 333) remarked: "The free expression by outward signs of an emotion intensifies it. On the other hand, the repression, as far as this is possible, of all outward signs softens our emotions." Glenberg et al. implemented this idea in the so-called pen task: subjects had to hold a pen between their teeth or between their lips while reading the sentences. The teeth condition produced a smile and via that smile a happy feeling, whereas the lips condition caused a frown and through that unhappy feeling. The results supported the supposed causal link from body to emotion: Under the teeth condition, the sentences with pleasant content were judged more quickly than the unpleasant sentences and in the lips condition the result was reversed. Resonance between mood and sentence content facilitated judgment on pleasantness, non-resonance took an extra step (establishing the difference) to get to the right judgment.

The experiment also shows that sentence content is not a purely cognitive content (as has often been assumed implicitly in linguistics), the content is automatically loaded with emotion, and this emotion plays a role in the processing of the sentence. These findings are in accordance with statements that can be found already in Osgood et al. (1957: 21): "[S]timuli from several modalities, visual, auditory, emotional and verbal, may have shared significances of meanings – cross-modality stimulus equivalence."

Recently, the grounding of emotional words has become a topic of interest in second language acquisition research, cf. Pavlenko (2008). The first (L1) and second (L2) language differ in the strength of their link to emotions, both on the level of the language in general and on the level of individual words. It has often been reported informally that people who acquire a second language later in life and speak it rather well, nevertheless feel that it is easier for them to talk about emotional issues in their first language. This observation is reflected in experiments. In general, L2 words take more processing time in experimental tasks than L1 words (in a lexical decision task, etc.); however, the difference between L1 and L2 is even stronger when emotion-laden words are involved. Apparently, the L1 emotional words have strong links with the emotional system, which facilitates processing, whereas the L2 words do not. This difference between L1 and L2 may be caused by the way they were learned. L2 is often learned in a more rational context (school), with the consequence that it takes time (years may be) for L2 emotion words to get linked to the emotional system. Harris et al. (2003) have shown the differential impact of emotion words in L1 and L2 by measuring skin conductance by which one can measure how well electricity is conducted between two electrodes on the skin. In general, emotional "agitation" leads to stronger skin conductance. Subjects had to read taboo words and reprimands in L1 and L2 and showed stronger skin conductance for the L1 words. Processing words, in this case emotion words, is, apparently not an isolated, encapsulated, process.

In Cognitive Linguistics, it has been argued that language (structures and meanings, in short: constructions) should be grounded in cognition, cf. Croft & Cruse (2004: 3), who refer to Langacker's slogan 'grammar is conceptualization'. Cognition, in its turn, has been increasingly considered as being grounded in motion and action, cf. Fischer & Zwaan (2008). The present chapter is in agreement with this view, but proposes that, besides motion, a second foundational pillar must be added, namely emotion, to get a balanced, solid grounding of the higher functions of cognition and language. In recent literature, the foundational role of emotion is explicitly acknowledged.

Vigliocco et al. (2009) support the core assumption of embodied cognition theories "that the representation and processing of semantic information automatically recruits, in some form or other, the same neural systems that are engaged during perception and action". But at the same time, they emphasize "the role of affective, or emotional, information as another type of experiential information that is foundational

(i.e. primary and necessary) in learning and representing meanings, especially for abstract words" (p. 220). From their review of experimental research they conclude (p. 228) "that the primarily subcortical system engaged in processing emotion from non-verbal stimuli (i.e. faces) is also engaged in processing emotional valence of words. This suggests interactions between language processing and the limbic system along similar lines as it has been argued above for sensory-motor system, thus, supporting the idea of a foundational role of affect".

From an ontogenetic perspective, Doan (2010: 1071) states this view as follows:

> While there is very little research examining how affective understanding in the first year of life may facilitate language acquisition, these studies are suggestive in pushing the idea that since emotion is such a fundamental mechanism for communication in early life, it may lay the foundations for language acquisition in the first year. Affect, whether expressed in language, or through behavioural interactions between mother and child, may facilitate children's understanding through the mechanism of engagement.

Finally, we may take a short look at phylogeny. From this perspective, motion has been identified as an important basis for the origin of language, cf. Arbib (2005: 34): "[B]rain mechanisms supporting language evolved from the mirror system for grasping in the common ancestor of monkey and human, with its capacity to generate and recognize a set of manual actions". Increasingly, the role of social cognition in human evolution is acknowledged, and in that perspective, the foundational role of emotion for language comes in perspective, cf. Tomasello (2008: 210): "[T]he desire to cultivate affiliations with others forms the basis for one of the three basic motives in the cooperation model of human communication: the desire to share emotions and/or attitudes with others." (the two other motives are requesting and informing, which have a more practical orientation). In summary: In early humans, motion (action) and emotion were important ingredients of practical and social life and both were strong stimuli, or even necessary prerequisites, for language to emerge.

6.   Conclusion

Shanahan (2007: 2) states that "the more formal kinds of understanding we have developed in the last half-century and more largely ignore the fact that feelings inform language as much as the cognitive features that have come to dominate the study of it." The preceding sections have made clear, I hope, that emotion gradually receives its proper place in research on linguistic meaning. The way emotions "inform language" is at least threefold, as I have tried to show in this chapter. Emotions are (a) conceptualized in languages by a variety of word forms, with "literal" and figurative meaning, (b) can be

expressed in a more direct way by prosody, morphology, syntactic constructions and by the use of figurative speech, and (c) are foundational for processing language and its ontogenetic and phylogenetic genesis and development.

I conclude with the question whether insights from research on the relation between language and emotions can be transferred to practical contexts. I mention a few areas where such insights could be relevant:

– Language teaching: if the link to emotion is relevant for learning to speak a language, the L2 should be taught in ways that allow emotional involvement, cf. Schumann (1997).
– Psychotherapy: The use of an L2 might protect, in an early phase of therapy, against evoking too strong emotions related to traumatic experiences. Switching to L1 later in the therapy can have a 'breakthrough' effect (cf. Pavlenko 2005).
– Alexythymia (from the Greek a = lack, lexis = word, thymos = emotion). Alexithymic people are hardly able to talk about their emotions, neither with direct vocabulary nor in figurative or other expressive speech.
– Product advertisement: Putoni et al. (2009) showed that advertisement in L1 and L2 have a differential emotional impact. International firms should think twice before automatically choosing English as the one and only language for advertisements across the world.
– Intercultural communication, cf. Dem'jankov et al. (2004:177): "The use of 'emotional formulae' in negotiations is efficient to different degrees in different European and non-European societies."

The 'emotional revolution' that took place in psychology 15 years ago, has finally reached linguistics. I hope to have shown that linguistics cannot neglect the emotions anymore and, for that matter, that emotion research cannot neglect linguistics. Deeper insight in the relation between language and emotion can only be reached if the interdisciplinary contacts that have been signaled in this chapter are strengthened in future research.

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From pre-symbolic gestures to language

Multisensory early intervention in deaf children

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In this article we will discuss the early development in deaf children and the interaction between linguistic, cognitive, and emotional factors. In this context we will consider the model of Piaget (1962), in which the early stages of development are stated and a pre-linguistic-symbolic form of a toddler's intelligence is recognised. In addition to Piaget's initial ideas we will focus especially on the function of gestures in mother-child-communication, which also occur in a hearing toddler's development and have been dubbed *Baby Signs* by Acredolo and Goodwyn (2002). These gestures will be discussed as pre-symbolic signals that enable early communication and have a distinctive function in the transitional process towards language acquisition. Subsequently it will be argued that a holistic perspective on the development of deaf children should include all means of early communication in order to provide a cognitive, linguistic, and emotional environment as stimulating as possible. We will conclude that an early intervention philosophy, which includes signs or sign languages, embraces such a perspective on deaf children's linguistic and cognitive development and can help to address their psycho-emotional needs.

Keywords: deaf children; early communication; social-emotional development; language acquisition; early intervention; baby signs; sign language; bilingual education

1. Introduction

Over the last decade major developments have occurred in deaf education: Many countries, like Germany and the USA, are developing newborn hearing screenings in order to be able to identify a hearing loss at an earlier stage (Sass-Lehrer & Bodner-Johnson 2003; Bundesministerium 2008), there are more sophisticated hearing devices available, i.e. digital hearing aids and cochlear implants. On top of that, intensive early intervention programs have been established in many places. Despite these efforts, the

classical problem of deaf education remains, whereby 40 to 65 percent of the congenital deaf children show a clear developmental disorder in spoken (and consequently written) language (Günther, i.p.). This is linked to a permanent crisis in communication and leads to problems in the social-emotional development: Deaf children are three to six times more likely to develop child-psychiatric disorders than their hearing counterparts (Meadow & Trybus 1979: 402; Kammerer 1988: 193; Hintermair 2009).

Also, more recently a deeper understanding of the nature of sign language has been established, which has lead to its recognition as a regular language and the evaluation of its cultural and social benefits for the deaf community (Heßmann 2001: 2; Marschark et al. 2006: 9). Sign language has become more accepted in deaf education in recent years and is nowadays included in some teaching concepts in schools for the deaf (Karchmer & Mitchell 2003: 26; Günther et al. 2009), because of results indicating that sign language serves as a functional base for the acquisition of verbal language (Chamberlain & Mayberry 2000; Günther & Schäfke 2004; Günther & Hennies 2011). Furthermore, it has been discovered that language development in spoken language and in sign language show strong resemblances when learned from a caregiver who primarily uses the language. Research has proven that the language acquisition in both languages undergoes similar milestones in the same timeframe, from the *syllabic babbling state* to the first words and two-words-structures (Petitto 2000: 43; Masataka 2008: 201), as well as in the acquisition of semantic, morphological, and syntactic structures (Schick 2003). But especially in early intervention programs professionals – i.e. medical personal and special need educators – often advise parents against the use of sign language or do not include sign language in their concepts (Diller et al. 2000: 58; Meadow-Orlans et al. 2003: 22), following the argument that the use of sign language would harm the successful acquisition of spoken language.

2.   Language development in deaf children

Language skills of deaf children have traditionally been tested by examining reading or writing. These pioneering studies on literacy can be found in the first two decades of the 20th century, linked to names like Rudolph Pintner in the USA (Chamberlain & Mayberry 2000: 222) or Rudolf Lindner in Germany (Günther 1985: 27). Although their results already foreshadow the findings of later studies, the seriousness of the deaf students' problems in written language has become evident in larger studies since the 1980ies: Conrad (1979) shows that 50% of deaf students and 25% of hard-of-hearing students of a specific graduation year in England and Wales leave school as functional illiterates. For the western part of Germany these findings have been confirmed by Günther and Schulte (1988). In the USA the reading literacy of deaf and hard-of-hearing students has been tested on a regular basis since in the 1970ies,

using a special standardized version of the *Stanford Achievement Test* (Paul 1998: 67). Despite the general early identification and supply with hearing aides or cochlear implants, the results of the reading segment in the 9th edition of 1996 remains poor: The median score of deaf and hard-of-hearing students at the end of their entire school career is comparable to what hearing children achieve in the last years of primary school (Gallaudet Research Institute 1996; Holt et al. 1997; Traxler 2000; Karchmer & Mitchell 2003: 31). Although hard-of-hearing students outperform the deaf students, they nevertheless show a substantial delay in their reading development compared to the hearing norming sample. Therefore, it is plausible that the underlying reason for the delayed literacy skills is a very limited ability in spoken language, influenced by the degree of hearing loss (Marschark & Spencer 2006: 13).

Since more recent studies have concentrated on the early language development, especially under the condition of early cochlear implantation, it can be demonstrated that the origin for poor results in reading and writing lie in the delayed language acquisition in early childhood.

The current situation of deaf children cannot be discussed without addressing the question of the benefit of cochlear implants. A cochlear implant is a medical device that replaces the damaged function of the inner ear, when hair cells do not transform acoustic information into neural stimulation (NIDCD 2007). It picks up sound outside the ear and sends it to electrodes in the cochlear, directly stimulating the acoustic nerve. In the case of a functioning acoustic nerve deaf people will experience auditory sensations immediately after the adaptation of the speech processor, thus being able to "to hear" in a broader sense. Cochlear implants have been in use since the 1980ies for those who lost their hearing later in life; in the 1990ies children who were born deaf started to receive cochlear implants. Currently about 50% of the congenital deaf children undergo this operation often at a very young age because of the early identification of their hearing loss during a newborn hearing screening. However, even under the improved circumstances of early identification, cochlear implantation and speech therapy, a successful language acquisition of deaf children is by no means guaranteed, as shown in the following paragraph:

In Germany there has been one major study that documented the language development of a representative sample of early identified deaf children (N = 91) with hearing aids or a cochlear implant in oral communication programs (Diller et al. 2000: 133). The study relies on the assessment by parents of their offspring's development in given categories: About 50% of these children show delays in their language acquisition, in the subgroup of children with a cochlear implant there are 40% with language delays and in the subgroup of children with hearing aids about 60%. After these initial findings there have been several studies with smaller groups of cochlear implanted children, like the first one also stressing oral communication programs and excluding children with first languages other than German or additional handicaps. All of

these studies, although different in methodology and scientific approach, suggest that about half of the early identified deaf children with a cochlear implant show language delays, without a predictor previously indicating for which of the deaf individuals this is to be expected (Szagun 2001a, 2001b; Lürßen 2003; Graser 2007; Szagun 2010). The study by Szagun (2001a/b) is important even for the international discussion, because it includes a strictly controlled group of 22 deaf toddlers, who had received the implant at a very young age (mean age: 02;05 [yy;mm]; earliest age: 01;02; latest age: 03;10). None of them had had additional handicaps and they all came from monolingual backgrounds and were in a professional early intervention program. 22 hearing toddlers served as a control group, with an age comparable to the "hearing age" of the deaf children (the time period since the implantation). Based on periodically recorded spontaneous utterances the language acquisition was analysed with regard to the lexicon, the MLU (mean length of utterance in morphemes) and the morpho-syntax. 12 of the 22 deaf children only produced MLUs of 2.3 morphemes about three years after the implantation. Because these children had already reached an age of five to seven years, Szagun (2001: 136) doubts that they will ever will catch up with their peers. In the USA studies have shown similar results with 40% to 70% of cochlear implanted children not undergoing a language acquisition comparable to hearing children (Geers 2006: 263).

Results of a longitudinal study with Australian deaf children support these findings, that cochlear implanted children achieve higher average scores in language related tests than children with hearing aids, but still show language delays and do not reach the same language acquisition rate as hearing children (Blamey et al. 2006: 89). Furthermore, there is a broad variety of results within the sample of implanted children, with language delays between one and six years, when age equivalent of test scores and real age are compared (Blamey et al. 2006: 94).

But these problems do no affect deaf children (with or without cochlear implant) alone: A long-time documentation of the development in a German clinic leads to the assumption that even a significant portion of less-than-severe hard-of-hearing children is facing similar obstacles in their language acquisition (Kiese-Himmel 2006).

It has been argued that "a range of outcome levels is to be expected in any heterogeneous sample, whether or not the children use cochlear implants" (Geers 2006: 263), but since the group of deaf and hard-of-hearing children is not likely to become more homogeneous in the future, this should lead to a reconsideration about how early intervention programs can react adequately to this challenge.

3.   Consequences for the socio-emotional development

As for the question on the possible consequences that delayed language acquisition and the reduced communication skills of the deaf children have on their socio-emotional development, only a limited number of studies is available. There is a groundbreaking

study by Kammerer (1988), in which he discusses the ability of 10 to 13 year old students in schools for the deaf (N = 274) to express themselves and communicate: More than 40% of these deaf and hard-of-hearing teens describe their chances to communicate with their families as low or non-existing, while the parents, and especially the mothers, see their offspring's chances to communicate with them overwhelmingly positive (Kammerer 1988: 123). When it comes to communicating with strangers a majority of the hearing-impaired children say that they have limited abilities, including about 75% of the deaf children (Kammerer 1988: pp.130).

These communication problems lead to equally severe emotional consequences, with studies indicating that deaf and hard-of-hearing students are in great risk of developing psychological problems, the percentage being about three to six times higher than for the hearing population (Kammerer 1988: 193; Meadow & Trybus 1979: 402). In the mean time these findings have been supported by most studies about the social and emotional situation of deaf and hard-of-hearing children, most recently by a number of studies in German, using the "Strengths and Difficulties Questionnaire" (SDQ-D) (for an overview, see Hintermair 2009): In their CHEERS-study in Austria Holzinger et al. (2007: 449) confirm that there is a significant relationship between child-psychiatric problems and the ability of deaf and hard-of-hearing students (n = 116) to communicate with their families.

However, although these findings about the socio-emotional development are highly likely to be rooted in the early childhood, the link between the deaf infant's upbringing and the deaf adolescence's and adult's condition has not been conceptualized. In addition to this, the emotional and linguistic development is rarely investigated in a single framework. There is only one longitudinal study focusing on different aspects of the development of deaf and hearing infants (N = 80) between 6 and 18 months (Meadow-Orlans 2004: 26). Based on a number of studies a model of specific developmental aspects at the age of 9, 12 and 18 months could be established, in which the mothers' hearing status and their choice of communication serve as predictors for the deaf children's early social interaction and subsequently have an impact on their language development (Spencer et al. 2004: 216): "[A] uniquely significant contributor" to the "[q]uality of interaction" in deaf children at the age of 12 months proved to be the "[m]others' production of sign and/or gestures", regardless of the mothers' hearing status (Spencer et al. 2004: 211). The "mothers' production of sign/gestures at 12 months" is also "[t]he only unique predictor" for the 18-month language level of these children (Spencer et al. 2004: 210), including measures of signed and spoken language skills (Spencer 2004: 152). This study provides important insight into the relationship between social, emotional and linguistic developments. It shows that "[t]he entire set of mother and child 12-month measures contributed to prediction of deaf children's language" (Spencer et al. 2004: 216) and highlights the importance of the early social and emotional development in a deaf child. Although there is no determined result of any choice of communication, the inclusion of signs or gestures has

a positive impact – or one can argue that it is also their exclusion that has a negative impact – on the social development. A stable social interaction with ones mother is a necessary precondition for a flourishing language acquisition.

These findings indicate that it is not the *diagnosis shock* of hearing parents alone which lead to the social and emotional difficulties in a deaf child's upbringing, but rather the way intervention programs deal with these initial emotions. In their study Hintermair et al. (2000: 119) find less than a quarter of 217 parents of deaf children mentioning a pedagogical or medical professional as a supportive force in their lives. This is an astonishingly low number and raises the question, if all of these programs provide the best suitable environment for the upbringing of a deaf child. Part of the problem might be the preference for a certain choice of communication and the biased pressure to concentrate on spoken language, nowadays very often linked to the advice for an early cochlear implantation. Because of this, other important aspects of a caregiver's behaviour are likely to stay underdeveloped. In Germany only one private initiative offers (early) intervention with the participation of deaf *and* hearing professionals. There is only feedback from a limited numbers of families participating in this program, but this has been very positive (Hintermair & Lehmann-Tremmel 2003).

Pisoni et al. (2008: 89) add to the mentioned results a neuropsychological perspective: Deaf children with cochlear implants show "evidence of disturbances in cognitive and emotional control, monitoring behavior, self-regulation, planning and organisation" (89 – see also Luria 1973). They argue with Clark (1998) for viewing "development and use of speech and language as embodied processes linking brain, body, and world together as an integrated system" (94).

The cited research on language skills, communication, and social development merely presents pieces of a puzzle that has not been fully investigated. It is evident, though, that the crisis concerning these aspects of a deaf or hard-of-hearing person's life already starts in the early infancy and is not solely linked to the ability to acquire spoken language. Early intervention programs should be designed in such a way that they address all aspects of early development instead of focusing primarily on spoken language skills and medical procedures. In the next paragraph we will discuss the preconditions for such a holistic early intervention philosophy during the first years.

4.   From pre-linguistic gestures to language

We will choose the works of Piaget (1951; 1952; 1962) as a fundamental basis for the discussion because he provides a single semiotic framework, in which the early development of recognition, cognition, and language can be discussed. According to Stern (1990) and Dornes (1993) an infant displays more competences than Piaget (1951) had assumed. Although they give a more differentiated picture about the

sensorimotor intelligence in early childhood, they basically support Piaget's ideas. For the period of the first two years his model offers particularly notable insight. This period is also at the centre of the first broader longitudinal study on deaf children's emotional and linguistic development (Spencer et al. 2004) that may help in understanding about how the early social and emotional behaviour is linked to the first measurable linguistic skills. Therefore, we will concentrate on the transitional aspects towards language in this period, meaning the processes which lead to what William Stern (1971: 133) called the "discovery of the general symbolic function of the language".

According to Piaget a child undergoes its *sensorimotor stage*, roughly during the first one and a half years of its life. In this period it has a dominant visual attention, shows manual competences (touching/grasping), has an episodic cognition and gradually enriches its cognitive schemes in order to combine different sensual sensations about a single object. The infant does not yet have an iconic-symbolic representation. In this stage spoken language is recognised in form of its phonological patterns (Dittmann 2002: 20), but it is comparatively less stimulating than the dominant visual and sensorimotor sensation.

The second period of Piaget's model is the *preoperational stage*. In the transitional processes between the sensorimotor and the preoperational stage certain conditions for the ability of symbolic representation are being developed: Especially the discovery of object permanence and playful imitation contribute to this competence. This discovery that "everything has its name" (Stern 1971: 132) can also be described as "permanence of meaning", which Lüdtke (2006: 281) sees as a first climax in early child development, in which the interaction with the mother enables a child to gradually enrich its understanding of the others' communicative motives through imitation. In this transitional period meaningful interaction and shared use of communicative signals are linked to the emotional connection with the caregiver, because both are neurologically based on mirror neurons or mirror systems. Tomasello (2005: 21) points out that "joint attentional frame and common ground" between mother and child as well as the ability of the child to understand "communicative intentions" are central aspects of the movement towards language.

During this period we find even in hearing children gestures in the communication between caregivers and children (Acredolo & Goodwyn 2002), which can be seen as an expression of the emerging understanding of symbolic systems. Such deictic and iconic gestures precede the hearing child's language and are replaced by the first words (Volterra & Erting 1990). When a deaf child is raised by a deaf caregiver, hence by a *native signer*, it shows pre-linguistic gestures before actually acquiring the sign language system in the same way hearing infants do (Petitto 2000: 43, Masataka 2008: 213). Together with *manual babbling* in deaf *and* hearing children (Petitto 2005; Masataka 2000: 18; 2008: 201) and *vocalic babbling* in hearing children these gestures

are part of the early dominance of a manual-vocal communication. At the age of 14 months a "gestural-vocal 'equipotentiality'" (Volterra et al. 2005: 34) is reached and spoken language is established as main means of communication.

These are strong indications that pre-linguistic gestures are part of the natural development towards language, especially since they cannot be conceptualized without addressing the emotional binding between mother and child. In the case of deaf children of hearing parents one can assume that these natural components of the language development are neglected or even suppressed when parents are advised to concentrate on spoken language and not to use signs or sign language. Horsch (2004) documents the case study of a deaf toddler and compares it to a control group of hearing children of hearing parents. She investigates the role of *early dialogues* between the mother and the infant. She finds that the deaf infant's early communication attempts, including vocalization, occur even more often than in the hearing control group (Horsch 2004: 127). The mother of the deaf child produces communication in form of *motherese* less often than the mothers of the control group (Horsch 2004: 133). If these findings can be reproduced on a larger scale, it could lead to the assumption that the focus on spoken language and the exclusion of early signs and gestures might even hinder parents to support the first steps towards an acquisition of spoken language by not reacting to early phonetic utterances as part of an early acquisition of dialogue structures. The results of Spencer et al. (2004) that the social development of a deaf child in this age group is influenced by the mothers' choice of communication suggest that the exclusion of a communication system is more likely to result in a mother-child-relationship in which the emotional base for an early dialogue is less given.

Finally, when we take into consideration the parallelism of spoken language and sign language acquisitions, where the role of *speech motherese* in the first dialogues between hearing parents and their hearing children is very similar to the way *signed motherese* is used by deaf parents of deaf children (Grieder 2000; Masataka 2000: 4; 2008: 191), it is evident that sign language and spoken language develop inside the same *milestones of development*. A holistic and multisensory approach to the early intervention might prove valuable to match a deaf child's developmental needs. Such an approach could be considered as part of a larger, multilingual intervention concept that includes signs or sign language.

5.   Benefits of early bilingual intervention

In the USA there is an ongoing scientific debate comparing the results of oral communication programs (OC) and total communication programs (TC), but the findings have been inconclusive (Geers 2006: 256). One reason might be that the way

"[c]ommunication mode (...) is (...) dichotomized into OC approaches and TC approaches" (Geers 2006: 256) is a too broad concept for comparative studies. Especially the variety of concepts that fall under the term of *total communication* can emphasize different visual communication systems and include them in a variety of ways (Geers 2006: 256). Therefore, often only case-studies support the idea that a deaf cochlear implanted child can benefit from a sign language including early intervention programs: In a study of three children Yoshinaga-Itano (2006: 323) demonstrates how spoken language can be based on a sign language, comparable to a "piggyback ride".

It is useful to turn to the Scandinavian countries when the possible benefits of bilingual early intervention are being discussed, the use of sign language having been traditionally less controversial in these countries. Preisler et al. (2002) follow the development of 22 deaf toddlers and preschoolers with cochlear implants who are between 2 and 5 years old, by periodically video-taping their interaction with parents, educators, and peers: The children with good oral skills also demonstrate good sign language skills due to the fact that they "live in a stimulating communicative environment" (413). It is also remarkable that one of the few studies about the social-emotional development, in which deaf students do not show significantly worse results than the control group, is a representative evaluation of 379 Finnish hearing-impaired students among whom the use of sign language is common (Sinkkonen 1994). Future early intervention research with the focus on language abilities in different modalities might confirm these findings, especially because in school settings the positive influence of sign language skills or a bilingual teaching method has been described in several studies (Günther & Schäfke 2004; Günther & Hennies 2011; Chamberlain & Mayberry 2000).

6.   Implications for early intervention

The development of an early diagnosis due to the establishment of newborn hearing screening has led to the fact that congenital deaf children are increasingly identified in their early infancy. Despite this fact the portion of deaf and hard-of-hearing children with massive problems in the acquisition of spoken language and subsequently of written language, as well, remains high. Consequently the social and emotional development of these children has to be seen as highly problematic. Therefore, it is reasonable to reconsider and re-evaluate the methods of early intervention. There is obviously a new need to include the knowledge about early psychological processes in intervention programs. But the long-term social-emotional consequences of these developments are not clear, neither have professionals in the field of early intervention programs been prepared for this kind of challenge. Traditionally the major concern expressed by

these professionals is the early stimulation of biological pathways in order to acquire spoken language. This concern has lead to a massive implantation in deaf children, often at an age of less than two years. As shown above such a biased perspective bears the danger of failing deaf children in their overall development, which may also pose a great burden on their families. It is very likely that the strong advice not to use a certain way of communication and to focus on one sense primarily hinders the parents, who are already emotionally destabilized, in their ability to apply *intuitive parenthood* even further. In extreme cases the focus on spoken language might become one of the obstacles to actually acquire it.

Marschark and Spencer (2006: 5) describe how "[b]uilding (...) spoken language skills can range from unisensory (...) to bilingual-bicultural programs". In the light of Piaget's model it might be more adequate to speak of a range from unisensory to multisensory methods during the pre-symbolic phase. The term of "monoligual" and "bilingual programs" are useful in the post-symbolic phase.

A multisensory early intervention philosophy could include pre-linguistic signs and could lead to a bilingual preschool setting, offering deaf and hard-of-hearing children all possibilities for a functional language development. If this turns out not to be necessary, a monolingual language acquisition can easily be built on a multisensory early intervention. However, to apply a multisensory approach with the declared goal of a monolingual language acquisition is an inconsistent model.

In an early intervention program the parents' choice of communication should be respected, however, there should nevertheless be obtainable information about the role of spoken language in a deaf or hard-of-hearing individual's life as well as an insight into the life of deaf sign language users and the signing community. An equal cooperation of deaf, hard-of-hearing and hearing professionals in the field of early intervention would contribute to such a holistic perspective.

7.   Conclusion

In this paper we have discussed the linguistic, emotional, and social development of deaf and hard-of-hearing children. The results of the available studies indicate that a notable part of these children suffers from a massive retardation of spoken language and reduced possibilities in their means of communication, and shows disturbances in the social and emotional development. Only recently more studies focus on the early years. They support the suggestion that these problems start in the infancy of the hearing impaired child. Using Piaget's stages of development we have discussed the transition of the sensorimotor stage to the pre-operational stage when the function of symbolic communication is discovered by the toddler. The importance of this

period has been highlighted by Spencer et al. (2004). They link the mothers' choice of communication to the social and emotional interaction between mother and child during the sensorimotor stage, and to the first language expressions in the pre-operational stage. In this transitional process towards language we find pre-linguistic gesture as a first expression of the symbolic function of language, during the same time in which Piaget describes the occurrences of the object permanence and playful imitation in children to take place.

In order to assist deaf children in these crucial moments of early development intervention programs should apply a holistic and multisensory philosophy, which is open to all forms of communication. We would argue that the advice to exclude signs, gesture or sign language from the communication with deaf children does not correspond to the needs of these children. It contributes to the parents' problems to develop attachment to and a satisfying early communication with their deaf children. All these are factors that might influence the language acquisition of deaf children in a negative way. This leads us to the conclusion that a holistic and multisensory early intervention with the option for a later bilingual education would rather serve the developmental needs of a deaf child.

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The challenge of complexity

Body, mind and language in interaction

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In our post-Cartesian times we can assume that human abilities are integrated abilities and that body, mind, language and emotion interact. We can finally open up the 'black box' and observe how the brain works, at least to some extent. 'New Science' has been developed on the basis of consilience or the unity of knowledge of the natural and social sciences and the humanities. The challenge is to describe how human beings address the complexity of life, which includes the issue of how we can move others by moving ourselves.

The chapter starts from human beings and their abilities, which are determined by human nature, the environment and culture. On a sociobiological basis it proposes a holistic approach that aims to explain how human beings act and react in ever-changing surroundings. Different theses on the relationship between the individual and the species are discussed, resulting in the view of human beings as social individuals who need to go beyond the shared mind and to interact in dialogue. The Mixed Game Model is introduced as a holistic model that starts from the natural object and derives methodology from it. The object is the complex human ability of 'competence-in-performance', which requires an adequate methodology based on Principles of Probability. A few authentic examples are analysed in order to illustrate how different human abilities interact in language use, especially the abilities of speaking, thinking, having emotions and perceiving, and to show how they enable us to move others by moving ourselves.

Keywords: emotions; integration; consilience; sociobiology; holism; the Mixed Game Model; competence-in-performance

1. Living in post-Cartesian times

How is it possible that 'moving ourselves' can lead to 'moving others', those we do not even know, those who might live at the opposite side of the world? Many actants are involved: words in language use such as *to move*, modern communication technology, and at the core the internal relatedness of ourselves and others. The "New Science" addresses the issue of "how we connect with others" (Iacoboni 2008). The connection

certainly is made in our minds but is not restricted to our minds. Can it make sense to consider the human species as beings destined to understand each other? The human species is a species of individuals who need to interact in dialogue. The mental ability of 'understanding' in the hearer's mind is only the first step in the interactive process of 'coming to an understanding'. From the very beginning, mirror neurons point to action and not only to understanding (Weigand 2002a). Dialogic action presupposes dialogic mental orientation. 'Intersubjectivity' or 'the shared mind' can be considered a precondition of interaction (Trevarthen 1999; Zlatev et al. 2008). The issue is: how are we to conceive of this *step from intersubjectivity to dialogic action*?

The 'New Science' starts from the natural object, living beings, and tries to describe their behaviour and actions by means of goal-directed observation. According to Feynman (2001:173), "making observations" must not omit "the vital factor of judgment about what to observe and what to pay attention to". Such an endeavour cannot accept the limits of disciplines nor can it be restricted to abstraction and reduction. What is abstracted from is lost forever. The complex object inevitably requires a *holistic theory* if it is to be adequately described and explained. It does not evolve from addition of methodologically separated parts but from interaction of sub-complexes (see also Zlatev 2003:8). As a whole it is more than the sum of all the interactions. A few voices, like Austin (1962) and Simon (1962), emphasized that the starting point has to be the complex whole. They did however not get a great deal of attention in the past. Recent neurological experiments on mirror neurons, for instance, eventually demonstrated that there is no 'simple' starting point (e.g. Rizzolatti & Arbib 1998; Damasio 1994; 2000): the physiological object cannot be separated from its function (cf. Weigand 2002:230). From the very outset, body and mind, perception and intention are directed towards dialogic interaction.

Body, mind, and language interact, as is also testified by language use if analysed without methodological blinders. For instance, we have the phrases *the inner eye, their mind's eye* "*das geistige Auge*" or we can *move the audience* as well as *move the chairs*. Of course, we can construct artificial theories and describe such phrases as figurative or metaphorical use of language. However, separating in this way the concrete from the mental contradicts routines of language use. The concrete and the mental are connected as interacting components in the "architecture of complexity" (Simon 1962) which allows us to explain how physical motion can cause physiological (e) motion and vice versa. All our senses, cognitive abilities and emotions are embodied senses and abilities. How else could we, for instance, explain blushing as an external marker of embarrassment? Even our sense of being a self is anchored in a body (Ramachandran 2003:125). Embodiment of cognition and emotion seems to be a key concept to human behaviour.

Human beings need specific capacities in order to cope with ever-changing surroundings, basically the capacity of adaptation. Adaptation means grasping the

complex from the very outset as a whole by any ability and means available, and by changing the course of action whenever necessary. Human abilities are used in the way they are neurologically programmed. As we know in post-Cartesian times, they are *internally connected* and used in integration. The mind or cognition inevitably interacts with other human abilities. What science has separated over the centuries in the wake of Descartes by postulating, for instance, an area of reason separated from emotion, turns out to be the result of a methodological fallacy (Damasio 1994).

Starting from human beings and their abilities is an inevitable consequence for any scientific endeavour if it seriously reflects the insight that whatever we think and perceive is dependent on our abilities. This insight might seem banal but it is crucial in respect of analysis: human *abilities are capacities as well as restrictions*. The world as such or any so-called absolute truth is beyond our reach. We are at the centre of the complex whole, we live *in* the world, not outside the world. What we perceive and think is not the total range of what can be perceived and thought. There are, for instance, animals which can see and hear what human eyes and ears cannot perceive. In the end any statement of truth remains a claim to truth, or as Wittgenstein (1972: 32e) puts it: "Mustn't we say at every turn: 'I believe this with certainty'?"

If we try to develop a theory which accounts for the complex whole, we need to go beyond traditional theorizing and to start from our natural object of study 'human action and behaviour' by means of 'goal-oriented' observation. Observation is thus combined with evaluation according to the benchmark of crucial criteria. Crucial criteria for human action and behaviour are, in the end, evolutionary criteria. In this way we can set up *premises* that circumscribe the complex object and describe how it works. The *methodology* of such a holistic theory can then be derived from the premises (see Section 3).

2.   The individual human being and the species

The complexity starts with human beings' double nature as individuals as well as social beings (Weigand 2007). The relationship between the individual and the species has been the object of various theses:

–   human beings as selfish individuals (Dawkins 2006)
–   human beings as symbolic beings (Deacon 1997)
–   human beings as intersubjective beings (Trevarthen e.g. 1999; Zlatev, Racine, Sinha & Itkonen 2008)
–   human beings as social individuals (Weigand e.g. 2007)

These will be, in turn, discussed in this section.

2.1 Human beings as selfish individuals

Nobody would object that human beings are selfish beings. I am however reluctant to follow Dawkins' thesis (2006: 2) that we misunderstand how evolution works if we assume "that the important thing in evolution is the good of the species (or the group) rather than the good of the individual (or the gene)". Of course, such a view and the catchword of the "selfish gene" excite attention. Dawkins' arguments however are not always convincing. He explains the selfish gene as follows (p. 88):

> It is trying to get more numerous in the gene pool. Basically it does this by helping to program the bodies in which it finds itself to survive and to reproduce. But now we are emphasizing that 'it' is a distributed agency, existing in many different individuals at once.

To my mind, Dawkins' argumentation turns the chain of reasoning upside down. He rightly points to the survival of "the bodies". However, he considers the bodies to be individuals and contradicts the statement that they are programmed as members of the species. I think this precisely makes the difference: according to Dawkins, human individuals are genetically programmed as individuals and can learn altruism by culture (p. 3): "Let us try to *teach* generosity and altruism, because we are born selfish." Even if he thus concedes "a limited form of altruism" (p. 2), his overall tenet stands as it is: evolution is directed towards "the good of the individual (or the gene)" rather than "the good of the species (or the group)". To my mind, however, it is hardly sufficient, in terms of evolution, to believe that the individual counts as an individual. In terms of evolution, the individual counts insofar as it counts for the species.

According to Lipton (2008: 15), "we need to move beyond Darwinian Theory, which stresses the importance of *individuals*, to one that stresses the importance of the *community*. […] Evolution becomes a matter of the survival of the fittest *groups* rather than the survival of the fittest individuals." Wilson (2004: 157ff.) imagines "a spectrum of self-serving behavior" ranging from benefiting the individual to benefiting "the highest sociopolitical units". He considers human beings as having an "innate predisposition" to social behaviour and assigns them a position "on the spectrum somewhere between the two extremes". For him it is not self-contradictory that "true selfishness […] is the key to a more nearly perfect social contract"; or to put it like Gordon (1975): "man defending the honor or welfare of his ethnic group is man defending himself".

The individual has been at the centre of philosophic interest since antiquity. Stressing now the selfish gene as an argument for the *selfish individual*, goes beyond philosophical thought and introduces evolutionary criteria. Talking about the selfish gene throughout a whole book however seems to me exploiting a single phrase inappropriately. Genes as well as human individuals are interacting members of complex networks. Genes distributing themselves as "replicators" or "distributed agencies" are

not really interacting. Interaction needs some shared basis, for human individuals 'the shared mind', which is laid down in our genetic blueprint. Our consciousness is a double consciousness that of being individuals as well as social beings. Human beings' double nature is differently weighted in any individual on a scale that ranges from extreme selfishness to seemingly total social orientation. Evolution certainly needs the individual's selfishness because otherwise the species could not survive. Trying to attract attention by the catchword of the selfish gene may have an effect for a moment but in the end does not stand up to close examination.

The goal of describing and explaining human actions and behaviour points, at its core, to the ultimate question of who we are, a question which seems to go beyond the reach of human cognition. We can explain our self-consciousness, according to Damasio (2000), by our ability to connect our actions and behaviour with ourselves, but the question of who we are ultimately seems to be inaccessible to our consciousness and understanding. What does it really mean when we all think of ourselves in terms of 'ego'? We seem to have consciousness about what we are doing, what we are feeling, and about being dependent on what our fellow beings are doing. But, in the end, the ego, our own ego, remains an elusive concept. Perhaps the last illusion? Certainly an illusion or at least a question of faith if we believe that our own personal self will have some existence after our lifetime. Why should it be of interest to biology that the individual survives as an individual? Evolution is interested in the survival of the species. The species survives if the individual struggles to survive. This is the reason why the individual has to be a selfish individual. There is no contradiction between the selfishness of the individual and the advantage for the species. On the contrary, it is in the interest of the species if individuals are to some degree selfish individuals. It is not a question of 'either or' but a question of 'as well as'. If the individual's selfish ego acts exclusively in its own interests, it will, in the end, destroy the species as well as itself. Acting exclusively for social concerns, on the other hand, is basically nothing other than masking the individual's selfish interests with social terms. Human beings are neither individuals in the sense of hermits nor cogs in the social machine. The species flourishes if the individual flourishes. Consciousness of our own self implies consciousness of our social embeddedness, of the self as being the self of the other human being.

2.2   Human beings as symbolic beings

The thesis of human beings as the *symbolic species* also draws on the individual even if it uses the term "species" (e.g. Deacon 1997; Wilson 1999). Deacon's book on "The symbolic species" stimulated intensive discussion among linguists as it concerns a central linguistic issue, the issue of word meaning and reference. Although Deacon and Wilson depict a reasonable network of the co-evolution of social and biological

processes, their view of language and communication is restricted to what they call "symbolic communication". We might be content that they include communication, but their focus is on the feature "symbolic". It is not so easy to understand what they really mean by these terms. According to Deacon (1997: 22), "language is not merely a mode of communication, it is also the outward expression of an unusual mode of thought – symbolic representation …", or more precisely (p. 41):

> I mean language in the following very generic sense: a mode of communication based upon symbolic reference (the way words refer to things) and involving combinatorial rules that comprise a system for representing synthetic logical relationships among these symbols.

According to Wilson (1999: 146f.) "concepts and their symbols are usually labeled by words. Complex information is thus organized and transmitted by language composed of words." The background of such theses is a view of language as transmitting information by means of words. With respect to the progress brought about by the view of 'coevolution of genes, mind, and culture' (Lumsden & Wilson 2005), the view of language as symbolic language can be interpreted as a relapse into orthodox models of sign theory. Symbolic representation as a mode of thought characterizes human beings as thinking individuals. Nothing is really said about communication if it is reduced to symbolic reference by words and to information transfer.

As a linguist I wonder what symbolic reference as "the way words refer to things" is intended to mean. Deacon combines symbolic reference with "combinatorial rules that comprise a system for representing synthetic logical relationships among these symbols". Reference in the narrow linguistic sense of identifying objects as individual or generic objects is not achieved by words but by noun phrases which are in part constructed by combinatorial rules. In Deacon's "generic sense" of "the way words refer to things", word meaning can be understood as evoking concepts independent of the speech situation in a process which is unique to human communication. However we interpret the "everyday miracle of word meaning and reference" (p. 43), the term "symbol" is obviously used in a broad sense, not in the literary sense of creating a symbol which by means of the concrete points to something figurative.

Symbols play an important role in mainstream linguistics, not only in models of language as a sign system but also in pragmatic models that try to arrive at performance by starting from competence. The meaning of a word is claimed to be a concept in our mind, a 'symbol' for its 'real' meaning in the external world. It is attached to and described as a defined part of the sign. In performance, however, meanings are not defined by signs but negotiated by human beings. The symbolic model is based on methodological exigencies of reduction and abstraction, not on the complex natural object.

Reference to things not present in the situation is certainly a very important component of interaction, which increases the effectiveness of language for communicative purposes. The evolution of the species however does not primarily depend on its ability to refer to things but on its ability to negotiate communicatively, i.e. for dialogic purposes including reference. Language plays a major role in this process of negotiating meaning and understanding, not as a system of symbols but as an integrated component that is in part determined by biology and in part by culture (Weigand 2007).

One might wonder whether the concepts of language as a system of symbols and language as an integrated component in the process of negotiating meaning and understanding really exclude each other. Couldn't we revise the theory of signs with the aim of arriving at natural language use? The question is to be posed in principle: could there be a semiotic theory of performance? A theory of signs might be part of a semiotic-pragmatic theory; however, such a pragmatic theory cannot cope with performance as it is artificially constructed by the addition of parts, which do not exist as separate parts in natural language use. Using the terms 'component' versus 'part' underlines the issue at stake. Integration of components does not come about by the addition of parts; integration means the interaction of components that are interconnected from the very beginning. Including a system of symbols in a theory of performance inevitably represents an artificial step that affects the whole theory.

A revised theory of signs, such as Ruthrof's 'corporeal pragmatics' (2009 and forthc.), is based on two parts: language and perception. There is however no language as such, no signs which have meaning on their own. Rather, there are human beings and their abilities of speaking and perceiving which are from the very outset integrated as components of the complex whole of human behaviour (Weigand forthc.). It is human beings who communicate by the use of their abilities; all their abilities, from emotions to self-awareness, are inevitably embodied abilities. Perhaps Ramachandran (2003: 125) is right in suspecting mirror neurons to be "at least partly involved in generating our sense of 'embodied' self-awareness as well as our 'empathy' for others".

Semiotics, in general, and Ruthrof's corporeal pragmatics, in particular, does not go beyond structuralist methodology. They start by claiming the existence of two sign systems, of verbal expressions and non-verbal ones. Furthermore, the 'perceptually oriented theory of language' needs to be humanised (Weigand 2002b). It is from the very outset human beings' needs and purposes, not simply perception, from which communication starts. Communication as interaction means more than "information control" (Ruthrof 2009: 6), namely making claims to truth and volition and interactively negotiating these very claims (see below). Some remarks by Ruthrof (forthc.: Chapter 8) can be read as pointing to 'interaction' and the need to go beyond a 'corporeal pragmatics'. The issue however cannot be settled by 'complementation' but by changing the core of description.

2.3 Human beings as intersubjective beings

A dialogic perspective is put forward by Trevarthen (e.g. 1999: 415) and his view of human beings as *intersubjective beings*

> Intersubjectivity is the process in which mental activity including conscious awareness, motives and intentions, cognitions, and emotions is transferred bet] ween minds.

But 'transfer between minds' is not yet dialogic action. For Trevarthen (1999: 416) "human linguistic dialogue … rests on intersubjective awareness". 'Mental activity' and 'linguistic dialogue' thus remain to some extent separated, the one being the basis for the other. 'Linguistic dialogue' in the sense of dialogic action however does not mean transferring thought into action. Nor is it the case that we 'do things with words'. We 'do things' with our abilities to talk to one another and to share our minds and perception in interaction. What I would like to stress is the intrinsic interconnectedness of body, emotion, mind, and language from the very beginning, as for instance, suggested by research on mirror neurons (e.g. Weigand 2002a; Bråten 2007). Emotion and mental activity are not something in the air but from the very outset are embodied in the brain. Only in this way are we able to feel empathy and compassion and are moved by perceiving what happens to other people, be it in everyday life or in the arts.

Trevarthen's position of the intersubjective being is an important step forward as it goes beyond the limit of the individual being and takes account of the individual's dialogic orientation. The mind is a mind we share in part. The same view is, for instance, taken by Humphrey (2002: 176): "We are beings with a unique capacity to mind, to mind what we are and to mind what other people are."

Zlatev et al. (2008: 6) define the notion of intersubjectivity as "the sharing and understanding of experiential content". Whereas Trevarthen (forthc.) considers intersubjectivity to be also shared by animals, according to Zlatev et al. (2008: 12) intersubjectivity points to the complex phenomenon of "what it means to be human". 'The shared mind' however cannot be the pivot of the survival of the species any more than can 'transfer between minds'. Living together means we need to talk and act together practically. Moreover, what does 'the shared mind' or 'sharing experiential content' mean precisely? Human beings are social individuals. They are able to share experiences in part but do not act on totally common ground. Meaning and understanding are different for different individuals and are negotiated in dialogue. Some common ground and the ability to share experiences are a necessary precondition; the pivot however is human beings' needs and purposes, which drive them to act communicatively and practically. Human beings are not destined to think dialogically but to interact dialogically.

There is one point in the work of Zlatev (2003) which is particularly worth mentioning. In his sketch of a "meaning-as-value theory", he suggests seeing the driving force for

human action in an internal value system which "is intimately connected to *emotion* and *feeling*" (p. 258). Even if 'notions of moral obligation' were already included in Trevarthen's notion of intersubjectivity (1999: 417), Zlatev relates values more directly to human action. Although he considers meaning in a very general sense that goes beyond linguistic meaning, it is enlightening to see that his hierarchy of meaning systems starts from value systems. His tenet that "life implies the presence of *intrinsic value*" (p. 255) coincides with my assumption of evaluation as the basic and intrinsic first step in human action (e.g. Weigand 2007). According to Zlatev (2003: 258) "internal value systems signal to the organism that some action needs to be taken. They thus give rise to motivation and various degrees of *intentionality*, in the sense of goal-directedness." The issue however remains how the term 'action' is to be conceived.

2.4   Human beings as social individuals

Intentionality and goal-directedness are indeed crucial features of human action that need to become the centre of attention. If we try to justify our view by evolutionary criteria, I doubt whether humankind's evolutionary development can be solely based on intersubjectivity and sharing our minds. Intersubjectivity is rooted in the double nature of human beings as social or dialogic individuals. Trevarthen (2008: vii) rightly points out that human beings are not "single heads processing information, storing it up in memory for reprocessing, and transferring it symbolically". Nor are they restricted to having minds that can share mental activity. There is no independent theory of the mind. The dialogic mind calls for dialogic action. All the abilities and concepts discussed so far – self-interest, symbols, intersubjectivity and value systems – are essential components in human dialogic interaction but are not crucial in themselves as far as evolution is concerned. Humankind is not limited to intersubjectivity; human beings could not survive if their intentions only referred to sharing experience. Human beings are destined to interact. They are *social individuals* who act in their own interests but inevitably have to take account of social concerns. In this sense, it is not the dialogic mind but dialogic interaction that characterizes human beings as the *dialogic species*. Evolution cares for the individual only insofar as it is a member of the species. Evolutionary concerns of the human species require dialogic interaction and the emergence of *language* when the purposes and goals of interaction become more and more demanding.

3.   How to deal with complexity

Progress in science requires going beyond the limits of traditional approaches. Nowadays, we recognize limits in various respects: the limits of individual disciplines, of the individual human being, of the mind and of language if considered as

separate independent fields. The view of human beings as social individuals faces the challenge of addressing complexity with a genuinely holistic approach which crosses the limits of disciplines, goes beyond the level of the mind and places individual beings at the centre of the dialogic action game. Let us see what conclusions can be drawn for the architecture of a holistic theory that is capable of describing and explaining human beings' action and behaviour.

The theory of dialogic action games or the *Mixed Game Model* (MGM) addresses complexity in two steps. The first step aims to achieve an understanding of the complex whole by a set of *premises* which are the result of goal-directed observation. An understanding of the whole includes understanding how it works. Thus the *methodology* of the theory has to be derived from the object, i.e. from the premises about the complex whole, not vice versa. A holistic theory only works in this direction: the starting point has to be the complex natural whole from which methodology has to be derived. Starting from methodological exigencies will inevitably 'damage' the natural object and result in a reductionist model (Martinet 1975: 10). Having expounded premises and the resulting methodology of the MGM in various recent publications (e.g. Weigand 2006a; 2007; 2009; 2010), I can restrict myself here to focusing on how the model deals with the interaction of body, emotion, mind, and language.

3.1   Premises

Let me start with *premises* which circumscribe the complex whole and identify the key or driving force for how it works.

– The object-of-study or the complex whole can be grasped as a dialogic action game with human beings at the centre. Human beings do not find themselves outside the world or detached from what happens in the game but live *in* the world, act *in* the game. Physical 'reality' is dependent on the instruments used to measure it. What we consider as concrete, visible or audible depends on our senses. The world could be a different world looked at with different eyes and apprehended with different minds. The world as such is beyond our reach.
– Human beings have needs and desires, which are the driving force for their actions or the key to opening up the complex whole. As dialogic beings their demands are dialogically directed and negotiated in dialogic interaction.
– Human beings are not the 'victims' of complexity; they are able to cope with the mixed games of life by their extraordinary ability of 'competence-in-performance' which can be paraphrased in Sampson's words (2005: 193) as "being capable of coming to terms with whatever life throws at us".
– Competence-in-performance consists of many integrated abilities, among them the abilities that draw on the mind and body, i.e. cognition, emotion, perception,

and speech, which are used as dialogic means for dialogic purposes. There is no separate object language, only the ability to speak which interacts with other abilities and is influenced by emotions (cf. Weigand forthc.). As a consequence, linguistic models that address performance by the separation and addition of parts, such as the speaker, discourse, and the situation, cannot claim to describe competence-in-performance.

–   Complexity as a whole is more than the sum of individual components and abilities (Simon 1962). Sociolinguistic models based on the addition of components, such as 'language' and 'interaction' (e.g. Gumperz 2003: 111ff.), will not solve the issue of complexity (Weigand 2004a). Language use is more than a sign system put to use. Linguistic signs and conditions of performance are incompatible and resist any reasonable combination.

–   Complexity is ever-changing and requires human beings to act as adaptive beings under conditions of uncertainty according to Principles of Probability. Human beings apply rules and conventions as far as they go and rely on individual inferences when the game turns out to be played as a game beyond standard conditions.

The Theory of the Mixed Game thus starts from human beings as dialogic individuals and aims to explain how physics and physis interact, how moving ourselves can cause others to be moved, how reason is influenced by emotion, or, in general, how body, mind and language interact. Human beings' consciousness is a consciousness of these various abilities in their mutual dependencies that cannot fully be controlled. Human beings can question their abilities but cannot go beyond them. Human cognition inevitably remains restricted to human capacities.

3.2   Methodology

As mentioned above at the beginning of Section 3, the *methodology* of a holistic theory is to be derived from the premises about the complex object. Competence-in-performance does not arise from an independent system of rules, conventions or norms nor from a methodology of 'anything goes'. The contrast between semantics and pragmatics, between a coded system and inferential use, is a contrast constructed by orthodox theory and inadequate to explain language use. The methodology we are looking for has to conform to the way human beings come to grips with the uncertainty of life (Toulmin 2001). Explicit and implicit means of communication, the use of rules and inferences, complement each other. In simple cases, where everything seems to be explicitly said, suggestion will not be needed. In complex cases where nothing seems to be clear, human beings proceed tentatively by referring to particularities of the game that might help to clarify what is going on. In general, they address the uncertainty of life by adapting to ever-changing conditions on the basis of Principles of Probability.

The bridge between competence and performance which linguistics has searched for for decades is not a step that combines different methodologies but a step taken in human beings' minds. Principles of Probability are applied to the decision of individual interlocutors and are changed in accordance with the conditions of the game.

Before starting to introduce the individual principles in more detail, I would like to shed some light on the very first step in this process of adaptation to the complex architecture of the game. This first step is a simple mental action that is often neglected: the step of focusing attention. Being at the centre of the mixed game, we first focus attention on some sub-complex. In this way we start with complexity from the very outset. Usually we first focus attention on standard conditions and in a second step broaden our view towards particular conditions if understanding cannot be achieved by reference to standard cases.

From this view of human beings as dialogically interacting beings, *constitutive* or basic *principles* can be derived. These are the Action Principle, the Dialogic Principle proper and the Coherence Principle which is of special interest to the issue of body, emotion, mind, and language in interaction. Examples that illustrate the principles are given in Section 4.

The *Action Principle* gives an answer to the question of what makes up an action in general. Having intentions does not yet necessarily mean carrying out an action. Actions of any type, communicative, mental and practical actions, are based on the correlation of purposes and specific means by which the purposes are attained. Depending on the type of action, the specific means are communicative, mental, or practical means. Dialogic actions can be double-layered actions, i.e. behind openly expressed purposes they can pursue different hidden interests. Consequently Searle's (1969) formula F(p) has to be extended by including interests as dominant predicate (e.g. Weigand 2006a):

Action Principle

Interest [purpose (reference + predication)] $\leftrightarrow$ communicative means

Figure 1. Action Principle

Communication does not proceed by means of a concatenation of single autonomous speech acts but by means of sequences of internally related initiative and reactive speech acts. The features 'initiative' versus 'reactive' are not only formal features dependent on the position in the sequence but primarily qualify the speech acts as functionally different speech acts: initiative speech acts make a dialogic claim, reactive speech acts fulfil this very claim (e.g. Weigand 2006a). Dialogic action is, in the end, based on two fundamental claims, a claim to truth and a claim to volition, which conform to the basic mental states of belief and desire (Weigand 1991).

The connection between the processes in the brain and language action that has been searched for extensively becomes manifest and emotion plays a fundamental role: action starts from beliefs and desires.

The dialogic nature of every single speech act and the resulting basic structure of communication are represented by the *Dialogic Principle proper*:

Dialogic Principle proper

Dialogue
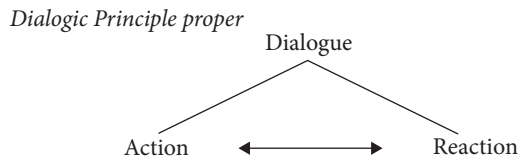
Action ⟷ Reaction

Figure 2. Dialogic Principle proper

In this way dialogue is constituted at the level of interaction by action and reaction. Only by action and reaction can the interactional purpose of the dialogue 'coming to an understanding' be attained. The correlation of *action and reaction* goes beyond the correlation of *meaning and understanding* at the level of the shared mind or intersubjectivity. An utterance is meant by the speaker and more or less understood by the interlocutor. Understanding or sharing our minds is never total, always gradual. Understanding is a mental action by the hearer and related to the utterance of the speaker. However, due to the intrinsic integration of our abilities we are unable to stop with understanding and cannot help taking a position, i.e. reacting, in general by accepting or objecting, i.e. basically evaluating the speaker's position.

The third constitutive principle, the Principle of Coherence, relates to the dialogic means by which dialogic action is performed. Dialogic means rely on abilities of the body, mind and language and are used as integrated means which complement each other. Coherence of dialogue comes about by understanding how the dialogic means interact. The *Coherence Principle* thus represents the crucial principle for the interaction of body, emotion, mind and language:

Coherence Principle

Interest [purpose (reference + predication)] ↔ communicative means
(speech, perception, cognition)
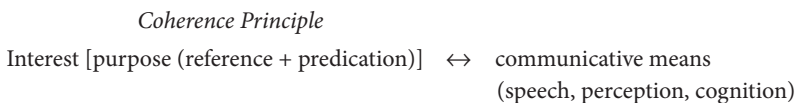
Figure 3. Coherence Principle

The term 'coherence' was initially introduced as a term that exclusively related to the text, i.e. to verbal means. In the meantime the level of the text has lost its autonomous status: coherence of the text changed to coherence in the mind (Givon 1993; Weigand 2000). Speaking or verbal means are intrinsically intertwined with other communicative

means, mainly those of thinking and perceiving. Feelings as a physiological phenomenon have a bodily expression that becomes manifest without or even against the intention of the speaker. They can take the role of communicative means in so far as they are intentionally demonstrated. The basic tenet of speech act theory of 'doing things with words' can be considered very generally a catch phrase. We do not act by speaking alone; we act with utterances which are a combination of different communicative means. By making an utterance we speak and at the same time we see what is going on in the speech situation and we make assumptions about the conditions of the game. Our communicative abilities interact when producing the utterance as the carrier of the action.

As a consequence of such a view of coherence, we have to change our traditional view of language and speaking. There is *no separate object 'language'*, only the ability to speak which is an integrated part of human competence-in-performance (Weigand 2009). The nature of language manifests itself in language use as it happens in dialogic interaction. Language is used by individual human beings. Of course, there must be something common in their use, not only rules, conventions or norms but also techniques such as inferences; otherwise language would be of little help in coming to an understanding. It is however the speakers who decide whether to conform to these norms or not. "Common knowledge" is only in part common knowledge and above all not equal knowledge. The species is made of individuals who do not precisely know what is behind the face of the other individual. As social, intersubjective individuals, we are able to share knowledge, in principle and in part. Shared knowledge is, in the end, individually shaped knowledge and is negotiated in dialogue. Negotiation of meaning and understanding presupposes intersubjectively oriented minds.

Constitutive Principles are combined with Regulative and Executive Principles. *Regulative Principles* mediate between different and even contradictory abilities and interests. They are, for instance, responsible for how we match our self-interest with respect for the other human being as well as for how we deal with emotions. Principles of Emotion mediate between emotion and reason. Methods of regulation are dependent on cultural conventions (Weigand 1998a, 2007). Whereas in Northern Europe we often follow a principle such as "Hide your emotions in public", such a principle does not seem pervasive in southern countries or in America (Weigand 2004b: 18f.). Emotions are only in part intentionally controlled. They are strong enough to cancel rationality whereas the "controlling power of reason is often modest" (Damasio 2000: 58).

The eminent role of emotion in human beings' behaviour is in fact no longer in doubt (e.g. Lüdtke 2006). According to Foolen (1997: 26), "emotions are an important part of our self-experience, and they cannot be left out of an enterprise that aims to be experiential". How could such an experiential enterprise be reconciled with a view of language as determined by norms? The result would invariably be an artificial concept of language incompatible with human self-experience.

Executive Principles finally refer to cognitive processes and strategies with which we try to successfully pursue our interests and purposes. Executive Principles are thus part of a rhetoric of dialogue which evaluates communicative means with respect to their effective use in specific dialogic action games (Weigand 2008a).

4.   Sample cases

Having sketched the theoretical basis of the mixed game, I am now going to illustrate the interaction of language, emotion, mind, and body by a few obvious examples. They clearly manifest our competence-in-performance as a complex integrated ability if looked at without methodological blinders. Even if "pragmatics allows humans into the analysis" (Yule 1996: 4), one might still be burdened by the traditional view of language as an independent object. Yule thus considers it a "problematic case" when he passes other people and is unable to understand what they are talking about even though they are speaking the same mother language. There is nothing to be surprised at if we take into account that discourse or spoken language is not an autonomous object. We communicate by simultaneously speaking, thinking, and perceiving. It is therefore a natural consequence that as observers we often cannot understand what other people are talking about even if they speak the same language; we simply do not share their minds. We have to be insiders of the game, and not even as insiders can we see what is going on behind the face of our interlocutors. In the end, in problematic cases only the speaker knows what he/she meant.

Such a view of the complex integrated whole is beyond the reach of clear-cut rule-governed models where understanding is conventionally or normatively defined and presupposed as the equal understanding between speakers of the same mother language. Methodological claims of this type cannot be our starting point if we aim to come to grips with human beings' competence-in-performance. We have to start from the complex whole and try to find coherence at the level of interacting components. Understanding then turns out to be a never-ending process that can only gradually be attained.

The first type of examples we are going to analyse illustrates the interaction between speaking and thinking or *language and cognition*. I take the well-known example of Brown & Yule (1983: 196):

(1)   a.   There's the doorbell.
      b.   I'm in the bath.

These two utterances show no sign of textual coherence; nonetheless they are connected. Obviously we understand their internal relationship even without any description of the situation. We do not need, like Brown & Yule, to resign, or need to assume

a zero connector, like Stati (1990). Coherence comes about by the Dialogical Principle proper and by the interaction of verbal means with cognitive means. Our actions are dialogically oriented: with the initiative utterance of our example the speaker makes a dialogic claim to truth, and indirectly to volition, and expects a reaction that addresses this claim from the interlocutor. The initiative and reactive utterance are thus connected at the cognitive level by making and fulfilling the same claim. That is precisely what is represented by the Dialogic Principle proper, which is not in need of any verbal sign because it is based on human beings' nature as intersubjective, i.e. dialogical individuals.

Cognition comes to play in this example in another respect, too. The claim to volition of the initiative utterance is not explicitly expressed by verbal means but left to inferences. It is a characteristic of indirect speech acts that the real claim remains uncertain, in the balance of probabilities and is thus to be negotiated: someone has to open the door, if possible the interlocutor (also Weigand 2002b).

Speech not only relies on sharing our minds; it is also intrinsically connected with *shared perception* as we can see with the following authentic example (Weigand 2002b):

(2)   a.   One for her.
      b.   Eve, too.

Without a description of the speech situation we will not really understand what is going on in this action game. We might be baffled and ask: *Where have all the 'sentences' gone?* We do not find sentences; we find utterances, i.e. communicative means, not just verbal ones. Verbal means are integrated with perceptual means in a way that go beyond language rules or norms. It is necessary to perceive what is going on in order to understand. In our case we can observe that B, the father, is cutting willow branches for the son, and A, the mother, asks him to cut a branch for the daughter: *one for her*, which is accepted by the father: *Eve, too.* Integration in the sense of interacting dialogic means – verbal, perceptual, and cognitive – is a constitutive feature of human competence-in-performance.

Perception cannot be separated from speech. This is in part the reason why oral and written language cannot be directly compared. Perception in the speech situation and perception in the written medium are completely different and consequently result in different ways of constructing utterances.

There is also another issue that finds its genuine explanation in the integration of speaking, thinking, feeling and perceiving: the issue of human beings' ability to produce ever-new utterances never produced before. It can no longer be considered an astonishing event but the natural consequence of the fact that meaning is created through the eyes of individuals and is not only expressed by the use of verbal means. The complexity of meaning and understanding is, in principle, without limits. Neither Chomsky's recursive rules (1965) nor the infinite possibilities of variation in spoken language touch upon the real issue.

The following authentic example illuminates once more very clearly the complex network of communicative means that we use without any effort in everyday communication (see also Weigand 2004c). I will first present this example without any description of the speech situation, i.e. as if we could 'trust the text' (Sinclair 1994) or accept a concept of language as autonomous object:

(3)   H: Lassen Sie sich nicht anstecken!
        (Don't let yourself get infected!)
        E: Sind Sie krank?
        (Are you ill?)
        H: Haben Sie nicht das Wasser gesehen? Jeder hat sein Hobby.
        (Didn't you see the water? Everyone's got a hobby.)
        F: Das würde ich nie machen, wo wir soviel bezahlen allein fürs Putzen.
        (I'd never do that when we pay so much just for the cleaning.)
        E: Ah, jetzt verstehe ich. Sie haben recht. Nein, da lasse ich mich nicht anstecken!
        (Ah, now I understand. You're right. No, I won't let myself get infected!)

I am quite sure that you will not understand what is going on in this action game. You may try to find some thread running through the text and arrive at an approximate partial understanding by guessing. But are we guessing in language action? On the contrary, we do not need to guess because as human beings we not only use our ability to speak but inevitably bring in other integrated abilities, namely perceiving, feeling and thinking. In order to understand what is going on in language use, we have to participate in the action game and to analyse it *from inside*, addressing the complex directly and not reducing it to the empirical level of the text.

Consequently language action is not action by speaking but by integrated dialogic means including verbal means. In the action game we approach each other as individuals with different cognitive backgrounds and cannot therefore presuppose understanding. Sharing our minds does not mean knowing what is in the mind of other people nor does it mean that meaning and understanding would be pre-given by rules or norms and thus be the same for every participant in the game. Sharing our minds means the possibility of opening up our minds and of coming to an understanding by negotiating meaning and understanding and this also includes tackling problems of understanding. In our example, the first utterance, *Don't let yourself get infected!* is not immediately understood by the interlocutor, instead he/she is the victim of a misunderstanding. Language-in-use can accept the risk of misunderstandings because they are normally immediately repaired, as in our example.

It thus becomes evident that we have to go beyond the empirical level of the text and have to add a description of the cognitive, emotional and perceptual background from which the interlocutors derive their cognitive and perceptual means of communication. Clearly, they do not trust the verbal text alone but trust cognitive means,

associations and allusions, which an observer cannot understand. Thus in our example H refers to a person not present in the action game without explicitly expressing it, a person who, some days ago, had spilled water on the ground when cleaning the roof of the house entrance: *Didn't you see the water?* The action game takes place near the entrance of the house. It is therefore enough for H to raise his head and to look and move his body in the direction of the entrance hall thus alluding by perceptual means to what had happened a few days ago, and ironically commenting on it *Everyone's got a hobby.* He deliberately only uses the anonymous term *everyone* and takes it for granted that the interlocutor will understand. His wife F, too, uses an anonymous phrase: *I'd never do that* trusting that E will understand because they are supposed to share knowledge as a result of the fact that all three live in the same house. She adds a critical comment on the price they have to pay for the cleaning of the hallway. All these means together, verbal, perceptual and cognitive ones, are necessary for E to come to an understanding and to arrive via negotiation at the right meaning of *to be infected*, namely 'to be infected by a mania for cleaning'. There is no explicit disambiguation by the verbal environment.

I think the conclusions to be drawn from this example are evident. Linguistics as a science of language alone is not capable of addressing language action. Yule is right when he writes that as observers we can only understand simple examples that are mainly based on verbal means. Trusting the text in a corpus does not lead to an understanding of the interaction. On the other hand, corpus linguists who consider the corpus as a record of our behaviour, like Stubbs (1996: 233), are wrong because only part of our behaviour is recorded in the corpus.

Example (3) also shows how *body movement* is deployed as perceptual communicative means. Perception is directed at the body, at gestures and any other body movements. Whereas gestures have already been dealt with at length in the literature as an important dialogic means (e.g. Nash 2007), body movement still needs to be analysed in more detail. Not every body movement can be conceived of as communicative means, only movements that are intentionally carried out, as in our example where moving forward indicated the place of the event.

After these three basic examples which demonstrate the nuts and bolts of the interaction of body, emotion, mind and language, I want in addition to focus on some special components and consequences of the complex interplay between them. It is as a consequence of the intrinsic interaction of language, emotion and body that the *notion of text* must be questioned. The written text sometimes includes graphic or pictorial images which are not simply a complement to the written text but interact with it in an essential way. This combination of visual and verbal means exerts a particularly strong persuasive force and evokes powerful emotions. Such textual compositions are therefore frequently and readily used for advertising messages or any other appeals to action (see Roque 2008; Weigand 2004c).

Body movements are not only deployed to indicate the place or direction of an event but also to strengthen our dialogic claims and express emotions. We can, for

instance, intimidate our interlocutor by hitting the table or by using paralinguistic devices such as increasing the loudness of our voice. *Physical motion* indicating potential violent action sometimes seems to be the last resort for demonstrating power and imposing our claims on our opponents. We know how this can result in waging wars in order to achieve political and religious goals even those of social order, democracy or Christian faith.

The correlation between *facial expressions* and emotions is another very clear example of the internal, biologically determined interdependence of body and mind. Ekman's numerous publications (e.g. Ekman 1999) clearly demonstrate that there are typical universal facial expressions, including activities such as crying, from which we can deduce the corresponding emotion. These facial expressions are only in part intentionally controlled and can thus reveal emotions we do not wish to show. They may however also be feigned and thus intentionally used for manipulative purposes.

Emotions are a strong force that can be used to move other people's minds. On the basis of our shared minds, appeals to compassion are a powerful persuasive technique. Whether these appeals will have any effect depends on the individual actants in the particular game. Politicians know the power of compassion and use it in their own interests. George W. Bush, for instance, in his famous speech in Congress on the State of the Union of January, 28, 2003, deployed this technique in picturing in detail a terror scenario by using a sequence of typical utterances in order to get acceptance for a pre-emptive war against Iraq:

(4) Iraqui refugees tell us how *forced confessions* are obtained: by *torturing children while parents are made to watch*.

International human rights groups have catalogued other methods used in the *torture chambers* of Iraq: *electric shock, burning with hot irons, dripping acid on the skin, mutilation with electric drills, cutting out tongues, and rape.* If this is not evil, then evil has no meaning. [Applause]

At the literal level, he uses the phrase *torturing children while parents are made to watch* as an argument to excite compassion, and he lists violations of human rights as further arguments by using phrases such as *electric shock*, *burning with hot irons*, etc. all of which are designed to provoke indignation. He thus evokes powerful emotions in this indirect directive game in order to move his audience.

There is a nice story on the Italian internet which once again demonstrates the power of words and of indirect speech acts (cf. also Weigand 2008b). It is the story of an anonymous author, not the description of an authentic case. The story compares two ways of asking for help in the case of a blind beggar. The beggar first writes directly and explicitly on the sign beside his hat:

(5) I am blind. Please help me.

He directly expresses the fact that he is blind as an argument why people should help him, and gets very few coins. A copywriter passes by and changes the text: the argument of blindness is now expressed as an appeal to compassion and the claim to act is left verbally unexpressed:

(6)   Today, it's springtime, and I can't see it.

And the hat fills up with coins. People are more likely to be moved by persuasive appeals to their emotions than by direct demands telling them what to do.

Finally let us have a look at some *lexical phrases,* which clearly confirm the intrinsic connectedness of body and mind, as already mentioned in Section 1. We must however again abandon traditional theorizing in order to cope with the way the interaction of body and mind is conventionalized in the lexicon. Phrases like those in (7) suggest that the lexical unit is the phrase, the way-of-use, or collocation (e.g. Sinclair 1998; Weigand 1998b), which is in most cases unambiguous between bodily and mental readings.

(7)   the inner eye – *das geistige Auge*
       I see what you mean – *ich sehe/verstehe, was du meinst*
       as far as the eye can see – *soweit der Blick reicht*
       to be moved – *gerührt sein*

To start with single, often highly polysemous words and to claim that they would be disambiguated by the context amounts to an artificial manoeuvre which contradicts language use. Traditional views, for instance, by Sweetser (1990), separate the field of perception from cognition and explain diachronic change by a change from concrete perception to figurative cognition or from body to mind. They are based on methodological hypotheses that 'damage' the natural object. Language change does not start with human beings separating their abilities. On the contrary, there is evidence that earlier historical periods did not make the distinction between their bodily and mental abilities but instead considered concepts of the mind as perceptual concepts. This can be seen with the Greek examples *thumós* relating mind to fumes and *psyché* relating mind to breath (Weigand 2006b: 98). Kronasser's comment in this respect (1968: 188f.) that it is often difficult to distinguish between the meanings of these words is very instructive. The separation between these two domains has been made by linguists in an attempt to divide the simple concrete area from the more difficult cognitive one.

The lexicon is rife with phrases of this type that easily cross over from physical perception to cognition and emotion. We can *stir the dough* as well as *stir somebody to pity*. Emotion influences everything, cognition is bound to perception and vice versa. Instead of artificially constructing lexical theories as codes that divide the multi-word lexical units into words and describe use by a transformation from literal to figurative

meaning, we should accept that language represents a network of phrases used by human beings in combination with other communicative means in order to negotiate meaning and understanding.

5.   Conclusions and outlook

The conclusions to be drawn from the examples given above are clear: if we want to understand human beings' actions and behaviour, it is of no help to refer to a concept of language as a code. Signs carrying meanings that are defined by a code are constructs of reductionist theories of language. An adequate theory of human beings' actions and behaviour in performance has to cope with the complexity of its object. Motion and emotion, moving our body and moving the minds of other people, are not completely separated but interrelated and interdependent actions. Human beings as dialogic individuals aim to move other people's minds in their own interests but simultaneously they need to take account of the fact that they live in a community. Consciousness of our own self is at the same time consciousness of the other self. As individuals we differ in the way we position ourselves between the extremes of egocentricism and social self-sacrifice.

Genuine interdisciplinary research is research on the same complex object from different perspectives and with different scientific interests. Any scientific endeavour is in the end related to human abilities. Our abilities allow us to proceed some steps within the hierarchy of complexity. They also allow us to point to mysteries that are beyond our explanatory reach. Mysteries such as the fact that matter does not have to be visible or that there is not only a single geometry (du Sautoy 2004: 110f.) once again question the distinctness of matter and energy, of body and mind. However, in order to shed some light on these dark areas, we must not take refuge in the simple but must dare to undertake an adventure of the complex which we ourselves are part of.

Emotions play a crucial role on the switchboard of human behaviour and action. They are however not completely controlled by reason and can show up in our physiological reactions even against our intentions. Like any other human ability they are invariably embodied and can be purposively deployed as communicative means. Emotions are not superfluous abilities but fit the evolutionary schema of survival needs. In this sense, 'fear', for instance, indicates the need for protection. In the end, it is the interests and advantages of human beings, which induce and guide human behaviour.

Attempts at defining emotions demonstrate another specific feature: emotions resist being explicitly described. They are to some degree the inexpressible. This is why they are often talked about by means of metaphors or symbols. Emotions thus cross the limits of verbal communication; on the basis of intersubjectivity, they

are emotion and motion at the same time and can be comprehended without and beyond words.

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(E)motion in the XVIIth century

A closer look at the changing semantics of the French verbs *émouvoir* and *mouvoir*

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According to Geeraerts & Grondelaers (1995: 176), "the medieval physiological-psychological theory of the four humors and the four temperaments has left its traces on our emotional vocabulary". In this study, we would like to go a step further by showing how the changing conceptualisation in the era of Descartes also influenced our emotional lexicon. The XVIIth century can be considered as a key moment in the origin of modern emotive consciousness (see Bloem 2008). For instance, from this period on, the term *émotion* is used more frequently in a rather abstract sense instead of the "mouvements de l'ame", which was commonly used until then in order to refer to emotional changes. In our analysis, we confront the semantic and syntactic profile of the verbs *émouvoir* and *mouvoir* in order to study their uses within the XVIIth century. Therefore, the attested occurrences are analysed in a semasiological way, inspired by Geeraerts' (1997) prototype semantics. I especially peruse some encyclopaedic treaties like for instance *Le tableau des passions humaines* (1620), *Les charactères des passions* (1640), *De l'usage des passions* (1642) and *Les passions de l'âme* (1649). These works provide us with very important testimonies regarding the changing conceptualisation of emotions. In other words, I examine the evolution of *émouvoir* and *mouvoir* within reflections about the nature of emotions in order to demonstrate the close connection between culture and lexicon (see also Kövecses 2005; Gevaert 2005).

Keywords: Descartes; metaphors; cultural and diachronic perspective; semantic and syntactic profile; verbal analysis of *mouvoir* and *émouvoir*

1. Introduction

In order to better understand the historical origin of our (linguistic) concept of emotion, and its close connection to that of motion, this chapter examines the relation between culture and lexicon by investigating how the changing conceptualisation of emotions in the era of Descartes influenced our emotional lexicon. One of the main

questions is whether we can perceive the diminishing influence of the theory of the four humours, in inverse relation to a rising influence of the encyclopaedic treaties within the XVIIth century.

Within the literature, some references to the influence of humoral theories on the emotive lexicon can be found. First of all, according to Geeraerts & Grondelaers (1995: 176), "the medieval physiological-psychological theory of the four humors and the four temperaments has left its traces on our emotional vocabulary". More specifically, they propose that:

> As the original literal motivation gradually disappears, the elements of our emotional vocabulary could receive a new interpretation as figurative expressions of the physiological effects of particular emotions.
>
> (Geeraerts & Grondelaers 1995: 171)

Such a take on our metaphorical language concerning emotion seems contrary to that of Conceptual Metaphor Theory, CMT (Lakoff & Johnson 1980; Lakoff 1987; Johnson 1987) which takes a rather opposite approach stating that, rather than cultural conceptions, (universal) bodily experiences ground metaphorical language (see also Zlatev et al. this volume). According to CMT, conceptual metaphors are based upon bodily source domains:

> Thought is embodied, that is, the structures used to put together our conceptual systems grow out of bodily experience and make sense in terms of it ; moreover, the core of our conceptual system is directly grounded in perception, body movement, and experience of a physical and social character.
>
> (Lakoff 1987: xiv)

However, as argued by Quinn (1991), Geeraerts & Grondelaers (1995), Gibbs (1999) and Gevaert (2007), the impact of supposedly universal and ahistorical metaphors needs to be put in a cultural perspective. In this chapter, I investigate whether the disappearance of the humoral pathology had an impact upon the emotive lexicon. In other words, the role of cultural influence will be further explored by showing how the changing conceptualisation in the era of Descartes influenced the emotional lexicon in French.

How to study the Cartesian influence upon the emotive lexicon? I will focus on the semantic analysis of the verbs *mouvoir* and *emouvoir*, two prototypical verbs of emotion in Old and Middle French. I will especially present in detail their behaviour within theoretical and encyclopaedic treaties within the XVIIth century. The XVIIth century can be considered as a key moment in the origin of modern emotive perception (see also Bloem 2008). For instance, from this period on, the term *émotion* is used more frequently in a rather abstract sense instead of the "mouvements de l'ame" ('movements of the soul'), which was commonly used until then in order to refer to (strong) feelings. By examining here the linguistic evolution of *émouvoir* and *mouvoir* within reflections about the nature of emotions, the chapter will argue for a close connection between culture and lexicon (see also Kövesces 2005; Gevaert 2005, 2007).

If we take a closer look at the global evolution of *mouvoir* and *émouvoir*, we see that these verbs have been subject to different patterns of semantic change. The following sections will present the results of different corpus studies which show some intriguing tendencies.

2. Patterns in the semantic "evolution" of *mouvoir* and *émouvoir*

In Old and Middle French, *mouvoir* and *émouvoir* are often found in similar contexts and domains, especially within those of movement and emotion (see also Bloem 2007). The following sentences show that in Old and Middle French, *mouvoir* and *émouvoir* can be used in very similar contexts. In the following sentences, both verbs are possible in order to refer to the concrete movement of heaven and the movement of the firmament:

(1) Et il covient ke le ciel et le firmament se tornent et muevent tozjors; et s'il ne fust reont, quant il se tornoie il covendroit a fine force k'il revenist autre point ke au premier dont il estoit **esmeus**. *Carmody* éd., p. 86.

(2) […] & il convient que li ciel & le fermament si tornent & se muent tousjor, & s'il ne fust reont quant il se tornoie il convendroit a fine force que il revenist a autre point que a premier dont il estoit **meus**. *Baldwin & Barrette* éd., p. 67.

In the next contexts, again, both *émouvoir* and *mouvoir* can be used in order to say that somebody is moved to anger and hate (*esmu a ire et a haine*) or to joy or sadness.

(3) Sachiés que lor est il damages dou parleor a dire le fait selonc ce que il a esté quant celle chose desplaist as oïans & que il en soient contre lui **esmu** a ire & a haine, se il ne adousist por le bons argumens que conferme sa chause. *Baldwin & Barrette* éd., p. 328.

(4) Car les grans fortunes qui adviennent a nos amis nous doivent notablement **mouvoir** a joie ou a tristece. *Frantext*.

In Modern French, however, we observe a strict division between the uses of those two verbs. *Mouvoir* for instance is almost exclusively used in order to express concrete and often physical movement whereas *émouvoir* expresses emotional change. In other words, we could say that the verb *émouvoir* underwent a process of "psychologisation".

3. Corpus and categories

For the purpose of the study, a corpus from various registers such as literary texts and encyclopaedic texts was compiled. Different attestations of the verbs *mouvoir* and *émouvoir* from various sources were selected. For Old French, the database *Frantext*

and *Laboratoire de français ancient* was used. I also selected occurrences from various scientific texts such as the editions by Francis J. Carmody (1975 [1948[1]]) and by Spurgeon Baldwin & Paul Barrette (2003) of *Li livres dou tresor* and *Sydrac le philosophe*. Besides this, *Le livre de la fontaine de toutes sciences*, edited by Ernstpeter Ruhe in 2000 was studied. For the XVIIth century, I used the database *Frantext* and included encyclopaedic treaties such as *Le tableau des passions humaines* from Nicolas Coeffeteau (1620), *Les charactères des passions* from Cureau de la Chambre Marin (1640), *De l'usage des passions* from Jean-Francois Senault (1642/1987) and *Les passions de l'âme* from René Descartes (1649)[1]. These works provide us with very important testimonies regarding the changing conceptualisation of emotions. The analysis examined the semantic profile of the verbs *émouvoir* and *mouvoir* in order to study their uses within the XVIIth century. These uses were confronted with the uses of the verbs in Old French in order to identify patterns in their historical evolution.

The attested occurrences were analysed in an empirical and semasiological way,[2] inspired by Geeraerts (1997) *diachronic prototype semantics*. More precisely, 809 contexts from Old French and 1674 contexts from the XVIIth century were gathered, analysed and categorised. In this way, five main categories based on the number and nature of complements and on their encyclopaedic reality were established, as shown in Table 1.

Table 1. The five major categories of analysis

Uses of *mouvoir* and *émouvoir*				
Concrete		Abstract		
(1) PM	(2) PHM	(3) PP	(4) E	(5) E
Physical, concrete movement	Physiological movement	Psychophysiological movements	Psychological movement or emotion	Stimulation
All concrete cases of movement	Movements within the body	Ambiguous contexts in which the experiencer has to be inanimate and psychophysiologic, such as the heart or the soul	All abstract contexts	To give [somebody] an appetite, to encourage somebody to do something, to exhort to/to incite to/to urge to, to stimulate/to excite…

1.   I used the edition of Rodis-Lewis (1970) of *Les passions de l'ame* and the editions of *Les charactères des passions, Le tableau des passions humaines* and *De l'usage des passions* that have been published on the website *Gallica* of the *Bibliothèque nationale de France*.

2.   This means that I used the different verbal occurrences as a starting-point for the delimitation of the different semantic categories, shown in Table 1.

The first category we can distinguish is the one of physical, concrete movement (PM) in which all concrete cases of movement are gathered, such as those in (5) and (6), which deal with movement of water:

(5)   Et c'est pource que la lune […], quant elle vient en orient et qu'elle com-
       mence a monter sur la terre, **esmoet** adonc la mer de ses rais. *Problèmes*.
       "And that's why the moon […], when she comes from the east and when she
       begins to rise above the earth, she thus **moves** the sea with her rays".

(6)   […] en la maniere que l'yaue quant on y giete aucune pierrete se **moet** de
       toutes pars […] *Problèmes*.
       "[…] the way in which water **moves** everywhere when one throws a
       stone in it […]"

Within this category, we also find many cases in which a directional movement, or "bounded translocation" (cf. Zlatev et al. this volume) from A to B is expressed:

(7)   Ceste .ix.e espere donc **se meut** de sa propre nature de orient
       en occident […] *EAM*.
       "This 9th sphere **moves** itself from the east to the west […]"

(8)   En la contree de Asyam vers le Levant un moult tres durement grant
       ost **s'esmovra** et encontre son annemi ira et il perdra. *Syderac*.
       "In the region of Asyam towards the east, a very big army will **move**
       and it will go towards his enemy and he will lose."

The second category is that of physiological movement (PHM), that is, movements within the body which deal with movement of humours (*les melancolies*), movement of the heart and veins (*coeur* and *arteres*) and phlegm (*flegme*):

(9)   […] et pource dit ausy Ypocras que u prin tans les melancolies
       se **esmoeuvent**. *Problèmes*.
       "[…] and that's why also Hippocrates says that during spring
       the humours **move**."

(10)   […] et pource se **moet** en ceste passion la chaleur naturele au
       dehors du cors impetueusement […] *Problèmes*.
       "[…] and that's why in this passion the natural heat **moves** violently
       outside the body […]"

The third category involves psychophysiological movements (PP), such as those expressed in sentences (11) and (12). In these cases, the experiencer has to be inani-mate[3] and psychophysiologic, such as the heart or the soul. In other words, these

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3.   Within this chapter, "animate" is exclusively used for persons or animals. Therefore, terms such as *soul* and *heart* are considered here as being "inanimate".

contexts are necessarily ambiguous because they deal with the physiological conse-
quences of emotive changes.

(11)   Et ausi se **moet** li coers ausi diversement et inordeneement en peur
       pour la commotion de la chaleur qui se depart de li […] *Problèmes*.
       "And also the heart **moves** so differently and disorderly in fear for the
       concussion of the heat which comes from it."

(12)   C'est la cause qui le courage fait a ire **esmouvoir**. *Problèmes*.
       "That is the cause that **moves** courage to anger."

It was not always easy to establish a strict division between this category and the former
one. Therefore, it is necessary to study the broader contexts in which the attestations
are found. When the sentence is embedded in a clearly medical context, the attesta-
tions were classified within the category of physiological movement (PHM). When the
contexts rather deal with emotional changes as a result of physiological actions, they
were placed within the third psychophysiological category (PP).

   Within the fourth category, i.e. "psychological movement or emotion" (E), all
abstract contexts were assembled, such as those in examples (13) and (14):

(13)   De ces choses et de moult d'autres **muevent** les hainnes. *Syderac*.
       "Hatred originates (lit: **moves**) from these and many other things".

(14)   Car les grans fortunes qui adviennent a nos amis nous doivent
       notablement **mouvoir** a joie ou a tristece. *Frantext*.
       "Because of the big fortune who touches our friends we have notably
       to **move** us to happiness or to sadness."

The fifth category of "stimulation" (S) is defined by contexts which deal with an agent
being stimulated, or "moved" to perform something, or otherwise to change his moti-
vational state such as: to give [somebody] an appetite, to encourage somebody to do
something, to exhort to/ to incite to/ to urge to, to stimulate/to excite…:

(15)   […] ris se **esmeut** […] *Frantext*.
       "[…] laughter **arises** […]"

(16)   […] aucun en sont **esmeu** a toussir, et c'est de l'oele de olive
       dont Aristote parle. *Problèmes*.
       "[…] some are **inclined** (lit: **moved**) to cough, and it is the
       olive oil of which Aristotle talks."

Besides these five categories, there were some instances which could be classified in a
sixth one in which the source or the origin of a legacy is mentioned (O), such as in "le
seigneur de qui li eritages **muet**" (*Frantext*) ("the lord of whom the heritage comes").
However, this is a very limited category, only attested for some minor attestations of
mouvoir in Old French.

4.   Quantitative analysis

The following figures provide us with a semasiological overview of all the uses for each verb within Old French and the XVIIth century. As we can see, in Old French (Figure 1), both verbs are most often used to express either physical movement (PM) or stimulation (S).
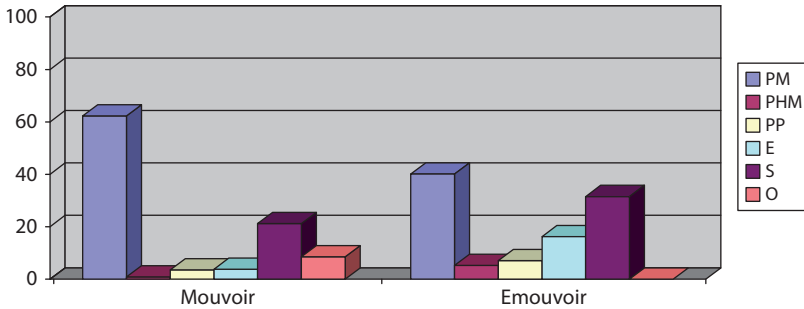
	Mouvoir	Émouvoir
PM	**62,24**	**40,06**
PHM	0,83	5,2
PP	3,53	7,03
E	3,73	16,21
S	**21,16**	**31,5**
O	8,51	0

Figure 1. A semasiological overview of *mouvoir* and *émouvoir* in Old French

Within the XVIIth century period (Figure 2), however, each verb is specialised in a different domain: *mouvoir* expresses in most cases a concrete, physical movement (PM) whereas *émouvoir* is mostly used in order to express emotion (E).

The semantic changes that have taken place between the two periods become even clearer if we compare the proportions of the six categories for the same verb. Comparing the semantic behaviour of *mouvoir* in Old French to the situation in the XVIIth century (Figure 3), we can see that in both periods *mouvoir* is mostly used in order to refer to a concrete and physical movement. However, while the proportion of (PM) increases, the other two more significantly represented categories in Old French, (S) and (O) decrease, while (E) and (S) remain marginal. We also notice a decrease within (PHM), which might indicate that referring to humoral movement gradually disappears.
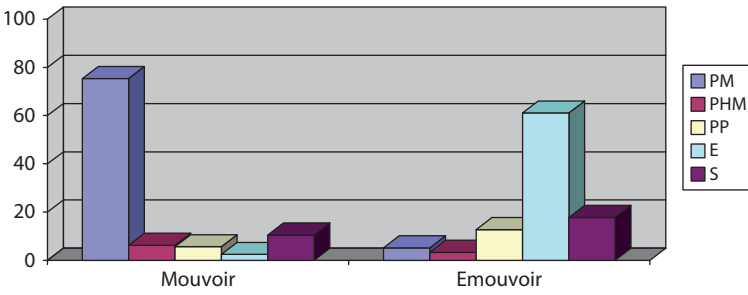
	Mouvoir	Émouvoir
PM	**75,33**	5,17
PHM	6,2	3,29
PP	5,59	12,69
E	2,43	**61,1**
S	10,45	17,74

Figure 2. A semasiological overview of *mouvoir* and *émouvoir* within the XVIIth century
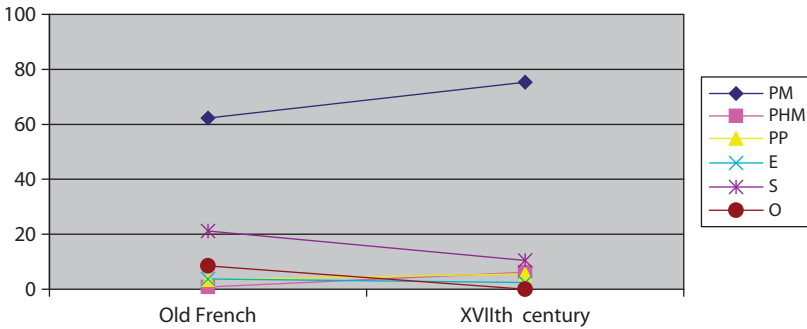
	Old French	XVIIth century
PM	62,24	75,33
PHM	0,83	6,2
PP	3,53	5,59
E	3,73	2,43
S	21,16	10,45
O	8,51	0

Figure 3. The global semantic change of *mouvoir*

The semantic evolution of the verb *émouvoir* (shown in Figure 4) tells us a completely different story. First of all, we observe a spectacular decrease in the number of cases expressing concrete, physical movement (PM). In Old French, still 45% of the

cases refer to concrete movement[4] and only 16% refer to emotions. Until the XVIth century, there is still a high amount of "stimulation" (S) uses. From the XVIIth century onwards, *émouvoir* is mostly used to refer to emotions (E).
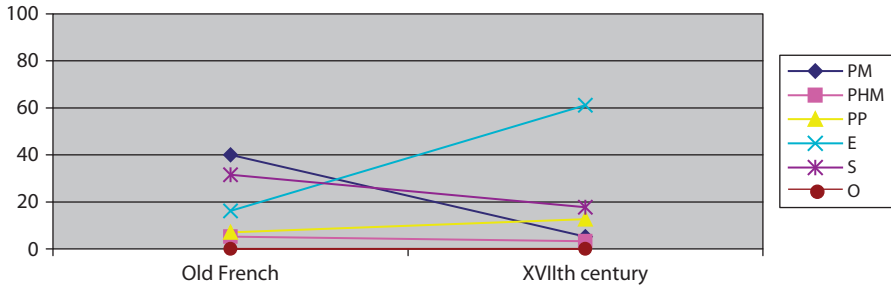
	Old French	XVIIth century
PM	40,06	5,17
PHM	5,2	3,29
PP	7,03	12,69
E	16,21	61,1
S	31,5	17,74
O	0	0

Figure 4. The global semantic change of *émouvoir*

5. Cultural influences on semantic change

How can the patterns described in the previous section be explained? We can begin by considering the importance of encyclopaedic information for semantic change, emphasized by Geeraerts (1997: 70):

> In the context of prototype theory, however, the synchronic observation is made that the borderline between semantics and world knowledge is inherently ill defined. Diachronically, this is reflected in the fact that alleged encyclopaedic information may at any moment be the starting-point for the birth of a new reading, and, as such, has to be taken into account when studying semantic changes.

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4. More precisely, we see that in Old French, 40,06% of the cases of *émouvoir* refer to physical movement and 5,2% refer to physiological movement.

Furthermore, according to Grondelaers and Geeraerts (2003: 68), the reason why a term is chosen in a particular context depends upon its semasiological salience in which the prototypicallity of the semantics of the term is being considered and upon its onomasiological salience (i.e. the term's relation to other related terms). Besides these two factors, it is also important to take into account the sociolinguistic context.

In other words, we need to take a closer look at the encyclopaedic reality, i.e. the nature of encyclopaedic "world" knowledge within the XVIIth century in order to explain the attested tendencies. Therefore, it is appropriate to analyse the encyclopaedic treaties of that period because those works are a good indication of how emotions and bodily movements were perceived at that time. For instance, we do find many reflections upon the metaphorical status of "mouvement de l'ame". In the following passage, taken from Descartes' "passions de l'ame" from 1644, we see that, instead of talking about "mouvements de l'ame", he prefers to use the term "emotion". In other words, it seems that the term "movement" is not convenient any more in order to talk about emotional change. In fact, Descartes suggests to use the expression "emotions de l'ame" (translated as "excitations of the soul", apparently to preserve the aspect of motion in English) because the term movement is too restricted in order to describe all the mutations and changes that can affect the soul (cf. also infra):

> Mais on peut encore mieux les nommer des *émotions de l'ame*, non seulement à cause que ce nom peut estre attribué à tous les changements qui arrivent en elle, c'est-à-dire à toutes les diverses pensées qui luy viennent, mais particulierement pource que, de toutes les sortes de pensées qu'elle peut avoir, il n'y en a point d'autres qui l'agitent et l'esbranlent si fort que font ces passions.
>
> (Descartes 1644: article 28)
>
> "But they may still better be named **excitations of the soul**, not only because this name may be attributed to all the changes that take place within it, that is, to all the different thoughts that come to it, but in particular, because, among all the sorts of thoughts that it can have, there are no others which agitate it and shake it so strongly as these passions do.   (Voss (trad.) 1989: 34)"

It must be underlined here too that within this period, the first uses of the substantive "emotion" are attested in the abstract way it is used nowadays. In Old and Middle French, *émotion* was rather used to refer to uprisings, rebellions and riots (cf. *DMF*).

Furthermore, within different texts of the XVIIth century, we find several sections in which the authors stress the problem of gaps in the lexicon in order to refer to emotional changes. For example, in the treatise "Les characters des passions" by Cureau de la Chambre, the author prefers talking about passions instead of using "mouvemens de l'Appetit naturel" and he criticises the fact that there are not enough proper terms in order to refer to emotional changes.

6.   The conceptualisation of emotions in the XVIIth century

In order to approach an answer to the question posed in the previous section, we need to consider still more facts concerning the conceptualisation of emotions within the XVIIth century which would allow us to embed the evolution of the verbs *mouvoir* and *émouvoir* within its cultural context. First of all, the previous examples clearly show that, through the centuries, there have been some changes with respect to the term *mouvement* ('movement'). More precisely, whereas in the past, *mouvement* referred to "power", from the XVIth century onwards, *mouvement* becomes a near synonym of *déplacement* ('displacement'), as also stated by Talon-Hugon (2002: 10). More importantly, from this period on, preclassical conceptions of movement and soul(s) are abandoned: instead of the aristotelic-thomist notion of the soul, the soul is considered to be a *res cognita*, ("thinking substance") from the XVIIth century onwards (Desjardins 2001: 76).

My proposal is that these changes have gradually affected the lexical level. We find evidence for this in sections in which Cureau de la Chambre reflects upon the metaphorical status of the lexeme "mouvement de l'ame". He literally says that the words used in order to specify what happens to the soul do not properly express what really happens and that they are rather "metaphorical".

> Les mots que l'on employe pour s'en expliquer, sont tous metaphoriques & ne designent point proprement ce qui se passe alors dans l'Ame.
>
> (Cureau de la Chambre, vol. V, p. 301)
>
> "The words used in order to explain this, are all metaphorical and do not properly point out what is then happening in the Soul."

In the following section, Cureau also mentions the lexical problem with respect to the classification of different passions. He stresses the fact that one should use the differences within movement in order to define various passions:

> Quoy qu'il en soit, puisqu'en definissant la passion en general on se sert du mot de mouvement, il faut de necessité pour marquer les differences des passions, y employer les differences du mouvement, & trouver en chacune d'elles quelque agitation particuliere qui ait de la convenance & du rapport avec quelqu'un des mouvemens sensibles.
>
> (Cureau de la Chambre, Vol. I, pp. 42–43).
>
> "Be that as it may, since defining passion in general one uses the word movement, it is necessary in order to mark the differences of the passions, to use the differences of movement, & to find in each of them some particular agitation that is convenient & that has a link with some of the sensible movements."

Thus, we may conclude that during the XVIIth centrury in France, considerable changes of the concept of emotions have taken place and that these changes have

caused many lexical problems with respect to the field of emotions. One factor seems particularly important to help explain what precipitated these changes: a Cartesian conception of mind and emotion which especially consists of a separation of body and mind and which in the XVIIth century overruled the galenic-medieval physiologic and humoral conception. Whereas in older times, emotions were conceived as being the result of bodily movements and a humoral disproportion, from the XVIIth century onwards, emotions became rather abstract and metaphorical sensations, entirely disconnected from the body or movements of fluids. Besides this, it is also important to underline the development of anatomic and scientific analyses and the overall upcoming more rationalist worldview. It is thus within this framework that the increase of the abstract uses of the verb *émouvoir* can be situated.

However, we could wonder why it is especially *émouvoir* instead of *mouvoir* that is used in order to express abstract emotive changes? A possible answer lies within the meanings of the different uses of the two verbs. Although both verbs could be used in a concrete way in Old French, some subtle differences, even within the oldest attestations of these verbs do exist. First of all, within the category of physical movement, the verb *émouvoir* was more often used in Old French in order to refer to water or to violent movements or even big changes (see also Section 3). On the other hand, *mouvoir* was mostly used in order to refer to directional movements from A to B and to refer to more neutral movements. The same is also true at the physiological level: whereas *mouvoir* was used to refer to neutral movements, *émouvoir* was used to refer especially to fluid substances such as humours, and more often than *mouvoir* to substantial changes such as *bouillir* ('to boil') or *échauffer* ('to overheat'), as is the case in example (17) from the XIVth century.

(17)   Et pource, quant en l'yver ces superfluités sont ataintes et estraintes de la froidure circonstant, elles se eschaufent par dedens et **esmoeuvent** a ebullition et putrefaction, Et ainsy font fievres, car fievre n'est autre chose que une excessive chaleur estendue par tout le cors. *Problèmes*.

"And that is why, when during winter, these superfluities are affected and closed up by the surrounding cold, they overheat from the inside and they are **moved** to boiling and putrefaction, And make fever this way, because fever is nothing else than an excessive heat spread out all over the body."

Another possible motivation is that the prefix *es-* is used in Old-and Middle French as en intensifier such as in *esgarder*, ('to look closely, to inspect'), garder ('to see, to examine').

In short, from the XVIth century onwards, the humoral theories were replaced by a far more analytical view in which body and soul are clearly separated and this was also reflected within the uses of the verb *émouvoir*. When we look at its complements, we can observe that, in older times, *esmouvoir les humeurs* ("movement of the

humours") was very frequent. Gradually, psychophysiological movements such as *esmouvoir le coeur a ire* ('to move the heart to anger') were increasingly attested. Nowadays, we almost exclusively find constructions in which the effect upon the person is stressed, as in *émouvoir quelqu'un* ('to move somebody'). We could designate this process as a delitteralisation process, i.e. a semasiological chain from the spatial to the psychological uses by means of the physiological and the psychophysiological ones.

7.   Conclusions

The diachronic semantic analysis presented in this chapter revealed that, from the XVIIth century on, the verbs *mouvoir* and *émouvoir* have become specialised in French. Indeed, from this period onwards, the verb *mouvoir* is almost exclusively used as a verb of movement whereas *émouvoir* has become a real psychological verb. The evolution of the verb *émouvoir* can be considered a delitteralisation process because of the fact that we can observe a chain starting from the spatial to the psychological uses.

It has also to be stressed that the XVIIth century appears to be a very interesting period for the study of the changing conceptualisation of emotions and its influence on the emotive lexicon. More precisely, within this century, encyclopaedic texts provide us with very explicit thinking on the psychophysiological level of emotions. What's more, within these texts, we also find many reflections on certain linguistic "problems". Cureau de la Chambre's writings show clear evidence of metalinguistic reflection about the metaphoric status of the phrase "mouvement de l'âme", which was probably typical of the time.

By studying the uses of the prototypical verbs of emotion, namely *mouvoir* and *émouvoir*, within encyclopaedic reflections revealing the changing conceptualisations of emotions during that period, I have stressed the relevance of taking into account cultural and historical influences upon the lexicon. This way, we observed that, besides the influence of the humoral doctrine, we also have to take into account the Cartesian impact in order to understand the evolution of the emotive lexicon in French. These findings allow us to underline the importance of cultural motivation for metaphor formation instead of focussing exclusively on universal bodily conceptualisations.

However, it has to be stressed that these changes are especially true for the French *émouvoir*, *mouvoir* and *émotion*. It is interesting to note that in English, the word *emove* and *emotion* have been borrowed from French. However, nowadays, *emove* is not attested anymore. It thus seems that, in English, *motion* and *emotion* remain more closely related to each other than it is the case for French. In other Romance languages, such as Italian, the Italian equivalent *emozionare* is used. Curiously, another verb, *commuovere,* is also used in order to designate emotional changes. The same is true for Spanish in which *emocionar* and *conmover* are used.

To sum up, while Descartes may have contributed to separating motion and emotion, both linguistically and conceptually, the close etymological relation between the two expressions parallels the close relationship between the two concepts, investigated within this volume. In both European and non-European languages (see Zlatev, this volume), we still metaphorically refer to feelings in terms of movements. In other words, emotions have not entirely cut off their "motion roots".

Acknowledgments

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Metaphor and subjective experience

A study of motion-emotion metaphors in English, Swedish, Bulgarian, and Thai

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The concepts (or "domains") of *motion* and *emotion* are closely related in both language and experience. This is shown by the presence of many metaphorical expressions (e.g. 'my heart dropped') across languages denoting affective processes on the basis of expressions originally denoting physical motion. We address the question *why* this is the case, and distinguish between three kinds of theoretical proposals: (a) (embodied) conceptual universalism, (b) (strong) language/culture dependence and (c) consciousness-language interactionism. After an "eidetic" analysis of motion informed by phenomenology, and to a more limited extent - emotion(s), we describe an empirical study in which 115 motion-emotion metaphors in English, Swedish, Bulgarian and Thai were systematically analyzed and compared. The findings show considerable differences, especially between the Thai metaphors and those in three other languages, but also significant similarities. The results are interpreted as supporting a dialectical, interactionist relationship between language and consciousness, on the one hand, and between motion and emotion, on the other.

Keywords: consciousness; cross-linguistic analysis; culture; 'inner' vs. 'outer' motion; phenomenology; 'private language argument'; translocation; Husserl; Wittgenstein

1. Introduction

Wittgenstein's famous private language argument (Wittgenstein 1953) states that the meaning of linguistic expressions cannot be determined by "private" experiences. The reason for this is that linguistic meaning is *normative*, in the sense of conforming to public criteria of correctness, and (radically) private experiences lack such criteria (cf. Itkonen 2008). This implies that the meaning of words such as *pain* and *joy* cannot be exhaustively constituted by the corresponding states (or processes) of affective consciousness. Rather, their meaning must be at least *co*-determined by intersubjectively

observable phenomena such as "natural reactions" (cf. Racine, Wereha & Leavens this volume), along with features of the contexts in which these words are appropriately used.

We accept the validity of this argument, but we do not think that it excludes the relevance of subjective experience for the meaning of "mental" predicates; it only states that such experience is not *sufficient*. Indeed, one can argue that consciousness, as subjective experience as well as reflection, is a prerequisite for language (Zlatev 2008) without denying that language adds further dimensions to consciousness. The cognitive advantages of a public symbolic system for communication and thought are many, and one of these is that language makes possible, or at least radically enhances the potential for narrative, and thus for autobiographical memory (Stern 1985; Nelson 1996; Hutto 2008; Menary 2008; Gallagher this volume). On the most general level, the goal of this chapter is to investigate the relation between consciousness (understood as subjective, personal experience) and language. We propose to do this by examining linguistic expressions that denote both motion situations and emotions, i.e. *motion-emotion metaphors*, in four languages (and cultures) which vary to different degrees: English, Swedish, Bulgarian and Thai.

The fact that the English words *motion* and *emotion* are so similar is not a coincidence, as can be attested by a glance at their etymology. The word *emotion* is attested in English texts from around 1570–80, apparently borrowed from Middle French *esmotion,* derived from *esmovoir* 'to set in motion, move the feelings', which can be traced back to the Latin verb *ēmovēre*. Such intermixing of expressions for something that can be intersubjectively observed – the motion of objects and animate creatures – and what is subjectively experienced (feelings) is far from being restricted to English and other European languages. In fact, the use of expressions primarily denoting motion to talk about emotions is widely distributed in the world's languages.[1] What is less clear is *why* motion-emotion metaphors are so common. In particular, we can single out the following two questions:

– What role does subjective experience play for establishing such metaphors?
– What role is played by language-specific (and culture-specific) conventions?

Comparing motion-emotion metaphors in the four languages under investigation should allow us to evaluate three types of theoretical positions on the basis of the predictions following from them.

The first position is that of (embodied) *conceptual universalism*, proposing to ground linguistic meaning in pan-human bodily experiences, or their neural underpinnings. This is the case in Lakoff & Johnson's (1980, 1999) Conceptual Metaphor

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1.   It may even be a so-called "universal" – though claims of linguistic universals have been much overstated in the past, and the empirical database for semantic universals is much too sparse at present (Koptjevskaja-Tamm et al. 2007; Evans & Levinson 2009).

Theory (CMT), according to which the meanings of non-concrete expressions are based on non-linguistic, and purportedly universal *primary metaphors* such as SIMI-LARITY IS PROXIMITY IN SPACE (cf. Grady 2005; Johnson & Rohrer 2007). If the motion-emotion metaphors in the four languages under discussion can be shown to be more or less the same, this would lend support to theories of this type.

The second position claims that thinking in general, and metaphor formation in particular, *depends crucially on language* (or discourse). If motion-emotion metaphors turn out to vary extensively and "arbitrarily" across languages this would give credibility to the position that the meanings of emotion expressions are derived primarily from their role in the linguistic-conceptual schemes provided by the languages themselves, rendering subjective experience largely irrelevant. In general, such a position was earlier held by representatives of structuralism, but has lost its appeal for most linguists. However, it has not yet done so for many analytic philosophers (cf. Dennett 1991), who tend to attribute a determinative role to language with respect to consciousness.[2] A weaker form of this position, concerning metaphors specifically, predicts that conventional metaphors would be what Zinken (2007) calls "form-specific", i.e. that the metaphorical meanings would be associated with specific expressions, in the manner of idioms, rather than derive from systematic cross-domain mappings, as in CMT.

The third position can be referred to as *consciousness-language interactionism* (cf. Zlatev 1997, 2003, 2008). It accepts that emotions are indeed basically subjective, even "private" experiences, but proposes that when speakers need to *talk* about their emotional lives, they use expressions referring to intersubjectively observable phenomena. The latter are chosen since they are either *analogous to* or *spatiotemporally associated with* the emotions in question. With time such expressions can become conventional, and in the process, shaped by cultural beliefs and discourse practices, as in the scenario envisioned by Zinken (2007). The predictions from such an interactionist position are therefore that there will be a degree of overlap between conventional motion-emotion metaphors in different languages, but that such overlap will be higher for more closely related languages and cultures (e.g. English and Swedish, and to some extent Bulgarian) than for more distant ones, such as Thai.

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2. Without disregarding the fact that analytic philosophy has aided in making our concepts clearer through an analysis of (ordinary) language, its practitioners have often been at error in extending the rigor of the method to a presumption of the rigidity of the "objects" of study. For example, just because we can define the concepts of mental states more precisely through semantic analysis does not mean that this analysis can substitute for the phenomena themselves, or worse: be read off as a map to the workings of the mind. Taking this for granted has given rise to misguided debates, such as that concerning the relation between "mental representations" and "propositional attitudes" (cf. Dennett 1981; Fodor 1987).

Furthermore, there should be a degree of "form-specificity", but not to the extent proposed by Zinken (2007).[3]

In the study described in Section 4, we test the predictions from these different (kinds of) theories on 115 motion-emotion metaphors from the four languages, derived above all through (near) native knowledge of the four languages, and a number of criteria specifying which expressions are to be considered, described in Section 3. But prior to this, we need to provide a conceptual analysis of the "source domain" MOTION. We do so, utilizing the analysis of *motion situations* offered by Zlatev, Blomberg, & David (2010). Such an exercise is necessary for two reasons. First, we will see that 'motion' is both pre-theoretically and theoretically an ambiguous term, and many misunderstandings derive from unclear or contradictory definitions of it (cf. Sheets-Johnstone, this volume). The second reason is that we require a conceptual framework in order to be able to perform the comparison between motion-emotion metaphors in the four languages in a systematic manner.

If motion is a complex concept, emotion is even more so, and we will not attempt any such general classification as with motion. Thus, only emotion metaphors derived from expressions referring to motion of the self, or of something considered a "part of the self", will be considered. But we will need to define more clearly what we mean by motion-emotion metaphors for the sake of the empirical study, and we do so in Section 3. In the final section, we summarize our findings and relate them to the more general questions concerning the relationships between motion and emotion, and between language and consciousness discussed above.

2.   What is motion?

2.1   Motion: Kinds and perspectives

A dictionary is always a good place to start when dealing with conceptual issues since, however imperfect, circular and variant dictionary definitions are, they give us at least a rough idea of the "common sense" meaning (or meanings) of the words used in a community. The more general, frequently used (and updated) dictionaries are, the better they are for this purpose, and with over 10 million searches daily, the free electronic dictionary of English available at *dictionary.com* is probably as good a place to start as

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3.   This is consistent with the general approach, if not with the specific analysis, of Kövecses (2000: 14): "In this work I propose that it is necessary to go beyond both the view that the concept of anger is simply motivated by human physiology and the view that it is simply a social construction. I will suggest that it is both motivated by the human body and produced by a particular social and cultural environment." (emphasis in original)

any. Its first four (and only relevant for our purposes) senses of the noun 'motion' are the following:

a. *the action or process of moving or of changing place or position; movement.*
b. *power of movement, as of a living body.*
c. *the manner of moving the body in walking; gait.*
d. *a bodily movement or change of posture; gesture.*

It is notable that senses (b-d) directly refer to 'bodily movement', while the first is intended to be more general, defining motion as 'changing place or position', and offering 'movement' as a synonym. In earlier work (Sheets-Johnstone 1999), and particularly in her contribution to the present volume, Sheets-Johnstone strongly criticizes a definition of motion such as that in (a): "contrary to the dictionary definition and to popular thought, movement is not 'a change of position'" (this volume, p. 38). Rather, on the basis of a phenomenological analysis of *bodily* movement from a first-person perspective, Sheets-Johnstone argues for a holistic, qualitative concept of movement:

> The qualitative structure of any movement generates a particular dynamic…it flows forth with a certain kinetic energy that may rise and fall in intensity, waxing and waning at the same time as spatializing and temporalizing itself in ways that contour the dynamic: making it explosive, attenuated, smooth, jagged, restrained, impulsive, magnified, narrowed and so on… (p. 38)

We would, however, suggest that Sheets-Johnstone's analysis attempts to capture what is common to senses (b-d) above, while the change-of-position sense (a) is not so much a matter of what she calls "received ignorance", but derives from a different perspective on motion: a third-person, observational one. Zlatev, Blomberg and David (2010) also attempt to provide a phenomenologically informed definition of motion, but departing precisely from such a third-person perspective:

> From the perspective of the analysis of (the invariants of) experience – *phenomenology* (cf. Husserl 1999 [1907]), motion as such can be defined as the experience of *continuous change in the relative position of an object (the figure) against a background*, in contrast to stasis – where there is no such change – and in contrast to a *dis-continuous* change, as when a light suddenly lights up in position A, "disappears" and then appears in position B."
>
> (Zlatev et al. 2010: 393)

By emphasizing the experience of the observer, this is no less experiential than the internal perspective argued for by Sheets-Johnstone. Such a perspective can also be applied to our own motion/movement, through the process of *perspective change*, well known in phenomenology (Zahavi 2001, 2003), and often mentioned

by cognitive linguists (Langacker 1987). Indeed, this is also acknowledged by Sheets-Johnstone (this volume):

> When we observe our own movement in this way, we precisely *perceive* it, perceive it as *a force or effort to put forth in time and in space*, a force or effort we are controlling or trying to control every step of the way. We do not *feel* our movement as an unfolding dynamic, a kinetic form-in the making…" (p. 40, emphasis in original)

There is a certain degree of similarity between this perspectival distinction (i.e. inner/outer motion) and a distinction made in many of the world's languages, observed by the French linguist Lucien Tesnière, as pointed out by Wälchli (2001: 298):

> Tesnière (1959: 307–310) introduced in passing the semantic distinction between movement ("mouvement") and displacement ("déplacement"). Movement is "inner" motion describing the kind of activity involved in motion (e.g. run, walk, jump, fly, swim). Displacement is "outer" motion and is concerned with how somebody or something changes its location in space, notably with respect to a given point of reference.

Tesnière noticed that Romance languages tend to express displacement ("outer" motion) with their verbs, while Germanic languages had more verbs expressing movement ("inner" motion). Talmy (1985, 2000) came to the same conclusion (apparently independently), but generalized it and proposed that all languages need to choose between one of the two strategies. Since displacement (or what Talmy called "translational motion") was argued to constitute the "frame" of a motion event, languages such as French were called "verb-framing", encoding "path" in verbs such as *monter* and *descendre*, while expressing "manner" adverbially (e.g. *à la nage, en nageant*). On the other hand are "satellite-framing" languages such as English, rich in verbs expressing movement/manner such as *rush*, while using particles e.g. *in, out of, up, down…* to express displacement/path. However, far from being a "binary typology", as Talmy claimed, it is becoming increasingly clear that all languages use a variety of means to express both the movement and the displacement aspects of motion (cf. Strömqvist & Verhoeven 2004; Levinson & Wilkins 2006). There is also experimental evidence that when observers categorize motion events spontaneously, both speakers of French (verb-framing) and Swedish (satellite-framing) may display a similar preference for movement/manner. However, if the two groups first *describe* what they see, a strong preference for displacement/path arises instead (cf. Zlatev, Blomberg & David 2010).

The point is that while languages may reflect the difference between *inner/self-contained motion/manner/movement*, on the one hand, and *outer/translational motion/path/displacement* on the other, and some constructions (and contexts) may focus more on one than the other, both perspectives on motion are relevant. Returning to phenomenology, we would venture to propose that this has to do with the fact that a

so-called motion event can be experienced both as "changing place or position" – when observed from a third-person perspective (in time and space), and as movement, when focusing on the "internal" qualitative dynamics. Of course, not all cases of observed motion involve the movement of an animate being (so-called "biological motion"), and even less so of a human being like oneself, but such motion is certainly a salient sub-type of motion in general. The terms 'outer' and 'inner' motion, used by Tesnière (cf. the quotation by Wälchli above) in fact correspond closely to the two ways of experiencing the lived body, as analyzed by Husserl: *Körper* (3rd person perspective) and *Leib* (1st person perspective). It has been argued persuasively that this duality of the body (corresponding in our proposal to the duality of motion) is essential for our self-consciousness, as well as for understanding others as being essentially "like us", while still remaining others (Husserl 1989 [1952]; Zahavi 2003). We will return to this point, important for the theme of the present volume, in the final section.

2.2 A taxonony of motion situations

Given the distinctions made in the previous subsection, and acknowledging that we are taking above all an observational perspective, we can pursue the analysis of *motion situations* presented by Zlatev, Blomberg & David (2010). What we are presenting here is not a "conceptual analysis" based on the analysis of language, but an *eidetic analysis* in the sense of Husserl (1981 [1913]), and one that we would claim to be in principle independent of language. By this, we mean that the distinctions made should be perceivable and understandable by, in principle, anyone. As pointed out in the introduction, such an analysis is a key prerequisite for comparing how different languages and speakers express these situations linguistically. For convenience, we will illustrate the analysis with English examples.

We can depart from the general definition of motion quoted from Zlatev, Blomberg and David (2010: 393) in the previous subsection: *continuous change in the relative position of an object (the figure) against a background*. As pointed out, this definition distinguishes motion from stasis, from change that does not involve motion, and from imaginary acts of Star Trek-like "teleportation". Also following our previous analysis, we can distinguish between *three different parameters* according to which motion situations can vary.

2.2.1 *Translocative vs. non-translocative motion*
Translocative motion involves the perception of continuous change of an object's average position according to a spatial frame of reference, while in *non-translocative* motion the figure maintains its average (perceived) position (as in the situation described by the sentence *He waved goodbye*). Here, the concept of spatial frame of reference (FoR) is central. It has been argued by Levinson (2003) that there are three universal frames

of reference, differentially prominent and linguistically expressed in the languages of the world. Levinson defines these for static relations and the horizontal plane. Here, we follow their generalizations to motion situations and the vertical plane, presented in earlier work (Zlatev 2005, 2007).

In the *Viewpoint-centered* FoR the perspective of the observer serves as a reference point, as in example (1). The second FoR is *Geocentric*, relying on geo-cardinal positions as reference points, as in (2–3). Finally, there is the *Object-centered* FoR, which can take as reference point either the position of the focused (and possibly moving) object, the *figure*, or that of an external object, a *landmark*, as in (4–5).[4]

(1)   *Turn right.*
      FoR: Viewpoint-centered

(2)   *Drive West.*
      FoR: Geocentric, Horizontal

(3)   *The balloon flew up in the air.*
      FoR: Geocentric, Vertical

(4)   The demonstration pushed forward.
      FoR: Object-centered, Figure

(5)   *The horse walked into the stable.*
      FoR: Object-centered, Landmark

A particular case of translocation can thus be specified according to one or more of these frames of reference, which provide the reference points allowing us (a) to judge whether the object/figure has indeed changed its average position and, if so (b) to determine its Path or Direction, as described in the following subsection.

2.2.2   *Bounded vs. unbounded motion*

The boundedness of a process undergone by the figure implies that it will inevitably (not just possibly or probably) lead to it undergoing a state-transition (cf. Vendler 1967). This means that in expressions of *bounded* motion, the figure will depart from a Source (as in 6), pass through a mid-point (7), or reach a Goal (as in 5) – or all three as in (8). In *unbounded* motion, this is not the case, and in principle the motion of the figure can go on indefinitely, as in the motion situations described above in

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4.   Note that our use of the term figure (deriving from Gestalt psychology) corresponds to that of Talmy (2000) and Levinson (2003), and the term trajector used by others (Lakoff 1987; Zlatev 1997). On the other hand, our use of the term landmark, is more specific than that used in much of the cognitive linguistic literature (Langacker 1987), in referring to an object, which is typically expressed through a noun phrase in language (cf. Zlatev 2005, 2007).

examples (1–4). In our analysis (and terminology) bounded translocative motion always involves the category Path, with one or more reference points being defined through the object-centred, landmark-defined FoR. In the case of unbounded translocative motion, we have rather the category Direction, specified either as a *vector* according to one of the other FoR conditions (as in 1–4), or as a *trajectory* that can take particular shapes such as AROUND or ALONG.

(6) *I left the room.*
(7) *He crossed the road.*
(8) *The dog ran out of the barn across the field to the house.*

Note, furthermore, that the two parameters discussed so far are independent. We have seen how translocative situations can be either unbounded, e.g. (1–4) or bounded e.g. (5–8). Non-translocative motion can be either unbounded, as (9–10), or bounded – if the motion involved leads to a state-transition, as in (11) or the Swedish equivalent (12), which involves an extended use of the motion verb *gå* ('go').[5]

(9) *John ran on the treadmill.*

(10) *John ran in the park.*

(11) *The vase broke (in pieces).*

(12) *Vas-en   gick   sönder.*
      Vase-DEF go.PAST broken

2.2.3   *Self-motion vs. caused motion*

The final parameter concerns whether the figure is perceived to be moving under the influence of an external cause or not. The relevant notion of causality concerns the (naïve) human lifeworld, and not our scientific understanding of the universe. Thus, the situation described in (13) is one of translocative "self-motion" even though the motion of the raindrops is caused by gravity. On the other hand, (14) clearly represents a (translocative, bounded) caused motion situation.

(13) *Raindrops are falling on my head.*
(14) *John kicked the ball over the fence.*

This parameter is likewise independent of the other two, so it is possible to have caused translocative, unbounded motion situations (15), caused non-translocative bounded

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5. One might counter that Examples (11) and (12) do not really express, but presuppose motion, but since the event described will (typically) involve a perception of physical change (against a stable background) these sentences do count as representations of non-translocative bounded motion, in the broad sense used here.

ones (16), and caused non-translocative unbounded ones (17). The self-caused coun-
terparts to these have already been illustrated.

(15)   *Peter pushed the car forward.*
(16)   *Susan tore up the letter.*
(17)   *Mary waved the flag.*

2.2.4   *Summary*

This analysis gives us the 8 types of motions situations in Table 1, illustrated with schematic
representations in English.

Table 1. Illustration of the expression of 8 motion situation types in English;
F = Figure, LM = Landmark, C = Cause, View-C = Viewpoint centred,
Geo-C = Geocentric, Obj-C = Object centred Frame of Reference

	–CAUSED	**+CAUSED**
+TRANSLOC +BOUNDED	F goes to LM	C throws F into LM
+TRANSLOC –BOUNDED	F goes away (View-C) F goes up (Geo-C) F rolls forward (Obj-C)	C takes F away (View-C) C pushes F upward (Geo-C) C pushes F forward (Obj-C)
–TRANSLOC +BOUNDED	F breaks (up/down)	C breaks F (up/down)
–TRANSLOC –BOUNDED	F waves	C waves F

The tense in the examples in Table 1, the present simple, is only seldom used with
any of these situation types (constructions) in English, but it is intentionally used in
Table 1 in order to highlight the fact that the different situation types (i.e. specifying the
values of the three parameters) can be expressed through one or more of the follow-
ing means: (a) the lexical semantics of the verb, (b) verb-satellite (particles or affixes),
(c) adpositions (prepositions or postpositions), (d) the clause-level grammatical con-
struction (e.g. intransitive vs. transitive).

While tense and aspect markers can make the distinction between e.g. bounded
and unbounded situations even clearer, i.e. by rendering the bounded ones in past sim-
ple tense as in (14), and the unbounded ones in present continuous as in (13), this is
not necessary for making the parameter differentiations. Therefore, we would suggest
that morphological aspect introduces an extra dimension of meaning over and above
those expressed by (a)-(d), by allowing the profiling of motion situations (translocative
or not) either as *ongoing processes* or as *completed events* – whether they are inherently
bounded or not. Thus, (13) is also a representation of bounded motion (despite being
ongoing), and (17) a representation of an unbounded motion (despite being "in the

past" and thus completed). Examples (18) and (19), taken from the British National Corpus (http://www.natcorp.ox.ac.uk/), show how *fall*, used in the past tense, can be used to express unbounded translocation, despite the fact that the events are being represented as taking place in the past, and thus as "completed".

(18)   *The wind blew and the snow fell, but it didn't matter.*
(19)   *... the devaluation of stock as component prices fell.*

3.   Emotion and motion-emotion metaphors

As with the term 'motion', we can start by considering what a dictionary definition of 'emotion' could tell us. The first three senses found in *dictionary.com* are:

a.   *an affective state of consciousness in which joy, sorrow, fear, hate, or the like, is experienced, as distinguished from cognitive and volitional states of consciousness.*
b.   *any of the feelings of joy, sorrow, fear, hate, love, etc.*
c.   *any strong agitation of the feelings actuated by experiencing love, hate, fear, etc. and usually accompanied by certain physiological changes, as increased heartbeat or respiration, and often overt manifestation, as crying or shaking.*

As we can see in (a) and (b), the popular conception does *not* distinguish 'emotion' from 'feeling' along lines such as those of Damasio (2000), where the first term is reserved for a physiological reaction, and the second for the conscious perception of this reaction. Indeed, 'physiological changes' and 'overt manifestation', mentioned in (c) are regarded as occurring "usually" along with emotions, but not essentially. This common sense view may be criticized for being "dualistic", and philosophers such as Wittgenstein have argued that it is mistaken. "Inner" and "outer" manifestations of emotion are intermingled in experience, and we do not use the second to infer the presence of the first in others, but perceive others' emotions "directly", as emphasized by phenomenologists, as well as Wittgenstein (Zlatev et al. 2008; Racine et al. this volume):

> We see emotion." – As opposed to what? – We do not see facial contortions and *make the inference* that he is feeling joy, grief, boredom. We describe a face immediately as sad, radiant, bored, even when we are unable to give any other description of the features.   (Wittgenstein 1980: #570, emphasis original)

However, we are also capable of making the distinction between the feeling itself, and its "expression". Experientially (and conceptually) when I feel angry from say, someone not replying to my greeting at the department in the morning, what I experience is

not in any obvious way 'increased heartbeat and respiration' but the emotion/feeling of anger, or at least irritation, itself. At the same time, I can notice such concomitant bodily processes, in myself as well as others, and refer to these, "metonymically" when I need to talk about my (or others') emotions (cf. Kövecses 1990, 2000).

We can also notice that in (a), and implicitly in (b), emotion is regarded as a "state", while (c) is closest to the etymological sense of emotion mentioned in Section 1, i.e. as a *process*, a 'strong agitation of the feelings'. This ambiguity (state vs. process) of the concept of emotion is apparent both in experience and in language. Certain emotions and emotion expressions appear more state-like: *happy, sad, calm...* Others like *agitate, calm down, relax...* are more process-like. Arguably, it is the latter that are more focal in consciousness: we typically notice the changes between intermittent states, not the states themselves – analogously to the way we tend to pay attention to motion rather than stasis in the external world. We will not try to make any strong claims for this here, but since it is motion-emotion metaphors that we investigate, we will pursue the (c) sense of emotion in the definition. To summarize, we will regard emotions as *changes in affective consciousness*.

In speaking of such changes, the self, or some relevant "part of the self" can be described *as if* being set in motion, i.e. as the *figure* in the expression of motion situations, such as those given in Section 2. The difference is that in examples such as (20–22), where the metaphorically moving figure is highlighted, there is at best a kind of "metaphorical motion", rather than actual perceived motion (from a third-person perspective).

(20)   *My spirits are rising.*
(21)   *My mood is sinking.*
(22)   *I was attracted by her smile.*

These are the type of expressions that we compare cross-linguistically in Section 4, and refer to as motion-emotion metaphors. We can set up the following set of criteria, some of which were mentioned already, for singling them out in the languages under study:

a.   If the figure-expression refers to the self (or part of it), there is no perceived motion in the "physical world".
b.   If the figure-expression (and the landmark-expression if necessary) is substituted for an expression referring to a physical object, the sentence would be a description of a motion situation (as defined in Section 2).
c.   Motion is expressed by the verb-root (also), and not only in a verb-satellite (prefix or particle).
d.   Both the motion and emotion interpretations (depending on the nature of the figure-expression) are present in the language synchronically (currently).

According to criteria (a) and (b), examples (20–22) would qualify as motion-emotion metaphors, since examples (23–25) are indeed descriptions of motion situations, while there is no actual motion involved in the first set.

(23)   ***The moon*** *is rising.*
(24)   ***The boat*** *is sinking.*
(25)   ***The piece*** *of metal was attracted by the magnet.*

On the other hand, (26) is not a motion-emotion metaphor since apart from concerning emotion it also describes actual (non-translocative) motion. Example (27) is disqualified for another reason: it concerns emotion, involves metaphorical motion, but what is "moving" is not the self (or part of it), but the personification of the emotion itself, which is presented as if external to the self. The motivation for such a metaphor cannot obviously be in perceived motion of the self, or part of the self, and therefore this and similar cases of "external" metaphorical motion fall outside our analysis.

To the extent that there is any metaphorical emotion in (28) and (29) at all, it is connected to the English satellite *up* and the Bulgarian *do-* ('by', 'to'), and not to the verb-root, and thus such examples are excluded by criterion (c). Furthermore, any possible motion interpretation in the Bulgarian example (29) would only be due to the etymology of *do-volen* ('pleased'): *do* ('to') + *volen* ('free'), and thus criterion (d) comes into play as well.

(26)   *She trembled with fear.*
(27)   *He was gripped by fear.*
(28)   *Mary was worked up.*
(29)   *Ivan   e   do-volen*
       Ivan   Cop.3p.SING   pleased.SING.MASC
       'Ivan is pleased.'

These criteria were essential for being able to perform the comparison between the motion-emotion metaphors in the four different languages.

4.   A cross-linguistic study of motion-emotion metaphors

4.1   Method and analysis

Initially, we identified as many motion-emotion metaphors as possible, primarily on the basis of our native (or near-native) speaker intuitions for Swedish, English and Bulgarian, and those of a meta-linguistically aware informant for Thai. The method was basically to consider all possible expressions for emotion in the four languages, and then to eliminate those that did not fulfill the criteria described in Section 3. For Thai, extensive use was made of a compilation of "over 1,000 phrases which are connected

with the heart" (Moore 1998:15): the word *caj* ('heart, mind, spirit…'). Conversely, we made concordances of motion verbs in two corpora[6], looking for uses extended to emotion.

In the next step, we grouped individual motion-emotion expressions into *types*. What characterized each type were differences in (a) the lexical semantics of the verb, (b) verb-satellite (particles or affixes), (c) adpositions, (d) the grammatical construction (e.g. intransitive vs. transitive) – the four means of expressing different motion situations presented in section 2.2.4. Specific sentences instantiating these could vary depending on the figure and landmark expressions and (in most cases) tense-aspect forms. Strongly idiomaticized expressions such as *fall in love* were not considered. The motion-emotion metaphor types were then classified according to the taxonomy of motion situations presented in Section 2, using only one situation type per metaphor (type), based on what appeared to be the basic (most unmarked) form of the metaphor.

This three-step procedure gave rise to 38 motion-emotion metaphors for English, 27 for Swedish, 19 for Bulgarian (though see below) and 31 for Thai, a total of 115. In comparing the motion-emotion metaphors across the languages, we paid special attention to whether a given motion-emotion metaphor had a "near-equivalent" in one or more of the other languages, based primarily on overlap of the literal (motion), rather than the metaphorical (emotion) senses.

4.2 Results

In English we encountered the largest number of motion-emotion metaphors, 38, with the majority of these having corresponding expressions in one or more of the other languages. We found predominance for Caused motion expressions (25 vs. 13). In most cases (rendered in the simple present tense in Table 2) the metaphors were not limited to a specific form of the verb, but in several cases, they were limited to past participles.

The following 12 motion-emotion metaphors were found to be specific to English. Notably, only those exemplified in (30)–(33) express metaphorical translocative motion, while the others are non-translocative. The examples in (30–32) and (35) involve metaphorical self-motion, while the others imply caused motion, commonly (though not necessarily) expressed using a passive construction. Example (34) is intermediate: the figure is expressed by the grammatical subject, and "breaking down" can be thought to occur for internal reasons, but typically, as in the example, an external cause is presumed. In terms of boundedness, half of the expressions involve a (clear) state-transition, and half do not.

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6.   British National Corpus, http://www.natcorp.ox.ac.uk/ and Thai Concordance, www.arts. chula.ac.th/~ling/ThaiConc/

Table 2. Motion-emotion metaphors in English, using the present simple tense (when the metaphor is not form-specific) and past participle (PART) when confined to a specific verbal form. F = Figure, LM = Landmark, C = Cause, (S) = corresponding expression in Swedish, (B) = corresponding expression in Bulgarian, (T) = corresponding expression in Thai, * = lack of corresponding expression (with example in the main text)

	Self motion	Caused motion
+Transloc/+Bound	F falls into LM * F plunges into LM *	C moved F to LM (S) C drives F to LM (S, B) C brings F to LM (B)
+Transloc/−Bound	F soars * F rises (S, B, T) F sinks (S) F creeps F (S) F drops (S, B, T)	F is downcast * – PART C pulls F (S, B) C attracts F (S, B) C repels F (S, B) F is uplifted (S, B) – PART
−Transloc/+Bound	F breaks down * F breaks (S) F collapses (S) F explodes (S)	C puts F off * C throws F off F's feet * C upsets F * C shatters F (S, B, T) C knocks F off F's feet (S) C knocks F out (S) C floors F (S) C tears F apart (B)
−Transloc/-Bound	F flutters * F swells (S)	C presses F * F is unperturbed * – PART C makes F shrink * C moves F (S) C shakes F (S, B, T) C stirs F (S, B, T) C agitates F (S) C calms F (S, B) C relaxes F (B, T)
Total	13 (5*) (8S) (2B) (2T)	25 (7*) (15S) (12B) (4T)

(30)	*I fell into a state of depression.*	(−Caused, +Trans, +Bound)
(31)	*He plunged into despair.*	(−Caused, +Trans, +Bound)
(32)	*My spirit soared.*	(−Caused, +Trans, −Bound)
(33)	*She was sad and downcast at the party.*	(+Caused, +Trans, −Bound)
(34)	*I broke down under the pressure.*	(−/+Caused, -Trans, +Bound)
(35)	*My heart fluttered.*	(−Caused, −Trans, −Bound)
(36)	*His bad manners put me off.*	(+Caused, −Trans, +Bound)
(37)	*Their threats made me shrink.*	(+Caused, −Trans, −Bound)
(38)	*I was thrown off my feet.*	(+Caused, −Trans, +Bound)
(39)	*She was upset by his rudeness.*	(+Caused, −Trans, +Bound)
(40)	*I was pressed by the circumstances.*	(+Caused, −Trans, −Bound)
(41)	*My uncle looked at me, unperturbed.*	(+Caused, −Trans, −Bound)

Of the 27 motion-emotion metaphors found in Swedish and shown in Table 3 again there was a preference for Caused motion expressions. The majority of the metaphors were not confined to a particular verbal form, but a few "unbounded" ones required the use of a present participle. Only five, exemplified in (42–46) were found to be specific for the language.

Table 3. Motion-emotion metaphors in Swedish, using the present tense, when the metaphor is not form-specific, or else a present participle (PART). F = Figure, LM = Landmark, C = Cause, (E) = corresponding expression in English, (B) = corresponding expression in Bulgarian, (T) = corresponding expression in Thai, * = lack of corresponding expression (with example in the main text)

	Self motion	English gloss	Caused motion	English gloss
+Transloc/+Bound	–		C kastar ner F i LM * C rör F till tårar (E) C driver F till vansinne (E, B)	*throws down in* *moves to tears* *drives to madness*
+Transloc/–Bound	F kryper (E) F stiger (E, B, T) F sjunker (E, B, T)	*creeps* *rises* *sinks*	C trycker ner F * C attraherar F (E, B) C är tilldragande (E, B) – PART C stöter bort F (E, B) C är frånstötande (E, B) – PART C är upplyftande (E, B) – PART	*pushes down* *attracts* *is attractive* *pushes away* *is repelling* *is uplifting*
–Transloc/+Bound	F bryter ihop/ samman* F rasar (E) F brister (E) F flyger i luften (E)	*breaks down ('together')* *rages ('collapses')* *bursts* *explodes ('flies up in the air')*	C golvar F C krossar F (E, B, T) C knäcker F (B, T) C knockar F (E)	*knocks down ('floors')* *crushes* *breaks apart* *knocks down*
–Transloc/–Bound	F svävar * F svajar * F sväller (E)	*hovers* *swings* *swells*	C (om)skakar F (E, B, T) C lugnar (ner) F (E, B) C upprör F (E, B, T) C rör F (E)	*shakes (up)* *calms (down)* *agitates ('stirs up')* *moves*
Total	10 (3*) (7E) (2B) (2T)		17 (2*) (14E) (11B) (4T)	

(42)   *Han **bröt** ihop under begravning-en*
       He   broke.PAST together during funeral-DEF
       'He broke down during the funeral.' *(–Caused, –Trans, +Bound)*

(43)   *Hon **sväv-ar** av lycka*
       She hover-PRES of happiness
       'She is floating in happiness.' *(–Caused, –Trans, –Bound)*

(44)   *Hans humör **svaj-ar**   på ett oberäkneligt   sätt*
     His   mood swing-PRES on a   unpredictable   *way*
     'His mood changes in an unpredictable manner.' *(–Caused, –Trans, –Bound)*

(45)   *Han **kasta-de-s**   ner i en djup   depression*
     He   throw-PAST-PASSIVE down in a deep   depression
     'He was cast into deep depression.' *(+Caused, +Trans, +Bound)*

(46)   *Jag **tryck-te-s**   **ner**   av omständigheter-na*
     I   press-PAST-PASSIVE down by circumstances-DEF
     'I was burdened by the circumstances.' *(+Caused, –Trans, –Bound)*

In Bulgarian, we similarly found that only 5 of the identified 19 motion-emotion metaphors, shown in (47–51), lack corresponding expression in the other three languages. Only the expression in (47), shown with PAST in Table 4, is limited to a specific verb form.

Table 4. Motion-emotion metaphors in Bulgarian, using the present tense, when the metaphor is not form-specific, and past tense (PAST) otherwise. F = Figure, LM = Landmark, C = Cause, (E) = corresponding expression in English, (S) = corresponding expression in Swedish, (T) = corresponding expression in Thai, * = lack of corresponding expression (with example in the main text)

	Self motion	English gloss	Caused motion	English gloss
+Transloc/+Bound	F pre-mina *	*Passed*	C do-karva F do (E, S)	*drives to*
			C do-vežda F do (E)	*brings to*
+Transloc/–Bound	F idva *	*comes*	C pri-vlicha F (E, S)	*attracts ('drags to')*
	F pada (E, S, T)	*falls*	C ot-blăskva F (E, S)	*repels ('push from')*
			C po-vdiga F (E, S, T)	*raises*
–Transloc/+Bound	iz-buhva (E,S)	*expodes*	C raz-kăsva F (E)	*tear apart*
	F se V ←		C raz-vălnuva F * - PAST	*rippled*
			C raz-biva F (E, S, T)	*shatters*
			C pre-chupva F (S, T)	*breaks apart*
			C raz-tărsva F (E, S, T)	*shakes up*
–Transloc/–Bound	F se V ←		C po-bărkva F *	*makes crazy*
			C pod-tisva F *	*suppresses*
			C u-bărkva F (E, S, T)	
			C u-spokojava F (E, S)	*confuses*
				calms
			C ot-pusva F (E, T)	*relaxes*
Total	4		15	
	(2*) (2E) (2S) (1T)		(3*) (11 E) (9 S) (6 T)	

As with English and Swedish, Bulgarian seems to show a dominance for Caused motion, but here there is a complication: each one of the 10 non-translocative, caused motion metaphors can also be used to describe metaphorical self-motion of the figure

(F), using the reflexive construction with the particle *se* (see Table 4). In English and Swedish, the corresponding expressions can also apply to the figure, without mentioning the Cause, but in that case one would use a past participle (e.g. C presses F → F is pressed), thus implying external causation. In Bulgarian, on the other hand, the reflexive construction implies self-causation. If these "extra" 10 self-motion expressions were considered, there would be a near complete balance between self-motion and caused-motion expressions.

(47) ***Pre-mina***   *mi*
      PRF-pass.PAST   1P.SING.DAT
      'Passed over for me.' ≈ I feel better *(–Caused, +Trans, +Bound)*

(48) *Natroenie-to*   ***idva-še***
      mood-DEF   come-PAST.PROG
      'The mood was coming.' *(–Caused, +Trans, –Bound)*

(49) *Toj me*   ***po-bărvka***
      He 1P.SING.ACC IMP-stir.PRES
      'He stirs me on.' ≈ He drives me crazy. *(+Caused, –Trans, –Bound)*

(50) *Pesen-ta*   *me*   ***raz-vălnuva***
      Song-DEF   1P.SING.ACC   PRF-ripple.PAST
      'The song rippled me.' ≈ moved me *(+Caused, +Trans, –Bound)*

(51) *Samota-ta*   *go*   *pod- tisna*[7]
      Loneliness-DEF   3P.MASC.ACC   under-press.PAST
      'Loneliness depressed him.' *(–Caused, –Trans, –Bound)*

In Thai, as shown in Table 5, the picture is markedly different from that of the other three languages. First of all, we can notice that most of the expressions appear in the category Self-motion. This has to do with the fact that the metaphors combine intransitive or transitive motion verbs and the word *caj* ('heart', 'mind'), which constitutes an important cultural concept in Thai. While related to the word for the biological heart, *hûa-caj* (literally 'head heart'), it denotes not a body-part, but something like the centre of emotional life itself. Thus, the composite expressions can be used intransitively, for example applying to oneself. Therefore, all motion-emotion metaphors in (52–68) may constitute complete sentences, with an elliptic first person pronoun. All of these composite expressions also unambiguously refer to emotion; only without *caj* can the verbs be used to describe corresponding motion situations.

　　The second major difference is that only a handful of examples have "near equivalents" in the other languages – the only ones given as glosses in Table 5. The

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7.   This form, with the prefix pod- ('under'), is incorrect according to prescriptive Bulgarian grammar and lexicon, and the correct form should rather be with the prefix *po-*. However, in spoken Bulgarian, as well as on the internet, the most common use is that with *pod-*.

overwhelming majority, listed below, appear clearly "exotic" from a Western perspective. Let us consider these by motion situation type. In each of the examples we give a literal translation and approximate English gloss. In some cases (59–61), the glosses are identical, and it would take considerable cultural knowledge to understand the appropriate uses of the different expressions (cf. Moore 1998).

Table 5. Motion-emotion metaphors in Thai, all of which involve the word *caj* ('heart', 'mind'). F = Figure, LM = Landmark, C = Cause, (E) = corresponding expression in English, (S) = corresponding expression in Swedish, (B) = corresponding expression in Bulgarian, * = lack of corresponding expression (with example in the main text)

	Self motion	English gloss	Caused motion	English gloss
+Transloc/+Bound	F thǔuŋ-caj * F klàp-caj * F caj-hǎaj * F aw-caj-ɔ̀ɔk-hàaŋ *		C sàj-caj F *	
+Transloc/−Bound	F tòk-caj (E, S, B) F chuu-caj (E, S, B)	*frightened* ('*fall heart*') uplifted ('*lift up heart*')	C taam-caj F * C aw-caj F *	
−Transloc/+Bound	F thalǎm-caj * F sàdùt-caj * F tàt-caj * F tam-caj * F bàat-caj * F thîm-teeŋ-caj * F ráŋáp-caj * F thɔ̀ɔt-caj * F caj-hǎaj-caj-khwâm* F caj-sàlǎaj (E, S, B) F hàk-caj (S, B)	 *devastated* ('*heart shatter*') restrained ('*break in two heart*')	C phûut dâj cɔ̀-caj F * C khàt-caj F *	
−Transloc/−Bound	F caj-têen * F caj-têen-mâj-pen-jaŋwà* F waaŋ-caj * F plɔ̀ɔj-caj * F sàtɯan-caj (E, S, B) F jɔ̀ɔm-caj (E, B)	 *deeply hurt* ('*shake heart*') relieved ('*relax heart*')	C chák-cuuŋ-caj F * C klɔ̀ɔm-caj F * C kuan-caj F (E, B, S)	*disturb* ('*stir heart*')
Total	23 (17*) (5 E) (5 S) (6 B)		8 (7*) (1 E) (1 S) (1 B)	

Examples (52–55) would, in the source domain of the metaphor, express self-caused, bounded translocative motion.

(52)   *thuǔŋ-caj*
reach heart ≈ feel gratified

(53)   *klàp-caj*
return heart ≈ feel repentant

(54)   *caj-hǎaj*
heart disappear ≈ feel very surprised

(55)   *aw-caj-ɔɔk-hàaŋ*
take heart leave far ≈ feel that you are betraying

A much larger number of metaphors involve actions that imply non-translocative motion. Those given in (56)–(64) concern actions with a state-transition, i.e. they are bounded. The examples in (57) and (72) may perhaps be considered metaphors for cognition rather than emotion, but especially in Thai the two phenomena are extremely difficult to separate, as seen by the glosses 'heart' and 'mind' for *caj*.[8]

(56)   *thalǎm-caj*
trip heart ≈ feel mistaken in love

(57)   *sàdùt-caj*
trip heart ≈ suddenly realize

(58)   *tàt-caj*
cut heart ≈ feel discouraged

(59)   *tam-caj*
pierce heart ≈ feel betrayed

(60)   *bàat-caj*
cut heart ≈ feel betrayed

(61)   *thîm-teeŋ-caj*
stab-wound heart ≈ feel betrayed

(62)   *ráŋáp-caj*
stop heart ≈ calm down

(63)   *thɔɔt-caj*
take-off heart ≈ give up effort to achieve something

(64)   *caj-hǎaj-caj-khwâm*
heart disappear, heart overturn ≈ feel shocked

Examples (65)–(68) may be said to involve metaphorical unbounded, non-translocative motion.

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8.   When speaking English, and saying something about "my mind", Thai speakers commonly point to their heart (observation made by the first author, during three years of living in Thailand).

(65) *caj-tên*
heart dance ≈ feel surprised

(66) *caj-tên-mâj-pen-jaŋwà*
heart dancing jerkily ≈ feel one's heart to flutter

(67) *waaŋ-caj*
put down heart ≈ feel trustful (of your partner)

(68) *plɔɔj-caj*
let-go heart ≈ be in a state of daydreaming

The transitive, "caused-motion" expressions concern actions that are performed with respect to someone else. The "heart" that is being moved (or acted upon) is metaphorically that of another. Thus, these can be said to be "second-person" emotion expressions, relying on empathy with the metaphorical figure, the experiencer (E). Examples (69)–(71) would express literal translocation in the absence of *caj*, with the first one bounded, and the other two unbounded.

(69) *sàj-caj E*
put in (someone's) heart ≈ take care of someone

(70) *taam-caj* E
follow (someone's) heart ≈ please someone

(71) *aw-caj E*
carry (someone's) heart ≈ please someone

The final Thai motion-emotion metaphors (without corresponding expressions in the other three languages) build on non-translocative motion, with the first two bounded (72–73), and the last two unbounded (74–75).

(72) *phûut dâj cɔ̀-caj E*
make a hole (in someone's) heart ≈ reveal something unpleasant about someone

(73) *khàt-caj* E
cut (someone's) heart ≈ irritate someone

(74) *chák-cuuŋ-caj E*
drag (someone's) heart ≈ persuade someone

(75) *klɔɔm-caj E*
cradle (someone's) heart ≈ soothe someone in distress

4.3 Discussion

The presentation of the motion-emotion metaphors attested in the four individual languages showed both similarities and differences. We can now consider these findings in the light of the three theoretical positions on the relation between metaphor and subjective experience, outlined in the introduction: (a) conceptual

universalism, (b) strong language dependence/specificity and (c) consciousness-language interactionism.

As a reminder, the prediction from (a) was that there would be extensive overlap between the metaphors in the four languages. In fact, a degree of overlap was indeed found, though relatively limited. Table 6 shows correspondences between five motion-emotion metaphors in the four languages, i.e. involving 20 of the 115 expressions. Interestingly, these are fairly systematic: MOVE UP and MOVE DOWN are converse motions, and the target emotions can be subsumed under the headings POSITIVE and NEGATIVE, respectively, which are also "antonymic". The (non-translocative) motions in the other three cases form a sort of hierarchy of intensity: BREAK UP > SHAKE > STIR and it seems that the emotions these map to do so likewise.[9]

Table 6. Cross-linguistic metaphor types attested with expressions in all four languages

Metaphor type	English	Swedish	Bulgarian	Thai
MOVE DOWN → NEGATIVE	F drops F sinks	F sjunker	F pada	F tòk-caj
MOVE UP → POSITIVE	F is rising	F stiger	C po-vdiga F	F chuu-caj
BREAK UP → VERY STRONG NEG. EMOTION	C shatters F	C krossar F	C raz-biva F	F caj-sàlăaj
SHAKE → STRONG NEG. EMOTION	C shakes F	C (om)skakar F	C raz-tărsva F	F sàtuan-caj
STIR → NEG. EMOTION	C stirs F	C upprör F	C u-bărkva F	C kuan-caj F

At the same time, we should notice that the metaphors in Table 6 do not correspond to one another completely, and are only *near* equivalents. English *sinks* and Swedish *sjunker* ('sink') imply downward movement through a liquid medium, while the other three verbs imply downward movement through air. *tòk-caj* in Thai denotes feelings of intense surprise, rather than emotional discouragement, "downheartedness" as in the other three languages. The Bulgarian metaphor for MOVE UP → POSITIVE, *po-vdiga* ('raise') is alone in referring to caused, rather than

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9.   A generalization, in the style of CMT, could perhaps be made for all these cases. The neutral state of the self, in both physical and emotional experience is that of BALANCE (which of course could be differently valued in different cultures). Various forces may dislocate the self from this position (shake, stir) or even threaten its integrity (break). The negative character of downward motion can be associated with the loss of balance, as when one is overcome by the forces of gravity. What makes upward motion positive (rise) is the experience of being liberated from those forces, of increased mobility and thus a sense of "freedom".

self-motion motion. Finally, the Bulgarian expression listed in the last row, *u-bărkva* is less clearly related to emotion than the corresponding ones in the other languages since it describes the "state of mind" of F in general.

Most problematic for conceptual universalism, however, is that a total of 46 metaphors (12 for English, 5 for Swedish, 5 for Bulgarian and 24 for Thai) were found to be language-specific. This, along with a certain degree of form-specificity, could be taken rather in support of language dependence. In the case of Thai, where we cannot use the criterion of a "frozen" tense-aspect form to determine form-specificity (i.e. strong idiomaticity), since the language lacks morphological tense and aspect, we can nevertheless attribute a high degree of conventionality to all the motion-emotion metaphors attested in the language, due to the obligatory conjunction of the word *caj* with the respective verbs and phrases.

At the same time, none of the 46 language-specific (and in a few cases form-specific) expressions can be properly called "arbitrary", since in all cases a relation of similarity (or contiguity) could be found with corresponding motion situations. Otherwise the examples would not have been analyzable according to the framework presented in Section 2, Table 1, into the categories in Tables 2–5. The glosses given for the 24 Thai expressions lacking "near equivalents" in the other three languages (52–75) may give the impression that some of these metaphors are "exotic" (from a European perspective), but their motivation is certainly not incomprehensible.

So despite the considerable number of "language-specific" motion-emotion metaphors in the four languages, the overall impression is that there is considerable overlap between the languages – even between the genetically and geographically most distant ones (see Figure 1 below). And conversely, while the attested language-specificity constitutes negative evidence for conceptual universalism, the cross-linguistic correspondences, and systematicity shown in Table 6 are problematic for the thesis of (strong) language-dependence.

On the other hand, the findings can be naturally interpreted as supporting a dialectical theory of type (c), consciousness-language interactionism. It should be remembered that it also made the prediction that the degree of overlap between the metaphors in the four languages will correspond to the degree to which the languages/ cultures are related: English and Swedish are most similar, both genetically and culturally. Bulgarian, a Slavonic language from South-Eastern Europe is more distant, while Thai is clearly the "outlier" in the group.

As shown in Table 7, this prediction seems to be confirmed. 23 of the English metaphors were also represented in Swedish, while only 14 had a "near equivalent" in Bulgarian and 6 in Thai – despite that Thai had nearly as many motion-emotion metaphors as English. From the perspective of Swedish the situation was similar – extensive overlap with English (21 of 27 metaphors), less so with Bulgarian (11), and much less with Thai (6). Bulgarian overlapped nearly identically with English (13) and Swedish (11), with about two-thirds of its motion-emotion metaphors, and less so with Thai

(7). The degree with which Thai motion-emotion metaphors had counterparts in the other languages was relatively small, and nearly identical for all three languages.

Table 7. Degree of overlap between the motion-emotion metaphors in the four languages

Language-to-language overlap	English	Swedish	Bulgarian	Thai
English	38 (12*)	23	14	6
Swedish	21	27 (5*)	11	6
Bulgarian	13	11	19 (5*)	7
Thai	6	6	7	31 (24*)

If we disregard the fact that relationship "overlap with language X" was not completely one-to-one – since several near synonymous expressions in one language can correspond to a single one in another – we can illustrate this degree of overlap between the languages as in the (approximate) representation in Figure 1.
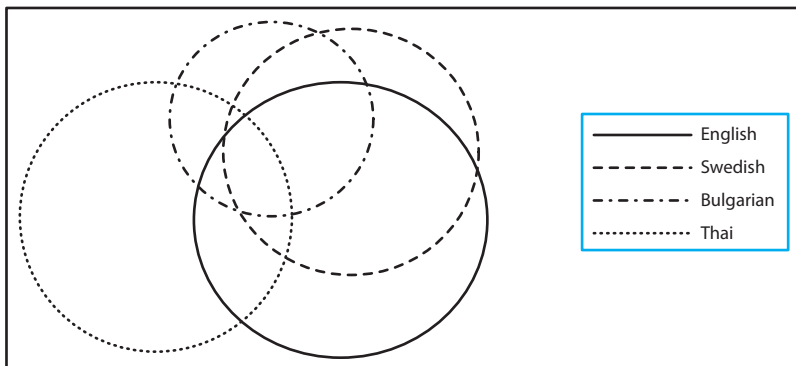
Figure 1. Graphical representation of the overlap between motion-emotion metaphors in the four languages

In fact, Thai overlaps less with the other three languages than what the tables and Figure 1 show, since similarity in the "source domain" meaning of several of the Thai metaphors listed as counterparts to those in the other languages were not matched with similarities in their metaphorical meanings. As with *tòk-caj*, mentioned above, *hàk-caj* ("break heart") has a different conventional emotional meaning compared to the other three languages (to restrain oneself).

5.   Conclusions

In this chapter, we relied on cross-linguistic evidence in order to broach a difficult topic: the relationship between subjective experience and metaphorical expressions,

focusing on metaphors connecting the "domains" of motion and emotion. Departing from Wittgenstein's so-called private language argument, we pointed out that while the meaning of linguistic expressions cannot be reduced to subjective experience, the latter may, and indeed should be relevant for many expressions denoting states and processes of consciousness. Public criteria for the correct use of expressions provide "half the story". While "an 'inner process' stands in need of outward criteria" (Wittgenstein 1953: #580) to determine the conditions for appropriate language use, we could reverse this and say that "outward criteria stand in need of an inner process", or else words denoting mental phenomena would be gutted of their experiential content, and their meaning reduced to use. Linguistic expressions of emotions appear as a prime "test case" for investigating this dialectics of the "inner" and the "outer".

The study of motion-emotion metaphors in four differentially related languages (and cultures) here described gives support for a view according to which personal, subjective experience and language (use) closely interact in the formation of metaphorical expressions used to talk about, and at least to some extent think about, emotions. In brief, this position implies a scenario on the "evolution" of emotion metaphors such as the following.

People can and do experience emotions (or feelings) of various sorts even independently of language, but to be able to talk about them, these less "tangible" experiences must be expressed by words whose meaning is public. The most natural way to do so is to use expressions which refer to publically observable phenomena, but which are in some ways either *similar to* (analogy, iconicity) or *spatiotemporally related to* (contiguity, indexicality) the subjective experiences. Expressions denoting motion situations are convenient for this purpose for two reasons, corresponding to the two kinds of motivation. First, due to their dynamic character, motion situations may be found to be (phenomenologically) similar to emotions (i.e. changes in affective consciousness). Second, due to the close association between feelings and co-occurring bodily processes and sensations, the latter become "metonymic" or "indexical" of the first. Hence, in historical time some speakers could creatively use expressions referring to such analogous or contiguous (motion) events in the "external world" in order to describe their "inner worlds", and hearers could understand them, due to the motivated nature of the expressions. With cultural transmission, both within and between generations, such expressions become conventional (though still motivated) and thus convenient language-specific and culture-specific "moulds" for construing emotional experience.

The empirical findings and the theoretical position of this chapter are in harmony with the theme of the present volume – the fundamental roles of motion and emotion for "consciousness, intersubjectivity, and language". First of all, emotion and (the perception of) motion were analyzed as central aspects of (human) consciousness. Concerning intersubjectvity, however, a qualification to what has been said so far needs to be made. In referring repeatedly to "subjective experience" we may have

given the impression of emotions as fundamentally private phenomena, at least prior to their expression in language. While with Husserl, and phenomenology in general we would insist on the irreducible character of consciousness, (human) subjectivity is tightly connected to inter-subjectivity. Thus, we would maintain that our first-person experience of emotions (i.e. feelings) is indeed basic, but it is not radically "private" in the sense that Wittgenstein criticized, since our emotional capacities have evolved and develop through communal life. Bodily expressions of emotion such as postures, cries and facial expressions are intrinsically public, and through empathy, we are literally capable of "sharing into" the emotions of others (Gallagher, this volume). As pointed out in Section 2, the dual nature of the body – on the one hand perceived from the outside, and on the other, as a lived body, *Leib*, experienced subjectively, is probably fundamental for achieving this. However, this is done without thereby abolishing the distinction between self and other. As stated clearly by Zahavi (2003: 114): "To demand more, to claim that I only experience an Other the moment I gain access to the first-person givenness of the Other's experiences is a fundamental misunderstanding that far from respecting the transcendence of the other … seeks to abolish it."

With language, however, the individual differences in subjectivity become less relevant than the collectivity of the common senses (meanings). The motion-emotion metaphors such as *my heart dropped* discussed in this chapter are of this kind: conventional, without being arbitrary, since they are doubly grounded in both (inter)subjective emotional experience and in conditions for appropriate usage.

Acknowledgements

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Epilogue

Natural sources of meaning in human sympathetic vitality

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"It is by natural signs chiefly that we give force and energy to language; and the less language has of them, it is the less expressive and persuasive. […] Artificial signs signify, but they do not express; they speak to the understanding, as algebraical characters may do, but the passions, the affections, and the will, hear them not: these continue dormant and inactive, till we speak to them in the language of nature, to which they are all attention and obedience."
Thomas Reid (1764). *An Inquiry into the Human Mind on the Principles of Common Sense.*

1. Human nature, common sense and language: The motives of cultural learning

The problem of reconciling natural creativity and rational artifice in human affairs is endless. On the one hand there is the spontaneous actions, intuitive awareness and affections of the life of a human person in intimate relations with other known persons, and on the other the complexity of factual explanations in a practical society that rules its membership with an impersonal logic of laws and symbols. Whitehead in his *Science and the Modern World* explored how this dilemma has been manifest through the history of European thought. It seems we must draw attention once again to the "fallacy of misplaced concreteness" (Whitehead 1926: 68).

The contributors to this volume are convinced that many scholars of language, of the philosophy of mind, of the psychology of cognition, and of cultural patterns and social institutions are misguided by a modern tradition of rational explanation. Consciousness and knowledge are proclaimed to be effects caused in single heads, impressions in excitable cerebral matter of stimulating events, the 'true' nature of which is made clear by rules of educated thought and language, and by scientific instruction in laws of matter. Within this tradition it is taken as given that each young human mind, alone, after assimilating the forms of reality experienced as a result of its instinctive

actions, somehow infers or imitates a capacity for logical thought, acquiring 'reason' or 'intelligence', the communication of which depends on a special learning of how to articulate in language what is known. The body with its affections has a peripheral part in this mind's work, as a sensitive instrument.

When turning attention to questions of how to educate the human computing 'system', a cognitivist may admit that the child has some active 'strategies' or 'devices' for gaining practical schemata and symbolic knowledge, besides primitive means of communicating body-related satisfactions or displeasures. In explaining how meanings are communicated, they attend first to the signalling of practical needs and regulatory practices of productive work – to the organisation of essential tasks in complex systems of technology, commerce and industry, and the pragmatic reasoning that represents, justifies and legislates them. Education is directed to instruction in technical knowledge and media for its communication.

Experts in this scientific theory of intelligence and its instruction do not sufficiently appreciate the biological foundations, the adaptive nature of the child's curiosity of being alive, and its seeking for company, which are evident in all human communities, no matter how advanced their civilisation and industry, or how 'primitive'. There is a creative spirit of agency inside every human body from birth, the movements of which express a time of being, appreciated as a single self-consciousness by many modalities of sense, and the purposes and affections of this vitality demand to be shared. The rational theories cannot explain how this need to share affective life is open to artful cultivation in celebrations of community, or how every child is inspired to achieve, imagine and remember their purposes and projects with serious and sociable playfulness. Rational theories of language structures do not explain how we find it compelling to communicate what we do, know and care about – whether we are speaking and hearing, writing and reading, or not employing words at all. We pursue our goals, even as infants, with great tenacity, and with very powerful feelings, and we share these intentions and feelings richly, in many ways. Those are some of the topics the authors of this book wish to clarify.

With different interests and for a variety of reasons, we believe the scholastic 'gaps' between mind and body, self and other, reason and emotion, are impediments to appreciation of how human nature lives and grows, and how it responds to language and the other tools of culture. These gaps are sustained in cognitive science by claims about the structure, uses and origins of language, about discoveries about correlated activity in pieces of brain, and by philosophical analysis of an ideal, reflective consciousness that attempts to recall and explain experience as facts perceived outside the body, as an 'informatics' system.

All the contributors to this book suggest, with evidence from different fields, that the confusion may be cleared, and the gaps of understanding 'filled in' – so they no longer trip us up or invite laborious detours of explanation – by attending to the

way each of our human bodies acts as an intentionally coherent *animate Self*, aware of itself, and conscious of participating in the world. By a descriptive natural science that takes note of how a human person, as an animal, guides his or her actions by an intelligent 'environment expectant' awareness that grasps environmental affordances for what they intend to do – how it *feels* its acting, and how it imagines the future feel of experience and recalls the past with feeling, *aesthetically*. Finally, we ask how this active, aware and imaginative Self shares defined interests with other persons *morally,* with sympathetic affections. How a person expresses their self confidence in language or by other means, engaging with human Others who are perceived as persons in their living selves full of passions, and as potential cooperative companions or competitors in self-conscious and mutually responsive action, feeling and knowing.

Those of us who seek evidence from the way language defines and qualifies its messages believe that considerations of the emotional liveliness of the speakers and listeners, of the sharers of signs, or of the writers and readers of verbal texts, mathematical formulations or musical scores, must be kept as the foundation for any theory of how the words and symbols work. We accept Thomas Reid's distinction between natural and artificial signs. Manifestly language is not just a *thing*; it is *something we do*, and with passionate intention. As a troubled Wittgenstein discovered, when he took on the job of teaching children how to talk and think, language is a 'game' we play (Wittgenstein 1953; Sluga 1996). If the wealth of reference in language is to be shared and make sense, its natural motives need to be vitally present. We urge a return not only to ordinary everyday 'first person' experience of our being and doing in felt movement, but also to the 'second person' sociability of understanding that Reid (1764) called 'common sense', which includes wise distinctions and precisions 'buried in the structure of everyday language', and which are transmitted richly if we share sympathy for one another's 'active powers'.

2.   Some history of the controversy over the nature of human intelligence and meaning

Voices of the past 150 years give support to our enquiry, providing alternative interpretations to the dualism of the thinking conscious mind in a single head, commanding with verbal skill an animal mechanism of senses and muscles, a body with only automatic passions that require reasoned regulation in a society of rational persons, like unruly children. We may cite Husserl, Mead, Wittgenstein, Bakhtin, Vygotsky, Gibson and above all Merleau-Ponty, all of whom believe the Self is intentional in its awareness, with emotions that bring us into a community, giving each one of us a sense of being in a life time we can share, and a sense that one is a recognized person with individual character. In order to present the present volume in a broader historical

context, it may be useful to review the thoughts of these and other leading seekers of a more vital and sympathetic account of the human condition and the making of meanings under headings that attempt to identify the key topics they chose to elucidate.

2.1   Animal agency and its awareness

In the mid 19th Century, Helmholz, pioneering sensory psychophysics, refused to separate mind and body. He explained vision, looking with two eyes while perceiving a motionless surround, as a product of an 'unconscious inference' needed for guiding all actions of a self in the world. By the beginning of the 20th century a physiological science of animal intentions, self awareness and feelings of vitality was growing strong, transforming psychology. Sherrington (1906) gave a brilliant account of the integrative action of the nervous system, attributing consciousness to a power of knowledge inferred though the 'extero-ceptive' distance senses to guide movement by an imaginative 'projicience', which seeks confirmation by use of the 'proprioception' of body movement, he called this sensing 'the material Me' in action. The objects are brought to the body for 'affective appraisal' by 'viscero-ceptors'. Research by von Holst (1936) on how animals move with awareness proved the crucial role of 'loosely coupled' intrinsic rhythms of central nervous activity. In 1950, he and Mittelstaedt demonstrated the "Reafference Principle" by which an organism distinguishes self-generated sensations from exafferent (externally generated) stimuli, and the same year Sperry showed that an animal's control of its movements requires a "corollary discharge" of nerve energy that anticipates the 'correct' sensory feedback from each movement. In a paper entitled "Neurology and the mind-brain problem", opposing the behaviourist theory, he maintained that perceptions serve movements rather than cause them – that we perceive what we intend (Sperry 1952). Sperry used experiments on the development and regeneration of brain circuits to show that fields of neurons are mapped with representations of the body's field of movement and awareness, by a genetically determined coding of nerve growth patterns (Sperry 1963). This 'chemospecificity theory', abundantly confirmed by molecular genetics research, affirms that psychological processes are innately adapted for awareness of, and movement within, a world perceived relative to the form of the body. Drawing conclusions from his work on the different mental functions of the human cerebral hemispheres revealed by commissurotomy, for which he received the Nobel Prize in 1981, Sperry (1983) also wrote on the creative and unifying power of a 'supervening' consciousness to master the elementary processes of awareness and movement. Like Dewey, he insisted that human awareness must be imbued with conscious moral purpose.

Gibson's ecological perception theory (Gibson 1986) relates to insights from von Helmholtz, Sherrington and Sperry. From research on practical problems of steering vehicles and object recognition, he showed that perceivers "pick up" information to

guide their movements with "prospective control", detecting invariants in the shapes and transformations of the visual world related to how their bodies move within it. He called the perceived properties "affordances", and came to reject the cognitivism that emerged in the 1960s, on the grounds that perception clearly can "directly" perceive the information needed about useable reality without rational intervention. Eleanor Gibson, James' wife, studied perception in infants and young children, demonstrating that perceptual learning proceeds from differentiation of innate abilities to detect new affordances of spatial arrangements and of the forms of object in the world (Gibson 1993). Prospective motor control by generation of a 'motor image' for the desired movement was demonstrated by the Russian physiologist Bernstein and has been given a powerful mathematical formulation by Gibson's student David Lee (1980).

2.2   Affect, or the values of life

Darwin concluded that innate emotional expressions of humans guide the development from an affectionate infancy to a cultural life with its learned skills. Modern neuroscience of the affective nervous system in animals and humans, with research on social signalling in different species, goes some way to dispel philosophical confusions about the nature and function of emotions, giving natural emotions in engagement between persons a primary creative role in development of human consciousness and action (Panksepp 2005; Gallagher 2008, interviewing Panksepp).

But there is still a prevailing idea that emotions are reactive, subordinate to psychological states of consciousness and their sharing between us. Lipps, however, proposed that emotions in the subconscious mind draw feelings from contemplated objects, or persons, colouring their perceived nature aesthetically. He called it *Einfühlung*. This was translated to English as 'empathy', taking a Greek word for a feeling 'projected into' the object of awareness, or, as Gallagher interprets it in this volume, 'taken in' as an "involuntary sensory-motor mirroring" or "kinaesthetic imitation" of what is in another person that makes them behave as they do. Lipps' idea of emotions arising in the subconscious gave a foundation for Freud's 'hydraulic' theory of the inner energy forces, how they may regulate experience, and how they may be recruited in psychodynamic therapy to combat the dangers of mental illness brought about by deeply felt memories of past failures, or of excesses of shared emotion.

Merleau-Ponty enriched the theory of sympathetic and constructive sharing of affections as they emerge in social encounters, developing an account that contrasts to Lipps' theory of emotional projection (Zahavi 2005). Research on neonatal imitation has shown that there need be no learning for a human being to seek mutual, dialogic contact and sharing of affections with another person in full, open sympathy, as Reddy explains, and these feelings of relating quickly become a rich resource for building intelligent companionship in play with infants.

With Darwin, Wittgenstein and Merleau-Ponty, Scheler (1954) accepted that we have *direct* appreciation of states of affection in others, without any need of conscious analysis of expressions. In his romantic conception of sympathy Scheler gave first importance to the joy of erotic love, or the threat of anger, to which the spirit or self-determining 'life drive' of another human person responds immediately. By evaluating highly the most powerful intimate affects in this way he leaves problematic the more subtle moral feelings of pride and shame, or of loyalty and solidarity in companionship, and he fails to recognize the creative dynamics and challenges of fun in play, or the need for reflection on the responsibilities of feelings in trusting relationships.

Inspiration for a more open intersubjective psychology, one that appreciates the mutual recognition between minds in dialogue and their subtle emotional values, even in infancy, comes from the poetic writings of Buber. His distinction between the willing intimacy of an I-Thou or I-You relationship, as an essential foundation for any sincere and open affection between persons and for religious sensibility, and the I-It relationship that a rational and practical mind can have for use of an object, has taught many of us to accept the deep difference between an information-based and a feeling-based consciousness.

2.3   Animal social agency – ethology, the evolutionary bridge to culture

Von Uexküll, early in the 20th Century, presented a theory of natural agency and social collaboration, according to which each animal species exploits a particular niche, perceiving it as an Umwelt or environment by adaptive actions that orient to and test its benefits and that guard against its risks (von Uexküll 1957). In acting in its world, an animal identifies the *signs* of 'pertinent' objects or situations that it may use to support life. These adaptive actions and 'judgements' are communicated within a social group by special *social signs*. Thus von Uexküll created his bio-semiotic theory of animal communication soon developed by Lorenz, Tinbergen and von Frisch as the science of ethology, which describes the signals and instinctive rituals by which animals cooperate in their 'life world' in such vital activities as mating, care of offspring and collective foraging or defence against predators. By the end of the 19th Century, the natural history of social communication in animal and human societies was gaining respectful attention from leading philosophers.

2.4   The psychology of human will and collaboration

The philosophical observations of Brentano, James and Bergson confirmed the intentional, time-making and time-feeling nature of awareness, the 'felt present' and intuition, within and between persons. James's monumental *Principles of Psychology* (James 1890/1981) laid the foundations for a unified understanding of both physiological and philosophical aspects of the distinctive mental lives of different persons,

their rhythmic and sociable "streams of thought", at least after they are formed out of what he conceived as the "confusion" of infant experience.

Bergson lucidly exposed the limitations of a scientific materialism and a materialistic logic of causes that gives no special place to the life of intuition, the infusion of immediate awareness with changing purposes, and the socially shared humour that instinctively challenges mechanical simulations of human action. His humanism and pragmatism supported James' psychology and they became friends, and he influenced Merleau-Ponty.

Like Darwin and Sherrington, Dewey gave 'habit', or the self-aware experience of agency, primary importance. He thought that the 'transactions' of experience and belief, including those of religious beliefs, should be 'experimental', not dogmatic, as they are developed into negotiable descriptions and explanations and into works of art and rituals of practice. He wrote, "Till the Great Society is converted in to a Great Community, the Public will remain in eclipse. Communication can alone create a great community" (Dewey 1927: 144).

Mead carried the cause of pragmatism and humanism of James and Dewey into an analysis of the wilful sharing of meaning, creating what we now know as social science. His theory of "mind, self, and society" explains both 'mind' and 'self' as products of the transactions of individuals communicating in society. Infant's gestures of interest, at first unaware, he thought, of their effects on another agent, become symbols when that interest and willingness of the other to respond are acknowledged. He believed that only a human being is capable of making such a significant symbol as a social act. Mead, with James distinguishes the subjective "I" responding to others, and the socially perceived "Me" who is known as a particular kind of person, a target of others' regard and appraisal. There is a perpetual internal dialogue between the "I" and the "Me" in oneself. This line of thinking, inspired by Adam Smith's theory of sympathetic intentions of buying and selling, and his definition of the *conscience* as a judge of one's actions, has been found of special value to the work of Bråten in his search for an understanding of intersubjective mirroring and 'participation in the act of the other' (Bråten 2009).

Whitehead, after writing the first edition of *Principia Mathematica* with Bertrand Russell, turned to critically examine the philosophy of science in the modern world, and then to develop a philosophy of society close to that of Brentano, Dewey and Mead. His 'process philosophy' conceived each 'organism' as a creative agent with adaptations to take use of the world and to cooperate with other agents. In later life Whitehead developed his highly influential educational philosophy that gave first importance to the creative 'zest' of the learner, which must be supported by a teacher. Like Dewey, but going further in his estimation of the child's natural enthusiasm, he criticised a too formal school instruction, with neglect of creative cultural arts, saying in an address on *The Aims of Education* made in 1916, to the Mathematical Association of England,

"Culture is activity of thought, and receptiveness to beauty and humane feeling. Scraps of information have nothing to do with it." (Whitehead 1929).

Merleau-Ponty also gave active perception by engagement with the world, and particularly perception of people by engagement with their actions, first importance. His phenomenology is strongly appreciated by post-cognitive theorists who analyse the way an animal body acts to generate a serviceable awareness with inbuilt knowledge of how to grasp and employ the environments affordances efficiently (e. g. Clark 1999; Dabiri et al. 2006). *Self-animacy* of an animal moving in the medium for which it has evolved proves to be more effective, more 'intelligent', than the performance of any physical device that lacks prospective control by adaptive projicience, thinking ahead.

2.5   Art and aesthetics: Guiding creativity with affect

Langer, a pupil of Whitehead and admirer of Cassirer, contributed a philosophy of active aesthetic experience and the inventions of symbolic, active meaning – in metaphor, music and the arts. Like Bakhtin she studied the spontaneous creation or presentation of meaning in movement (Langer 1953). Her insistence on the vital forms of performance and their weaving into narrations of purpose in human experience with emotion inspires Stern in his exploration of 'vitality dynamics' in development of the child's self and mind, and in the arts (Stern 2010). Langer rejects that music *causes* emotions; musical meaning is symbolic and emotional within the personal experience of feeling in body movement – it is made by combinations of the experiences of action sensed as Gestalts or forms and narrations, as *melodies*, not by cognitive assembly or sequencing of separately perceived sound elements (Meyer 1956; Kühl 2007).

2.6   Language: How meanings and their objects make sense in dialogue

Many of us find the later philosophy of Wittgenstein to be a source of firm understanding for the vitality and human sense of language as a "game" that is motivated in "forms of life". He rejected the view that the Self is all we can really know. Thinking must be both social and mental from the start. Wittgenstein's crucial conversion from logical positivism and his interpersonal theory of language came after a retreat from philosophy of about ten years, during which he became, with his sister's help, a teacher of young children in Austria. As a school teacher, "his attention was drawn to the informal language of everyday life, to the fact that language is primarily a medium of communication …. to the way language is learned and more generally to the whole process of enculturation." (Sluga 1996). He became concerned with how the "games" of language may mislead thinking, creating of false problems, such as the mind-body problem. (Wittgenstein 1953).

The writings of the Russian semiotician and literary theorist Bakhtin on the origins of language and thought in dialogue have had a profound influence on

many human sciences (Bakhtin 1986). He defined language and culture as products of human social acts that take the form of dialogical exchange, producing forms or 'genre' in discourse that have varieties of ethical and political as well as aesthetic power. With Mead he asserted we can only find or understand ourselves, not in any mirror or photograph, but in received communication with others and the collective culture. Each person's self has a worth that must find its expression in dialogue with the motivated actions of other human souls. Bakhtin's analysis of rhetoric makes clear that our opinion of our worth and identity is something described by the perception of others who engage themselves with us, with our distinctive "voice", tone and manners toward them, as well as with what we say and believe to be "true". For the polyphony of voices to flourish and make a community there must be a celebration of playfulness or "carnival", as in the exaggerated inventions of theatre and literature. Language is not just the exchange of symbols with defined meaning. It must be creatively used, and affectively, aesthetically and morally appreciated.

Vygotsky, like Wittgenstein, was convinced by his studies of children learning language that thinking is first social then a possession of single minds – that talking comes before thinking. He saw a child has a gift for agency and a potential for seeking and benefitting from intimate engagement with teachers. His social-developmental theory (Vygotsky 1978) proposes that 'intra-mental' work is an image of the 'inter-mental' exchange; that overt mutually contrived conversation becomes the 'inner speech' of thinking and problem solving. Evidently, however, private thinking and social thinking exist in corresponding and complementary forms from the start and throughout mental life, changing as they grow, but retaining the same rhythms and cycles. Neither is the source of the other. The crucial element is a purposeful inter-subjectivity that allows mental collaboration as well as propositional cognition. Preschool children often talk loudly to themselves, assuming roles and relationships, generating and attempting to solve or 'self-regulate' problems, and so do engrossed adults. And these forms of shared or private expressive reasoning may be mediated by gestures as well as speaking. Thus young children have difficulty 'thinking' mathematical problems if they are asked to keep their hands still by sitting on them (Goldin-Meadow 2006). The whole expressive body is a tool for thought, as Einstein said it was for his mathematical invention (Hadamard 1945).

Vygotsky's developmental theory led to a new understanding of the role of teacher or therapist in aiding the development of a child's skills. From work with handicapped children, he learned that it is necessary to enter cooperatively into the "zone of proximal development "of the child, where their skills are at the limit and need help to be completed. Bruner labeled the helper's task one of "scaffolding" the learner, but Vygotsky's conception gave strong importance to the child's will to act and know, and the metaphor of scaffolding does not bring that to the fore.

2.7 Recent advances to a psychology of cultural life, and how it is learned

By the mid 20th Century, the importance of intended and shared life experience for the vitality of human culture was gaining recognition in the human sciences, stimulating new conceptions in anthropology, education and social theory. I mention the work of four thinkers whose works have had important academic and social consequences.

Jerome Bruner's educational psychology, which has guided the work of teachers for two generations, depends on a theory of 'collaborative learning' by which concepts and skills of cultural meaning, and language, are transmitted (Bruner 1996). He describes schools as 'communities of learners'. Bruner's students and collaborators Rogoff and Greenfield have researched the teaching and learning practices of different cultures, and they show how, in societies where there is little or no formal schooling, social and technical skills and cultural rituals are passed on by 'intent participation' of the young with the more expert knowledge and abilities of instructors, by actually doing and making things of use and value with them (Rogoff 2003; Greenfield 2004). The knowledge and thinking is not formulated in an abstract written curriculum, and their achievements, products and explanations are appraised aesthetically and corrected in action, not assessed by tests. Bruner gives shared imaginative play, and performance of narrative rituals to assist recognition of 'recurrent events', central importance. With Whitehead he views the child as a creative learner. Among cognitive psychologists, Bruner's theory of 'joint attention' has come to be the accepted explanation of cultural learning, but with insufficient recognition of the strong intersubjective feelings that give his theory more useful application in pedagogy.

With experience of the role of ritual and celebration in African culture, Victor Turner & Edward Bruner (1986) proposed an 'anthropology of experience', which, in contrast to an ethnographical analysis of products, attempts to share the animated awareness of different peoples in their world, and in the celebratory and religious practices. Turner (1982) describes the intimacy, equality, solidarity or consensus and spontaneous celebration of relations among persons who know each other and who share artistic and spiritual affections as 'communitas', distinguished from the formal and legislated structure of 'societas'. The seriously playful celebrations of communitas recall the 'carnival' of Bakhtin in which many voices are heard and permitted. The feelings and imaginative practices of community may rebel against the disciplined structure of society, leading to marginalisation of persons to 'liminal' states of exclusion. Turner's anthropology of experience and his analysis of the affections and risk taking of community has an important message for the strivings and conflicts, including religious, commercial and political conflicts, of societies at any level of complexity and technical achievement.

The social philosopher Jürgen Habermas proposed that a mutuality of understanding is possible only by communication of purposes and that "dialogue constituent universals" of language generate and describe the intersubjectivity in minds of language users, as well as in forms of communication that are independent of speech. At a first

level, personal pronouns enable an "interlacing of perspectives" between people by which they keep separate their viewpoints and so understand the meaning in surroundings they share. This corresponds to the primary intersubjectivity of a protoconversation with a two-month-old. Habermas' second level universals are deictic expressions that specify time and space, the articles and demonstrative pronouns. These "link the levels of intersubjectivity on which the subjects converse and interact reciprocally with the levels of objects about which the subjects converse" (Habermas 1970: 141–142). This function appears in proto-language at the end of the first year (Halliday 1975) and is what we have termed secondary intersubjectivity (Trevarthen & Hubley 1978). The third and fourth classes of dialogue constitutive universals are performatory speech acts. Speech act theory (Austin 1962) attends to the interpersonal functions or intentions (illocutions) in spoken language (locutions), which are not necessarily expressed directly in the propositional content. Bruner (1983), Bates (1979) and Dore (1983) have applied speech act theory to holophrases in early language development and in infantile communications which are precursors of speech acts. Habermas' theory of society allows us to relate these essential developmental stages to the practices in the mature dynamic structure of a verbal society. Dewey's political philosophy, as well as Bruner's study of the communications or narrations implemented in legal practice, may be compared to the analysis Habermas made of legal and political processes in modern society, and of the restrictive effects of enforced rationalization for efficiency and control (Habermas 1987).

Finally, Pierre Bourdieu (1990) portrayed human society as a space of 'life-styles' where persons with different points of view and develop relationships and roles. These define a person's place within the *habitus*, the system of classification of the practices of their group, and that define the affections, values or 'tastes' by which the practices of individuals are appreciated and negotiated. He pioneered investigation of the functions of social, cultural and symbolic 'capital' and of power relations in society. We have found his concept of acquired habitus of value in understanding how rituals of communication, song, play and reference develop as a 'proto-habitus' in the intimacy of the life of an infant with its mother and other close companions in the family (Gratier & Trevarthen 2008).

3. The multiplex agency of the self and its (mis) representations in language

There is one motive feature of the active human body, surely vital to the rest, that is crucial. Juvenile human beings take special delight in the movements of a very complex body with several acute and independently mobile senses and collaborating eyes, hands, mouth and, eventually, two propulsive feet. A newborn infant appears

to have, from early months, a self-conscious pleasure in their 'consilience' of move-ments. Is this 'feeling how one is doing' a *reflective conscience*? Young infants seem to record the drift of their activities and their discoveries of the limbs and feelings of body and the world, and ponder them – to be able to 'imagine acting' harmoni-ously with multiple movements, either alone or in company, and to be giving their animated imaginings 'affective appraisal'. I believe this 'thoughtfulness without logic', having in mind projects and problems of action in the self, to be followed through and cared about, is an essential part of being ready to become an *other-consciousness* in the ritual humour of play, and that it may experience and express not only pleased satisfaction, but 'pride' and 'shame' about how its inventions and propositions are, or may be, received and appreciated by others, from early months. It is ready to be a 'pupil' of others interests. I do not believe such subtle human morally-regulated sociability is learned – it is prepared for by a sense of the several ways a human agent may act and interact through experiencing actions in animated life of the body and senses, within the Self, and with Others. As the physiologists discover, the brain is a theatre of polyrhythms which generate systematic changes in a fusion or constant mutual adjustment that reconciles many different oscillators (Buzsáki 2006), making an every changing flow of changes in energy and arousal, which Daniel Stern calls 'vitality dynamics' (Stern 2010). And this is the kind of brain that is also adapted to be 'sociable'.

This is perhaps the most revolutionary claim I have to make from my observations of infants – that a baby's mind carries, as an adaptation for using a body with many mobile parts, a *multiplex consciousness* with internal debates between the impulses of several agents of moving that may be making assessments between rival purposes. We are adapted to engage the world and one another mastering what Merker (2005) has called 'the liabilities of mobility' with an exceptionally labile consciousness that con-stantly reconciles between alternatives in action and interest, and that is profoundly appreciative of risks and benefits likely to follow, and how well or bad their agency might feel.

It is just plainly true, and easily demonstrated with precision recording and unprejudiced attention to detail of movements, that the refinement of infants' actions in which hundreds or thousands of local muscle contractions are mutually adjusted and sequenced, are products of an economic synthesis and synchrony of excitations active throughout the brain. A quiet-alert newborn has an 'integrated' self-sensing proprioception that is prospectively aware – a realisation, by generation of prospec-tive 'motor images of movement' (Bernstein 1967), of a virtual animate Self, which Sherrington (1906) called his 'felt Me'. Contrary to the presumptions of mature ratio-nal intelligence that looks only for skilful object directed moves, learned by building representations of external reality, the infant's body is not in chaotic, random motion

at the mercy of reflex responses – it generates fast flowing rhythmic purposeful and experimental compositions that integrate the acts of the many parts of their bodies and their several senses, making *narratives* of experience in action, and setting up *projects* which may lead to the identification of *problems* to be solved. This is direct evidence of an embodied, articulated, kinesthetically and emotionally regulated agency of a mind, albeit an 'inarticulate' one (see Figure 1).

The complexity of innate intentionality has the capacity to generate and experimentally elaborate cognitive 'schemata' that *work* for mastering objects outside the body, as Piaget demonstrated. In 1967, Papoušek reported the 3 or 4 month old infants moved with careful purpose to cause interesting effects, predicting consequences of their movements, and that they showed emotions of pleasure when they predicted correctly, and displeasure when they made a 'mistake' – they were showing 'human feelings' of responsible agency. But a young infant's 'sensori-motor' intelligence is not just interested in physical effects produced on objects or in an apparatus; they are selectively receptive to the symptoms of another person's movements and the emotions persons signal from inside their bodies, as Darwin demonstrated. Mary Catherine Bateson showed that at 2 months this interpersonal intelligence is most lively and 'organised' in intimate dialogues or proto-conversations, which she described as conducted with 'delighted ritual courtesy' (Bateson 1979: 65). Within a few weeks the infant expresses his or her vitality in rhythmic action games and musical 'attunement' of interests and affections with partners in *play* (Stern 1985, 2010), and in these expectations and deceptions tease one another, stimulating and satisfying both creativity and infectious pleasure (Reddy 2008, this volume).

I believe this sociable human creature – the whole of it, body and soul – is the "Language Acquisition Device" (LAD) sought for by generative grammar, and that it is gifted for all sorts of special cultural projects besides the grammar of language. As Jerome Bruner said, the little human creature, while trying to *use* words to *do something* interesting and meaningful, is looking for the company of an affectionate, and playful, teacher who will be a Language Acquisition Support System (LASS) (Bruner 1983). Linguistic concepts are first realized in action, and actions become important by being shared.

But gaining language is not always gaining understanding. We may be confused by words we are led to use by custom in erudite discussion. Words become indispensible tools of shared meaning, but they can be misused, become chipped or dull, and choice of the wrong tool can wreck the task. Some become so transformed that their original purpose is lost. The metaphorical power of a word, what Fonagy (2001) calls 'languages within language', if they lose their poetic roots and are taken 'literally', can misguide our view of life and our relations and beliefs in society (Lakoff & Johnson 1980). Thomas Reid (1764), anticipating Darwin by more than a century, argued

The frog's body-centered field of behaviour & awareness

The muscles of human vision

Map of the visual world in the frog's mid-brain
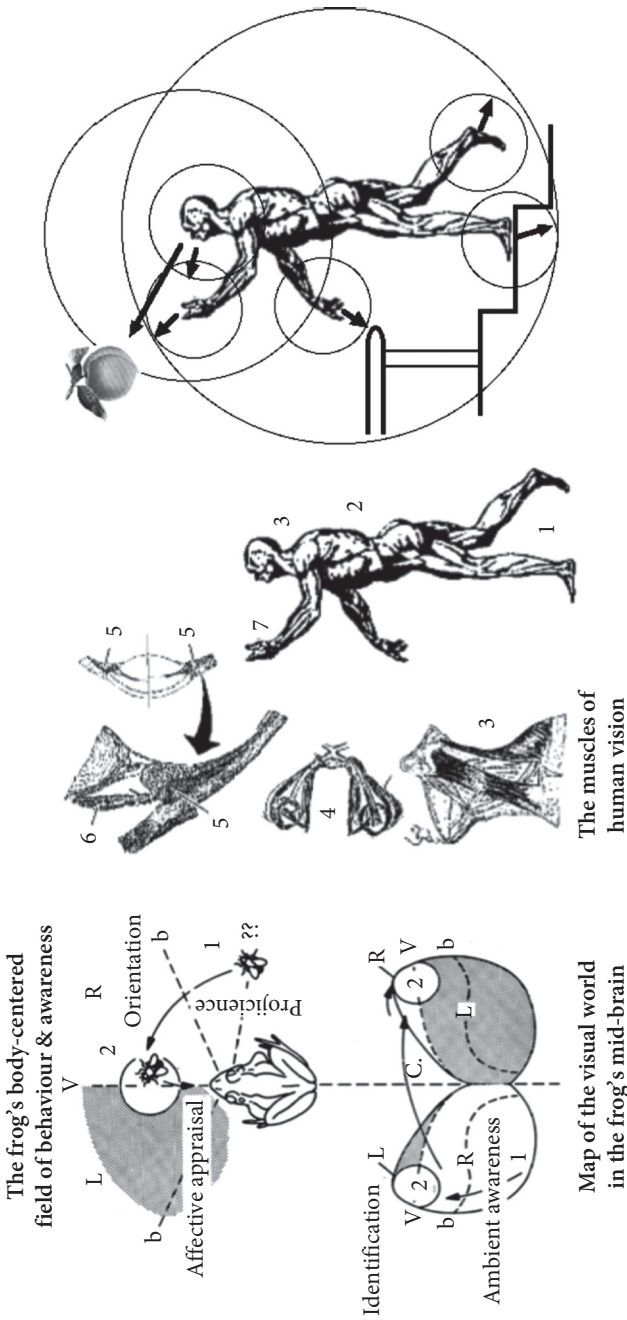
Figure 1. Illustrating the simple mobile agency of, for example, a frog, and the multiplex human being moving in his visual world, seeking gratification from a peach by coordination of actions in many body-related 'behaviour spaces'

passionately for proper recognition of the primacy of the universal 'natural language' of human expressive movements of voice, hands and face, and of the importance of their emotions for the mastery of the artificial articulations of speech and writing.

I am concerned that there may be deep faults of mis-translation, or serious distortions of meaning, in three words to which this volume gives special importance: *motion*, *emotion*, and *empathy*. I believe changes from older more 'natural' meanings of these words reflect interpretations of literary authority that have been favoured since the 17th Century. They are products of a rational detachment from lived experience.

As Sheets-Johnstone (this volume) reminds us, "movement differs from objects in motion in creating its own time and space and in thereby creating a particular spatio-temporal kinetic qualitative dynamic." Rich meanings stored in language, understandings of this vital difference, may be found by checking the relationship between spelling and grammatical function in forms of the Latin verb *movere* (as in *moveo*, 'I move'), in contrast with parts corresponding to *motus sum* ('I have been moved'). All active, present and future tenses of this verb, and the gerundive (about 'doing something', e. g. by 'moving', *movendi*) begin with *mov*. All passive and pluperfect parts begin in *mot*. The clear distinction made by the two consonants, 'v' and 't', is between words for actions in the present or future *brought about by will and intention*, which begin in *mov*; and those signifying the *imposed, done, not longer active* as in 'had moved', these words begin in *mot*. The sounds of the words 'express' differences in human will or submission. This fits with the meaning of 'moving' as *intended animal activity* by an agent; and 'motion' as a *physical displacement of a body* that implies no intention, and that is perceived as an inanimate, physical event in abstract 'scientific' space and time. So, I shall use 'movement', and not 'motion' when I describe actions of animals and people.

As Bloem (this volume) explains, in French, during the past 400 years, a Cartesian sense of 'e-motion' as a manifest 'disturbance' of the rational mind, has taken usage from 'passion' and 'affect', which signal recognition of much more vital sources than externally perceived expressive 'motion'. I have to qualify the word 'emotion', to bring out cases where what is expressed is part of an intended and felt state of mind and therefore an expressive wilful 'movement', that can 'move' others' wills. As Reddy (this volume) observes, our state of feeling is profoundly moved by others' attitudes and manners of address toward us, by our sense of their emotions responding to out presence and actions.

Also it is important that 'persons' know one another as members of a *community*, as proclaimed by Mead, by Turner and by Habermas and Bourdieu, and that 'subjects' live in a *society* more or less controlled in their actions by social laws and customs. Inter-subjectivity should be about the vital processes that create and regulate that belonging and cooperation between people in varying degrees of intimacy. I use 'community' when I want to speak of the willing and affectionate association of people, and

'society' when I discuss the regulation of activities by laws, taught habits, and precisely defined practices and meanings that do 'work'.

Finally, I perceive a serious change of meaning in the use of the word 'empathy', which, as mentioned earlier, has displaced 'sympathy'. 'Empathy' is now used to designate 'comprehending' how other persons feel, and, by extension, 'kindness', 'helpfulness', or 'concern for others', and any kind of 'understanding' of another's feelings. But, the original Greek word *empatheia* means projecting feeling into an object of contemplation or a person perceived with affective 'judgement'. In modern Greek *empatheia,* retaining its original intention, signifies a vindictive, jealous 'evil eye'! Sympathy, in contrast, is derived from *sympatheia* meaning 'feeling with, compassion, liking'. It is clearly more inter-subjective and 'two-way' than 'empathy', which, paradoxically, is self-centred. Adam Smith in his *Theory of Moral Sentiments* (1759) took 'sympathy' to designate any kind of 'moving and feeling with', whether motivated positively or negatively, and including posturing and acting in the same expressive way as another's body. He said: "Sympathy… may… , without much impropriety, be made use of to denote our fellow-feeling with any passion whatever." (Smith 1759, *Part I – Of the Propriety of Action; Section I – Of the Sense of Propriety, Chapter I – Of Sympathy*). From its origins, the word 'sympathy' clearly conveys best the core sense of intersubjective awareness of agency and emotion that works reciprocally between persons. Martin Buber (1958) has urged us to acknowledge the fundamental difference between the sympathetic 'I-You' engagement between persons, and one person's relationship to an inanimate 'It'. The latter relationship cannot be reciprocal, though Buber allows that one can be 'open' to sense an I-You relationship with a favoured object.

The rational analysis of bodily feelings and emotional expressions has impoverished understanding of sympathy, as well as the deep connections between affections and intended movement. The neurochemistry of the affective systems of the reveals a natural set of adaptive ways of applying and regulating intended movements or actions within the central nervous system, which is common to all higher vertebrates, at least. Jaak Panksepp (2005) distinguishes the neurochemical regulatory agents as having different tasks to perform as 'raw feelings' in the evaluation and maintenance of both individual acts of animacy and social communication, with or without cognitive estimations or judgements.

I have mapped Panksepp's affects to distinguish appraisals of risk and benefit to the living Self, related to three kinds of motive and sought-for experience: toward the body of the Self, toward outside Objects, and toward other Persons, with whom one may become involved sympathetically (see Figure 2). All of these can be distinguished in the expressive behaviours of infants when they are actively attentive and involved. None are just reactions to stimuli (e-motions). They do not depend upon cognitive deliberations for their distinct adaptive functions in giving values to intentions of the Self. More complex but equally innate affections of

'pride' and 'shame', which regulate shared actions, experience and social transactions from infancy, become further adapted by learning to regulate intimate, public, educational, productive and institutional or 'official' actions in society (Scheff 1988; Trevarthen 2005, 2011).
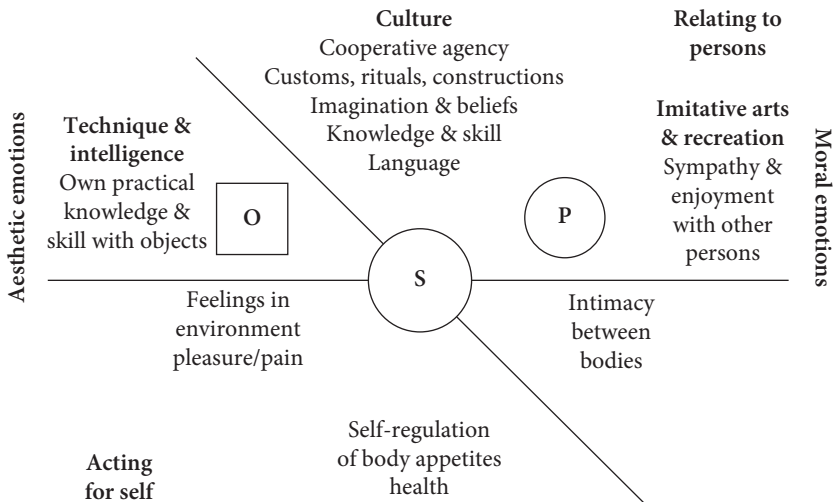
Figure 2. A diagram to explain the three different ways the animated Self (S) of a human person maintains regulation of its actions, with emotional appraisal – for its body, for engagement with non loving objects (O), and with other-conscious persons (P). Cultural knowledge and skills require positive coordination between technical interests that are rationally and aesthetically appraised, and artful creativity of the community in which relationships are made and regulated by sympathetic engagement of moral emotions

4. Reflections on *Moving ourselves and moving others*

Here, I offer a brief survey of the rich variety of arguments put forward in this book to chart a more active, imaginative and sympathetic interpretation of the human mind, and how human minds in human persons, with their expressions of interest and affection, share the ever-changing meanings in the culture of their society.

4.1 Part 1: The dependence of consciousness upon moving with emotion

Sheets-Johnstone makes a spirited and clear statement of the powers of *animacy,* the creative purposes, emotions and awareness of moving. These powers are inseparable as the source and synthesis of all that we can accomplish. Research on how infants search to 'make sense', and how they strive passionately to share it, brings

out the dynamic 'musicality' of their "kinetic aliveness". The rhythmic parameters of the self-feeling vitality in their bodies become the signals of intersubjective contact in emotional attunement to others' vitality, and this impulse to share interest with affection leads through life to engagements with persons whose intentions and feelings are known best, opening the way to cooperation in learned cultural habits, including language.

Ellis and Newton agree; an animal agent is an organism that acts with emotion and that acquires knowledge of the affordances of the world to satisfy its motives. Evidence from neuroscience and neuropsychology abundantly demonstrates how skilful action, every kind of knowledge, and all 'mirroring' of the intentions and feelings of others, depend on core processes of 'action imagery' and specific emotional charge. It is also clear that, "the view of representations as intrinsically meaningless symbols, manipulated syntactically in order to encode information about the external world, is completely inappropriate in the context of enactivism". And 'enactivism' itself must allow that one must *care about* what one is doing, must have an emotional investment in the moving and its consciousness, as Panksepp argues.

Both these chapters affirm that 'understanding' of projects for knowing and doing may be completely intuitive, requiring no articulate 'interpretation'. And this intuitive understanding of purposeful movement may be shared in 'felt immediacy' as Bråten (2009) says. But moving as the other moves, as a 'mirror' agent, is not enough to explain intersubjective sharing,– the other's action has to be felt to be intended and knowledgeable, which involves immediately sensing from their movements the motivating source of their coherent self-awareness and 'participating' in it. And yes, motives are felt when one appreciates one's self being active in imaginary ways, or in dreaming. Even an infant has this power self-sensing, as Darwin observed.

Overgaard explores the idea (deriving from Husserl) that all 'out there' experience in the visual world must be apprehended with reference to the 'action space' of potential movement, which is inscribed in the patterns of nerve circuits as the brain and body are formed. This integrated power to move with direction in self-awareness can be shared for an animal carried by another mover. Infants look forward or turn when they are carried, taking possession of the course of movement of their carrier. Bråten has studied such co-orientation in the case where a baby chimpanzee is clinging to the mothers back as she moves about, looking where she looks, and were she goes. He says it enables 'mother-centred learning' (Bråten 2009: Figure 5.2), clearly a talent capable of adaptation for learning language, given the unique human powers of vocal expression and imitation (Merker in press).

Shanker adopts a complementary view of emotion 'regulation', a venerable concept, endorsed by the rational philosophers of the Classical Athenian civilization, and of course by the Old Testament, which accepts that an experienced authority or a subduing function of 'reasonableness' is required for guiding a child to mature

participation in society from an initial unformed state. Like Ellis and Newton, Shanker assumes the infant is too uncoordinated to have self-conscious responsibility for actions or feelings, and, presumably, no trace of morality. It is claimed that the infant only gradually achieves a capacity to maintain a focused state of attention, or to calm distress. I believe research on the intentional and communicative capacities of young infants requires this view to be modified, and I have cited Darwin's observations, as has Sheets-Johnstone, that infants display many complex emotions, including subtle ones of pleasurable affection and delight in playful achievement 'noticed by' companions. Shanker and Greenspan observed the cultural differences in emotional 'upbringing', intended to ensure that the child will act with appropriately modulated emotions that are socially approved. Of course, there are considerable differences in the regulation of 'prosocial behaviours' in different societies. (Bierhoff 2002). And the intuitive emotional regulations may be damaged by lack of affectionate support. The lamentable effects in many large modern societies of inappropriate rational demands, or neglect and abuse, testify to the fragility of the young child's psyche, but these inhuman circumstances do not prove the child is without strong native emotions that can serve positively and flourish in more sympathetic families and communities. Shanker confirms, "Positive emotions are essential, not only for activating and energizing actions, but also for motivating and sustaining the attention necessary for learning to occur. Indeed, it is ultimately the child's motivation, interest, curiosity, and her feeling of security and self-worth that enable her to *thrive*: to experience what the Ancient Greeks referred to as *eudaimonia*, and what we simply refer to today as *well-being*." These positive emotions of well-being are part of the lively nature of the child, to be supported by the affectionate and playful company all young children can enjoy, but not *made by* that company. The Norwegian musicologist Bjørkvold (1992) contrasts 'school culture' with 'the child's culture'. He says in the former the child is instructed to "Sit still". The response of the natural child is, "I can if I am interested".

Reddy takes evidence that children *can be moved*, in action and in feelings, by other persons, and turns it around. She says, "This paper explores the other side of this phenomenon: that of wanting to – and trying to – move specific *others*." She quotes Hegel, Bakhtin, James and Buber, all recognizing that being 'open' to the awareness and intentions and feelings of the other is essential for self-awareness. She gives a rich description of original research which documents the provocative and humorous talents of infants for engaging companions from birth, how moving others develops, and how expressions of self-consciousness may serve to distance persons, or their own person in a mirror, whose near approach is felt by the infant to be undesirable or too intrusive. She also discusses limitations of this other-engaging behaviour in children with autism, which serve to underline its developmental importance of the ability to take emotional initiative in relating and in sharing meaning, and she describes methods of therapy that elicit curiosity about the other's attitude, to bridge the gap.

Elsewhere Reddy has examined how being able to adjust to the quality of reciprocal other-awareness is important in engagements between different cultures (Reddy 2008).

4.2 Part 2: Moving and emotion, shared between individuals – the powerful intuition of intersubjectivity

Gallagher, tackling the problem of 'other minds', concludes that the evidence from imitative interactions between infants and adults, and from the brain science of events correlated with interpersonal actions and awareness, renders representational social-cognitive theories, such as Theory of Mind, redundant, and qualifies the motor Simulation Theory derived from 'mirror neurone' effects. Natural human interactions and brain events that reflect them take place in affective 'narrations', phenomena of action and awareness that require more than automatic identification with expressions of emotion, or with patterns of intention in movement. Emotional engagement, which he calls 'empathy', after Lipps and Titchner, has an intuitive agency that develops. With De Jaegher and Di Paolo (2007), Reddy (2008), Rochat (2004) and Zahavi (2008), Gallagher supports an Interaction Theory (IT) to explain the shared kinaesthesia and affective evaluation of an 'inner imitation of observed vital activity' with which we perceive one another. Such a sharing of life impulses is required for the acceptance-seeking, trust-testing and fun-creating engagements described by Reddy. Gallagher's IT is supported not only by 40 years of descriptive research on infant intersubjective behaviours (Trevarthen 1998), but also by analyses of the 'musicality' of narrations created in proto-conversations between mothers and young infants (Malloch & Trevarthen 2009). There is an innate impulse to share projects of intention and interest and their affective regulations, to share the life time of the mind in intimate meaningful 'stories' (Bruner 1990). Developments in the motives of infant intersubjectivity are clearly in the direction of creating meaning with willing companions in this way. Propositional logics, language and symbolic rituals of explanation depend on this natural foundation, as Thomas Reid said.

Fultner examines theories of how human minds share both transactions of the pragmatic, usable world but also affects that evaluate relationships – how societies of minds create and use collective meaning. She goes beyond Habermas' theory of the negotiation of intentional meanings to bring in understanding of 'alterocentric participation', which requires engagement between subjects as persons in Bråten's 'felt immediacy'. She says, "an adequate account of the social nature of linguistic communication must do justice not only to the lifeworld as a shared background of intelligibility, but also as a background against which differences in point of view are articulated." She reviews what we know about how a child comes to recognize others' different 'points of view', evaluating them with 'emotions of relating' as well as practical awareness of the 'situation'. With Wittgenstein, Quine and Davidson she rejects the theory that language

is primarily for transmission of ideas and thoughts. She observes that philosophers of language have, "paid much less attention than might be expected to ontogeny, and they have all but neglected emotional aspects of meaning and the conative dimension of social interaction in general." We are born ready for negotiation of a lifeworld of socio-culturally mediated habits and imaginings from the start, some of which may be absurd or 'laughable' for the 'comic spirit' (Bergson 1911), and the companionship is regulated by dynamic affections of relating, even in 'serious' formal schooling. The language learning child is an 'active agent', wanting to claim 'authorship' in close relationships, all the way. With Dewey, Fultner concludes that such matters have important implications for political theory.

Carpendale and Lewis, also, argue that the development of thinking must involve emotions, and, in agreement with Mead, that thinking must be shared for self consciousness, or self-awareness, to grow – communicating first and thinking after. The social interactive experiences, *sought for by the infant* and supported by human companions, make language and the sense-making of any symbols, possible. However, the evidence is not with Mead that the infant's first gestures do not 'intend to communicate'. They, again like the plover acting a broken wing, are adapted or 'intended' as animate messages, calling for attention of another. I think this is what Stuart (2010) means by the 'enkinesthesia' of biosemiotics, moving 'for attention of the other'. Vygotsky's Zone of Proximal Development is *a property of the child* that invites support and instruction. As Reddy argues, self-other consciousness is manifest early, perhaps already in those imitation games with newborns that Kugiumutzakis and Nagy have described. The 'motor helplessness' of infant humans does not apply to their rich repertoire of movements that express states of mind, including subtle movements of the hands, which open "a new way of being social". And these sensory-motor capacities are adapted to find the appropriate affordances in intimate encounters with other person's expressions. Moral emotions also are developed early for sensing and signaling qualities of intersubjective engagement – they are not just products of social learning, but motivate it. Their formation, along with defective temporal patterning of actions and awareness, may be at the heart of the problems autistic children have with participating in meaningful communication. They are powerfully expressed in the reactions of infants over 6 months of age to the incomprehension and insensitivity strangers often display in response to the infant's motives to make contact, and they mediate in interactions with peers when adults are absent (Selby & Bradley 2003).

Racine, Wereha and Leavens welcome, "a shift away from conceiving of mental capacities as private, individual, simple efficient causes of behaviour to something far more complicated and far less in-the-head that has often been theorized." They remind us that we know an animal is alive and mindful if they move with rhythmical passionate rhythm and intensity – stones have no such signs of sensation, as Wittgensein observed. Mind in an animal's behaviour, any intentions, hopes,

emotions or awareness they may have, we, or other animals, can only perceive from what and how they act. But this 'common sense' idea is, "made oddly mysterious in much psychological theorizing." Like genes and 'mirror neurons', mind states should not be conceived as causes, but as components in a complementary system of agencies and effects, that have 'environment expectant' potentialities, and that change in different circumstances. Thus chimpanzees in the wild do not point at food they want, because they can get it by their own actions. In cages, captive apes do point, like immobile infants do, to get others to respond by handing them desired objects. The ability is a product of the talents for sensing purposes and feeling in others, and of consciousness of a common world. It is a latent skill brought out in particular circumstances.

These behaviours show humans need acquire no added special-purpose 'joint attention' concept, and mechanisms that appear to be essential in the frontal parts of the human brain for learning to speak are but one set of players in the 'system' of a consciously active subject in the world, who has inner and outer experiences that can be 'directly perceived' by another subject who shares the same capacities in a compatible world. We differ from one another, and from other species, in what Margaret Donaldson (1992) called 'loci of concern', which may also change greatly with development and experience. For example, "in order to hope, one must have mastered many human abilities, customs and concepts." The same applies to a capacity for cooperative awareness in the use of objects or 'secondary intersubjectivity'. For both human infants and non-human primates the affective quality of relations with intimate others is important in developing more extended loci of concern, or the capacity for imaginative cooperation. This is no 'theory of mind'. Surely many animals, besides primates, are aware of one another's purposes with no need to attribute articulate intentions, but maybe they can 'think about' what they are doing, have done, or may do. The important thing is that the circumstances and the company enable sharing the 'time and place of life'. Humans, and to some extent apes (and dogs?), are psychologically and physically 'expectant' of a cultural form of life where objects are shared, but apes' capacities for understanding vocal symbols is very limited. That is a special ability of humans, a "dedicated capacity for vocal production learning" shared with some species of bird (Merker in press), but it is not a 'language module'. We are warned not to place too much explanatory importance on single metaphors such as 'mirror neurons', 'motion' and 'emotion', or, for that matter, 'intersubjectivity'

Frank and I relate the developing intersubjective powers of infants in intimate relations with their families to the larger socio-cultural picture of how members of a large society may share, or fail to share, the benefits of a commonwealth of meanings. To interpret the fate of the infant's innate inter-subjectivity in its social habitat we drew on the European scholarship with particular attention to the social science of Bourdieu and the social philosophy of Habermas. A young child may become a successful and

contented contributor to the work of the community, and, in time, an affectionate parent, or the motives for development my lead to the distress of social exclusion or to marginalisation in a peripheral counter-culture, and failed family life. It is clear that the place a person gains in life activities of the 'sociosphere' into which they have been born depends on intimate affectionate and communicative relations in 'self-other awareness' with a few persons who will give consistent companionship through critical stages of life. That is how the skill in sharing the symbolic meanings of Lotman's 'semiosphere' is acquired. These same principles of cooperation in intentions and emotions may re-establish social belonging for a person who has lost self-confidence and self-respect in relationships with others through misfortune of development. We give an example of how a young man with autism was led to happier and more productive communication.

Lüdtke closely examines the affective foundations of communication, which she shows have been persistently neglected. She finds, "no prominent theory explicitly focuses on the importance of emotions in language or in prelinguistic and linguistic development." Even in interactionist and psychoanalytic theories the role of emotions is 'hidden'. Yet there is increasing evidence of the power of emotions from recent semiolinguistic and neuropsychological research, both of which employ the concept of 'intersubjectivity'. In short, she reminds us that we meet and relate to one another with intentions, not just to exchange information, but as actors in the intersubjective theatre of metaphors with affective charge where the expressive forms that Ivan Fonagy (2001) called 'languages within language' play their part. We master communication with Stern's 'vitality dynamics', by which infant and mother 'attune' to one another's impulses for sharing life, and in the playfulness of Bruner's young child who is learning how to talk the language game. Lüdtke traces the stages by which infant and mother discover the power of words in affectionate and playful games, accepting emotions of self-expression as emotions of relating. She illustrates the interest they discover in one another and in the icons and indexes of voice and gesture that they invent together, and how they transform these into conventional semiotic and/or linguistic signs that refer to events and goals in the more widely shared world. In the process the infant's Virtual Other becomes a real Significant Other, and their companionship of affectively charged meanings becomes encoded in words. She recommends for clinical use the concept of 'emotional collaboration' to diagnose at which level of disturbed language development the child is stuck or led astray, and where the will to communicate needs to be met to animate his or her zone of proximal development. In effective Relational Language Therapy, "the Significant Other has to become the embodiment of a dialogic partner who helps to restore dialogicity by creating and offering the relational emotional bases for the intersubjective construction, negotiation and validation of meaning and their verbal and nonverbal expression." And further, "In contrast to many other therapies decisions about therapeutic materials, such as sensory stimuli, picture

books, talker or word cards, are here viewed as secondary, because they are deeply interrelated or even dependant on the Significant Other." Lüdtke envisions a future of theory, practice and research into brain function where serious attention is given to relational emotions in linguistic development, "fully incorporating the concept of intersubjectivity".

4.3   Part 3: How languages may transform the interpersonal life of intentions and affections

Foolen takes up the search for a theory of language that includes emotions, classifying words (nouns, verbs and prepositions) and phrases that carry intentions of emotional meaning. These, he says give an embodied 'grounding' for language learning, as for its evolution. As cognition affects language, and is affected by language, and emotion affects and is affected by cognition, emotion must engage with language. However, the role of emotion in the meanings of language will vary, depending on what the emotion is about. For example, is it about shared events and objects, or about inner states of the person? The role of cognition appears to be to assist 'conceptualisation' of emotions, and this will depend upon cultural suppositions and customs, as is further explored by Zlatev, Blomberg and Magnusson.

Emotion is communicated in how one moves expressively, whether with or without words, and in patterns of rhythm, prosody or melody through time, as in theatre, poetry and music. But here Foolen is concerned more with the emotional lexicon of text, how it is understood when read, and in reference to a particular place or context of events and actions. In distinguishing names for 'primary' emotions, which may be named as 'states', he notes that languages differ, expressing differences in how emotional states are perceived in oneself and in others. Emotional meanings are 'constructed' in language. Mental verbs take different roles in conveying emotion, identifying emotive events, denoting their expressive movements, or conveying how they feel to be changing in the body. Again cultures differ in how they acknowledge the different 'places' of emotion. Some are more personal, others more objective, and they differ in the respect they show for authenticity, for cooperation, or for authority. The 'somatisms' that describe feelings in organs of the body would seem to be fundamentally important in explaining emotions, not as causes but as regulations. The 'figurative' expressions are not as dead, or contrived, as the nouns for 'primary' emotions. If such strongly experienced and powerfully communicated emotions are 'abstract' it is because they are about alive persons, not objective things. And of course metaphors as 'portative', or 'important', forms of speech will be rich in affects.

It is good to know, from recent brain science, that affective activity in the brain can benefit cognitive understanding. Clearly moods expressed in language, and perceived more strongly in the right hemisphere, assist comprehension. Surely the conclusion is

welcome that, "besides motion, a second foundational pillar must be added, namely emotion, to get a balanced, solid grounding of the higher functions of cognition and language". On the question of how language evolved, there is both archeological and anthropological evidence of the primacy of emotional communication and celebration of community in embodied displays, leading to the theory that human ancestors expressed shared understanding first musically or by a mixture of expressive vocalization and gesture before speaking, and that such 'musicality' is necessary for language to emerge (Darwin 1874; Donald 2001; Mithen 2005; Dissanayake 2009). Foolen indicates that the theory that 'emotions inform language' has important implications for language teaching, psychotherapy, for helping people who cannot talk about their emotions, and in facilitating effective business communication. Emotions should no longer be neglected in linguistics.

Bloem describes historical changes in the ways emotions have been written about since Descartes by a study of the meanings of *émouvoir* and *mouvoir* in French theoretical and encyclopaedic texts, how the medieval account of the four humours or temperaments inside persons was displaced by a different, more rational or psychological description of the emotions in their relationship to thinking. According to Conceptual Metaphor Theory, CMT (Lakoff & Johnson 1980) biological bodily experiences, not cultural conceptions, ground metaphorical language. However the review of language usage between the Old French and the XVIIth Century French shows otherwise. The language itself, and reflections upon its use in a changing cultural world, changes metaphorical usages. In particular, while *mouvoir* remains an active or motivated verb to denote an event, *émouvoir* became more psychologised or 'abstract' as a cause expressed in the tone or intensity of thinking or acting. Descartes changed his "mouvements de l'ame" to emotions as "*excitations* of the soul". The noun *emotion* changed reference from a public disturbance, to be controlled, to a tumult within the soul or psyche. It is interesting that the word 'control' derives from the expression *contre le rôle,* the word *rôle* referring to "a list of articles or persons making up a register as in 'payroll'. The controller was the person who checked the register." (Packard 2006: 205, footnote 26). Much of our collective elucidation of emotion and movement relates to the vertical of hierarchical regulations of the animal vitality of individuals in 'civilised' society. Clearly such things become salient in a culture regulated by the powers of educated persons who rely on texts for their understanding of how to employ the authority of reason, of the "thinking substance" of the mind. That may be why emotions became more 'abstract' ('ineffectual'?) in the language of modern French, as also in English. We can hope that the science of movement and its imaginative and affective regulations will help bring the active sense of *movere* back to life in the psychology of language, as also argued by Foolen & Zlatev et al.

Weigand argues for recognition of the full complexity of engagements between body, mind, language and emotion. With others she finds the concept of 'inter-subjectivity',

if it means 'transferring' mind functions, goes only part way to understanding how meaning flourishes, struggles and changes in the interpersonal dialogues of culture, and how actions and emotions are interpreted and changed by language. A Mixed Game Model seems to use a notion not unlike Whitehead's philosophy of 'processes' in 'organisms', which grow and live adaptively by combining powers of creativity and cooperation. But Whitehead, like Darwin, would not accept that these processes are just 'probabilistic' or 'stochastic'. They are adaptively motivated in advance of function, with preparations for their actions and 'affective' protections against injury and conflict, and 'uncertainties'. Weigand's 'new science' gives hope for acceptance of intentions in movement, but it is not yet a 'game' that includes all players. It must follow Feinman's advice to keep the mind attentive to many possibilities, to look between disciplines, and between 'theories of mind'. Weigand lists examples where behavioural and mind scientists have failed to attend to this advice and have looked for single causes or 'devices'. She gives many illuminating examples of how 'adaptable' and creative this understanding of talk and text is between us. It is never just joint attention, or joint intention, but involves joint aliveness with heartfelt experience, in sympathy with movements that show the differences of being. And her conclusion is, "if we want to understand human beings' actions and behaviour, it is of no help to refer to a concept of language as a code."

Günther and Hennies describe the difficulties a large proportion of deaf children have learning spoken or written language despite advances in early diagnosis and introduction of cochlear implants to enable hearing, and the cognitive and emotional problems they suffer. The children's difficulties are made worse by insistence by some medical professionals and special need educators on training in lip reading to help them speak, and a belief that sign language, which they can learn readily, will interfere with development of speech. All infants are highly expressive with their hands and can learn hand sign language from signing parents at the same rate as speech is learned in a hearing family. Sign language can serve to facilitate learning to speak. The evidence is that poor reading and writing learning follows poor early language learning, so attention must turn to how deaf infants can be encouraged to acquire symbolic communication through normal stages from early infancy.

When mothers, deaf or hearing, are encouraged to use sign language in the first year this benefits the deaf infants language development in the second year. As has been found in studies of the benefits of secure attachment in infancy for subsequent development, "a stable social interaction with one's mother is a necessary precondition for a flourishing language acquisition." We can compare this conclusion with Frank's work to assist communication with a youth suffering from autism and Lüdtke's account of the emotional factors in language development. "Early intervention programs should be designed in such a way that they address all aspects of early development instead of focusing primarily on spoken language skills and medical procedures."

I am surprised however, that Piaget's theory of the development of praxes and cognitive abilities is considered the best model to guide the authors' recommended treatment strategy. Surely the evidence we have of age-related changes of infants' motives and related brain developments, invites us to relate their cognitive object-related actions and 'concepts', such as 'object permanence' and 'playful imitation for amusement of the self', with the powerful growth of interpersonal and rhythmically expressive emotional communications, which Piaget largely ignored. The child is led to symbolic functions by strong motives for cooperative play and joint task performance. Tomasello's "joint attentional frame and common ground" lacks the affectionate and humorous quality of parent-infant play that leads to flourishing learning of conventions and rituals of cooperation and that sets a foundation for language. Musical-dancing forms of communication and rhythmic rituals and narrations combining song with gesture, as in normal communication with infants under one year of age, are effective in aiding second language learning, and that they, with mediation of communication by touch, are essential in overcoming the isolation of congenitally deaf and blind persons (Tønsberg & Hauge 1996; Janssen & Rodbroe 2008). Consciousness is polymodal from birth, including all sensations of the moving self and how they may collaborate with sensations others' movements. All of which supports the conclusion of the authors that, "a holistic and multisensory early intervention with the option for a later bilingual education would rather serve the developmental needs of a deaf child."

Zlatev, Blomberg and Magnusson classify words that convey 'motion/emotion' metaphors and compared their functions in four languages. There are, of course, universal tendencies and experience of human individuals as active persons with feelings, which must be respected in language, but there are cultural differences and 'public criteria of correctness' also. These can transform how affects are spoken about, as has been shown for the effects of historical change of word use in French by Bloem, and is discussed by Racine, Wereha & Leavens. The purpose of language is to be understood in many conscious ways and different social contexts, not only to be sympathised with and affirmed in vital, personal, matters, or to seek comprehension in conceptions of human embodied awareness (see comment on Lakoff and Johnson's Conceptual Metaphor Theory in Bloem this volume). Linguistic expressions for emotion must deal with the 'inner process', of being alive, active and caring about it, and the public criteria for moving events, especially those between persons. Without the inner process, "words denoting mental phenomena would be gutted of their experiential content, and their meaning reduced to use". The spatial or temporal 'dimensions' of emotion-charged events are perhaps convenient for reference, but they can become 'gutted' of significance if they lack sincere interest in affective appraisal, as in much political oratory. This is the subjectivity/inter-subjectivity dilemma, which can only be resolved by sincerity, trust and tolerance, as James and Dewey said. Language works in both senses, to promote common understanding, and to protect personal realities.

Zlatev, Blomberg and Magnusson found that the European languages were similar in having many emotional terms related to active behaviours and to events affecting persons. In English there were the largest number of motion-emotion metaphors, the majority of these having corresponding expressions in one or more of the other languages. Most were for 'caused motion' expressions inflicted on the subject by other agents or events, not just happening to them. The other European languages were similar, Swedish and English being, as expected, most alike and Bulgarian somewhat distant from them, but Thai was oriented to a quite different use of motion/emotion metaphors. Apparently the mores of Thai culture acknowledge more openly the 'heart-felt' feelings of deference and self-restraint. That is how I interpret the prevalent use of a single term *caj*, which apparently denotes a feeling of physical excitement or intension (of heart or mind), and which is qualified by a verb indicating an action given or received (transitively) or a state experienced (intransitively) by the person with the feeling.

5.   Conclusions

We differ from other animals in two respects, which give life and emotional meaning to language and culture (Aiello 1992; Merker in press).

First, we are the most complex animated organisms, moving on two feet with hands, eyes and head free for many concurrent tasks. Correspondingly, our selves have more senses. These monitor both the intra-corporal forces of ambitious agency, the visceral costs and benefits, including new ways of getting nourishment from the environment, and the distant affordances of the spaces, objects and other beings in the world we use. And we have a greatly enlarged capacity for retaining 'episodic memories' in our spherical heads, and a long life in which to learn them. Human actions and senses are integrated in a richly imaginative and retentive self-awareness and a polyrhythmic sense of subjective time in which we create and retain intricate projects of serial action and personal histories, developing an autonoetic or 'self-knowing' consciousness (Tulving 2002).

Second, our self-conscious projects are transformed by an other-awareness that seeks confirmation by sight touch and hearing of the intentions and emotions of human beings, and new information from them about where to go, what to do, and what to notice. We share our lives by oral and gestural mimicry of thoughts, a narrative process that makes possible the accumulation of cultural ideas and artefacts – both artistic, serving to celebrate vitality in community, and technical, mastering cooperative exploitation of physical surroundings (Trevarthen & Delafield-Butt 2011). Thus a rich and changing socio-noesis or communal consciousness is transmitted through generations to make infinite cultural meanings and artefacts (Trevarthen 2007).

Cultural artefacts include language, encoding endless subtle discriminations into rational and poetic stories. Culture produces money, luxury goods, prepared foods, buildings, cities and whole national and international 'infra-structures' – a symbolic wealth of objects that have transactional value. The complexities of social life in culture require legal and political 'managements' that regulate behaviour of individuals and of organizations and institutions.

Such features of our extraordinary collective experience are alive in the play and eager learning of three-year-olds, in every human community. Because we have big hungry brains, our mothers need help with birth, and we are born immature and in long dependence on maternal care (Hrdy 1999). But we come with imaginative consciousness, wanting to meet an affectionate and playful partner who gives her imaginative intelligence to our nascent thoughtfulness and sociability in a musical language we eagerly respond to. She and other intimate companions invite an apprenticeship in the cultural awareness of a larger community and its past, and we are keen to attend.

It is hopeless to expect to explain what we sophisticated scholars believe about the human condition without accepting that we depend upon natural inclinations to share intentions with emotion. Mere logic of facts will not do.

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Index

The close relationship between motion (bodily movement) and emotion (feelings) is not an etymological coincidence. While moving ourselves, we move others; in observing others move – we are moved ourselves. The fundamentally interpersonal nature of mind and language has recently received due attention, but the key role of (e)motion in this context has remained something of a blind spot. The present book rectifies this gap by gathering contributions from leading philosophers, psychologists and linguists working in the area. Framed by an introducing prologue and a summarizing epilogue (written by Colwyn Trevarthen, who brought the phenomenological notion of *intersubjectivity* to a wider audience some 30 years ago) the volume elaborates a dynamical, active view of emotion, along with an affect-laden view of motion – and explores their significance for consciousness, intersubjectivity, and language. As such, it contributes to the emerging interdisciplinary field of *mind science*, transcending hitherto dominant computationalist and cognitivist approaches.

"*Moving Ourselves, Moving Others* is an indispensable contribution to the human science of mutuality in meaning, feeling and understanding. It belongs on the shelves of all students of subjectivity, intersubjectivity and sociality, with contributions by leading researchers from a host of disciplines and a profusion of perspectives."

Chris Sinha, *University of Portsmouth, Co-editor of The Shared Mind*

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