DIGITAL AGEISM

HOW IT OPERATES AND APPROACHES TO TACKLING IT

Edited by Andrea Rosales,
Mireia Fernández-Ardèvol and Jakob Svensson

Digital Ageism

This anthology contributes to creating awareness on how digital ageism operates in relation to the widely spread symbolic representations of old and young age around digital technologies, the (lack of) representation of diverse older individuals in the design, development and marketing of digital technologies and in the actual algorithms and datasets that constitute them. It also shows how individuals and institutions deal with digital ageism in everyday life.

In the past decades, digital technologies permeated most aspects of everyday life. They became ingrained into human existence in a process that, for a great part of society for whom it represents a series of improvements, was perceived as smooth. However, this volume focuses on how digitalisation reinforces spirals of exclusion and loss of autonomy of older adults, and particularly, how age is represented and experienced in relation to digital technologies leading to digital ageism.

The book addresses social science students and scholars interested in everyday digital technologies, society and the power struggles about it, providing insights from different parts of the globe. By using different methods and touching upon different discourses related to digital ageism and how it plays out in contemporary connected data societies, this volume will raise awareness, challenge power, initiate discussions and spur further research into this field.

Andrea Rosales is an Associate Professor of communication, technology and society at the Faculty of Information and Communication Sciences at the *Universitat Oberta de Catalunya* (UOC), and Coordinator of the Digital Societies Unit of the Communications Networks and Social Change research group at UOC. Her research focuses on the challenges of data societies, particularly in relation to ageism. She analyses the social impact of artificial intelligence to counterbalance the intrinsic power relationships of digital technologies.

Mireia Fernández-Ardèvol is an Associate Professor of Digital Communication at the Faculty of Information and Communication Sciences at the

Universitat Oberta de Catalunya (UOC) and a Senior Researcher with the Communication Networks and Social Change research group – IN3 research institute (UOC). She is interested in interdisciplinary approaches in the Social Sciences field and uses mobile communication as an entry point to analyse power relations. At present, her research focuses on analysing the intersection between digital (mobile) communication and the ageing process, and the challenges hyper-digitisation and hyper-datafication create in our societies.

Jakob Svensson is a Full Professor in Media and Communication Studies at Malmö University, Sweden, Department of Computer Science and Media Technology. His research interests include (digital) media and empowerment, technology cultures and political communication. In 2021, he published a book on the people behind data and algorithms, *Wizards of the Web*.

Routledge Studies in New Media and Cyberculture

Digital Ageism

How it operates and approaches to tackling it

Edited by Andrea Rosales, Mireia Fernández-Ardèvol and Jakob Svensson

Routledge
Taylor & Francis Group

MALMÖ UNIVERSITY

Contents

Figures

Tables

Contributors

Inês Amaral is an Associate Professor at the University of Coimbra and Researcher at the Communication and Society Research Centre at the University of Minho. Inês main research interests are related to sociabilities in digital social networks, media and digital literacy, technologies and ageing, audiences and media consumption in the digital age, gender and media.

Roxana Barrantes is an Economist. She received her PhD (1992) and Master's (1989) from the University of Illinois at Urbana-Champaign; Bachelor of Social Sciences (1984) and Economy (1987) from Pontificia Universidad Católica del Perú (PUCP). She is a Professor, Department of Economics, (PUCP); Researcher, Instituto de Estudios Peruanos. Currently, a member of the board of directors of the Peruvian Central Bank.

Roser Beneito-Montagut is a Senior Lecturer in Sociology at the School of Social Sciences, Cardiff University (UK). She is also a researcher in the group CareNet at the Internet Interdisciplinary Institute (IN3/UOC, Spain). Her research interests include the study of digital technologies, particularly in relation to the topics of social connectedness, later life and care infrastructures in the networked society. She has written about the socio-cultural and material dimensions of "being" and interacting online; emotions and affects; methodological innovations in relation to the availability of digital data; and about later life.

Alessandro Caliandro received his PhD from the University of Milano and is an Associate Professor in Sociology of Culture and Communication at the Department of Political and Social Sciences at the University of Pavia. His current research focuses on digital methods, digital consumer culture, platformisation of culture, surveillance capitalism and ageing and digital media.

Francesca Comunello is a Full Professor in the Department of Communication and Social Research, Sapienza University of Rome, Italy. Her research and publications focus on the intersections between digital technology and

society, including ageing and digital communication. Her work has been published in Journals like *New Media and Society*, *Information Communication and Society*, *Media Culture and Society*, *International Journal of Press/Politics*, *The Sociological Review*, *The Communication Review*, *Ageing and Society*, *American Behavioral Scientist* and *Violence Against Women.*

Mireia Fernández-Ardèvol is an Associate Professor of Digital Communication at the Faculty of Information and Communication Sciences at the *Universitat Oberta de Catalunya* (UOC) and a Senior Researcher with the Communication Networks and Social Change research group – IN3 research institute (UOC). She is interested in interdisciplinary approaches in the Social Sciences field and uses mobile communication as an entry point to analyse power relations. At present, her research focuses on analysing the intersection between digital (mobile) communication and the ageing process, and the challenges hyper-digitisation and hyper-datafication create in our societies. She has published books and book chapters with MIT and Routledge, and articles in journals such as *Media, Culture & Society*, *New Media & Society, Mobile* and *Media & Communication.*

Ana Marta M. Flores has PhD and Master in Journalism, and a post-doctoral fellow at the University of Coimbra. She is a Researcher at ICNOVA (NOVAS University of Lisbon) and a Collaborating Researcher at the Trends and Culture Management Lab (CEAUL/ University of Lisbon), Flores is also Invited Professor at NOVA University Lisbon.

Emma Garavaglia received her PhD from Università Cattolica del Sacro Cuore and is a Senior Lecturer in Economic Sociology at the Department of Architecture and Urban Studies at the Politecnico di Milano. Her current research focuses on ageing and work, ageing and digital media, and surveillance capitalism.

Francesca Ieracitano is an Assistant Professor at the Department of Communication and Social Research of Sapienza University of Rome. Her research focuses on the digital media representation of ethnic, gender and generational differences. She also explores teen digital dating violence and the effects of online hate speech and digital disconnection.

Loredana Ivan is an Associate Professor at the National University of Political Studies and Public Administration, Communication Department, Bucharest, Romania. She has a PhD in Sociology and a post-doctorate in Social Psychology and she was the chair of the European Network of Aging Studies (ENAS), 2019–2022. Her areas of interest include Interpersonal Communication mediated by Technology, Fake News & Generations and Family Communication.

Magdalena Kania-Lundholm has PhD and an Associate Professor of Sociology at the School of Culture and Society, Dalarna University, Sweden. Her research focuses on the intersection between culture, power and technology and more specifically societal consequences of digitalisation, technology (non-)use among older adults and digital inclusion. Magdalena's work was featured in journals such as *Sociology Compass*, *Journal of Aging Studies*, *Media Culture & Society*, *Digital Media & Society*, *International Journal of Ageing and Later Life* and others.

Eugène Loos is an Associate Professor of Communication, Policy and Management Studies at the Utrecht University School of Governance in the Netherlands. He is a member of the Research School NIG (Netherlands Institute of Government). His research agenda focuses on the (ir)relevance of age for (1) digital information search behaviour, (2) the perception of the reliability of digital information and (3) the identification with images in digital information sources.

Daniel López-Gómez is an Associate Professor of Social Psychology at the Open University of Catalonia and a researcher of the CareNet group at the Internet Interdisciplinary Institute (IN3). Drawing on Science and Technology Studies and ageing studies, his work explores the transformation of care and ageing in technological societies.

Silvana Manrique is an Economist from Pontificia Universidad Catolica del Perú (PUCP), Lima. She has professional experience in industrial organisation, competition policy, economic regulation and applied statistics, focusing on the analysis of the telecommunication sector and digital policy. At present, she is an associate of APOYO Consultoria, Lima.

Giulia Melis has her PhD from the University of Milano-Bicocca and is a Research Fellow in Sociology of Culture at the Department of Pedagogy, Psychological Sciences and Philosophy at the University of Cagliari. Her current research interests cover media ideologies, media consumer practices, qualitative research methods and life course studies.

Simone Mulargia is an Associate Professor at the Department of Human Studies – Communication, Education and Psychology of LUMSA University of Rome. His research and publications study the relationship between culture, technology and society, focusing on the role of digital media. His work is published in journals such as *Media Culture and Society*, *Ageing and Society*, *New Media and Society* and *The Sociological Review*.

Akiko Ogawa is an Associate Professor at the Graduate School of Informatics, Nagoya University, Japan. Her research focuses on visual and aural community media, which she investigates from the perspective of social inclusion, hyperlocal journalism and people's media literacy.

Andrea Rosales is an Associate Professor of communication, technology and society at the Faculty of Information and Communication Sciences at the *Universitat Oberta de Catalunya* (UOC), and Coordinator of the Digital Societies Unit of the Communications Networks and Social Change research group at UOC. Her research focuses on the challenges of data societies, particularly in relation to ageism. She analyses the social impact of artificial intelligence to counterbalance the intrinsic power relationships of digital technologies.

Emanuela Sala has her PhD, from the University of Milano and is an Associate Professor in Research Methods at the Department of Sociology and Social Research at the University of Milano-Bicocca. Her current research interests include methodology of longitudinal surveys, data quality in surveys and ageing and ICT use.

Andrea Santesmases is an Assistant Professor at the Department of Social Work at National Distance Education University (UNED). Her background is in Sociology and Anthropology. Her main lines of research are the intersections between gender studies and disability studies.

Sergio Sayago is an Assistant Professor in the Department of Computer Science and Digital Design at the Universitat de Lleida. His research aims to improve the digital and social inclusion of older adults by examining their technology use. Sergio holds a PhD Cum Laude in Human-Computer Interaction from Universitat Pompeu Fabra.

Maria Sourbati's current research explores the social implications of emerging technologies with a focus on mobility, age and data. Maria has developed expertise in communications and social policy, digital media, smart mobility and age relations. In these areas, she has led qualitative research and published in numerous top ranked peer-reviewed journals.

Justyna Stypińska completed her PhD on the topic of "Age discrimination in the labor market. A sociological-legal analysis". Her research focuses on multiple forms of age discrimination and age inequalities in contemporary societies, especially in their most recent digital forms. In her current project, funded by the Volkswagen Foundation Germany, "AI Ageism: new forms of age discrimination and exclusion in the era of algorithms and artificial intelligence," she analyses with an international team (UK, Spain, Poland) the effects of use of a rtificial intelligence technology on the ageing populations in Europe.

Jakob Svensson is a Full Professor in Media and Communication Studies at Malmö University, Sweden, Department of Computer Science and Media Technology. His research interests include (digital) media and empowerment, technology cultures and political communication. In 2021, he published a book on the people behind data and algorithms, Wizards of the

Web, which can be accessed for free here: https://www.nordicom.gu.se/sv/publications/wizards-web

Daniela Ugarte Villalobos is a PhD student in the Sociology department at the University of Toronto. She received her master in Sociology (2021) from the University at Albany, New York (SUNY), and her bachelor's degree in Social Sciences with a mention in sociology (2013) from Pontificia Universidad Catolica del Peru.

Jane Vincent is a Visiting Fellow and a Guest Teacher in the Department of Media and Communication at the London School of Economics and Political Science and a member of the NuMe Lab in the Department of Mathematics, Computer Science and Physics at the University of Udine, Italy. The focus of her research is the interactions and personal relationships people of all ages experienced as a result of using communications technologies, especially mobile communication devices. Research areas include Emotions, Mobile Phones, Young People, Oldest Old, Ageism and History of Communications Technologies. Jane is an author and editor of numerous publications including over 60 peer-reviewed articles and 13 edited volumes: most recently, *Smartphone Cultures* (Routledge 2018) jointly with Leslie Haddon.

Sarah Wagner is a Postdoctoral Fellow at the University of Victoria and was formerly a JSPS Fellow at Nagoya University. Since 2019, Sarah's research has been addressing communication inequalities in long-term care. Sarah employs creative, critical and collaborative methods to examine the factors that shape individuals' civic positioning in digitalisation.

Daniele Zaccaria has his PhD from the University of Brescia and is a Researcher at the Centre of Competence of Ageing, Department of Business Economics, Health, and Social Care of the University of Applied Sciences and Arts of Southern Switzerland. His research interests include older people's well-being, everyday life technologies, life course trajectories and survey methods for the oldest-old populations.

Digital ageism in data societies

Andrea Rosales, Jakob Svensson and Mireia Fernández-Ardèvol

With the social distancing imposed by the COVID-19 pandemic, basic processes and services of everyday life became digitalised in many countries. These include restaurant menus, making medical appointments and managing prescriptions and the mandatory use of credit and debit cards instead of cash. Retail stores also increasingly rely on online shopping (Nanda et al., 2021).

In Spain, a large social movement emerged against the deterioration of in-person bank services in late 2021. This movement collected almost 650,000 signatures on an online platform to ask banks and the government to stop the dehumanisation of banking services that, according to them, excluded older users (De Laorden, n.d.). The movement captured political attention and influenced the discussion of public policies. A new regulation came into force in February 2022, compelling the banking sector to extend opening hours and implement dedicated telephone lines to serve older adults. This situation results from existing trends that create and sustain the exclusion of older adults (Fernández-Ardèvol, 2022). First, the COVID-19 pandemic drove the spread of digital banking due to imposed physical isolation during lockdowns and after them. Second, the banking sector is in the midst of a significant digitalisation of services that involves the closure of numerous branches and the dismissal of many staff (Blomquist & Hägglund, 2021). The most important banks offer limited face-to-face service and make it almost compulsory to use other channels for every transaction, leaving people with low digital skills unattended (including many older adults). However, and this is the third element, digital banking was never designed for older clients, and neither were ATMs. Instead, digitalisation targeted young and mid-age adults as they were deemed more likely to accept and appreciate a digitally based relationship with banks. Such a decision might have been shaped by myths that assume that older adults are not interested in digital technologies and have no capacity to learn how to use them (Sawchuk et al., 2020).

The difficulties some groups have in participating in the forced digitalisation of society, accelerated by the COVID-19 pandemic, have made their exclusion more evident (Faraj et al., 2021). So, while digitalisation and digital innovations could be natural for a great part of society and represent an

improvement, for some people, particularly those on the wrong side of the digital divide, it represents yet another source of exclusion and loss of autonomy.

Moreover, in Western societies, while youth is much admired, praised and sought after, growing old is considered something to avoid. When growing older, individuals are expected to be different from younger adults and have different interests and attitudes. Ageism is about this; it builds on the widely accepted and unquestioned stereotypes about what people should be doing, feeling or thinking depending on their age (Ayalon & Tesch-Römer, 2018). As such, ageism can be positive or negative and can be directed towards people of any age. However, ageism tends to be more negative and more common towards older adults and more positive towards younger adults (Lagacé et al., 2015; Lev et al., 2018). The increasing importance of digital technologies in data societies (which are difficult to escape as we are thrown into a "digital existence"; see Lagerkvist, 2017) reinforces ageist spirals of exclusion and loss of autonomy of older adults.

That digital technologies are biased has been discussed for some time now. Amazon's search algorithms have been accused of being homophobic (Striphas, 2015) and Google's search algorithms of being racist (Noble, 2018). Scholars found gender biases in image-search algorithms (Kay et al., 2015) and race and gender biases in face-recognition algorithms (Sandvig et al., 2016). Academic research has shown how bots reproduce discriminatory behaviours (Neff & Nagy, 2016) and how digital technology is generally geared towards men (Klinger & Svensson, 2021).

However, there is less awareness of digital ageism (Chu et al., 2022). The struggles digital ageism creates might become the elephant in the room. The struggles build on age stereotypes and prejudices that often do not fit reality, but digital ageism is not recognised on those conflicts and it is not named, therefore, it remains massively unquestioned. Building on age stereotypes, public and private discourses over-generalise about older adults' relationship with digital technologies, thus ensuring that digital ageism will affect all adults as they grow older. Ageism could be more pervasive than sexism or racism (Officer & de la Fuente-Núñez, 2018), and as such, it represents one of the largest sources of discrimination (Ayalon & Tesch-Römer, 2018).

In this chapter, we use an age perspective to analyse how digital technologies are conceptualised and designed and how age is perceived, experienced or depicted concerning digital technologies. Our aim is to create awareness of how ageism operates in society and contribute to a broad discussion about digital ageism. We begin with a section about the inevitability of digital technology. This is followed by a section on ageism, and particularly digital ageism, to show at the end of the chapter how such concepts are related to the rest of the book.

Existing in connected data societies

As communication scholars, we tend to underline language and communication in the study and understanding of ourselves. This is most apparent in social constructionist traditions, such as discourse theory and our history and

cognition accounts. Our brains developed, and we became *Homo Sapiens* (the wise human) when we developed a language and started communicating with each other (McCrone, 1990). This means of communication made it possible for us as a species to conquer the surrounding world as it facilitated large-scale cooperation, imagination and social coordination (Harari, 2014). In contemporary times, as our cultures and societies developed, they did so in tandem with popular media and communication platforms. *Mass society* was accompanied by the advent of *mass media* (Gurevitch & Curran, 2005), and with the rise of *network media*, accounts of *network societies* became prevalent (Castells, 2011; van Dijk, 2012). Today, when almost all aspects of our lives *are rendered into data*, data that then is used for various algorithmic calculations and so-called *datafication* (see Cukier & Mayer-Schoenberger, 2013), it is possible to argue that today we live in *data societies*. Data societies are characterised by the hyper-datafication of services, processes, interactions mediated by data and algorithms, and everyday decisions based on data and algorithms. "Referring to the world we live in as a 'data society' is to acknowledge not only the ubiquitous presence of data in society, but also that these data have an impact on our worlds and our experiences of living in them" (Pinney, 2020, p. 224).

Undoubtedly, digital technologies (data, algorithms, and other types of data-supported decision systems) are becoming increasingly important. As we attend to our banking business, report student grades, travel and socialise, we are apparently expected to put our lives, work and friendships into the hands of digital, data-fed, (semi) automated systems. They are also, often inadvertently, used in credit-scoring systems, public transportation and state funding. Furthermore, through digital products and services, these technologies shape our thinking (Dancy, 2018) and imagination (Rushkoff, 2019). For example, social media services are increasingly replacing traditional media channels as information intermediaries (Diakopoulos, 2016). By sorting, filtering and ranking information, these services focus on some ideas and goods and draw us away from others (van Dijck, 2013, pp. 13, 62). Hence, social media services are not a reflection of reality. They create reality and shape the public interest. As Pasquale (2015) argues, these services profoundly influence decisions about what to do, think and buy.

Within the area of *existential media studies,* Peters (2016) argues that the media is both "the habitats and materials through which we act and are" (p. 15). Media is not only about the world; media is the world. To discuss digital technologies thus becomes equivalent to asking what existence is, as digital technologies are becoming environmental, the background of life and our infrastructure of being. This refutes an instrumental view of media and communication technologies as outside tools. Instead, users emerge through or in tandem with the tools (i.e., instruments) they use. As Lagerkvist (2019) puts it, today's environmental and wearable, all-encompassing and increasingly automated digital technologies "co-shape, bring about, and transform the human condition" (p. 1). Even if we do not know we are using the

internet, we use different systems that are based on the internet and are fed by user data. The internet has become an intimate technology that touches upon every facet of life for those living in data societies. Adapting Heidegger's concept of *throwness* to digital media, we are thrown into a digital human condition in which our existence cannot be escaped (Lagerkvist, 2019). But, while digital technologies limit users, they also open up possibilities within their limits. That our existence is *co-constituted* by digital technologies is not the same as being determined by these technologies (Peine & Neven, 2021). Where there is power, there is always a possibility for resistance (Foucault, 1970 as cited in Hou, 2021).

Ageism, an overview

Ageism is one of many forms of "bigotry" (Butler, 1969), and yet it remains relatively unnoticed (e.g., Gendron et al., 2020). There is no agreed-upon definition of ageism or what causes it (Ayalon & Tesch-Römer, 2018; Iversen et al., 2009; Palmore et al., 2005; Snellman, 2016). As explained by Palmore et al. (2005), definitions include attitudes (prejudice) connected to certain age groups, specific behaviours (discrimination) towards individuals because of their age, or both. Attitudes, in turn, can be separated into an affective (feelings you have towards an age group) and a cognitive component (beliefs or stereotypes you hold about specific age groups). In addition to this, there is discrimination on the institutional level (Iversen et al., 2009; Nelson, 2002; Palmore et al., 2005); for example, young adults are expected to do specific tasks in the workplace while older employees are assigned others. Often, ageism refers to chronological age (Iversen et al., 2009; Palmore et al., 2005), meaning a person's age is measured in time from birth to a given date. Interestingly, implicit or explicit ageism operates between different age groups and within the older population and at an individual or institutional level (Bodner, 2009; Levy, 2001).

There is a consensus that ageism affects different ages (e.g., Ayalon & Tesch-Römer, 2018; Bodner et al., 2012) and that it can produce positive and negative outcomes (Levy, 2017). Nevertheless, this volume focuses on negative ageism towards older age groups. More than thirty years of research in the field have shown that older individuals suffer the most from ageism (Iversen et al., 2009; Lagacé et al., 2015).

As the awareness of ageism increases, definitions of it will probably become more inclusive and complex (Palmore et al., 2005). This will likely make ageism more difficult to study, measure and operationalise in reports and academic research (Iversen et al., 2009). Nevertheless, one helpful and condensed definition is the "complex, often negative construction of age" (Ayalon & Tesch-Römer, 2018, p. 3), which takes place at the individual, social and cultural levels (Iversen et al., 2009). This definition summarises the discussion on ageism and underlines that age is not only about biology, i.e., the number of years since birth, but also a socio-cultural construction.

Retirement, for example, appeared with industrialisation and the development of the welfare state. It is possible to argue that public pension systems are age-based policies that constitute positive discrimination towards older age groups. However, these systems have also pushed older adults out of the labour market and power positions both in personal and professional contexts. Consequently, retired older adults change their role in the economy and society (Harris, 2005). Once individuals retire, they become part of a social minority (older adults), a powerless population segment. Sometimes, policymakers, academia and the general population uncritically assume that older populations constitute a burden (Calasanti, 2020). Hence, while age and ageist policies often are connected to biology or chronological age, these intersect with socio-cultural values and imaginations about older adults that cannot be explained as solely a consequence of demographic shifts in society (Lim-soh & Ng, 2021).

Digital ageism

Given the importance of digital technologies, it is no wonder that critical studies are showing increasing interest in their biases, particularly in the emerging field of computer sciences and *critical data studies* (see Iliadis & Russo, 2016). Digital ageism has not been completely oblivious to this trend.

Digital ageism was early defined in the Ageing + Communication + Technologies Project as "the individual and systemic biases that create forms of inclusion and exclusion that are age-related" (*Mandate – Act Project – Concordia University*, 2014). At the project's core is the examination of the various ways in which "digital ageism" is manifested, that is, the often subtle forms of individual and societal biases that exclude or limit people from accessing digital innovations based on their (old) age (Fernández-Ardèvol & Blanche, 2019). Thus, with digital ageism, we refer to the implicit or explicit discrimination of older adults based on how age is represented and experienced in relation to digital technologies.

The first references to "digital ageism" in Google Scholar date back to the mid-2010s. It is used in relation to the network society in general (Sawchuk, 2015), or digital games (Romero & Ouellet, 2016), and digital leisure activities (Hebblethwaite, 2016), among others.

Later, the term digital ageism has also been used in relation to technologies: including digital surveillance (Berridge & Grigorovich, 2022) and artificial intelligence technologies (Chu et al., 2022); in relation to uses of digital technologies: including the social distancing imposed by the COVID-19 pandemic (Neves et al., 2022), the production of memes (Lee & Hoh, 2021), and the way feminist discourses are built-in digital platforms such as Twitter and Wikipedia (Ahlawat, 2022; Gauthier & Sawchuk, 2017); and in the design of digital technologies (Manor & Herscovici, 2021).

In a broader sense, digital ageism includes ageism in relation to digital technologies; including in relation to the digital divide (Choi et al., 2020),

digital platforms (Rosales & Fernández-Ardèvol, 2020), artificial intelligence (Stypinska, 2021) and age ideologies and age biases in the technology industry (Mannheim et al., 2022; Rosales & Svensson, 2021).

Digital ageism is deeply embedded in society and operates at the institutional and interpersonal levels, building on societal values or stereotypes that are widely accepted in society. This impacts on the image older adult users have of themselves and their potential interest in digital technologies, reinforcing processes of exclusion. In other words, individuals and institutions disregard, deprioritise and even exclude older adult users and thus reinforce existing inequalities. In the following sub-section, we contextualise how digital ageism operates at the institutional level, particularly in technology companies, and how it operates at the interpersonal level, building on social values.

Corporate biases

Structural biases are sometimes attributed to the makers of digital technologies and become embedded in such technologies (Rosales & Fernández-Ardèvol, 2019b). It is well-known that young white men dominate the workforce in digital technology companies. The industry has accepted a need for more diversity, meaning more women, people of non-white ethnic backgrounds, and those with different sexualities (Kamiran et al., 2012). There have been attempts to attract women to technology (Perna et al., 2008), but, in general, these have not been as successful as it seems (see Klinger & Svensson, 2021). In their research, Professor Svensson and Dr Rosales have witnessed how technology companies boast that their offices are accessible to people with disabilities and that they support local Pride parades. However, rarely are any visibly older adults, or people above middle age, seen walking around technology headquarters in Scandinavia, Silicon Valley, Barcelona or Bengaluru. Today the forefront of conscious technology companies seems to make room for co-workers with disabilities. "After gender, ethnicity and sexuality, now is the time to cater for co-workers with disabilities", one leading technology activist said at a conference in Berlin in 2019. However, old age does not seem to have entered the minds of the people populating the technology industry.

Furthermore, by being engineered by mostly young programmers, digital products and services risk reinforcing a youth bias (see Rosales & Svensson, 2021). During the design and development of digital technologies, programmers are often unaware of the interests, limitations and preferences of people different from them. For instance, digital technologies are often not trained with data from older users (e.g., Dong et al., 2011; Mannheim et al., 2022; Manor & Herscovici, 2021). In our previous studies, programmers reported that they did incorporate older and diverse participants. By this, they meant women in their 40s (Rosales & Svensson, 2021). User studies often group participants under the labels of 40+, 50+ or 60+, which tend to exclude and dilute the nuances of older users (Rosales & Fernández-Ardèvol, 2019b).

Corporate dynamics force product owners to identify the target user and focus all their efforts on that ideal user. Products are tailored, tested and advertised to the ideal user. Younger generations are generally more common and active in digital technologies, so they become the ideal behind many innovations. Thus, the interest, habits and uses of other users are often disregarded. Older users are barely considered when designing and evaluating new technologies (Li & Luximon, 2016).

Furthermore, while new services are designed to work on most devices, they are still geared towards the latest ones. People who use older devices often find that they do not have enough space or memory to download new apps or the required operating system. Studies have shown that older and second-hand devices are more common among older users (Jacobson et al., 2017). The same goes for academia. Age is not among the most common themes in critical data studies, partly because ageism is a more hidden and accepted form of discrimination (Chu et al., 2022; Rosales & Fernández-Ardèvol, 2020). Therefore, this edited volume is needed to create awareness and contribute to the discussion about ageism in digital technologies.

Institutionally, the digital technology industry often disregards the needs of older adult users in the design, development and advertising of its devices and services as these are most often developed by, and geared towards, younger users. Older adult users are excluded as potential target audiences, and thus their needs are ignored. Those services that are directed towards older adult users mainly focus on health matters in a rather patronising way, portraying older users as a group preoccupied with their health issues.

Interpersonal biases

At the same time, conceptions and perceptions of age in relation to digital technologies shape interpersonal relationships. One widely accepted common dichotomy is that between digital natives and digital immigrants (as also underlined by Judd, 2018). Prensky (2001) argues that "digital natives" are those who grow up with digital technologies, and because of this, they are meant to think, learn and behave differently from so-called "digital immigrants". Such a dichotomy contributes to stereotyping older and younger users of digital technologies. However, no one could claim innate digital skills; usually, it is a matter of access, interest and practice. Furthermore, the pace of innovation and change in digital communication is staggering. Digital technologies develop fast in terms of devices and services. So even if individuals are accustomed to digital technologies from an early age, they still need to update their knowledge continuously. And the ways individuals decide to engage with digital technologies also change and differ along life trajectories (Busch et al., 2021; De Nadai et al., 2019; Ganito, 2017; Tsetsi & Rains, 2017). To believe and spread a digital natives theory is thus somewhat naive. Some digital immigrants (older users) might

be very skilled in two-handed typing, for example, or have other types of expertise. Still, it is common to portray younger users as digital experts, leading them to "youngsplain" the "proper" way to use digital technologies (Comunello et al., 2020). This might overlook the fact that there are many different ways of using digital technologies and different interests and values. While some usages might relate to age, older users are not a homogeneous user group.

Another dichotomy that contributes to the negative stereotyping of older users of digital technologies is that between early and late adopters. Young adults are more likely to become so-called *early adopters* of new technologies, meaning the first users of any new technology and those who adopt it before it becomes well-established (Rogers, 2003). Early adopters are characterised by high motivation, which allows them to overcome the difficulties of accessing and learning these technologies independently. However, most users, including people of all ages, are middle or late adopters. Both middle and late adopters receive recommendations, guidance or support from early adopters. Some early adopters become *warm experts* (Bakardjieva, 2005), often younger relatives or friends (Hänninen et al., 2021). In addition, some late adopters need continuous support from warm experts to cover their needs, including support in acquiring digital skills required to be updated autonomously. Whether subjected to "youngsplainers" or in need of warm experts, the current pace of innovation and change in the digital communication landscape is accompanied by ageist stereotypes and practices, with some individuals (most likely older adults) being either patronised by others or becoming dependent on them, which signal a loss of autonomy to be able to conduct everyday activities.

In this context, digitally savvy older users often need to fight against stereotypes in their everyday digital practices. As studies have shown, it is possible to find early adopters and digitally savvy people among older users (Rosales & Fernández-Ardèvol, 2019a). In our previous studies, older adults reported their efforts to explain that they wanted the most advanced smartphone in a store, not just the one the shop assistant assigned to older users (Rosales & Fernández-Ardèvol, 2016). They surprise relatives when they exhibit knowledge about digital technologies that their younger family members had no idea about. In contrast to digitally savvy older users, who attract attention for their digital skills, there is a trend among younger users to disconnect altogether (Kania Lundholm, 2021). In search of balance and meaning in life, they either dispense with or decrease their connectedness to digital technologies (Syvertsen & Enli, 2020). So-called digital detox and disconnection are becoming popular among younger adults and are applauded by psychologists and mindfulness experts. Thus, while older adults are pushed to take advantage of the potential of digital technologies in their lives, young adults are cautioned against excessive use (Syvertsen & Enli, 2020). This reflects ageist stereotypes connoting non-use to older adults and heavy use to younger adults.

Overview of the book

This anthology contributes to creating awareness of how digital ageism operates in society and how to tackle it in areas such as the (lack of) representation of diverse older individuals in digital technologies, the widespread symbolic representations of old and young age in society related to digitalisation and product-design and development.

The chapters by Francesca Comunello, Simone Mulargia and Francesca Ieracitano and by Jane Vincent provide the theoretical framework for the book. Francesca Comunello et al. analyse digital ageism at the symbolic and design levels and use the discourses of active ageing to reflect on it (Comunello et al., 2023). Jane Vincent discusses the dichotomy between framing studies about older adults based on chronological age vis-à-vis using life events to define life stages; and how a biased framing affects older users (Vincent, 2023).

Ageism might be the elephant in the room; age stereotypes and prejudices plague interpersonal relationships in digital technology companies, and negative age stereotypes are also reported by digital technology workers about themselves, but there is little or no questioning about it (Svensson, 2021; Wiener, 2020). Older adults become the disregarded target(s) in digital products and services, building on the unconscious biases of the technology industry. Ageism becomes embedded in the values and principles of digital technology companies and influences the design, evaluation, testing and marketing of digital products. In this sense, the chapter by Justyna Stypinska, Andrea Rosales and Jakob Svensson analyses the Silicon Valley culture from an ageist perspective and investigates how it influences technological culture (Stypinska et al., 2023). Similarly, Jakob Svensson carries out an empirical analysis of the strands of ageism in the digital industry based on interviews with technology workers worldwide (Svensson, 2023). Concerning the representations of final users of digital technologies, the chapter by Loredana Ivan and Eugene Loos provides a content analysis of the advertising of technological products from an age perspective (Ivan & Loos, 2023). Finally, Sergio Sayago analyses the scarce reflections about ageism in human-computer interaction research (Sayago, 2023).

By virtue of being thrown into a digital existence, digital technologies also matter for individuals unaware of their interaction with these technologies or who barely use them. However, digital services often do not consider and are not trained with data from older users (e.g., Dong et al., 2011). Digital products and services learn from data traces generated by users. Hence this data is biased towards frequent users, who tend to be younger and with relatively high skills and income (Hargittai, 2020; Rosales & Fernández-Ardèvol, 2016). The bias is, thus, implicit in the datasets that reflect the intrinsic stereotypes of society and are amplified by the algorithms. Chapters by Maria Sourbati and by Inês Amaral and Ana Marta M. Flores provide insights into this line. Sourbati's chapter reflects on age biases in smart mobility

in the city of London (UK) and how they promote or impede mobility for all (Sourbati, 2023). Amaral and Flores analyse the active ageing discourses on Instagram and whether these reinforce classical normativities or not (Amaral & Flores, 2023).

Ageism is the Trojan horse that influences how individuals see themselves and their digital decisions (Mariano et al., 2022; Rosales & Fernández-Ardèvol, 2020). The counterpart to ageist prejudices often comes from tech-savvy older users' discourses, which are frequently celebrated for their alleged exotism (Sawchuk et al., 2020). Thus, digital ageism influences the attitudes and interests of older adults in digital technologies and the full integration and autonomy of mainly older adults in the digitalised society. This way, ageism amplifies inequalities and reinforces the digital divide (Calasanti & King, 2021). Roser Beneito-Montagut, Andrea García-Santesmases and Daniel López-Gómez explore imaginaries around older adults and technologies concerning their interests, abilities and skills (Beneito-Montagut et al., 2023). Magdalena Kania-Lundholm analyses how seldom and non-users of digital technologies in Sweden cope with the digitalisation of society and with related ageist stereotypes (Kania-Lundholm, 2023). The chapter by Sarah Wagner and Akiko Ogawa looks at how ageism operates in care homes for the oldest older adults in digital storytelling workshops (Wagner & Ogawa, 2023). Finally, Roxana Barrantes, Silvana Manrique and Daniela Ugarte break down stereotypes about older adults and digital technologies by showing how face-to-face interactions are complementary to social network platform use in six Latin American countries (Barrantes et al., 2023).

User studies in academia often do not include older adults or they group participants under labels such as 45+, 55+ or 65+, which tends to exclude and dilute the nuances of older users (Rosales & Fernández-Ardèvol, 2019b). In addition, studies and research funding that include older adults are often on health-related topics that focus only on the fragility of this cohort, as argued in the chapter by Jane Vincent (Vincent, 2023). The chapters by Sarah Wagner and Akiko Ogawa; Emma Garavaglia, Alessandro Caliandro, Giulia Melis, Emanuela Sala and Daniele Zaccaria; Roser Beneito et al. and Fernández-Ardèvol provide methodological reflections to counterbalance those and other age biases in related research. They illustrate the challenges and potentialities of more comprehensive methods for studying the relationship between ageing processes and digital technologies. Their methodological reflections include the analysis of digital storytelling methods (Wagner & Ogawa, 2023), digital device tracking, social experiments, online interviews (Garavaglia et al., 2023) and how to approach the topic of digital technologies for non-savvy users (Beneito-Montagut et al., 2023).

Finally, the concluding chapter (Fernández Ardèvol, 2023), based on the chapters of the book, reflects on how ageism operates at the design level and at the symbolic level in society. And it also elaborates on the different "ageisms" or the different conceptualisations of ageism used in relation to digital technologies, beyond Digital Ageism, that are conceptualised or used in the book.

The chapters approach the topic of digital ageism through different research methods, either by applying or by critically analysing them. They include literature reviews (Comunello et al., 2023; Sayago, 2023) and a phenomenological literature review (Vincent, 2023). There are quite a few qualitative studies that use or discuss focus group interviews (Kania-Lundholm, 2023), individual interviews (Svensson, 2023) and online interviews (Garavaglia et al., 2023). Some chapters use or discuss ethnographic approaches such as digital storytelling (Wagner & Ogawa, 2023), cinema club discussions (Beneito-Montagut et al., 2023), and participant observations (Svensson, 2023). Visual and text-based content analysis are also used (Amaral & Flores, 2023; Ivan & Loos, 2023). And there are also some quantitative approaches that discuss or rely on traditional descriptive and inferential statistics based on a survey (Barrantes et al., 2023), digital device tracking, social experiments (Garavaglia et al., 2023) and social network analysis (Amaral & Flores, 2023).

While not comprehensive or all-encompassing, this volume provides insights from different parts of the globe, uses different methods and touches upon different aspects of ageism and how it plays out in contemporary connected data societies. It is our hope that this book will raise awareness, challenge power, initiate discussions and spur further research into this field.

Acknowledgements

References

Ahlawat, I. (2022). Ageing on the internet: Feminist perspectives on sexist practices. *Convergence*, *28*(5), 1392–1406. https://doi.org/10.1177/13548565221085817

Amaral, I., & Flores, A. M. M. (2023). Challenging gendered and ageing normative stereotypes on Instagram. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Ayalon, L., & Tesch-Römer, C. (2018). *Contemporary perspectives on ageism*. Springer. https://doi.org/10.1007/978-3-319-73820-8

Bakardjieva, M. (2005). *Internet Society: The internet in everyday life*. Sage.

Barrantes, R., Manrique, S., & Ugarte, D. (2023). Digital and personal networks: Interactions in later life. Evidence from six Latin American countries. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Beneito-Montagut, R., López-Gómez, D., & García-Santesmases, A. (2023). Technological ageism in a sheltered housing for older people: An intersectional approach. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Berridge, C., & Grigorovich, A. (2022). Algorithmic harms and digital ageism in the use of surveillance technologies in nursing homes. *Frontiers in Sociology*, 7, 957246. https://doi.org/10.3389/fsoc.2022.957246

Blomquist, C., & Hägglund, A. (2021). *Forced digitalization as a result of Covid-19* [Umeå Universitet]. https://www.diva-portal.org/smash/get/diva2:1574276/FULL-TEXT01.pdf

Bodner, E. (2009). On the origins of ageism among older and younger adults. *International Psychogeriatrics/IPA*, *21*(6), 1003–1014. https://doi.org/10.1017/S104161020999055X

Bodner, E., Bergman, Y. S., & Cohen-Fridel, S. (2012). Different dimensions of ageist attitudes among men and women: A multigenerational perspective. *International Psychogeriatrics/IPA*, *24*(6), 895–901. https://doi.org/10.1017/S1041610211002936

Busch, P. A., Hausvik, G. I., Ropstad, O. K., & Pettersen, D. (2021). Smartphone usage among older adults. *Computers in Human Behavior*, *121*, 106783. https://doi.org/10.1016/j.chb.2021.106783

Butler, R. N. (1969). Age-ism: Another form of bigotry. *The Gerontologist*, *9*(4), 243–246. https://doi.org/10.1093/geront/9.4_part_1.243

Calasanti, T. (2020). Brown slime, the silver tsunami, and apocalyptic demography: The importance of ageism and age relations. *Social Currents*, *7*(3), 195–211. https://doi.org/10.1177/2329496520912736

Calasanti, T., & King, N. (2021). Beyond successful aging 2.0: Inequalities, ageism, and the case for normalizing old ages. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *76*(9), 1817–1827. https://doi.org/10.1093/geronb/gbaa037

Castells, M. (2011). *The rise of the network society*. Wiley. https://play.google.com/store/books/details?id=FihjywtjTdUC

Choi, E. Y., Kim, Y., Chipalo, E., & Lee, H. Y. (2020). Does perceived ageism widen the digital divide? And does it vary by gender? *The Gerontologist*, *60*(7), 1213–1223. https://doi.org/10.1093/geront/gnaa066

Chu, C. H., Nyrup, R., Leslie, K., Shi, J., Bianchi, A., Lyn, A., McNicholl, M., Khan, S., Rahimi, S., & Grenier, A. (2022). Digital ageism: Challenges and opportunities in artificial intelligence for older adults. *The Gerontologist*. https://doi.org/10.1093/geront/gnab167

Comunello, F., Mulargia, S., & Ieracitano, F. (2023). "Forever young?" Digital technology, ageism and the (non-) ideal user. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Comunello, F., Rosales, A., Mulargia, S., Ieracitano, F., Belotti, F., & Fernández-Ardèvol, M. (2020). "Youngsplaining" and moralistic judgements: Exploring ageism through the lens of digital "media ideologies". *Ageing & Society*, *42*(4), 1–24.

Cukier, K., & Mayer-Schoenberger, V. (2013). The rise of big data: How it's changing the way we think about the world. *Foreign Affairs*, *92*(3), 28–40. https://www.jstor.org/stable/23526834

Dancy, C. (2018). *Don't unplug: How technology saved my life and can save yours too*. St. Martin's Publishing Group.

De Laorden, C. S. J. (n.d.). *Tengo 78 años y me siento apartado por los bancos*. Change.org. Retrieved 13 February 2022, from https://www.change.org/p/tengo-78-a%C3%B1os-y-me-siento-apartado-por-los-bancos-todo-es-por-internet-

y-no-todo-el-mundo-se-maneja-pido-atenci%C3%B3n-humana-en-las-sucursales-bancarias-bbva-caixabank-bankinter-santander-resp-sabadell-help-cabk-responde--bbvaresponde-es?source_location=discover_feed

De Nadai, M., Cardoso, A., Lima, A., Lepri, B., & Oliver, N. (2019). Strategies and limitations in app usage and human mobility. *Scientific Reports*, *9*(1), 10935. https://doi.org/10.1038/s41598-019-47493-x

Diakopoulos, N. (2016). Accountability in algorithmic decision making. *Communications of the ACM*, *59*(2), 56–62. https://doi.org/10.1145/2844110

Dong, N., Smith, N. A., & Rose, C. P. (2011). Author age prediction from text using linear regression. *Proceedings of the 5th ACL-HLT Workshop on Language Technology for Cultural Heritage, Social Sciences, and Humanities*, 115–132. https://aclanthology.org/W11-1515.pdf

Faraj, S., Renno, W., & Bhardwaj, A. (2021). Unto the breach: What the COVID-19 pandemic exposes about digitalization. *Information and Organization*, *31*(1), 100337. https://doi.org/10.1016/j.infoandorg.2021.100337

Fernández-Ardèvol, M. (2022). Who cares about discrimination in online banking services? Book of Abstracts of the ENAS & NANAS Joint Conference, http://enas.comunicare.ro/wp-content/uploads/2018/01/Abstract_booklet_ENAS_NANAS_2022.pdf

Fernández-Ardèvol, M. (2023). Production, transmission and reproduction of ageist practices. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Fernández-Ardèvol, M., & Blanche, D. (2019). *Ideas and practices for non-ageist research in a digital world*. IN3 Blog. https://blogs.uoc.edu/in3/ideas-practices-non-ageist-research-digital-world/

Ganito, C. (2017). Gendering the mobile phone. In S. Taipale, T.-A. Wilska, C. Gilleard (Eds.) *Digital technologies and generational identity*: *ICT usage* across *the life course* (87–101). Routledge.

Garavaglia, E., Caliandro, A., Sala, E., Melis, G., & Zaccaria, D. (2023). Contrasting ageism in research on older people and digital technologies: A methodological reflection. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Gauthier, M., & Sawchuk, K. (2017). Not notable enough: Feminism and expertise in Wikipedia. *Communication and Critical/Cultural Studies*, *14*(4), 385–402. https://doi.org/10.1080/14791420.2017.1386321

Gurevitch, M., & Curran, J. (2005). *Mass media and society*. Bloomsbury Academic.

Hänninen, R., Taipale, S., & Luostari, R. (2021). Exploring heterogeneous ICT use among older adults: The warm experts' perspective. *New Media & Society*, *23*(6), 1584–1601. https://doi.org/10.1177/1461444820917353

Harari, Y. N. (2014). *Sapiens: A brief history of humankind*. Random House.

Hargittai, E. (2020). Potential biases in big data: Omitted voices on social media. *Social Science Computer Review*, *38*(1), 10–24. https://doi.org/10.1177/0894439318788322

Harris, D. K. (2005). Role expectations. In Palmore (Ed.), *Encyclopedia of ageism* (pp. 266–267). Routledge.

Hebblethwaite, S. (2016). The (in)visibility of older adults in digital leisure cultures. In *Digital leisure cultures* (pp. 106–118). Routledge. https://www.taylorfrancis.com/chapters/edit/10.4324/9781315666600-15/visibility-older-adults-digital-leisure-cultures-shannon-hebblethwaite

Hou, L. (2021). Foucault's power discourse and Morrison's the beloved. *International Journal of Social Science and Education Research*, *4*(3). https://doi.org/10.6918/IJOSSER.202103_4(3).0035

Iliadis, A., & Russo, F. (2016). Critical data studies: An introduction. *Big Data & Society*, *3*(2), 1–7. https://doi.org/10.1177/2053951716674238

Ivan, L., & Loos, E. (2023). The marketing of technology products for older people: Evidence of visual ageism. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Iversen, T. N., Larsen, L., & Solem, P. E. (2009). A conceptual analysis of ageism. *Nordic Psychology*, *61*(3), 4–22. https://doi.org/10.1027/1901-2276.61.3.4

Jacobson, J., Lin, C. Z., & McEwen, R. (2017). Aging with technology: Seniors and Mobile connections. *Canadian Journal of Communication*, *42*(2). https://doi.org/10.22230/cjc.2017v42n2a3221

Judd, T. (2018). The rise and fall (?) of the digital natives. *Australasian Journal of Educational Technology*, *34*(5). https://doi.org/10.14742/ajet.3821

Kamiran, F., Karim, A., Verwer, S., & Goudriaan, H. (2012). Classifying socially sensitive data without discrimination: An analysis of a crime suspect dataset. *2012 IEEE 12th International Conference on Data Mining Workshops*, 370–377. https://doi.org/10.1109/ICDMW.2012.117

Kania-Lundholm, M. (2021). Why disconnecting matters? In A. Chia, A. Jorge, & T. Karppi (Eds.), *Reckoning with social media: Disconnection in the age of the techlash* (pp. 13–36). Rowman & Littlefield.

Kania-Lundholm, M. (2023). Coping in the culture of connectivity: How older people make sense of living with digital ageism. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Kay, M., Matuszek, C., & Munson, S. A. (2015). Unequal representation and gender stereotypes in image search results for occupations. *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, 3819–3828. https://doi.org/10.1145/2702123.2702520

Klinger, U., & Svensson, J. (2021). The power of code: Women and the making of the digital world. *Information, Communication and Society*, *24*(14), 2075–2090. https://doi.org/10.1080/1369118X.2021.1962947

Lagacé, M., Charmarkeh, H., Laplante, J., & Tanguay, A. (2015). How ageism contributes to the second-level digital divide. *Journal of Technologies and Human Usability*, *11*(4). https://doi.org/https://doi.org/10.18848/2381-9227/CGP/v11i04/56439

Lagerkvist, A. (2017). Existential media: Toward a theorization of digital thrownness. *New Media & Society*, *19*(1), 96–110. https://doi.org/10.1177/1461444816649921

Lagerkvist, A. (2019). *Digital existence: Ontology, ethics and transcendence in digital culture*. Routledge.

Lee, S. Y., & Hoh, J. W. T. (2021). A critical examination of ageism in memes and the role of meme factories. *New Media & Society*, https://doi.org/10.1177/14614448211047845

Lev, S., Wurm, S., & Ayalon, L. (2018). *Origins of ageism at the individual level*. 51–72. https://doi.org/10.1007/978-3-319-73820-8_4

Levy, B. R. (2001). Eradication of ageism requires addressing the enemy within. *The Gerontologist*, *41*(5), 578–579. https://doi.org/10.1093/geront/41.5.578

Levy, B. R. (2017). Age-stereotype paradox: Opportunity for social change. *The Gerontologist*, *57*(suppl_2), S118–S126. https://doi.org/10.1093/geront/gnx059

Li, Q., & Luximon, Y. (2016). Older adults and digital technology: A study of user perception and usage behavior. *Advances in Physical Ergonomics and Human Factors*, 155–163. https://doi.org/10.1007/978-3-319-41694-6_16

Lim-soh, J., & Ng, R. (2021). Ageism linked to culture, not demographics: Evidence from an 8-billion-word corpus across 20 countries. *The Gerontological Society of America*, *76*(9). https://doi.org/10.1093/geronb/gbaa181

Mandate – Act Project – Concordia University. (2014). http://actproject.ca/mandate/

Mannheim, I., Wouters, E. J. M., Köttl, H., van Boekel, L., Brankaert, R., & van Zaalen, Y. (2022). Ageism in the discourse and practice of designing digital technology for older persons: A scoping review. *The Gerontologist*. https://doi.org/10.1093/geront/gnac144

Manor, S., & Herscovici, A. (2021). Digital ageism: A new kind of discrimination. *Human Behavior and Emerging Technologies*, *3*(5), 1084–1093. https://doi.org/10.1002/hbe2.299

Mariano, J., Marques, S., Ramos, M. R., Gerardo, F., Cunha, C. L., da, Girenko, A., Alexandersson, J., Stree, B., Lamanna, M., Lorenzatto, M., Mikkelsen, L. P., Bundgård-Jørgensen, U., Rêgo, S., & de Vries, H. (2022). Too old for technology? Stereotype threat and technology use by older adults. *Behaviour & Information Technology*, *41*(7), 1503–1514. https://doi.org/10.1080/0144929X.2021.1882577

McCrone, J. (1990). *The ape that spoke: Language and the evolution of the human mind*. Avon Books.

Nanda, A., Xu, Y., & Zhang, F. (2021). How would the COVID-19 pandemic reshape retail real estate and high streets through acceleration of e-commerce and digitalization? *Journal of Urban Management*, *10*(2), 110–124. https://doi.org/10.1016/j.jum.2021.04.001

Neff, G., & Nagy, P. (2016). Talking to bots: Symbiotic agency and the case of Tay. *International Journal of Communication Systems*, *10*, 4915–4931. https://ijoc.org/index.php/ijoc/article/view/6277

Nelson, T. D. (2002). *Ageism: Stereotyping and prejudice against older persons*. MIT Press.

Neves, B. B., Colón Cabrera, D., Sanders, A., & Warren, N. (2022). Pandemic diaries: Lived experiences of loneliness, loss, and hope among older adults during COVID-19. *The Gerontologist*. https://doi.org/10.1093/geront/gnac104

Noble, S. U. (2018). *Algorithms of oppression: How search engines reinforce racism* (Vol. *229*). New York University Press. https://psycnet.apa.org/fulltext/2018-08016-000.pdf

Officer, A., & de la Fuente-Núñez, V. (2018). A global campaign to combat ageism. *Bulletin of the World Health Organization*, *96*(4), 295–296. https://doi.org/10.2471/BLT.17.202424

Palmore, E. B., Branch, L., & Harris, D. (2005). *Encyclopedia of ageism* (1st ed.). Routledge. https://doi.org/10.4324/9781315043975

Pasquale, F. (2015). *The black box society*. Harvard University Press.

Peine, A., & Neven, L. (2021). The co-constitution of ageing and technology – a model and agenda. *Ageing & Society*, *41*(12), 2845–2866. https://doi.org/10.1017/S0144686X20000641

Perna, L., Lundy-Wagner, V., Drezner, N. D., Gasman, M., & Gary, S. (2008). The contribution of HBCUS to the preparation of African American women for stem

careers: A case study. *Research in Higher Education*, *50*(1), 1–23. https://doi.org/10.1007/s11162-008-9110-y

Peters, J. D. (2016). *The Marvelous Clouds.* https://press.uchicago.edu/ucp/books/book/chicago/M/bo20069392.html

Pinney, L. (2020). Is literacy what we need in an unequal data society? In M. Engebretsen & H. Kennedy (Eds.), *Data visualization in society* (pp. 223–238). Amsterdam University Press. https://play.google.com/store/books/details?id=ZyzYDwAAQBAJ

Prensky, M. (2001). Digital natives, digital immigrants. *From on the Horizon (MCB University Press)*, *9*(5). https://www.marcprensky.com/writing/Prensky%20-%20Digital%20Natives,%20Digital%20Immigrants%20-%20Part1.pdf

Rogers, E. M. (2003). *Diffusion of innovations*. Free Press. https://www.worldcat.org/title/diffusion-of-innovations/oclc/52030797

Romero, M., & Ouellet, H. (2016). Scaffolding digital game design activities grouping older adults, younger adults and teens. *Human Aspects of IT for the Aged Population. Design for Aging*, 74–81. https://doi.org/10.1007/978-3-319-39943-0_8

Rosales, A., & Fernández-Ardèvol, M. (2016). Smartphones, apps and older people's interests: From a generational perspective. *Proceedings of the 18th International Conference on Human-Computer Interaction with Mobile Devices and Services*, 491–503. https://doi.org/10.1145/2935334.2935363

Rosales, A., & Fernández-Ardèvol, M. (2019a). Smartphone usage diversity among older people. In S. Sayago (Ed.), *Perspectives on human-computer interaction research with older people* (pp. 51–66). Springer International Publishing. https://doi.org/10.1007/978-3-030-06076-3_4

Rosales, A., & Fernández-Ardèvol, M. (2019b). Structural ageism in big data approaches. *Nordicom Review*, *40*(s1), 51–64. https://doi.org/10.2478/nor-2019-0013

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence (London, England)*, *26*(5–6), 1074–1087. https://doi.org/10.1177/1354856520930905

Rosales, A., & Svensson, J. (2021). Perceptions of age in contemporary tech. *Nordicom Review*, *42*(1), 79–91. https://doi.org/10.2478/nor-2021-0021

Rushkoff, D. (2019). *Team human.* https://wwnorton.com/books/Team-Human/

Sandvig, C., Hamilton, K., Karahalios, K., & Langbort, C. (2016). *When the algorithm itself is a racist: Diagnosing ethical harm in the basic components of software.* https://social.cs.uiuc.edu/papers/pdfs/Sandvig-IJoC.pdf

Sawchuk, K. (2015). Digital Ageism: Age-related inclusions and exclusions in networked societies. *Proceedings of the Silver Gaming Intergenerational Summer School.* https://lel.crires.ulaval.ca/sites/lel/files/sgiss2015-proceedings-actes-r21.pdf

Sawchuk, K., Grenier, L., & Lafontaine, C. (2020). "That's surprising, at your age!" The myth of digital disinterest. In V. Billette, P. Marier, & A.-M. Séguin (Eds.), *Getting wise about getting old* (36–43). https://www.ubcpress.ca/getting-wise-about-getting-old

Sayago, S. (2023). Human-computer interaction research on ageism: Essential, incipient, and challenging. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it.* Routledge.

Snellman, F. (2016). Whose ageism? The reinvigoration and definitions of an elusive concept. *Nordic Psychology*, *68*(3), 148–159. https://doi.org/10.1080/19012276.2015.1125301

Sourbati, M. (2023). Age bias on the move: The case of smart mobility. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Striphas, T. (2015). Algorithmic culture. *European Journal of Cultural Studies*, *18*(4–5), 395–412. https://doi.org/10.1177/1367549415577392

Stypinska, J. (2021). Ageism in AI: New forms of age discrimination in the era of algorithms and artificial intelligence. *Proceedings of the 1st International Conference on AI for People: Towards Sustainable AI*, Bologna, Italy.

Stypinska, J., Rosales, A., & Svensson, J. (2023). Silicon Valley ageism – ideologies and practices of expulsion in tech industry. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Svensson, J. (2021). *Wizards of the web*. Nordicom. https://www.nordicom.gu.se/en/publications/wizards-web

Svensson, J. (2023). Technology culture as youth oriented. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Syvertsen, T., & Enli, G. (2020). Digital detox: Media resistance and the promise of authenticity. *Convergence*, *26*(5–6), 1269–1283. https://doi.org/10.1177/1354856519847325

Tsetsi, E., & Rains, S. A. (2017). Smartphone internet access and use: Extending the digital divide and usage gap. *Mobile Media & Communication*, *5*(3), 239–255. https://doi.org/10.1177/2050157917708329

van Dijck, J. (2013). The culture of connectivity: A critical history of social media. In *The culture of connectivity*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199970773.001.0001

van Dijk, J. (2012). *The network society* (3rd ed.). SAGE Publications Ltd. https://www.amazon.com/Network-Society-Jan-Van-Dijk/dp/1446248968

Vincent, J. (2023). Life stage or age? Reviewing perceptions of oldest ICT users. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Wagner, S., & Ogawa, A. (2023). Tackling ageism in sociotechnical interventions: An actor-network analysis of the pre-story space in digital storytelling workshops with care home residents. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Wiener, A. (2020). *Uncanny valley: A memoir*. M. C. D. Books.

1 "Forever young?": Digital technology, ageism and the (non-)ideal user

Francesca Comunello, Simone Mulargia and Francesca Ieracitano

The relationship between older adults and digital technology represents a privileged standpoint to highlight some important aspects of ageism. Ageism is defined as "the complex, often negative construction of old age, which takes place at the individual and the societal levels" (Ayalon & Tesch-Römer, 2018, p. 32). It deals with stereotypes and prejudices towards older adults, with a tendency to over-generalise, treating older adults as a homogeneous category, neglecting any individual (or social, cultural, etc.) differences. Such an over-generalisation represents a core element of ageism: by neglecting individual differences, ageist attitudes tend to neglect individuality itself.

When observing the relations between older adults and digital media, such an over-generalisation applies to the way scholars deal with both older adults' usage patterns and their digital skills and literacy. As Quan-Haase et al. (2018) pointed out, the term "grey divide" (and any account highlighting that older adults are less involved and less skilled in using digital media) "inaccurately assume[s] that older adults have had similar experiences over their life course that homogenised their digital engagement" (p. 1208). By adopting a generic understanding of older digital media users as a "grey zone" (Sawchuk & Crow, 2010), stereotyped views arise, ignoring older adults' differences in usage patterns, skills and attitudes towards the digital world. This "is then used as justification to deprioritise older adults in product design decisions" (Rosales & Fernández-Ardèvol, 2020, p. 1076), assuming that they, as a whole, are less interested and skilled in adopting digital media.

Ageism plays an important role not only in discourses surrounding digital media but also in technology industries due to interrelated factors: "through the homophily that shapes corporate teams, the discriminatory methods inadvertently embedded in their design and development processes and the (obscure) algorithms that increasingly run them" (Rosales & Fernández-Ardèvol, 2020, p. 1081). In observing such phenomena, we need to abandon a techno-deterministic approach by considering the mutual shaping processes that are at stake in the interactions between the materiality of "machines" and the socio-cultural factors that shape and are shaped by them. Technology workers, like every human being, are socially and culturally *situated* and

they operate from a given *standpoint*, which implies explicit and implicit knowledge (including tacit assumptions about the users of digital services). In Western countries, they have been described as disproportionately white and male. They are also younger than the average workforce and share an understanding of age that differs from that of society at large; Rosales and Svensson (2021) highlighted that, according to their own narratives, "young tech workers are under 30, and old tech workers are over 35. Hence, the label 'older' is pushed back by 20 years compared to other professions" (p. 89). The lack of diversity with respect to age and the representations of age shared by technology workers have consequences in the design process and in the configuration of the "model user" of devices and services.

Broader cultural considerations are also at stake in users' negotiations with digital media affordances and in defining the "appropriate" way to use digital platforms. In these processes, culturally situated depictions of different age groups and of the appropriate user for each digital device or service play a major role in shaping ageist (self-)stereotypes regarding older digital media users.

In this chapter, we aim to shed light on the relationship between older adults and digital technology, adopting a mutual shaping of technology and society perspective. In doing so, we focus on three different but interrelated dimensions: (active) ageing as a social construction, ageism within the design process and ageism at the symbolic level. Indeed, those three dimensions all deal with a socio-culturally situated and often normative understanding of "appropriateness": being an "appropriate old person" (active ageing debate), being an "appropriate user" of digital technologies (design level), and adopting "appropriate usage" practices (symbolic level). It is in the interrelations of these dimensions, which will be addressed in the next paragraphs, that important aspects of culture and power relations emerge.

De (digital) Senectute: From disengagement to active and successful ageing (and back)

The relationship between older adults and digital technology can be read through the lens of the active ageing debate, as the configuration of older adults, in terms of what they can do using technology, is problematically related to *who they are*. The active ageing debate intersects with both ageism in the design process (when these frameworks are adopted by designers) and with ageism at the symbolic level, as it influences scholars and policy, permeating people's understanding of old age.

Zaidi and Howse (2017) describe the phases characterising the debate about active ageing: 1940s–1960s: ageing as a social problem characterised by disengagement and dependency; 1970s–1980s: ageing as an economic issue (mostly related to employment issues); 1990s onwards: ageing as a global phenomenon which needs to be analysed through a multidisciplinary approach.

We observe a shift from descriptions of old age as passive and disengaged towards new ones, where older adults assume a participating role within society. Several expressions are used to describe this idea (active ageing, healthy ageing, successful ageing, productive ageing, Zaidi & Howse, 2017), with "active ageing" and "successful ageing" being prominent (Foster & Walker, 2015). Even if they are sometimes used interchangeably, successful ageing emerged as a concept in the United States as an answer to the disengagement theory (the idea that older adults disengage from active society, Cumming & Henry, 1962); active ageing started developing in the 1990s in Europe as a link between activity and health (Foster & Walker, 2015; WHO, 1994). Successful ageing focuses on the most relevant dimensions characterising active older adults; active ageing aims to construct policies for managing ageing populations (Zaidi & Howse, 2017), opposing the unequivocal relationship between old age and decline (Townsend, 2007).

As highlighted by Katz and Calasanti (2015), we owe to Havighurst (1963) the first definition of successful ageing, as an optimistic attempt to improve older adults' living conditions. Rowe and Kahn, from a medical perspective, described successful ageing as a condition characterised by "low probability of disease and disease-related disability, high cognitive and physical functional capacity, and active engagement with life" (Rowe & Kahn, 1997, p. 433).

Some policy documents contribute to our understanding of the underlying cultural context: "Towards a Europe for all Ages" (EC, 1999), starting from the titling, explicitly refers to a socio-cultural semantic, "promoting prosperity and intergenerational solidarity" aiming at "adding life to years" (EC, 1999). The document identifies four challenges: "the decline of the working-age population; expenditure on pensions systems and public finances; the increasing need for care; and diversity among older adults' resources and risks" that lead the Commission to identify four policies: "to increase the employment rate in Europe (by promoting lifelong learning, flexible working arrangements, and improving work incentives); to improve social protection policies and reverse early retirement trends; to support research relating to health policies and old age care; and to develop policies against workplace-based discrimination and social exclusion" (Foster & Walker, 2015, p. 86). Despite the overall goal of considering the ageing population as multidimensional, the solutions mainly deal with the economic sector.

This contrast between a broader understanding of ageing and a sort of economic reductionism is far from being overcome and is one of the most relevant sources of disagreement among scholars. Even the (supposedly) positive shift, from the conception of retirement as social death and disempowerment for older adults (Guillemard, 1972) to this idea of active and productive older adults, can be considered as problematic, as it was the disengagement theory (Cumming & Henry, 1961; Cumming et al., 1960; Hochschild, 1975).

The structural variables characterising how societies conceptualise older adults are intertwined with the phenomenological dimension of being old.

Such a complex relationship makes it hard to obtain a clear picture of what being old means nowadays. As summarised by Zaidi and Howse (2017), the critical debate is characterised by (at least) three main foci: scholars highlighting the exaggerated centrality of work in the definition of active age (Estes et al., 2003); critiques of the relationship between well-being and success (which is implicit in the successful age approach); and authors arguing against the exclusion of marginalised older adults (Powell, 2001).

We can assume that forced retirement is one of the most relevant sources of ageist stereotypes (Walker, 2009) as this specific event hypostatises the lack of older adults' agency, restricting them into a passive and marginalised role. Considering work as the unequivocal way to allow older adults to have an active role within society is, indeed, problematic.

The concept of successful ageing is more implied than operationally defined (Katz & Calasanti, 2015).[1] Even the measurement of autonomy is problematic (Stenner et al., 2011). It is hard to measure (WHO, 2002) and difficult to grasp when described by older adults in empirical research. But it is the very concept of *success* that has been questioned. The complexity associated with a specific stage of life seems to be reduced to a sort of game in a *win vs lose situation* (Dillaway & Byrnes, 2009). Such a renewed interest in older adults' capacity of being active and responsible for their destiny is also problematic. Rowe and Kahn (1997) argued that responsibilising older adults at the personal level neglects the weight of socio-structural variables. This approach has been criticised for not problematising the weight of gender, race and other variables in the definition of old age. Feminist scholars have criticised the active ageing approach due to its tendency to neglect that older women experience an accumulation of disadvantages for being women and old (Zaidi & Howse, 2017). The well-known conditions of inequality that women experience (unemployment, low wages/pensions, lack of economic independence) make it even more problematic to be old (Estes, 2001). Consistently, Schwaiger (2006) elaborates on Woodward's *double ageing* or *multiple ageing* (1999) to address how being woman and older worsens the experience of ageing for women.

Consistently, the so-called "political economy approach" (Zaidi & Howse, 2017) tries to link the personal dimension of being old with the socio-cultural determinants to analyse the complex interrelations of variables that constitute the materiality of old age. Van Dyk (2014) provocatively describes the contrast between "Happy Gerontology" (mainstream gerontology promoting a positive understanding of the potentiality of older adults) and "Critical Gerontology" (a research stream which problematises the optimistic view of old age). Authors considering positive ageing trajectories are influenced by some implicit social values related to consumer culture (Featherstone, 1990; Slater, 1997), which stresses the role of a new social actor who can extend her/his agency through consumption: older adults can actively choose to cross the line of several lifestyles without being forced to get stuck in the passive role of older adults. This approach highlights (or overestimates) the

role of the individual in healthy ageing, creating a meaningful (or problematic) alliance with the privatist approach to healthcare (Moody, 2001). Ageing well is a matter of *doing* something (following recommendations from healthcare systems) more than *being*, even because, due to so-called "age-imperialism", older adults are invited to embrace another age (specifically mid-life norms) in order to be accepted (Biggs, 2004). Critical gerontologists accuse happy gerontologists of perpetuating a different (but no less harmful) form of discrimination towards older adults. According to van Dyk, critical gerontologists propose a concept of *difference* which risks being normative: they problematise mid-age as the unquestioned reference point for evaluating older adults' performances, highlighting that old age must be acknowledged in its specificity, but in so doing, they implicitly refer to an idealised representation of old age (2014). We also need to problematise the positive representation of the uniqueness of old age, considering that concepts such as "mature identity" (Biggs, 1999), "gerotranscendence" (Tornstam, 1997) or *late style* can be patronising and oppressive (Van Dyk, 2014).

The debate is complex and far from stable conclusions. Are we facing an actual rethinking of old age, or rather a new version of ageism that requires a (never-ending) work activity as the exclusive form of legitimation for older adults (Biggs, 2004)? We need to consider that an idealisation of active ageing can be counterproductive, if not an actual means of oppression (Holstein & Minkler, 2007) while assuming that even the critical approach leaves room for an accusation of a patronising attitude towards older adults. Trying to understand the role played by technology means shedding light on the most general relationship between individual agency and social structure.

Observing ageism in the design process

The way in which the conception of (active) ageing has been reframed over time owes much also to the rapid spread of digital technologies and to their promises to improve the quality of life. Therefore, by questioning the role of the (ideal) user of digital artefacts, we try to raise questions aiming at observing ageism in the design process. As highlighted by Oudshoorn and Pinch (2003), technological devices are cultural artefacts that can be considered as *battlefields* where different social groups interact. Following such intuitions, we can assume that each technological device contains a representation of the so-called "ideal user" or, elaborating on Eco (1979a), "model user". Far from being a neutral user, the ideal user is often markedly characterised as young, white and male.

While different approaches have devoted attention to the role of digital media users, we mainly rely on some of those rooted in the social sciences. Before focusing on the ways in which the user has been conceptualised by social construction of technology (SCOT), by feminist scholarship and by semiotic approaches, it is worth recalling how the user entered the debate in computer science and design. In the early years of computers, engineers used

to design hardware systems that were meant to be used by technicians and other engineers (Preece et al., 2002). *Mainframe* computers did not contemplate the user's role as it is currently conceived. While some pioneering thinkers (among others, Engelbart, Licklider, Sutherland) had started elaborating a new conception of the computer as a *symbolic machine*, it was mainly after the rapid spread of personal computers in the 80s that users acquired a recognisable role in computer design. Human-computer interaction itself emerged in those years and, with it, the very concept of the user, together with the then pioneering idea that the user should be put at the centre of the design process. Norman and Draper's (1986) seminal work advocated for the need for a *user-centred system design*. While pioneering researchers (for instance, at the Xerox PARC) and *hobbyists* had already experimented with the constitutive elements of graphical user interfaces (GUIs), interfaces started gaining prominence in the 80s, even outside of Human-Computer Interaction. For instance, Turkle devoted major attention to the cultural role of interfaces in her best-selling book "Life on the Screen" (1995) by addressing the two different *aesthetics* that were confronting each other (epitomised by IBM and Macintosh and their interfaces), which she labels as "modern" and "postmodern".

If the "contemporary notion of 'users'" only appeared in computer science and design in the "late 1970s and early 1980s" (Turkle, 1995, p. 32), different social science approaches addressing the relationship between technology and users themselves *turned to users* in the same timespan (Oudshoorn & Pinch, 2003). The SCOT approach conceptualised users as an active group playing a role in constructing technology and its meanings (Pinch & Bijker, 1984). This perspective also focuses on the *interpretative flexibility* of each technological system: in the early stages of development, we observe a high degree of flexibility, while when it is stabilised, it loses some of it Bijker (1995) relies on the concept of "technological frame" to highlight the link between designers and users. A technological frame "structures the interactions among the members of a relevant social group, and shapes their thinking and acting" (Bijker, 1995, p. 69) and is built "when interaction 'around' an artifact begins" (ibid). The technological frame describes both how actors socially construct technology and how the technical realm influences the social. When considering the design process, Bijker (1995) emphasises technology's "malleability and interpretative flexibility" while, when considering the impact of technology on society, he highlights the need "to conceptualise the hardness or obduracy of technology" (p. 70). The author states that such "hardness" can assume two different forms, "closed-in hardness" and "closed-out obduracy", and exemplifies them by describing the ways in which a young student and the "old-fashioned author of this article" (ibid) would deal with a non-functioning mobile phone. While not systematically addressing age, indeed, the author thus introduces age-related differences in his discussion, even without further problematisation.

By addressing some of the criticism towards early SCOT approaches, Kline and Pinch (1996) recognised the need to consider "the social structure and power relations within which technological development takes place" (p. 767). Power is described as embedded into technological objects, while different social groups have different abilities "to shape the development of an artifact" (ibid) and are, in turn, differently shaped by it. While age is not directly addressed by the authors, this perspective can contribute to our understanding of ageism in the design process. Kline and Pinch (1996) call for a deeper consideration of the gender relationships that occur between different social groups, which represent, in their perspective, an important dimension for understanding power relations. A similar attention to the importance of considering different social groups and individuals also characterises the above-mentioned debate in gerontology.

Feminist scholarship provided historical reconstructions of technology's production, development and diffusion highlighting that most technologies were designed by men and for men. Haraway (1985) demystified the idea that gender was "invisible" in technological development, as several technologies produced an ideal user that was thought to be "objective" (and, of course, male). In the late 80s and 90s, cyberfeminists optimistically emphasised the absence of corporal cues in the online world, which could lead, in their opinion, to bypassing the dichotomous male-female categories (Braidotti, 1996). Haraway's concept of cyborgs as a politicised entity represents an attempt to make an explicit reference to the unnatural theoretical foundations of the "natural" (and neutral) user (Haraway, 1985).

Feminist sociologists have differentiated between three categories of users: end users, affected downstream by the products of technological innovation; lay end users, a concept highlighting some users' exclusion from the expert discourse surrounding technology; implicated actors, who are silent users, affected by the action, and function as a theoretical tool in order to account for potential "invisible actors" (Oudshoorn & Pinch, 2003). Feminist approaches to technology and design are relevant to us not only because they were among the first to raise the question of power relations and of the misrepresentation of a supposed (and misleading) "neutral" user but also because often age-related and gender dimensions intersect when it comes to ICT development and usage.

In deepening our understanding of the role played by users, we can apply concepts deriving from semiotics, recognising that users, like readers, collaborate in the definition of technologies' meanings, thus highlighting the debatable nature of meaning when applied to technology. The semiotic perspective highlights the dynamic nature of the process from which (technology) meaning emerges. By observing the role of the reader in narrative texts, Eco (1979a, 1979b) proposed the idea of a "model reader", who can be described as someone owning all the competencies that are requested by the text, being able to fully cooperate, on an interpretative level, with the text, such as the author has conceived it. The concept can be translated

to technological and digital artefacts by turning it into the "model user" (Deni, 2002) for objects and technological artefacts. The model user can be described as the user that any object foresees as its user, in terms of competencies, skills, goals and usage practices, and tries to create. It opposes the "empirical user", who, like Eco's (1979a) "empirical reader", is represented by each person who actually uses an object and might do so in ways that were not foreseen by the designers: following Hall's (1991) encoding-decoding model, empirical users may adopt "reading positions", with regard to digital media affordances, that can be hegemonic, negotiated or oppositional (Shaw, 2017).

By implying and constructing the desired user, the concept of "model user" leans towards specific skill levels, socio-demographic characteristics, usage practices and goals. This is generally an implicit process: the model user is implicitly embedded in the artefacts and shaped by them. Any empirical user who does not match the characteristics of the model user, including age, might feel unapt to perform his role as a user. As in the case of older adults dealing with digital media, this might translate into self-stereotypes, depicting older adults as unable to deal with digital platforms (Comunello et al., 2017) or assuming, in line with the active ageing perspective, that their technology use should consider the performative capabilities "required" by these technologies more than their ability to adapt to the needs and lifestyle of older adults, whether active or not.

In digital artefacts and services design, an operational translation of the model user can be found in so-called *personas*, which lead designers throughout the process. At this level, several issues emerge with regard to older adults. Overall, like every cultural artefact, digital tools and services are, at the same time, the product of an industrial process, as well as texts to be interpreted. The process of digital tool production might aim at influencing users, pre-selecting a model user who performs a set of usage tactics and strategies, pursuing specific goals with a precise set of skills; appropriation processes, nevertheless, retro-act on the tools themselves, both in terms of meanings and preferred usage strategies.

Considering technological devices as *battlefields* where different social groups interact means considering different intertwining processes. On the one hand, users exert a role in shaping technology, especially in the first stages of its development (interpretative flexibility). On the other hand, designers always design for an implicit or explicit "model user", who is generally, as we learned from feminist approaches to ICTs, thought of as "neutral" but is indeed related to socio-cultural considerations, which are influenced by broader societal processes, as well as by the designers' standpoint. Indeed, socio-cultural considerations and designers' backgrounds tend to converge: ICTs are generally understood as being "young", "male" and (in Western countries) "white". These considerations are consistent with the prevailing developers' and computer scientists' backgrounds (Rosales & Svensson, 2021), and affect, implicitly or explicitly, the design process, as the "model

user" is both embedded in and shaped by digital devices and services. In our opinion, questioning the "model user", and his assumedly "neutral" nature, might contribute not only to a better understanding of the (often hidden) assumptions and power dynamics embedded in technology but also to raise developers' awareness of "unexpected users" (Rosales & Fernández-Ardèvol, 2020).

Nevertheless, we are also convinced that, especially with regard to algorithmic systems and AI, just focusing on system (or design) *biases* alone offers a limited understanding of the dynamics at stake. In contemporary societies, algorithmic systems are – among other functionalities – increasingly responsible for selecting the content and information we get to see in online environments, including social media and search engines (Gillespie, 2014). Scholars have highlighted their biases with regard to gender (Kay et al., 2015) and race (Noble, 2018; Sandvig et al., 2016). While ageist biases in algorithms are hitherto far less studied, some authors, from both STEM and the social sciences, highlighted that age-related biases do not only apply to older adults but also to children (as compared to adults): Brandao (2019) highlighted relevant biases with regard to children in pedestrian recognition and face recognition systems; Chu et al. (2021) discussed digital ageism in AI; while Stypińska (2021) addresses ageist discrimination in algorithms and AI, claiming further attention "for the critical category of age" (p. 1); Kim et al. (2021) explored ageism towards older adults in facial emotion recognition systems.

As Klinger and Svensson (2015) underlined, "Algorithms are deeply dependent on human actors, especially in the first step; the input/design phase" (p. 4665). Furthermore, while *biases* are broadly explored also by computer scientists, to enhance system performances, if we adopt a mutual shaping of technology and society approach, we should not conceive "failures" in algorithms (for instance, to include or correctly represent older adults) just as design-related biases. Instead, we should rather consider the role of both "culture in the code" and "code in the culture" (Airoldi, 2022) because a very important role in shaping algorithmic systems is not only exerted by the socio-cultural, economic and generational standpoints shared by designers, but also by the data with which these systems are fuelled. If ageism is embedded in digital technologies design processes, especially as older adults are often conceived as non-model or unexpected users, ageism is also embedded in society at large when it comes to dealing with digital technologies. All those systems that *learn* from social media feeds or from other datasets are even more likely to enhance this ageist perspective: if ageism is embedded in digital data (and especially in user-generated digital data, as a consequence of a broad socio-cultural understanding of digital media, and of older adults interacting – or non-interacting – with them), and data are used to train and feed algorithms, this ends up reinforcing ageism in the very design process.

Ageism at the symbolic level

The idea of "model users" is not only embedded in technology design and architecture, nor only in technology workers' assumptions. It is also rooted in users' perceptions, especially those of young people (Loos et al., 2012). They tend to consider themselves as ideal users, heavy and savvy (Comunello et al., 2020) compared to older users who are often depicted and self-perceived as technophobic (Comunello et al., 2017; Neves & Amaro, 2012), limited and unskilled users (Comunello et al., 2020).

This gap cannot be reduced to generational clashes but is better understood by considering the interplay between the technical construction of ageism and the construction of ageism at a cultural and symbolic level, where stereotypes and self-stereotypes are at stake (Featherstone & Hepworth, 2005). Stereotypes imply the risk of discrimination and prejudice, being based on over-simplified mental images of an individual (Stallybrass, 1977). When stereotypes refer to old people, they may feed prejudicial attitudes towards them (North & Fiske, 2013), which increase considering the way they approach technology and which are strongly related to the approach society has both towards technology and this lifetime stage (Ayalon & Tesch-Römer, 2018).

We can assume, then, that the (ageist) idea of ideal users is culturally situated and consistent with the values shared by capitalistic and Western societies. Therefore, it deserves to be approached through a mutual shaping perspective (Boczkowski, 2004; MacKenzie & Wajcman, 1999). This problematic idea also characterises the gerontological debate and retroacts towards both designers and users by providing common knowledge grounds to describe and define older adults.

The stereotyped perception of old people as users, widespread in society (Ayalon & Tesch-Römer, 2018) and among younger age groups (Fernández-Ardèvol et al., 2020), is well documented by the number of contents, hashtags and accounts that have been dedicated on social network sites to what old users do with technology and social media platforms (see for example on Instagram: @oldpeopleweb; #oldpeopleonline; #oldpeopledoingthings).

The dominating narratives in these contents are often marked by two intertwined interpretative keys. The first one is aimed at presenting older adults' use of digital devices and social media platforms as something exceptional, emphasising that old people are "unexpected users" since adopting a (presumed) "disruptive and unconventional" approach towards technology (Comunello et al., 2020). The second one focuses on, and makes fun of, the difficulties older users may experience with technologies because of hearing, memory or eyesight problems. Stressing the age-related aspects that may inhibit or limit the supposed proper use of technology, these narratives shape a form of ageism that implies inferiorisation, disabilities and patronage (Comunello et al., 2020; Neves & Amaro, 2012).

A noticeable video circulates on social media (https://www.youtube.com/watch?v=YvT_gqs5ETk), proposing a fake Amazon commercial promoting

Alexa for old adults. The voiceover presents the fake product as "The only smart speaker device designed specifically to be used by the oldest generation: it's super loud and responds to any name even remotely close to Alexa". The stigmatising tone of voice reflects a socially shared thinking expressed by the perspective of ideal users, which is aligned to forms of design paternalism (Peine, 2019; Peine et al., 2014), which already affects technology projects, especially those aimed at creating genuinely adaptive technological devices (Gerontechnology, see Burdick & Kwon, 2004). Most of all, it conveys the idea that involving old people in an affordable use of technology requires the effort of creating an ad hoc design addressing their lack of skills, or physical deficit, instead of their capabilities, without considering nuances (Neves & Vetere, 2019), nor the possibility that old users can be challenged by technology more than comforted from the "overburdening and error" (Peine, 2019, p. 59) that, according to mainstream rhetoric, its use implies for them.

What is noteworthy in a culturological reading of ageism applied to technologies is the subliminal message that these assumptions bring with them. That is, the idea that technologies perform properly when the users themselves are at the top of their performance and have no vulnerabilities or weaknesses. This moves the reflection towards the idea that perceptions and stereotypes related to older technology users reside not only in the idea of the appropriate user but, most of all, on the idea of appropriate usage, consistent with the tendency stereotypes have in creating norms and roles that may affect behaviours (Stangor & Schaller, 2000).

The ideal users, which is grounded on the ideal usage, can be better understood through the concept of media ideologies, which provides a useful lens for understanding how the symbolic dimension of ageism is constructed both culturally and technically.

Media ideologies intervene in technology design and usage, and interplay in the construction and adoption of stereotypes, but also self-stereotypes that older adults interiorise, reinforcing inter-group discrimination processes. Media ideologies are "beliefs about how a medium communicates and structures communication" but also assumptions about how a medium accomplishes communicative tasks (Gershon, 2010, p. 21) and tend to be age- and cultural-specific. They define the understanding of appropriate use of technologies among young and older users, affect the way different age-cohorts interact with each other through technology and clarify how and why the two groups show differences in choosing specific media for specific interactions (Fernández-Ardèvol et al., 2020).

According to Gershon (2010), "people figure out together how to use different media, and often agree on the appropriate social uses of technology by asking advice and sharing stories with each other".

In the context of a case study that compared teenagers' and older individuals' perceptions, for instance, it emerged that young users build their beliefs on the inappropriate usage of technology by looking at the behaviours older adults have on social media platforms; the latter judge young people's

social media usage as wrong looking outside these environments, complaining about their "bad manners" (Comunello et al., 2020).

Those beliefs and assumptions affect the image old users have of themselves (Comunello et al., 2017; Fernández-Ardèvol et al., 2020). Ageism – as well as ageist (self-)stereotypes – influence digital usage habits (Neves & Amaro, 2012), guiding the old generation's specific preferences in technology usage to avoid what they consider age-inappropriate uses, such as: creating friendship groups or sharing personal information on social media (McCosker et al., 2018).

Beyond these self-imposed limits, which can be ascribed to the interplay between media ideologies and (self-)stereotypes and their role in defining what is socially appropriate behaviour on digital platforms for that age group, self-stereotypes affect old people's performance because of the anxiety deriving from facing younger adults with "greater" digital skills (Ivan & Cutler, 2021; Ivan & Schiau, 2016). Therefore, when awareness of these negative stereotypes increases, technology appropriation by this age group can be negatively influenced (Ivan & Schiau, 2016).

Although literature highlighted the heterogeneity in the approaches that different old adults have in appropriating technology (Fernández-Ardèvol, 2020), (self-)stereotypes come into action during all the stages of the domestication process (Silverstone, 2006; Silverstone & Haddon, 1996), mostly affecting some crucial steps. It is especially the case of the initialisation phase, during which old people start using technological devices: this age group may underuse or avoid using technology, fearing that negative stereotypes about their social group could be confirmed (Mariano et al., 2021). Access to the first mobile phone is often promoted by third parties, like relatives, who exert social pressure on older adults, inducing them to purchase a mobile phone. Alternatively, relatives provide older adults with technological devices as a gift or as dismissed devices (Comunello et al., 2015). The phases of acquisition and appropriation of technology become, thus, conflicting processes for older users, and such tension persists in the incorporation step since usability issues appearing in the first stages of adoption may cause rejection. Thus, while self-stereotypes may affect the domestication process, making it appear like a difficult challenge, media ideologies, interplaying with stereotypes, risk frustrating any potential for the positive challenges that technologies can bring to these users.

Therefore, the more (self-)stereotypes are widespread and rooted in culture, the more they may hinder the reduction of the perceived, or actual, gap between the image of young people as ideal users and that of older adults as unexpected users.

Conclusion

In this chapter, we separated ageism in the design process and ageism at the symbolic level for analytical purposes, but if we focus on how users negotiate with tools' and systems' affordances, those aspects are strongly intertwined.

Both aspects, furthermore, are deeply related to the conceptions of old age and of (active) ageing, as it has been (re)framed in the gerontological debate in the light of the spread of digital technologies, as *who* these users *are playing* a major role in the process.

Ageism at the symbolic level operates on, at least, three levels: older adults' (1) dealing with their own self-perceived limitations and weaknesses related to the effort that facing social expectations, policies for active ageing and constant innovation implies; (2) dealing with young people, perceived as ideal users, and their beliefs about supposedly appropriate norms of technology use; and (3) dealing with the materialisation of ageism and related media ideologies, through their symbolic representation which takes shape in UGCs. These are often rooted in the assumption that old users will never come across this content on the social platforms favoured by young people. Nevertheless, it is in this content that older adults' fears and self-stereotypes are confirmed.

The effort to adopt a more inclusive approach both in policies and in technology design is not enough if the content based on the prejudicial depictions of older adults spread on social media platforms. Similarly, a more inclusive cultural approach towards ageing without the unbiased effort of technology workers cannot be decisive. Technology is not able itself to solve all these contradictions, nor is it the only way older adults can unleash their potential. Technology is, indeed, a non-neutral actor playing its role in the very definition of old age, being also deeply implied within the power relations of contemporary society.

In the complex nuances characterising this problematic definition, older adults have the right to accept, and at the same time, question (if not refuse) the empowerment narration that characterises the description of the role played by technology. The mutual shaping perspective suggests that only a socio-technical change could give older users negotiating power to interpret ageing, active or not, in their own way beyond stereotypes, media ideologies, and expectations institutions and other users have on them, as well as impacting settled prejudices and stereotypes.

Ironically, while digital technologies are environments where ageism emerges at different levels, ageism itself is not yet discursively constructed as a widespread social issue by the media. This is one of the reasons why, in our opinion, studying older adults' stereotyping related to digital practices, in the context of uneven power relations, could potentially shed light on, at a broader level, how stereotyping and self-stereotyping work in Western societies.

Note

1 A review of 29 quantitative studies by Depp and Jeste (2006) found 28 different definitions of successful ageing (Katz & Calasanti, 2015).

References

Airoldi, M. (2022). *Machine habitus. Toward a sociology of algorithms*. Wiley-Blackwell.

Ayalon, L., & Tesch-Römer, C. (Eds.). (2018). *Contemporary perspectives on ageism*. Springer Open.

Biggs, S. (1999). *The mature imagination: Dynamics of identity in midlife and beyond*. Open University Press.

Biggs, S. (2004). New ageism: Age imperialism, personal experience and ageing policy. In S. O. Daatland, & S. Biggs (Eds.), *Ageing and diversity* (pp. 95–106). The Policy Press.

Bijker, W. (1995). *Of bicycles, bakelites, and bulbs: Towards a theory of sociotechnical change*. MIT Press.

Boczkowski, P. J. (2004). The mutual shaping of technology and society in videotex newspapers: Beyond the diffusion and social shaping perspectives. *The Information Society*, *20*(4), 255–267. https://doi.org/10.1080/01972240490480947

Braidotti, R. (1996). Cyberfeminism with a difference. In M. A. Peters, M. Olssen, & C. Lankshear (Eds.), *Futures of critical theory* (pp. 239–260). Rowman and Littlefield.

Brandao, M. (2019). Age and gender bias in pedestrian detection algorithms. *arXiv preprint arxiv:1906.10490*.

Burdick, D. C., & Kwon, S. (Eds.). (2004). *Gerotechnology – research and practice in technology and aging*. Springer Publishing Company.

Chu, C. H., Nyrup, R., Leslie, K., Shi, J., Bianchi, A., Lyn, A., McNicholl, M., Khan, S., Rahimi, S., & Grenier, A. (2021). Digital ageism: Challenges and opportunities in artificial intelligence for older adults. *The Gerontologist*, *62*(7), 947–955. https://doi.org/10.1093/geront/gnab167

Comunello, F., Fernández Ardèvol, M., Mulargia, S., & Belotti, F. (2017). Women, youth and everything else: Age-based and gendered stereotypes in relation to digital technology among elderly Italian mobile phone users. *Media, Culture & Society*, *39*(6), 798–815. https://doi.org/10.1177/0163443716674363.

Comunello, F., Mulargia, S., Belotti, F., & Fernández-Ardèvol, M. (2015, August). Older people's attitude towards mobile communication in everyday life: Digital literacy and domestication processes. In J. Zhou, & G. Salvendy (Eds.), *Human aspects of IT for the aged population. design for aging*. ITAP 2015. Lecture Notes in Computer Science, vol 9193. Springer. https://doi.org/10.1007/978-3-319-20892-3_43.

Comunello, F., Rosales, A., Mulargia, S., Ieracitano, F., Belotti, F., & Fernández-Ardèvol, M. (2020). "Youngsplaining" and moralistic judgements: Exploring ageism through the lens of digital "media ideologies". *Ageing & Society* 1–24. https://doi.org/10.1017/S0144686X20001312

Cumming, E., Dean, L. R., Newell, D. S., & McCaffrey, I. (1960). Disengagement-a tentative theory of aging. *Sociometry*, *23*(1), 23–35.

Cumming, E., & Henry, W. (1961). *Growing old*. Basic Books.

Cumming, E., & Henry, W. E. (1962). *Growing old: The process of disengagement*. Basic Books.

Deni, M. (2002). *Oggetti in azione. Semiotica degli oggetti: dalla teoria all'analisi*. Franco Angeli.

Depp, C. A., & Jeste, D. V. (2006). Definitions and predictors of successful aging: A comprehensive review of larger quantitative studies. *The American Journal of Geriatric Psychiatry, 14*(1), 6–20.

Dillaway, H. E., & Byrnes, M. (2009). Reconsidering successful aging: A call for renewed and expanded academic critiques and conceptualizations. *Journal of Applied Gerontology*, *28*(6), 702–722. https://doi.org/10.1177/0733464809333882.

Eco, U. (1979a). *Lector in fabula. La cooperazione interpretativa nei testi narrativi*. Bompiani.

Eco, U. (1979b). *The role of the reader: Explorations in the semiotics of texts* (Vol. 318). Indiana University Press.

Estes, C. (2001). *Social policy & aging: A critical perspective*. Sage.

Estes, C., Biggs, S., & Phillipson, C. (2003). *Social theory, social policy and ageing*. Open University Press.

European Commission (EC). (1999). *Towards a Europe for all ages. Promoting prosperity and intergenerational solidarity.* https://ec.europa.eu/employment_social/social_situation/docs/com221_en.pdf

Featherstone, M. (1990). Perspectives on consumer culture. *Sociology*, *24*(1), 5–22. https://doi.org/10.1177/0038038590024001003.

Featherstone, M., & Hepworth, M. (2005). Images of ageing: Cultural representations of later life. In M. L. Johnson, V. L. Bengtson, P. G. Coleman, & T. B. L. Kirkwood (Eds.), *The Cambridge handbook of age and ageing* (pp. 354–362). Cambridge University Press.

Fernández-Ardèvol, Mireia (2020). Older people go mobile. In R. Ling, L. Fortunati, G. Goggin, S. S. Lim, and Y. Li (Eds.), *The Oxford handbook of mobile communication and society* (pp. 186–199). Oxford University Press.

Fernández-Ardèvol, M., Belotti, F., Ieracitano, F., Mulargia, S., Rosales, A., & Comunello, F. (2020. "I do it my way": Idioms of practice and digital media ideologies of adolescents and older adults. *New Media & Society*, *24*(1), 31–49. https://doi.org/10.1177/1461444820959298

Foster, L., & Walker, A. (2015). Active and successful aging: A European policy perspective. *The Gerontologist*, *55*(1), 83–90. https://doi.org/10.1093/geront/gnu028

Gershon, I. (2010). *The breakup 2.0*. Cornell University Press.

Gillespie, T. (2014). The relevance of algorithms. In T. Gillespie, P. J. Boczkowski, & K. A. Foot (Eds.), *Media technologies: Essays on communication, materiality, and society* (pp. 167–194). MIT Press.

Guillemard, A. M. (1972). *La retraite: une mort sociale. Sociologie des conduites en situation de retraite*. Mouton.

Hall, S. (1991 [1973]). Encoding, decoding. In D. S (Ed.), *The cultural studies reader* (pp. 90–103). Routledge.

Haraway, D. (1985). A manifesto for cyborgs: Science, technology, and socialist feminism in the 1980s. *Socialist Review*, *80*, 65–108.

Havighurst, R. J. (1963). Successful aging. In R. H. Williams, C. Tibbitts & W. Donohue (Eds.). *Process of aging: Social and psychological perspectives* 1 (299–320). Transaction Publishers.

Hochschild, A. R. (1975). Disengagement theory: A critique and proposal. *American Sociological Review*, *40*(5), 553–569.

Holstein, M. B., & Minkler, M. (2007). Critical gerontology: Reflections for the 21st century. In M. Bernard, & T. Scharf (Eds.), *Critical perspectives on ageing societies* (pp. 13–26). Policy Press.

Ivan, L., & Cutler, S. J. (2021). Ageism and technology: The role of internalized stereotypes. *University of Toronto Quarterly*, *90*(2), 127–139. https://doi.org/10.3138/utq.90.2.05

Ivan, L., & Schiau, I. (2016, July). Experiencing computer anxiety later in life: The role of stereotype threat. In *International conference on human aspects of IT for the aged population* (pp. 339–349). Springer.

Katz, S., & Calasanti, T. (2015). Critical perspectives on successful aging: Does it "appeal more than it illuminates"? *The Gerontologist*, *55*(1), 26–33. https://doi.org/10.1093/geront/gnu027

Kay, M., Matuszek, C., & Munson, S. A. (2015). Unequal representation and gender stereotypes in image search results for occupations. In: *Proceedings of the 33rd annual ACM conference on human factors in computing systems*, Seoul, 18–23 April, pp. 3819–3828. ACM.

Kim, E., Bryant, D. A., Srikanth, D., & Howard, A. (2021, July). Age bias in emotion detection: An analysis of facial emotion recognition performance on young, middle-aged, and older adults. In *Proceedings of the 2021 AAAI/ACM conference on AI, ethics, and society* (pp. 638–644).

Kline, R., & Pinch, T. (1996). Users as agents of technological change: The social construction of the automobile in the rural United States. *Technology and Culture*, *37*(4), 763–795. https://doi.org/10.2307/3107097

Klinger, U., & Svensson, J. (2015). The emergence of network media logic in political communication: A theoretical approach. *New Media & Society*, *17*(8), 1241–1257. https://doi.org/10.1177/1461444814522952

Loos, E., Haddon, L., & Mante-Meijer, E. (Eds.). (2012). *Generational use of new media*. Ashgate.

MacKenzie, D., & Wajcman, J. (1999). *The social shaping of technology*. Open University Press.

Mariano, J., Marques, S., Ramos, M. R., Gerardo, F., Cunha, C. L. D., Girenko, A., & De Vries, H. (2021). Too old for technology? Stereotype threat and technology use by older adults. *Behaviour & Information Technology*, 1–12. https://doi.org/10.1080/0144929X.2021.1882577

McCosker, A., Bossio, D., Holcombe-James, I., Davis, H., Schleser, M., & Gleeson, J. (2018). *60+ online: Engaging seniors through social media and digital stories*. Swinburne University of Technology.

Moody, H. R. (2001). Productive aging and the ideology of old age. In N. Morrow-Howell, J. Hinterlong, & M. Sherraden (Eds.), *Productive aging. Concepts and challenges* (pp. 175–196). The Johns Hopkins University Press.

Neves, B. B., & Amaro, F. (2012). Too old for technology? How the elderly of Lisbon use and perceive ICT. *Journal of Community Informatics*, *8*, 1–12.

Neves, B. B., & Vetere, F. (2019). *Ageing and digital technology: Designing and evaluating emerging technologies for older adults*. Springer.

Noble, S. U. (2018). *Algorithms of oppression: How search engines reinforce racism*. University Press.

Norman, D., & Draper, S.(Eds.). (1986). *User centered system design*. Lawrence Erlbaum Associates.

North, M. S., & Fiske, S. T. (2013). Act your (old) age: Prescriptive, ageist biases over succession, consumption, and identity. *Personality and Social Psychology Bulletin*, *39*(6), 720–734. https://doi.org/10.1177/0146167213480043

Oudshoorn, N., & Pinch, T. (2003). *How users matter: The co-construction of users and technology (inside technology)*. MIT Press.

Peine, A. (2019). Technology and ageing – theoretical propositions from science and technology studies (STS). In B. B. Neves, & F. Vetere (Eds.), *Ageing and digital technology* (pp. 51–64). Springer.

Peine, A., Rollwagen, I., & Neven, L. (2014). The rise of the "innosumer" – rethinking older technology users. *Technological Forecasting and Social Change*, *82*, 199–214. https://doi.org/10.1016/j.techfore.2013.06.013

Pinch, T. J., & Bijker, W. E. (1984). The social construction of facts and artefacts: Or how the sociology of science and the sociology of technology might benefit each other. *Social Studies of Science*, *14*(3), 399–441.

Powell, J. L. (2001). Theorising gerontology: The case of old age, professional power, and social policy in the United Kingdom. *Journal of Aging and Identity*, *6*(3), 117–135. https://doi.org/10.1023/A:1011308231981

Preece, J., Rogers, Y., & Sharp, H. (2002). *Interaction design beyond human-computer interaction*. John Wiley & Sons.

Quan-Haase, A., Williams, C., Kicevski, M., Elueze, I., & Wellman, B. (2018). Dividing the grey divide: Deconstructing myths about older adults' online activities, skills, and attitudes. *American Behavioral Scientist*, *62*(9), 1207–1228. https://doi.org/10.1177/0002764218777572

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence*, *26*(5–6), 1074–1087. https://doi.org/10.1177/1354856520930905

Rosales, A., & Svensson, J. (2021). Perceptions of age in contemporary tech. *Nordicom Review*, *42*(1), 79–91. https://doi.org/10.2478/nor-2021-0021

Rowe, J. W., & Kahn, R. L. (1997). Successful aging. *The Gerontologist*, *37*(4), 433–440. https://doi.org/10.1093/geront/37.4.433

Sandvig, C., Hamilton, K., Karahalios, K., & Langbort, C. (2016). Automation, algorithms, and politics. | When the algorithm itself is a racist: Diagnosing ethical harm in the basic components of software. *International Journal of Communication*, *10*, 4972–4990.

Sawchuk, K., & Crow, B. (2010). Into the grey zone: Seniors, cell phones and milieus that matter. *WI: Journal of Mobile Media*, *5*, 17–20.

Schwaiger, L. (2006). To be forever young? Towards reframing corporeal subjectivity in maturity. *International Journal of Ageing and Later Life*, *1*(1), 11–41.

Shaw, A. (2017). Encoding and decoding affordances: Stuart Hall and interactive media technologies. *Media, Culture & Society*, *39*(4), 592–602. https://doi.org/10.1177/0163443717692741

Silverstone, R. (2006). Domesticating domestication. Reflections on the life of a concept. In T. Berker, M. Hartmann, Y. Punie, & K. J. Ward (Eds.), *Domestication of media and technology* (pp. 229–248). McGraw-Hill International.

Silverstone, R., & Haddon, L. (1996). Design and the domestication of information and communication technologies: Technical change and everyday life. In R. Mansell, & R. Silverstone (Eds.), *Communication by design: The politics of information and communication technologies* (pp. 44–74). Oxford University Press.

Slater, D. (1997). Consumer culture and the politics of need. In M. Nava, A. Blake, I. McRury, & B. Richards (Eds.), *Buy this book. Studies in advertising and consumption* (pp. 51–63). Routledge.

Stallybrass, O. (1977). Stereotype. In A. Bullock, O. Stallybrass, & S. Trombley (Eds.), *The Fontana dictionary of modern thought* (p. 601). Fontana/Collins.

Stangor, C., & Schaller, M. (2000). Stereotypes as individual and collective representations. In C. Stangor (Ed.), *Stereotypes and prejudice: Essential readings* (pp. 64–82). Psychology Press.

Stenner, P., McFarquhar, T., & Bowling, A. (2011). Older people and "active ageing": Subjective aspects of ageing actively. *Journal of Health Psychology*, *16*(3), 467–477. https://doi.org/10.1177/1359105310384298

Stypińska, J. (2021). Ageism in AI: New forms of age discrimination in the era of algorithms and artificial intelligence. *CAIP 2021, November 20–24*, Italy.

Tornstam, L. (1997). Gerotranscendence: The contemplative dimension of aging. *Journal of Aging Studies*, *11*(2), 143–154. https://doi.org/10.1016/S0890-4065(97)90018-9

Townsend, P. (2007). Using human rights to defeat ageism: Dealing with policy induced "structured dependency". In M. Bernard, & T. Scharf (Eds.), *Critical perspectives on ageing societies* (pp. 27–44). Polity Press.

Turkle, S. (1995). *Life on the screen. Identity in the age of the internet*. Simon & Schuster.

Van Dyk, S. (2014). The appraisal of difference: Critical gerontology and the active-ageing-paradigm. *Journal of Aging Studies*, *31*, 93–103. https://doi.org/10.1016/j.jaging.2014.08.008

Walker, A. (2009). The emergence of active ageing in Europe. *Journal of Ageing and Social Policy*, *21*(1), 75–93. https://doi.org/10.1080/08959420802529986

WHO. (1994). *Health for all: Updated targets*. https://www.euro.who.int/__data/assets/pdf_file/0006/109779/WA_540_GA1_85TA.pdf

WHO. (2002). *Active aging. Geneva: A policy framework*. https://apps.who.int/iris/handle/10665/67215

Woodward, K. (Ed.). (1999). *Figuring age: Women, bodies, generations*. Indiana University Press.

Zaidi, A., & Howse, K. (2017). The policy discourse of active ageing: Some reflections. *Journal of Population Ageing*, *10*(1), 1–10. https://doi.org/10.1007/s12062-017-9174-6

2 Life stage or Age? Reviewing perceptions of oldest digital technologies users

Jane Vincent

In the early days of user research on digital technologies (including information and communications technologies – ICTs), the emphasis in social sciences studies was on exploring user experiences and the impact of digital technologies on everyday life (for example, Brown et al., 2002; Haddon, 1997; Kant & Mante-Meijer, 1997; Katz & Aakhus, 2002). In the course of "doing being ordinary" (Sacks, 1992), what difference were these new personal digital technologies making to people? The early adopters were invariably business users and younger working adults and as researchers strove to explore this new field of study, they conducted many small qualitative projects among these younger cohorts. Corroborative quantitative data was drawn from sources such as Eurobarometer,[1] World Bank (2017), the ITU,[2] and national statistics,[3] while industry bodies[4] and organisations, such as the European Commission, began to fund larger programmes of study. In such a study in the late 1990s, Ling and his colleagues, who were exploring the future telecommunications user, suggested that the turn of the new millennium was bringing with it transformations in technology that could represent a new age – all aspects of society would be touched by changes in technology and the challenges that these presented. "How are people negotiating the new?" Ling et al. (1997, p. 7) asked as new technologies (and especially the mobile phone) began to penetrate all aspects of daily lives – whether or not people were ready for them. Twenty-five years on and those people who were in their 50s and 60s in the late 1990s are now most of the oldest digital technology users. Their experiences of encountering new technologies have been a constant process of changing mobilities and establishing new ways of doing things, resisting some and embracing others. During this time, they will also have experienced various life stage transitions such as changing jobs, having grandchildren, getting married, retirement, divorce, moving home or to residential care and more. All are events that do not occur at the same age for everyone (many also include those much younger) and each of these transitions increasingly calls for additional digital technologies use that will mostly likely mean changed future use as well. As Urban's (2021) study of the use of assistive technologies in old age suggests, they will have learned new ways of "doing age" – while "doing being ordinary". Yet, as this chapter posits, this oldest age cohort is

not usually included in research exploring adult digital technologies users' experiences. Indeed, it appears that digital technologies research (in academia, industries and governments) that is inclusive of the oldest is underdeveloped and has not kept pace with ageing users, preferring instead to focus on the same age groups – those aged up to 60 or even 50. Notwithstanding the differences in life expectancy around the globe[5] (global average life expectancy is 73 years), research about digital technologies users rarely includes the whole life course of most adults, usually combining all those aged over 60 into a single cohort and disproportionally focusing on the easy to reach 25–40-year-olds (Rosales & Fernández-Ardèvol, 2019). What this means for the oldest age cohorts (that is, those in the aged 60, 70, 80 and 90+ categories) is that they are usually invisible or ignored in most research that deals with the day to day, lived experiences of adult digital technology users. Even in new studies in countries where the life expectancy is over 80, those aged older than 80 are not normally part of study groups.[6] As explored in this chapter, the issue here is not only the age of the participant but also that the samples are not representative of all ages, many excluding the oldest completely. Additionally, those older than 60, many of whom have decades of experience of digital technologies, are now more likely to be examined separately, for example, within gerontological studies. The issues arising from this lack of age inclusivity in studies of digital technologies use are succinctly summed up in two studies, ten years apart, the first by Loe (2011, p. 258), who says of her ethnographic study of some oldest respondents, "Elders, like all of us, exist in circumstances that they cannot control. For example, they live in a culture that generally renders them invisible, patronizes them or treats them as sickly or senile". The second, by Bischof and Jarke, reported that:

> … we have highlighted a number of problematic approaches that, because they do not consider the lifeworlds of older adults and do not include them as active participants in the design process, fall back on cultural imaginaries of old age and ageing that are based on ideas of deficiencies and decline.
>
> (Bischof & Jarke, 2021)

Notwithstanding studies such as these that highlight the problem (see also Amaral & Flores, 2023; Ivan & Loos, 2023; Loos et al., 2018; Peine et al., 2021; Sourbati, 2008), there continues to be a misplaced emphasis on the frailties of the oldest both when they are included in research, or, by exception, when they are excluded from studies of everyday life. It is a sorry indictment of the research community when it appears so many are denying the oldest a voice in research or not reporting their voice in findings unless it is specifically addressing an issue pertaining to the oldest age. This is perhaps also exacerbated by funding agencies who favour projects about the oldest that examine mostly frailties, health and well-being issues (e.g., EU Horizon, 2020 robotics programme; UK Cohort Studies[7]). This is not to say the funding is ageist,

rather that it places too much emphasis on age related decline so that, as a consequence, it delivers an imbalance of research about the oldest age cohorts. This, in turn, reinforces and perpetuates the emphasis on issues of physical and mental decline being the domain of only the oldest whilst also neglecting those of all ages who may be excluded from studies that apply to their circumstances. Notwithstanding this imbalance of research focus, the question remains: how do we find out more about the oldest digital technologies users so as to assuage the apparent misperceptions that this age group are not interested, are luddites or naysayers or are not competent users capable of using and learning about the latest digital technologies? (Davies et al., 2010; Forster et al., 2021).

In this chapter, I thus set out to explore why this apparent age bias in research approaches is a problem for the oldest digital technology users, using the UK as my exemplar. I advocate a life stage approach to studies about digital technologies that is inclusive of all ages, so these cultural imaginaries of the oldest can be replaced with factually relevant evidence pertaining to life events rather than age. Following Garvey and Miller (2021), this cuts a horizontal perspective through an otherwise more usual vertical life course method. This present study takes a reflexive approach, conducting an interpretive analysis of literature comprising secondary data sourced from recent publications and older, extant literature from within the field, including research by the author. The cultural and cyclical aspects of the impact of new digital technologies and their adoption by ageing generations are also an important consideration here, and the discussion is thus framed by the concept of the circuit of culture (Johnson, 1986). The literature discussion will draw on prior studies that explore life stage and life events as a determinant of user experience (Frey et al., 2017; Hareven, 1994; Joyce & Loe, 2010; Taipale et al., 2018; Vincent, 2011, 2018.) for, although the life stages are not defined by technologies, they are certainly impacted by them. For example, parenting, grandparenting and childminding have been transformed by the use of personal computers and tablets for entertainment, education, surveillance and supervision (Mascheroni, 2020), and by smartphones, not least for coordinating last minute changes, participation in events, and more (Vincent & Fortunati, 2009; Walton, 2021). In the following sections, I will begin by exploring the circuit of culture in the context of cultural studies and how it applies to this present study. I will then examine literature about the ageing population in the UK from an intergenerational, life course and life stage perspective and go on to discuss learnings from this literature to challenge ageist approaches and argue for a life stage approach to research that is inclusive of all ages.

Theory

Cultural studies emerged in the UK in the 1970s addressing the tensions within and between politics, academia and institutions as they explored the everyday life. A cultural studies approach does not have one way or a single theoretical approach but, following Stuart Hall's account of its theoretical

legacies (Hall, 1996), there are multiple approaches towards the attainment of knowledge that identified the "organic individual" and an understanding of new and changing practices in people's lives. The circuit of culture approach, originally developed by Johnson (1986), allows the cyclical aspects of the appropriation, adoption and adaption of new cultural experiences to be explored, such as in the incorporation of digital technologies into people's daily lives. An example of this was the examination of the Sony Walkman by Du Gay et al. (1997, 2013), who developed Johnson's original approach, updating it in 2013 to include the mobile phone. More recently, Vincent and Haddon (2018) have applied this concept to exploring smartphone cultures, and collectively, these studies inform and frame my present analysis.

Following Johnson's exemplar of the mini metro car (Johnson, 1986, p. 286), the moment of production of a particular digital technology involves making meanings of the technological device, adapting and appropriating it and comprehending what it stands for; it is then represented in various forms according to its use. At this point, the digital technology becomes open to further interpretations or "readings" where the everyday use by others already knowledgeable about technologies – their "lived experience" – influences and aids the new users. This is particularly apposite for the oldest, who often rely on intergenerational experiences of digital technologies in their process of adoption (Taipale et al., 2018). Du Gay et al. (2013) developed this notion by including representation and identity as the digital technology becomes more meaningful in the lives of its users, both in their own lives and in understanding more about the companies producing the digital technologies. Moving then around the circuit to consumption, the digital technology is explored from the perspective of user experience, but also its role in society and its influence on social relations. Du Gay et al. (2013) added a further point to their circuit of culture, that of regulation, introduced to provide controls over the use of digital technologies where they might threaten everyday social life. I should add here also the recent proposition of an additional point in the circuit, that of "infrastructuring" as postulated by Hartmann in her exploration of the importance of power supply in enabling digital technologies (Hartmann, 2018). The dependence on electricity consumption to enable smartphones (and other digital technologies) to function presents a precarity in their use in a world in which reliable power supply is still not ubiquitous. Thus, in considering how digital technologies such as smartphones and tablets become embedded in everyday life, in the lived experience of the oldest, and indeed all ages, this circuit of culture takes us through the cycle of discovery, learning, appropriating and adapting that leads to the personalisation of the devices, each one with a unique interface with its user, providing a framework for the "organic individual". This shifting and shaping of identities through the adoption of digital technologies is particularly apposite for the oldest users. Older generations have had more time to develop an understanding of their identity than their younger counterparts and, in so doing, have a greater sense of their self (Bolin, 2016; Taipale

et al., 2018). They have many decades of experience in managing their way through new technologies filtering out those that have little meaningful impact on their lives and refining and synthesising them to determine those that are completely necessary or desired.

Literature

The scope of relevant literature for this topic is vast and potentially includes numerous disciplines and fields of study: typically, this covers research that does not include the oldest but probably should; studies of the oldest that would benefit from including comparative data from other ages; life course and intergenerational studies; statistical data about populations; life stage events that may or may not be linked to oldest age; and more. There are also various taxonomies of age that categorise old and the oldest differently that take a generational perspective. Loos et al. (2012, p. 2) suggest two definitions for generations are apposite, that which refers to a particular period within the life course such as being retired, and the other that refers to age cohorts such as baby boomers or the digital generation. Gilleard (2018) refers to the life course, mentioning "baby boomers" as an exemplar. It is noticeable in these examples that the group most left out of studies are those aged older than 75, the "silent generation" (born 1928–1946), and those older. This chapter explores this topic within the United Kingdom, where, with a population approaching 70 million, the number of people in the oldest age group is growing: 1.6 m were aged over 85 in the UK in 2019, a 23% increase since 2002. The number of people aged over 90 in the UK increased by 57% to 609,500 between mid-2002 and mid-2020, including 15,120 aged over 100, reflecting a trend towards an ageing population as well as one for whom the prospects of living into their 80s is more probable year on year (ONSa, 2020; ONSb, 2020). In the UK, the Office of National Statistics (ONS) is a government body that conducts representative sampling and surveys, delivering data which is used for policy and decision-making in government (and much else). In their recently published UK population forecasts (ONS, 2022), the UK life expectancy at birth in 2020 is 87.3 years for males and 90.2 years for females. This is an increase from 79 years and 82.9 years, respectively, from the previous 2018–2020 figures (ONS, 2021) and reflects the improvements in mortality post pandemic. With this ageing population in mind, the focus for this present study is on the perceptions and mis-representation of the oldest in digital technologies research – the cohort from whom we can learn most about the experience of ageing and becoming old. Accordingly, rather than conduct a systematic literature review, I explored articles found from keyword searches focussed on representation in recent UK research including oldest old; ageism; life stage; life course;/digital technologies use. I also drew on literature sources from my involvement in the former EU COST Action IS1402[8] "No to Ageism" and the ACT Project,[9] which have explored issues of ageism, inclusion and exclusion in digital society.

How the oldest see themselves, and how others see them, is central to the debate in this chapter. In exploring the issue of the oldest being excluded from research or being largely overlooked within a 40-year age cohort (aged 60+), one finds it is by no means a new topic; yet, although there are numerous findings that highlight the issue, it is still not being addressed. At the heart of the problem is a lack of acknowledgement that not only do people have changing needs as they age beyond 60, in much the same way as they do from age 20 to 60 but, contrary to misplaced assumptions, they also are capable of adopting new ways of doing things, albeit in a different way than maybe their younger self might have done when, for example, mobile phones first became ubiquitous in the late 1990s. It is also encouraging that it was the pensioners in Europe who were most likely to accept the use of social robots in healthcare (Taipale et al., 2015. 18), highlighting that it is perhaps too easy to make the assumption that the oldest are not interested in embracing new technologies (see also Amaral & Flores, 2023).

How the oldest are portrayed in the media sets expectations: both for older adults, of how they think they should behave, and for younger adults, of what becoming old might be like (Ivan & Loos, 2023; Katz, 2005; Ylänne et al., 2009). Achieving the correct balance between unrealistic activity, frailty and loneliness is problematic: television advertisements for mobility and bathing aids, cruises, burial and life insurance are prevalent in daytime television, portraying fit and immaculately groomed older adults, thus presenting the oldest with a vision of an active and healthy old age. As Katz (2005. 35) highlights, "advertising can also give false promises about ageing and might force older adults to construct themselves as ageless individuals". Changes in how the leisure sector is responding to the participation of older adults show that maybe these are not entirely false, as a recent survey by a UK walking tour company reported: "not only do modern-day pensioners believe they're not actually old well into their 70's but more than a third insist old age doesn't begin until you are over 80!".[10] In contrast, "The Mole Agent" (Alberdi, 2020), a documentary-based film from Chile, provides an example that exposes both misperceptions and less talked about aspects of old age. It opens with a series of men being interviewed for their ability to use a smartphone for a job as a private investigator in a nursing home; they are in their 80s and demonstrate varying degrees of (in)competence. The successful candidate makes reports from the nursing home, where he becomes a temporary resident, using the smartphone (and spy glasses) in an attempt to uncover allegations of neglect and harm made by a resident's daughter who does not visit her. As well as demonstrating the technological competence of the octogenarian "spy", the loneliness and isolation of the care home residents that emerges from his daily record is profound. Alberdi, the Director and writer, comments that over the year, she filmed it, and since the pandemic, there was more contact between families and those in the care home. The film highlights the paradoxes faced by the oldest in society, living their lives mediated by the expectations of family and society that puts them on

a trajectory to potential loneliness or isolation in their final years. However, in its honest portrayal, it also perpetuates the stereotype of how society perceives the very old. Makita et al. (2021), in their study of older users of social media, provide a detailed review of how being old or the elderly is defined and how perceptions of the oldest develop from the representations of this age group. "Posting messages on Twitter is an extension of our everyday interactions and, consciously or unconsciously, we hold an image of ageing and older adults. This image may be reflected in our personal tweets" (Makita et al., 2021, p. 248).

Twitter is a well-used platform in the UK for anti-ageism campaigners challenging the ways old age is portrayed, such as with too many images of wrinkly hands and frailty. In February 2022, the Centre for Ageing Better @ageingbetter, a charity that challenges ageism to ensure "everyone enjoys later life", updated their free library resource of "positive and realistic images of people aged 50 and over".[11] This resource is part of the outcome of a 2018 Report, "That Age Old Question," published by the UK's Royal Society for Public Health (RSPH, 2018). Findings from this report included the views of younger people aged 18–34 of whom 25% believed being depressed and lonely was part of being old. The attitudes of young people to ageing, however, were more positive among the black ethnic populations; differences in cultural and ethnic perceptions of ageing are areas of research that warrant more investigation. Including age as a characteristic of hate speech on social media was one of the RSPH "calls to action", and ageism has also been the subject of discussion in the Independent Press Standards Authority (Strohmann, 2018) regarding whether age should be included in their definition of discrimination within their code of practice for journalists. These examples show the public pressure being placed on policymakers and regulators and, following the circuit of culture, reflect a situation where social action is exerted when the inappropriate use of ageist terms via digital technologies might negatively impact social life.

Turning now to Gilleard's (2018, 2020) seminal work on the oldest, he challenges the ways that society has divided or separated the old, either as a generation that is somehow privileged due to having more money or an aged identity that is characterised by its frailties. Changes in consumerism, the increase in older adults with a higher disposable income, and changes in society that demand a greater self-sufficiency in later life all lead towards changing attitudes toward how older adults see themselves. He argues that we take our identities with us as we age, our musical tastes, our baby boomer ethics and consumerism. Those who were lovers of the Beatles and denim remain in that mode throughout life and do not suddenly change just because they have reached 80, thereby questioning how the oldest might fit within contemporary consumer culture (Gilleard, 1996). These studies are situated in a life course approach (Mayer, 2009) that looks at the whole life of individuals, of which later life, or the 3rd and 4th age as Gilleard names the oldest and oldest old, forms a significant part. My point is that within the life course

experience, there are multiple life stages that do not occur at the same age for all. There can be generalisations such as the age of undergraduates (18–21) or the years in which people become pensioners or retire (over 66), but there are far too many exceptions to ignore. Although it is the silent generation (those born before 1946) that are the oldest alive today, it is consistently the younger generations that are more prominent in digital technologies research. Turning again to the work of Rosales and Fernández-Ardèvol (2019, p. 54), in their analysis of structural ageism and big data, it is notable that many studies fail to reach minorities such as these oldest users, despite awareness in some studies that older users become more active when they start to use digital technologies. The problem of ageism in research, that arises out of misunderstood assumptions and prejudices, is an issue of bias in the design of studies with regard to the samples and tools used. In the former instance, they found that there was a disproportionate number of respondents in their 40s and younger, together with an expectation that because the oldest users were unlikely to exist in any quantifiable numbers, they were not really worth including.

In her study of older adults in sheltered housing Sourbati points out that "Two of the most popular and widely used generalisations are the labelling of young people as being 'online experts' (Livingstone et al., 2005) and older adults as being 'technophobes' (Riggs, 2004)" (Sourbati, 2008, p. 96). Indeed, the oldest adults' digital technologies experiences could be compared to those of the young children: both are very knowledgeable about some aspects of digital technologies but are not experts; they do not have a broad knowledge, rather they learn what they need to know to perform certain tasks but do not learn more than they need. They will also seek help from others, family members and friends who have more knowledge than themselves. Children are considered to be digital natives, as they have not known a world without mobile phones and computers. "Ask a child when you need a tech problem solved", it is often said, and a child will explore and find a solution naively unaware of any non-digital alternative. The oldest adults, on the other hand, are not considered to be digitally confident, are often assumed to all be luddites and not interested or capable, because they have experienced life before mobile phones and digital technologies. They may well not defer to a digital device when they already have an analogue way of solving the problem. This age-based assumption made by some researchers can obstruct the reality in which if a particular life event demands a digital technologies solution it will most likely be adopted.

Following Fernández-Ardèvol et al. (2017) it is also important to find ways of conducting studies with oldest users who may have made conscious decisions regarding their digital technologies use that belie their knowledge and competence with regard to the technologies and their usage. "What is important is to create accounts that grapple with the complexity of the personal histories of engagements of how the older-old engage with mobile devices and any other ICT at a particular moment of life" (Fernández-Ardèvol et al., 2017, p. 52).

Intergenerational research, such as is explored in the volumes by Taipale et al. (2018) and Loos et al. (2018), demonstrates the importance of familial relationships in the adoption of digital solutions, such as using Skype or Zoom to keep in contact with family who have moved away (and when meeting was forbidden during the pandemic) or staying in touch with grandchildren.

In order to mitigate some of the limitations of using only extant literature for this study and my reflexive approach to analysis, during the course of my research for this chapter, I participated in multiple random questionnaires[12] I was offered in my day-to-day life to ascertain what age categories they included. The UK ONS is notable in this literature review for their inclusivity and attempts to identify the over 90s in their data. ONS sourced COVID or Health Surveys in my sample included age cohorts in ten-year categories and a recent survey asking about COVID testing also asked what device the respondent was using to complete the survey. I challenged the authors of a 2021 survey for the local government plan "The Voice of [County]" about why they were asking about housing and transport needs but included everyone over age 65 in one age cohort. They agreed they had missed insights by not including more age bands and that they had already decided to change this in the future. Other responses from the originators of shopping or leisure experience feedback surveys cited the cost of surveying being a limitation; too many age bands generated too much data; they often asked the age of the respondent rather than 65+; or said that I should consult their market research company. These point to the logistics and costs of managing a survey being stronger determinants than to ensure a representative sample, moving instead towards the acceptance that convenience sampling will do.

Another perspective, raised by Lloyd-Sherlock et al. (2016) in their analysis of the health sector, is whether institutional ageism could be the problem. Described as being "characterised by language consistently depicting older adults in negative terms" (Lloyd-Sherlock et al. 2016, p. 1), this is perhaps a corollary to the earlier discussion on discrimination in the media. A claim of institutional ageism is a harsh challenge and one for which there is no specific evidence in the literature explored here. Nevertheless, many of the findings certainly appear to denote a lack of acknowledgment of the value of the opinions of the oldest and a lack of interest in allowing their voice to be heard. Opinions obtained from academic colleagues for the EU COST "no to ageism" study, whom I had asked why they did not include octa, nona and centenarians as a matter of course in their media studies research (Vincent, 2017) suggested a number of reasons. These included the inconvenience or perceived difficulty in finding people who are much older than themselves to survey, but also that they did not feel comfortable interacting with the oldest media users or that they did not use technology, so there was no point. Their responses were not entirely negative as some thought there were opportunities for exploring the growing activist movement among the oldest to fight ageism. Perhaps questions based on criteria for avoiding institutional ageism at the ethics approval and peer review stages of a research

project might at least demand justification for not delivering fully representative samples. However, it would appear that, increasingly, research is based on a convenience sampling approach to the detriment of the hard-to-reach participants.

It appears from the literature that the topic of this analysis has long been recognised by researchers in gerontology and similar fields of study, but it has yet to permeate big data analysis and all fields of research that purports to include the whole life course of adults. People of all ages are expected to access and confidently use digital interfaces for all manner of day-to-day living; thus, it would seem only reasonable to expect them all to be asked about it. There is, however, at least some recognition that there may be a problem with the accuracy of data being used. Within Europe, the Eurostat (2020) statistics are commonly used by many as the basis for determining population estimates. In 2001 it was recognised among the EU countries that these figures were no longer representative of the oldest age groups, particularly those aged older than 90. Each new study builds on baseline data from prior research, thus, when it comes to being representative of all ages the very old are under-represented. However, 20 years on the problem has yet to be fully resolved.

Discussion

Whether or not one uses life stage or age to learn more about the perceptions of oldest digital technologies users, one needs evidence, and it has become clear from literature explored that this is lacking with regard to a breakdown of groups within the aged 60+ cohort. This discussion thus begins by advocating the inclusion of all ages on a representative basis in adult digital technologies research, and particularly the inclusion of the oldest in defined age cohorts for the entire life course. Societies are ageing, people are living longer, and by 2050, those aged older than 65 will account for almost one-third (29.4%) of the population in the European Union (Eurostat, 2020, p. 8), rising from 20.3% in 2019 and with life expectancy also increasing it would seem imprudent not to obtain more knowledge now from those experiencing the oldest ages to plan for this time ahead.

The life stages begin with a change (e.g., job change, grandparenting, moving home) and then transformation, and, following the circuit of culture approach, new ways of doing things are developed as the experiences of others already in that life stage are brought to bear on all aspects of everyday life, including the interaction with and use of digital technologies. Loos et al. (2012, p. 4) highlight that over the course of time, there will be periods when new technologies are not easily taken up, and just because a technology exists does not mean it will be used. However, the enforced isolation of the pandemic lockdown has perhaps shown that technologies that may have previously been by-passed in favour of alternatives do become essential for

many – as Peine's studies suggested, older adults turned to online technologies to keep informed and stay in touch.

> … it is likely that older people [adults] also used technologies while quarantined for more routine domestic tasks, as well as recreational and creative pursuits – for example, ordering groceries, searching for recipes, participating in and producing content for social media, or engaging in online activism.
>
> (Peine et al., 2021, p. 3)

By the time adults reach 75 or 80 years old, their "organic identity" is well developed but still able to be influenced; they will have effectively been around the circuit of culture more than a few times regarding their use of digital technologies and developed and amassed experiences that can be applied to new encounters with digital technologies. Their experiences are more extensive than but different from those of "digital natives", so they provide more measured responses which may differ from responses provided by those with less experience due to their younger years. The point of tension for the oldest with regard to digital technologies use is the constant changes resulting from technological developments. As was alluded to by my former colleagues' attitudes to including the oldest old in their research, there are certainly some differences in how one might conduct research with the different age cohorts.

A 65-year-old in the UK in 2022 is not yet of pensionable age and yet their response to a survey about public transport, housing, shopping experiences, attendance at events and more is considered in the same age cohort as those aged 75, 85 or 95. Decisions about future housing and transport needs, provision of health and well-being services, new product development and more will not be addressing the different needs and aspirations of these age cohorts. As Haddon and Vincent (2018) suggest, the smartphone technology, whilst being at the heart of the day-to-day lives of many people of all generations, is not the only means for communications. In common with other technologies such as personal computers and tablets, it will have its limitations for some users. It may not be the most appropriate, simple to use solution – sometimes pen and paper will do, or the time taken to set up and interact with the device is too long.

Although it is clear from the literature review that there is plenty of recognition that those over 75, and especially those in care homes, are most likely excluded from research as a matter of course (Davies et al., 2010; Sourbati, 2008) there seems to be little change in the approach by researchers. Giving equal opportunity to all adults should be taken for granted. No matter their age, we all "do being ordinary," as Sacks (1992) showed us. However, if research does not ask the oldest users, there will be no opportunity to acquire new knowledge about what the ordinary, or extraordinary, might be for them, and insights will be missed. We cannot leave the acquisition of new knowledge about the oldest only in the hands of those researching the oldest;

this approach makes the research an exception rather than part of the norm. Addressing the issue across all disciplines can, perhaps, be best achieved by focussing on project approvals, including ageism within researchers' code of practice and promoting the avoidance of ageism from a peer review perspective. The more opportunity we have for including the oldest in future research, perhaps the less likely we are to be funding studies on loneliness and loss of cognitive capability. Older adults are life savvy, they are quick to know what makes a difference and what does not, they use lifehacks, "do it yourself" solutions to solve problems (Pierson et al., 2011) and increasingly this includes digital technologies, as the take up of Zoom and WhatsApp in the pandemic has demonstrated. As researchers, though, we owe it to ourselves to be clear that if we say "all adults", we will do so with the confidence that we have included all of them equally.

Conclusion

This chapter set out to explore whether a life stage or age approach is most appropriate for understanding the perceptions of the oldest digital technologies users from within the context of the UK. The challenge of obtaining a variety of independent data sources that are valid representations of all age cohorts has proved a limitation, whilst, at the same time, this is a key factor in highlighting the issues of missed and misrepresentation. Following data trails that lead back to Eurobarometer, the UK ONS, and more as their sources, provide little encouragement that those aged over 60, and certainly those aged over 80, are correctly represented in contemporary society. Reworking the same incomplete data sets in an ageing society is not progress. Whilst there are, indeed, many improvements in the recognition that the oldest digital technologies users are incorrectly perceived within research studies, and in their representation in the media, there are still significant obstacles to ensuring more widespread accuracy of representation. The suggestion that a binary approach of life stage or age might proffer a solution is useful in understanding the issues but does not offer a solution as there is such a paucity of accurate data in either category that provides a breakdown within the 60+ age cohort. Emphasis on either life stage or age does focus attention on missed information and data; for example, insights about the differences between say the assisted living needs of an 80-year-old and 65-year-old, and the similarities between their digital technologies use when childminding grandchildren could be better understood. As Garvey and Miller (2021) suggested, the approach needs to be one of both horizontal and vertical analysis of the data so that variations that are not attributable to age, but which may be to do with a particular life stage or experience, will not be overlooked.

What this exploration of extant literature on the topic of studying the oldest in society has shown is that the problem of under-representation and lack of knowledge of this age group has been a key finding for many for decades, and yet the problem does not appear to abate. The UK ONS explored this point in

the context of the revision of a European Standard, highlighting that however laudable the aim to provide a validated set of statistics might be, if the baseline for that data was founded on inaccuracy the problem would only proliferate. This is particularly pertinent for those aged over 90 for whom there is little foundational data due to the volume of people reaching this age being so few until relatively recently.[13] Obstacles for making a permanent change and to always include oldest respondents appear to be motivated by funding and a belief that the oldest are difficult to reach, but there is also a continuation of the "structural ageism" that Rosales and Fernández-Ardèvol (2019) write about, ageism among researchers and a continuation of preconceived notions that the oldest are in decline and not worthy of inclusion. The claim of institutional ageism attributed to the health sector by Lloyd-Sherlock et al. (2016) may yet be worthy of further exploration in the context of digital technologies user research.

For all researchers, be it a qualitative or quantitative study, a major challenge is usually obtaining a representative sample, but even before this, if they set out with an assumption that a convenient sample is good enough, as well as a negative attitude towards the validity and usefulness of the oldest ages for their study, it is already biased. In the UK, activism about ageism is gaining traction, whilst the Government ONS, together with its European counterparts, are progressing with including representative samples of oldest adults in their studies. Perhaps this will help to drive the same approach within academia, organisations and businesses and their market researchers.

Notes

1 https://europa.eu/eurobarometer/surveys (accessed 28 February 2022).
2 https://www.itu.int/en/ITU-D/Statistics/Pages/datacollection/default.aspx#questionnaires (accessed 28 February 2022).
3 Industry data was rarely shared due to commercial sensitivity.
4 For example www.gsma.com
5 See for latest data https://www.who.int/data/gho/data/indicators/indicator-details/GHO/life-expectancy-at-birth-(years) (accessed 28 February 2022).
6 Recent studies from Gaia et al. (2021) exploring older adults' social networking sites usage in Europe have made progress in including older users in a comparative study of other ages but nonetheless through the lens of the older user.
7 https://www.ukri.org/councils/mrc/facilities-and-resources/find-an-mrc-facility-or-resource/cohort-directory/
8 https://www.cost.eu/actions/IS1402/ 2014–2018 (accessed 28 February 2022).
9 https://actproject.ca/ (accessed 28 February 2022).
10 Survey of 500 grandparents by www.TreasureTrails.co.uk (accessed 10 February 2022).
11 @ageingbetter Tweet 24 February 2022.
12 June 2021 to February 2022. These included questionnaires from Local Government seeking views from residents for their ten-year plan (highest age cohort 65+); feedback on a family outdoor Christmas event (highest age cohort 60+); a shopping experience in a leading department store (60+); attendance at an arts and crafts exhibition (up to 95+); ONS COVID surveys (up to 90+).
13 The effect of loss of life in the WW1 and the post WW1 rise in births is the main contributor to this in the UK.

References

Alberdi, M. (2020). The Mole Agent. Interview Oscar-nominated director Maite Alberdi ("The Mole Agent") on loneliness and empathy | GOLD DERBY. https://www.youtube.com/watch?v=UjR6CKJpyh0 (accessed 28 February 2022).

Amaral, I., & Flores, A. M. M. (2023). Challenging gendered and ageing normative stereotypes on Instagram. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Bischof, A., & Jarke, J. (2021). Configuring the older adult. How age and ageing are re-configured in gerontechnology design. In A. Peine, B. L. Marshal, W. Martin & L. Nevin (Eds.), *Social gerontechnology interdisciplinary studies of ageing and technology* (pp. 196–212). Routledge. https://doi.org/10.4324/9780429278266-18

Bolin, G. (2016). *Media generations experience, identity and mediatised social change*. Routledge.

Brown, B., Green, N., & Harper, R. (Eds.). (2002). *Wireless world social and interactional aspects of the mobile age*. Springer.

Davies, K., Collerton, J. C., Jagger, C., Bond, J., Barker, S. A. H., Edwards, J., Hughes, J., Hunt, J. M., & Robinson, L. (2010). Engaging the oldest old in research: Lessons from the Newcastle 85+ study. *BMC Geriatrics*, *10*, 64. https://doi.org/10.1186/1471-2318-10-64

Du Gay, P., Hall, S., Janes, L., Koed Madsen, A., Mackay, H., & Negus, K. (2013) Second Edition. *Doing cultural studies: The story of the Sony Walkman*. Sage.

Du Gay, P., Hall, S., Janes, L., Mackay, H., & Negus, K. (1997). *Doing cultural studies: The story of the Sony Walkman*. Sage.

Eurostat. (2020). *Ageing Europe – looking at the lives of older people in the EU*. The European Union. https://doi.org/10.2785/628105

Fernández-Ardèvol, M., Sawchuk, K., & Grenier, L. (2017). Maintaining connections. Octo- and nonagenarians on digital "use and non-use". *Nordicom Review*, *38*(Special Issue 1), 39–51. https://doi.org/10.1515/nor-2017-0396

Forster, J., Tullo, E., Wakeling, L., & Gilroy, R. (2021). Involving older people in inclusive educational research. *Journal of Aging Studies*. 56. https://doi.org/10.1016/j.jaging.2020.100906

Frey, R. M., Xu, R., & Ilic, A. (2017). Mobile App adoption in different life stages: An empirical analysis. *Pervasive and Mobile Computing*, 40, 512–527. https://doi.org/10.1016/j.pmcj.2017.01.006

Gaia, A., Sala, E., & Cerati, G. (2021). Social networking sites use and life satisfaction. A quantitative study on older people living in Europe. *European Societies*, *23*(1), 98–118. https://doi.org/10.1080/14616696.2020.1762910

Garvey, P., & Miller, D. (2021). *Ageing with smartphones in Ireland: When life becomes craft*. UCL Press. https://doi.org/10.1177/02673231211045280a

Gilleard, C., (1996). Consumption and identity in later life: Toward a cultural gerontology. *Ageing and Society*, 16, 489–498. https://doi.org/10.1017/S0144686X00003640

Gilleard, C. (2018). The place of age in the digital revolution. In S. Taipale, T-A. Wilska & G. Gilleard (Eds.), *Digital technologies and generational identity ICT usage across the life course* (pp. 11–22). Routledge.

Gilleard, C. (2020). Old age as a new class or an outdated social category? Objective and symbolic representations of later life. *Ageing and Society. First View*, 1–14. https://doi.org/10.1017/S0144686X20001579

Haddon, L. (Ed.). (1997). *Communications on the move: The experience of mobile telephony in the 1990s COST 248 the future European telecommunications user mobile work group*. Telia AB.

Haddon, L., & Vincent, J. (2018). Introduction. In J. Vincent, & L. Haddon (Eds.), *Smartphone cultures*. Routledge.

Hall, S. (1996). Cultural studies and its theoretical legacies. In D. Morley, & K-H. Chen (Eds.), *Stuart Hall: Critical dialogues in cultural studies* (pp. 262–275). Routledge.

Hareven, T. K. (1994). Aging and generational relations: A historical and life course perspective. *Annual Review of Sociology*, *20*, 437–461.

Hartmann, M. (2018). Circuit(s) of affective infrastructuring. Smartphones and electricity. In J. Vincent, & L. Haddon (Eds.), *Smartphone cultures*. Routledge.

Ivan, L., & Loos, E. (2023). The marketing of technology products for older people: Evidence of visual ageism. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Johnson, R. (1986). The story so far and further transformations. In D. Punter (Ed.), *Introduction to contemporary cultural studies* (pp. 277–313). Longman.

Joyce, K., & Loe, M. (2010). Theorising technogenarians: A sociological approach to ageing, technology and health. In K. Joyce, & M. Loe (Eds.), *Technogenarians: Studying health and illness through an ageing, science, and technology lens* (pp. 1–9). https://doi.org/10.1111/j.1467-9566.2009.01219.x

Kant, A., & Mante-Meijer, E. (Eds.). (1997). *Blurring boundaries: When are information and communication technologies coming home?* A Report from the COST 248 Home and Work Group. Fartsta, Telia AB.

Katz, S. (2005). *Cultural aging: Life course, lifestyle, and senior worlds*. Broadview.

Katz, J., & Aakhus, M. (Eds.). (2002). *Perpetual contact mobile communications public talk private performance*. Cambridge University Press. https://doi-org.gate3.library.lse.ac.uk/10.1017/CBO9780511489471

Ling, R., Lohan, M., & Mante-Meijer, E. (1997). Introduction. In A. Kant, & E. Mante--Meijer (Eds.), *Blurring boundaries: When are information and communication technologies coming home?* (pp. 7–12). A Report from the COST 248 Home and Work Group. Telia AB.

Livingstone, S., Bober, M., & Helsper, E. (2005). Inequalities and the digital divide in children and young people's Internet use. Findings from the UK children go online project April 2005 (cited in Sourbati 2008). http://eprints.lse.ac.uk/398/1/UKCGOdigitaldivide.pdf

Lloyd-Sherlock, P., Ebrahim, S., McKee, M., & Prince, M. J., (2016). Institutional ageism in global health policy. *BMJ* 354:i4514. https://doi.org/10.1136/bmj.i4514

Loe, M. (2011). *Aging our way*. Oxford University Press. https://doi.org/10.1007/s11133-012-9232-6

Loos, E., Haddon, L., & Mante-Meijer, E. (Eds.). (2012). *Generational use of new media*. Ashgate.

Loos, E., Nimrod, G., & Fernández-Ardèvol, M. (Eds.). (2018). *Older audiences in the digital media environment: A cross-national longitudinal study. Wave 1 Report 1.0.* ACT Project. http://spectrum.library.concordia.ca/983866/

Makita, M., Mas-Bleda, A., Stuart, E., & Thelwall, M. (2021). Ageing, old age and older adults: A social media analysis of dominant topics and discourses. *Ageing & Society*, *41*, 247–272. https://doi.org/10.1017/S0144686X19001016

Mascheroni, G. (2020). Datafied childhoods: Contextualising datafication in everyday life. *Current Sociology*, *68*(6), 798–813. https://doi.org/10.1177/0011392118807534

Mayer, J. (2009). New directions in life course research. *Annual Review in Sociology*, *35*, 413–433. https://doi.org/10.1146/annurev.soc.34.040507.134619

ONS Office of National Statistics. (2021). *National life tables – life expectancy in the UK: 2018 to 2020*. 23 September 2021. https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/lifeexpectancies/bulletins/nationallifetablesunitedkingdom/2018to2020 (accessed 28 February 2022).

ONS Office of National Statistics. (2022). *Overview of UK Population 2020*. 25 February 2022. https://www.ons.gov.uk/releases/overviewoftheukpopulation (accessed 28 February 2022).

ONSa Office of National Statistics. (2020). *UK Estimates of the very old, including centenarians*. UK: 2002 to 2019 statistical bulletin. 24 September 2020. https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/ageing/bulletins/estimatesoftheveryoldincludingcentenarians/2002to2020

ONSb Office of National Statistics. (2020). *Population estimates for the UK, England and Wales, Scotland and Northern Ireland: Mid-2019*. https://www.ons.gov.uk/peoplepopulationandcommunity/populationandmigration/populationestimates/bulletins/annualmidyearpopulationestimates/latest

Peine, A., Marshal, B. L., Martin, W., & Nevin, L. (Eds.). (2021). *Social gerontechnology interdisciplinary studies of ageing and technology*. Routledge.

Pierson, J., Mante-Meijer, E., & Loos, E. (Eds.). (2011). *New media technologies and user empowerment*. Peter Lang.

Riggs, K. E. (2004). *Granny@Work: Aging and new technology on the job in America*. Routledge (cited in Sourbati 2008).

Rosales, A., & Fernández-Ardèvol, M. (2019). Structural ageism in big data approaches. *Nordicom Review*, *40*(Special Issue 1), 51–64. https://doi.org/10.2478/nor-2019-0013

RSPH. (2018). *That Age Old Question: How attitudes to health affect our health and wellbeing*. Report available at https://www.rsph.org.uk/static/uploaded/a01e3aa7-9356-40bc-99c81b14dd904a41.pdf (accessed 28 February 2022).

Sacks, H. (1992). *Lectures on conversation Vol 2*. Blackwell.

Sourbati, M. (2008). On older people, Internet access and electronic service delivery. A study of sheltered homes. In E. Loos, E. Mante-Meijer, & L. Haddon (Eds.), *The social dynamics of information and communications technologies*. pp. 95–104. Ashgate.

Strohmann, B. (2018). *IPSO Blog: Striking a balance – positive and negative stereotypes in the media*. https://www.ipso.co.uk/news-press-releases/blog/ipso-blog-striking-a-balance-positive-and-negative-stereotypes-in-the-media/ (accessed 28 February 2022).

Taipale, S., de Luca, F., Sarrica, M., & Fortunati, L. (2015). Robot shift from industrial production to social reproduction. In J. Vincent, S. Taipale, B. Sapio, G. Lugano, & L. Fortunati, (Eds.), *Social robots from a human perspective* (pp. 11–24). Springer.

Taipale, S., Petrovcic, A., & Dolnicar, V. (2018). Intergenerational solidarity and ICT usage: Empirical insights from Finnish and Slovenian families. In S. Taipale, T.-A. Wilska, & C. Gilleard (Eds.), *Digital technologies and generational identity, ICT usage across the life course* (pp. 69–86). Routledge.

Urban, M. (2021). *Topographies of ageing a new materialist analysis of ageing-in-place*. Routledge.

Vincent, J. (2011). *Emotions in the social practices of mobile phone users*. Thesis submitted for the degree of Doctor of Philosophy, University of Surrey, available https://openresearch.surrey.ac.uk/esploro/outputs/doctoral/Emotion-in-the-Social-Practices-of/99516501102346

Vincent, J. (2017). How well are octo, nona and centenarian age cohorts represented in UK media and communications research? Paper presented *at ECREA Digital Culture and Communication Section Conference*. 6 & 7 November 2017. University of Brighton.

Vincent, J. (2018). Electronic emotions, age and the life course. In S. Taipale, T.-A. Wilska, & C. Gilleard (Eds.), *Digital technologies and generational identity, ICT usage across the life course* (pp. 201–216). Routledge.

Vincent, J., & Fortunati, L. (Eds.). (2009). *Electronic emotion, the mediation of emotion via information and communication technologies*. Peter Lang.

Vincent, J., & Haddon, L. (Eds.). (2018). *Smartphone cultures*. Routledge.

Walton, S. (2021). *Ageing with smartphones in urban Italy: Care and community in Milan and beyond*. London UCL Press. https://www.uclpress.co.uk/collections/anthropology/products/171345 (accessed 28 February 2022).

World Bank. (2017). *Population ages 65 and above (% of total)*. https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS?view=map

Ylänne, V., Williams, A., & Wadleigh, P. M. (2009). Ageing well? Older people's health and well-being as portrayed in UK magazine advertisements. *International Journal of Ageing and Later Life*, *4*(2), 33–62. https://doi.org/10.3384/ijal.1652-8670.094233

3 Silicon Valley ageism – ideologies and practices of expulsion in the technology industry

Justyna Stypińska, Andrea Rosales and Jakob Svensson

Silicon Valley is the US centre for innovative technology and home to 2000 technology companies, the densest concentration in the world. Even more important, most of these companies are also industry leaders in areas that include robotics, artificial intelligence (AI), social media and other uses of the internet. Silicon Valley sets standards for others. Companies worldwide look up to the technology giants to incorporate their business models and management styles (Gold, 2018). "The future looks Californian", writes Sidney Rothstein, saying that California has captured the imaginations not just of consumers but also of policymakers (Rothstein, 2017). Digital transformation, advocated by political leaders as the cornerstone of future economic growth and combatting climate change, is being driven by those companies in an oligarchic way. Digital oligarchy is the fastest growing consolidation of power in the contemporary economic system. In fact, the number of influential technology companies is expected to shrink from 70 in 2017 to 30 by 2030 and possibly 10 by 2050 (Andriole, 2018).

Yet, these companies show rampant signs of various types of systematic biases and prejudice (Cook, 2020; Lyons, 2016), ageism being one of them. Gullette observes: "Silicon Valley can, in fact, be the most ageist place on the Earth" (Gullette, 2017, p. xx). Surveys carried out among workers in technology companies confirm that ageism is a reality for the workers in Silicon Valley. A survey among American tech workers shows that 76% of respondents say ageism exists in tech globally, while 80% of those in their late 40s say they are concerned that their age will affect their careers (Dice, 2018). Interviews conducted in Silicon Valley also suggest a hidden norm that no one over 35 will be hired (Svensson, 2021).

Not only are workplace relations and the careers of "older" tech workers at risk, but there is also a growing concern about how new technologies – including AI or big data approaches – are biased towards the young user (Rosales & Fernández-Ardèvol, 2019; Stypińska, 2022). There is ample evidence that biases in the tech industry translate into biases in the technology products and services developed there, particularly in cases of sexism or racism (Cook, 2020) and increasingly in cases of ageism (Rosales & Fernández-Ardèvol, 2020).

A plethora of anecdotal evidence and media coverage points to the brutal and ubiquitous character of ageism in technology industry. At the same time, empirical data, and a systematic approach to studying this phenomenon, are scarce in scientific literature. This chapter aims to explore and characterise the specific nature of ageism in Silicon Valley. While this has clear similarities to how culture is historically ageist and how this has a bearing on the technology culture today (see Svensson in this volume). The main purpose of this chapter is to propose a theoretical framework guiding future empirical and critical research into the phenomenon of ageism and perhaps other systems of oppression and discrimination in the technology industry. We, therefore, propose a conceptual framework of Silicon Valley Ageism to explore (1) what narratives of age are constructed in Silicon Valley companies and start-ups, (2) how this relates to workplace practices in the Valley and (3) how this has a bearing on the products and services coming out of Silicon Valley.

Silicon Valley ageism

Ageism and age discrimination have been prevalent in different ways and forms in various branches and sectors of the economy (Ayalon & Tesch-Römer, 2018). Ageism in employment and labour relations is, in fact, one of the oldest forms of ageism, which has been studied extensively for decades, as well as legally prohibited since 1967 in the US and 2004 in EU member countries (Stypińska & Turek, 2017). Various theories explain the origins of ageism and age discrimination in the labour market. Originating in social psychology, the Intergroup Contact Theory (Allport, 1954), one of the most prominent and empirically tested, suggests that properly managed contacts should reduce issues of stereotyping, prejudice, and discrimination that commonly occur between competing groups. Lack of contact between different age groups might thus lead to increased ageism and age discrimination. A socio-historical Modernization Theory (Cowgill & Holmes, 1972) claims that changes involved in the growth of industrial societies, with the crucial role of modern technology, cause a decline in the status of older persons and the development of ageism. More recent approaches, such as multilevel and dynamic organisational perspectives (Turek et al., 2022) strive to explain the underlying mechanisms of how stereotypes affect hard, soft and self-discrimination based on age in the workplace. Moreover, the concept of "relative age", referring to an individual's age as compared to the average or mean age in a sector, company or profession (McMullin & Dryburgh, 2011), can be a good starting point for understanding discrimination against individuals in a concrete enterprise setting.

Silicon Valley, apart from being a geographical territory, is also a conceptual artefact. It is home to many start-ups and global technology companies, and globally it is a symbol for the creation of digital technologies, the milieu of innovation (Castells, 1998) and one of the superpowers, next to China, in the global AI race (Lee, 2018). But it is also a place with its own myths

and even psychology (Cook, 2020). Defining it is an elusive task. In our understanding of the technology industry in Silicon Valley, we draw on the definition by Bartlett, who proposes to understand the technology industry as "the digital technologies associated with Silicon Valley —social media platforms, big data, mobile technology and AI – that are increasingly dominating economic, political and social life" (Bartlett, cited in Cook, 2020, p. 4). It includes both the technology giants as well as medium-sized companies and start-ups.

Digital transformation and the fourth industrial revolution (Industry 4.0) are behind the rapid and unprecedented rise in power, size and relevance of the technology industry globally. The founder of the World Economic Forum, Schwab, coined the term "Fourth Industrial Revolution" and described a new era characterised by a technological revolution "that is blurring the lines between the physical, digital and biological spheres" (Schwab, 2016). One where our lives will ultimately be altered by emerging technology breakthroughs in fields such as AI, robotics, the Internet of Things, autonomous vehicles, 3-D printing, nanotechnology, biotechnology, materials science, energy storage and quantum computing (Schwab, 2016). As a result, we observe that jobs in the technology industry are growing steadily. However, there are suggestions that this expansion might increase ageism and age discrimination in the workplace (Sink & Bales, 2016). Programming languages keep changing, and Silicon Valley programmers must keep learning throughout their professional lives to remain relevant or leave the scene for younger programmers (Rosales & Svensson, 2021).

The classical definition of ageism as "a systematic stereotyping and discrimination against people because they are old" (Butler, 1975) paved the way for understanding this phenomenon. Even though the use of chronological age as a cut off for defining older workers is not straightforward, a scoping review of research on age discrimination in the labour market demonstrated that ageism starts to affect workers who reach at least 45 years of age (Harris et al., 2018). As we will demonstrate in this chapter, "Silicon Valley Ageism" is directed against persons of much younger chronological age (already in late 20s, 30s and 40s). An online survey among technology workers shows that one-fourth of respondents in their early 30s already regard age as a barrier to obtaining a new job (Dice, 2018). Another study, carried out among UK workers, revealed that on average, across the wider workforce, people said they first started to experience ageism at work at an average age of 41, while IT workers say they first experienced this at an average age of 29 (Sevilla, 2020). In Rosales and Svensson's (2021) interview study of technology workers worldwide, 35 is the age when they are considered "old". Programmers over 40 are considered not to have the cognitive capacities required for a programming job or have other priorities beyond the commitment to job. They often worry whether they would be able to continue with all the effort required to be a programmer when they are in their 40s or 50s (Rosales & Svensson, 2021).

In this chapter, we conceptualise "Silicon Valley Ageism" as negative attitudes, beliefs, and behaviours towards older adults – manifested in interpersonal relations and institutional practices – as well as narratives about age and old age present in various ideologies and myths about Silicon Valley. Silicon Valley Ageism is characterised by an earlier onset in terms of chronological age than ageism in other areas and its effects result in the *expulsion* of older workers *from* the technology industry and narratives of ageing and older age *from* discourses.

To explore Silicon Valley Ageism, we draw theoretically on the concept of "expulsions" proposed by Sassen (2014). She uses the term to describe the extreme forms of exclusion and marginalisation in contemporary global economic relations, exclusions which are no longer possible to describe under the label of social inequalities. In her book, "Expulsions. Brutality and complexity in the global economy" she argues that the past two decades have seen a sharp increase in the number of people, enterprises and places expelled from the core social and economic orders of our time, as well as Earth's biosphere through destruction of the natural environment (Sassen, 2014). In place of the principle of inclusion in the pre-1980s Keynesian era, the planet is progressively governed by a principle of excluding people, land, natural resources, and water. Sassen writes, "the notion of expulsions takes us beyond the more familiar idea of growing inequality as a way of capturing the pathologies of today's global capitalism" (2014, p. 1). Examples of expulsions analysed by Sassen include austerity policies in Greece and Spain, land-grabbing (industrial acquisition of land) methods, or complex financial instruments resulting in mass homelessness in the USA after the mortgage crisis. The common denominator of those practices is the sweeping destructive effect on certain groups and populations leading to their marginalisation and disappearance from statistics and discourses. The expulsions are hidden behind a high level of complexity, which, as Sassen (2014) argues, became the organising principle of modern order-making systems, such as global finance or environmental protection.

Even though Sassen's book centres primarily on issues such as land grabs, the impact of structural adjustment and austerity programmes, financial speculation and fraud, as well as environmental destruction and degradation, we argue that the concept of expulsions can also be applied to Silicon Valley modes of operation. A vivid exemplification of this is put forward by Lyons in a book documenting his experiences in a technology start-up:

> Silicon Valley has a dark side (…) it is a world where wealth is distributed unevenly and benefits accrue mostly to investors and founders, who have rigged the game in their favor. It's a world where older workers are not wanted, where people get tossed aside when they turn forty.
> (Lyons, 2016, p. 115)

In this chapter we focus on the expulsions of workers (based on their perceived relatively older age) and images of ageing from the socio-technological
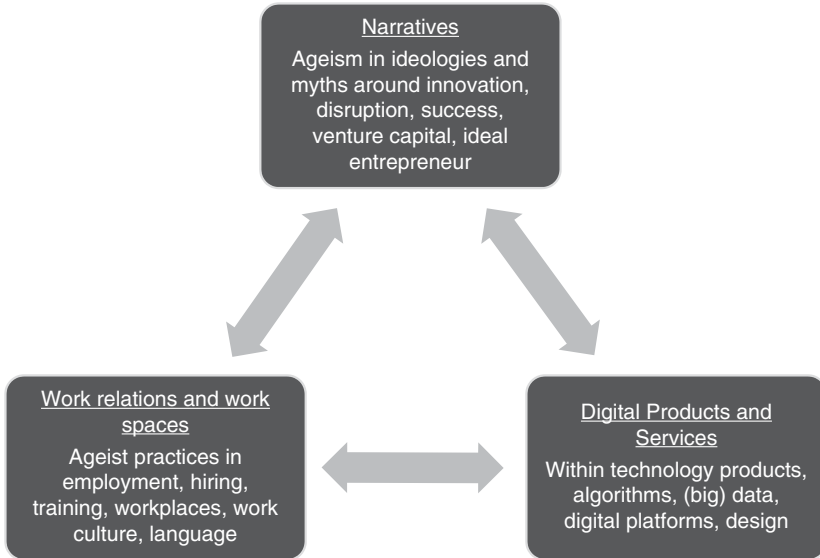
Figure 3.1 Silicon Valley ageism: The structure of multiple modes of expulsions.

systems. Using Sassen's (2014) terminology, we want to argue that the technology industry, with its champion Silicon Valley, has created a space of multiple modes of expulsions of old age and older people from (1) narratives, (2) work relations and workspaces and (3) digital products and services (see Figure 3.1).

Silicon Valley ageism: Narratives

Silicon Valley is a product of a series of narratives which shape and reshape ideologies and myths surrounding allegedly the most innovative place on Earth. Silicon Valley colonises the public imagination with visions of successful entrepreneurs, unicorn start-ups, ground-breaking innovation, cutting-edge technologies and lucrative business solutions. Some even argue that the biggest invention of Silicon Valley is the entrepreneurial and start-up culture (Fisher, 2018). The importance of these ideologies and myths for creating the meaning of Silicon Valley is underlined by Cook, who writes: "Silicon Valley is full of myths. Some of which are true. Many of which are not" (Cook, 2020, p. 67). The success behind the myths, stories and ideologies of Silicon Valley may be due to conscious and concerted efforts by various spin doctors and marketing agencies in the Valley and/or an effect of the spectacular commercial successes of the biggest players in the game (Cook, 2020). Either way, the promises and slogans of the technology industry, "making the world a better place" (Svensson, 2021), fall short of the reality of change they produce. In this section, we reflect on different types of narratives, ideologies

and myths surrounding the concepts of (1) innovation and disruption, (2) the ideal type of young entrepreneur/start-up founder and (3) ageing bodies and mortality in Silicon Valley.

The first narrative to be examined is that regarding the meaning of innovation and disruption. Silicon Valley Ageism occurs in companies driven by high innovation risk-taking, often financed by venture capitalists (start-up sector). It originated in a mindset that started during the dot-com explosion when young programmers monopolised technical know-how when launching digital start-up companies. Most of them were in their early 20s, and being 32 was already considered too old for investors. Indeed, investors are often dazzled by young programmers' passion and velocity (see Lyons, 2016; Rosales & Svensson, 2021). Here, the concept of disruption, originating in innovation and business theory, is essential. Disruptive innovation is "innovation that creates a new market and value network and eventually disrupts an existing market and value network, displacing established market-leading firms, products, and alliances" (Rahman et al., 2017, p. 112). Svensson (2021) argues that disruption is a core value in technology culture as it is conceived of as driving innovation, progress and success. These are the stories of "unicorn-start-ups"[1] with implausible success or established technology giants that started as the hobby of two geeks in their early 20s in a garage, which hold the collective imagination and frame the way success is understood in Silicon Valley. The unicorn, as a mythical creature that is rarely seen and almost impossible to capture, becomes a metaphor of the improbability of a start-up's success (Svensson, 2021). Ensmenger (2015) describes this narrative in terms of the underdog who, against all odds, produces technology immediately recognised as revolutionary; the lonely nerd that "turned accidental billionaire", and points at its importance in contemporary Silicon Valley imagination. Such narratives imply that anyone over 30 is incapable of innovation. The value given to the young age of start-up founders is entangled with an ideology that innovation, and more precisely the disruptive type of innovation, is an attribute of youth. "People under 35 are the people who make change happen (…) People over 45 basically die in terms of new ideas", said venture capitalist Vinod Khosla (Sink & Bales, 2016). Such blunt statements create a rather uncanny narrative about innovation and age, which seems to permeate the ideologies and values on which Silicon Valley is founded.

Second sort of narratives reinforcing ageism in the technology industry are those referring to the ideal type of entrepreneur and entrepreneurship and the intertwined meaning of success dominant in Silicon Valley. Slogans created by the industry range from Google's "Don't be evil" to Facebook's ambition to "bring the world closer together" to "revolutionising healthcare" – a claim made by now infamous Elisabeth Holmes and her company (unicorn start-up) Theranos. The case of Holmes is an excellent exemplification of how chronological age interplays with ideas of an ideal entrepreneur prevalent in Silicon Valley. The start-up, founded in 2003 by the then 19-year-old

college dropout, had all the necessary features of a Silicon Valley fairy tale. It operated in "stealth mode" for a decade while developing a new technology to perform many standard medical tests using only a single drop of blood. During this time, Theranos raised more than $700 million from investors (including billionaires Rupert Murdoch and Larry Ellison), who valued the company at $9 billion (Forbes, 2022). The media coverage of Holmes began when her start-up company managed to win immense amounts of venture capital and ended with her indictment and multiple charges of wire fraud and conspiracy to commit wire fraud. Regardless of the content of the given coverage, the young age of Theranos' founder and CEO was continually mentioned as her most characteristic trait, next to being depicted as charismatic, brilliant, and visionary. Due to her astonishing success at such a young age, she belonged to the club of the most spectacular careers Silicon Valley has ever witnessed. Like many other high-school dropouts (another ageist myth dominating Silicon Valley, see Svensson, 2021), she was frequently compared to Jobs, or the founders of Facebook and Google, who started their companies at a very young age. In 2014, when she was 30 years old, Forbes named Holmes the world's youngest self-made female billionaire – worth $4.5 billion. On 18th November 2022, she was sentenced to 11 years and 3 months in federal prison for defrauding investors in Theranos, Inc. of hundreds of millions of dollars (Office of the United States Attorney, 2022).

Silicon Valley's fascination for the young entrepreneurs is prevalent in Fisher's (2018) book about Silicon Valley. The whole chapter on Atari, a legendary video game company, is a tale of a group of boys having fun. Fisher provides stories about young people dedicating their lives to their companies and spending all their time in the office. "It did not look like a business whatsoever – it looked like a bunch of kids in their mid-twenties, you know, screwing around", as Google's executive Ayers phrases it, reflecting on the early days of Google (in Fisher, 2018, p. 279). "Everyone was twentysomething except for me, who was ancient at thirty-five" (Cairns, in Fisher, 2018, p. 281). Napster (one of the first file-sharing programs) programmer Aydar says that he was the older guy even though he was only 23 (Fisher, 2018). Napster is a prime example of Silicon Valley's weakness for youth, as it was created by Fanning when he was in his early teenage years. Hence, there seems to be a belief in Silicon Valley that "young people are just smarter", as Zuckerberg bluntly puts it (Fisher, 2018, p. 362).

This, and many similar stories, feed into the myth of a technology innovator and entrepreneur as a young person with a bold vision, determined to achieve exceptional success in a very short time. These images are further strengthened by entrepreneurs being profiled according to their age by business magazine outlets such as "Forbes 30 under 30" or "The Business Journal's Forty Under 40". This age-based framing of success stories of people's careers creates a rigid and impermeable system which divides people into categories of those who succeed and those who fail, and which does not account for the diversity of human life courses and different life experiences

by syphoning off only those who accomplished success before a certain age. Through such arbitrary age limits, a false perception of entrepreneurial success is created as something which is intrinsically age related. This, in turn, creates a reality where those who do not fit the age limits are symbolically expelled from even the potential for success, at least in a figurative way.

In the last few years, several memoirs documenting this reality have been published. Wiener describes her experiences as a misfit in Silicon Valley and being advised "that San Francisco is the best place to be young. You should try to go there before it is too late" (Wiener, 2020, p. 32). She reports how corporations offer a bonus at the start of the contract to attract young, qualified candidates and have offices that are more comfortable to live in than the flats they can rent in San Francisco. She also describes a sexist and ageist culture where people ask: "How would you explain that to your mother?" assuming that older women would have more difficulties understanding innovative digital technologies. Lyons (2016), in his memoirs, recalls multiple situations where his age stood in blatant contradiction to the ideology of the company he worked for and the way it handled its business and its workers. Both he and Wiener observe that the prevailingly young employees are ready to give their hearts and souls for the success of the company and, what's more, they are not only in the "best place to be young", but they feel privileged as employees and that with their disruptive innovations they are changing the world.

The last narratives of Silicon Valley to be discussed are those evolving around ageing, ageing bodies, the fear of death and obsession with immortality. These narratives create an unconscious bias against anyone and anything, which represents a reminder of ageing. Ageism here is the revulsion at the prospect of one's future self and that human beings manage deeply rooted fears about their vulnerability to death through symbolic construction of meaning (Martens et al., 2005). The management of this fear can take on a variety of forms, one of them being large financial investments in technologies in the anti-ageing industry. Recent media coverage about vast investments in the development of longevity medicine, fuelled by money from, inter alia, Jeff Bezos and other prominent figures (Sample, 2022) reveals the troubled relationship of technology industry giants with ageing and dying as an integral part of the human experience. A plethora of start-ups is involved in the race to find the ultimate fix for long life. There have been significant advances in the field of regenerative medicine, which promises an extension of life span. These technologies, including deep learning algorithms, mark a new era of research into biological ageing and the (alleged) possibility of slowing down, stopping or even reversing ageing processes on a cellular and molecular level (Zhavoronkov et al., 2021). With the goal of increasing a healthy lifespan, these technologies are indeed shifting how we think about health, sickness and ageing (Woods, 2020). Aubrey de Grey, biotechnologist and a prominent figure in regenerative medicine and in the anti-ageing movement suggests provocatively: "I think there is at least a 50/50 chance that most people alive

today will live to 1000 years old" (Sens Foundation, 2021). Those attempts should finally lead to the expulsion of ageing and problems related to it, as well as death, from the life experience of the technology oligarchs, giving them a supra-human status.

Indeed, technology has a problem with bodies in general and ageing bodies in particular. Hackers have always had a problematic relationship with the body. In popular depictions, they are (usually) overweight and unattractive, spending long hours in front of a computer screen neglecting their bodies, but behind the computer they are omnipotent (Thomas, 2002). As Levy (1984) puts it, programming is the ultimate disembodied activity. It is possible to trace this imagination to technology culture's origin in the 60s counter-cultural movement and hippie influence (see Svensson in this volume). The out-of-body experience induced by LSD and other psychedelic drugs greatly impacted how some pioneers imagined the future and the role of computers in it. It was believed that in an LSD trip, users escaped their bodies and experienced a kind of consciousness shared with all living things. This was compared to computer-mediated communication in which users could share experiences and communicate without being as dependent on having their physical bodies present in the same room (see Turner, 2006). To enter cyberspace, programmers needed to forsake their bodies and become information. Cyberspace offered transpersonal communion and became evidence of a mystical transformation of humanity. This theme also resonates in science fiction classics such as Gibson's "Neuromancer" from 1984. The novel describes how so-called "console cowboys" could wire themselves and leave their bodies behind. Disembodiment permeates the book as protagonist Henry Dorsett Case jacks himself "into a custom cyberspace deck that projected his disembodied consciousness into the consensual hallucination that was the matrix", or how Case "lived for the bodiless exultation of cyberspace", had a "relaxed contempt for the flesh" or how he "fell into the prison of his own flesh", for him the worst kind of punishment (Gibson, 1984, p. 6).

Work relations and workspaces

The second mode of expulsions of old age and older workers is the realm at the intersection of interpersonal relations and corporate culture. Ageism is manifested in hiring and firing practices and technology workers' training opportunities. The role of chronological age in hiring practices in IT companies is a well-known phenomenon. It is frequently addressed in discussion fora, such as Reddit, Quora or LinkedIn. Queries such as: "I'm 35 years old. Am I too old to join Google, Facebook, Microsoft or Apple as a software engineer?", "What's the maximum age at which Google will hire you as a fresher?" or "What is the age limit for a Google job?" resonate with many reports from programmers (Rosales & Svensson, 2021). The preoccupation with chronological age being a barrier to starting or continuing a technological career seems to be following the demographics of the industry giants.

According to Statista Research, the median age of Facebook's workforce is 28 (Statista, 2016). The social media giant is not unique in this regard: The average age at LinkedIn is 29, in the case of Google, it is 30, and at Apple or Amazon, the employees are, on average, 31 years old (Statista, 2016). For comparison – the median age of an American worker is 42. The magic word "diversity" does not seem to apply to age in Silicon Valley (Cook, 2020).

Age discrimination in the technology industry is a widespread phenomenon (Ajunwa, 2019). The Dice Diversity Report suggests that 76% of respondents agreed that ageism exists globally in technology industry. Moreover, age discrimination is the most common type of unequal treatment among IT workers, with 29% of respondents reporting having experienced it, in contrast to gender discrimination – 21%, sexual orientation – 6% and political affiliation – 11% (Dice, 2018). There is additional evidence that age discrimination in Silicon Valley is not only becoming more widespread but has long been more prevalent than discrimination based on race or gender. Research by Bloomberg showed that between 2008 and 2015, a staggering 226 age discrimination complaints were filed against the 150 largest information technology companies in California. In the same period, 28% fewer complaints of racial discrimination and 9% fewer complaints of gender discrimination were registered (Hymowitz & Burnson, 2016).

Ageism is not only identified in employment relations but also among the investors of start-ups. A "State of Start-ups" survey from 2018 showed that 37% of founders experienced ageist bias from investors (compared to 28% on gender and 26% on race). Founders participating in this survey said ageism starts at the age of 46. Furthermore, a quarter of the founders said the bias affects entrepreneurs as young as 36. A staggering 89% of respondents agree that older people face age discrimination in the industry (State of Start-ups, 2018). Lyons explains this as investors having "decided that the optimal return is young kids: Burn them out, get rid of them, replace them" (cited in Zara, 2016). The myth of dropping out of high school mentioned previously also plays out here. The ideal start-up founders are "white, male, nerds who have dropped out of Harvard or Stanford and have absolutely no social life", as voiced by one industry leader at the National Venture Capital Association meeting (Cook, 2020). Entrepreneurs recognise how investors are surprised by the enthusiasm, passion, and programming pace of the young technologist (Rosales & Svensson, 2021). This all feeds a myth that the young are cognitively quicker and more capable workers.

The expulsion of more senior workers in Silicon Valley also has a pragmatic explanation related to the profit orientation of the organisations, especially start-ups. The main argument against older workers in start-ups is their seniority and higher costs related to their employment. Prioritising younger workers began mainly as a cost-cutting exercise, wherein older staff were increasingly replaced with younger and cheaper employees willing to do the same work for less money (Lyons, 2016). The technology industry thus excludes older and competent programmers who might be more selective in their choice of

workplace. They are more inclined to seek autonomy, stability, and good working conditions, instead of incentives (Rosales & Svensson, 2021). In 2014, Facebook and Apple surprised the world with their egg-freezing incentives for their female workers or worker spouses (Sydell, 2014). Egg-freezing would allow the workers to devote their young years to the company, delaying their maternity or paternity plans for later. While it could be a good option for women unsure of assuming maternity earlier in their lives, it also could act as social pressure for not doing it as it becomes part of the "culture fit" of the industry.

"Culture fit" is the idea that to be a good recruitment choice for the company, you should possess the same qualities as those already working there (Ajunwa, 2019). This has resulted in a highly homogenous workforce in Silicon Valley, comprised primarily of people with similar backgrounds, perspectives and experiences (Cook, 2020; Lyons, 2016). This homogeneity has been identified as one of the main problems of "toxic tech" (Cook, 2020; Rosales & Svensson, 2021). The idea of culture fit is so deeply embedded within the vocabulary of Silicon Valley that Google famously has its own word for it: Googley (Cook, 2020).

Wiener describes her struggle to fit in in the following words:

> … my team partners were all experts with the RipStik skate (waveboard). They used to skate through the offices, turning and crouching with the laptop on their hand, answering calls from clients with their own mobile phones.
>
> (2020, p. 80)

> We played carnival games, tossed miniature basketballs against the rims of miniature hoops. We cluster by the bar and have another round, two. Eventually, we're dispatched on a scavenger hunt across the city. We pour out of the building and into the street, spreading across rush-hour San Francisco, seeking landmarks. We made human pyramids in the center of Union Square, snapped each other's sweatbands, photographed ourselves mid-jump on the steps of an old, regal bank.
>
> (p. 102).

In its extreme forms, ageism in the workplace may push young workers to seek rescue in plastic surgery. The number of people in the technology industry visiting plastic surgeons for cosmetic procedures was already on the rise almost a decade ago (Scheiber, 2014). Clients apparently seek everything from Botox to filler injections and micro-needling to more invasive surgeries such as chin lifts and liposuction. They are doing it in the hope of competing with their younger counterparts. Ageism is also at play in activities such as Friday afternoon Nerf-gun wars, "walking meetings" or unconventional office space design (e.g., exercise balls as chairs, table tennis, candy walls with free sweets) (Lyons, 2016). One reason why companies design and organise their workspaces as playgrounds with ping-pong tables, restaurants, cinemas and gyms, is that employees are expected to spend the whole day at

the company, including their free time. This is obviously more attractive for younger workers without family obligations (see Rosales & Svensson, 2021).

Silicon Valley ageism: Digital products and services

The third dimension where we can identify mechanisms of expulsion of old age and older people is the materiality of ageism in the technology industry, which transcends the ideological and interpersonal ageism dimensions and manifests itself in technological products and services. Cook argues that behaviours and tendencies are translated into patterns, which then become "increasingly embedded, not only in the industry's culture, but also in its products" (Cook, 2020, p. 39). In this section, we argue that ageism engrained in the ideologies and myths, along with the expulsions of older workers from this industry, results in products and services which disfavour older adults or do not account for their needs, wishes and preferences.

Technology is often designed for the young, by the young, and the rest of us are left to catch up with the youth or at least relate to their preferences. This poses a real dilemma as we are all becoming increasingly reliant on technology for everything from buying groceries to accessing medical care. Poor user experience design may exclude people from important services and products. In connection with older users, this has been highlighted by researchers on many occasions and regarding different types of products (Gallistl et al., 2020). Stereotypes of older adults as digital immigrants, afraid of new technologies and lacking in skills, contribute to the creation of products which, in turn, reinforce those negative stereotypes. The youth-orientated design of digital products and services is a direct consequence of ageist ideologies in the industry, lack of diversity and low awareness of older user preferences in the teams developing new products.

According to Manor and Herscovici (2021), ageism operates through two patterns in UX (user experience) design. On the one hand, at the design level, there is a lack of awareness and understanding of the needs and difficulties of older users. On the other hand, at the management level, there is a lack of research about older users and training AI systems with older-user data. This youth-orientated design is short-sighted from a business standpoint. Middle-aged and older users likely have far greater purchasing power than smartphone-savvy teens. Yet, many of the most used platforms seem to disregard usability factors for all – from automatic teller machines (ATMs) that operate too fast for new users to get used to, to the application of everyday products and services that only fit the latest smartphones, usually not owned by older users (Petrie & Darzentas, 2017). Then we have disturbing targeted adverting based on age predictions, such as face recognition systems (Yu et al., 2019). For example, a woman in her late fertility years, trying to have children but with difficulties conceiving, is emotionally affected by targeted advertising for fertility programmes (Nudson, 2020) addressed to her based on predictions about her age and life stage.

In recent years, scholars have expressed concern about the way AI-driven technologies show hidden biases, such as sexism or racism, resulting in the exclusion and discrimination of members of marginalised groups (West et al., 2019). Studies have shown how face-recognition systems work poorly for women with dark skin (Buolamwini & Gebru, 2018) and that word embeddings – a framework used for text analysis in machine learning and neural language processes – exhibit female/male gender stereotypes to a disturbing extent (Bolukbasi et al., 2016). A recent analysis also shows that age-biased samples and tools used for constructing algorithms tend to exclude the habits, interests and values of older users and hence contribute to reinforcing already existing ageism in digital products and services (Rosales & Fernández-Ardèvol, 2019). Another study showed evidence that sentiment analysis, which is a popular machine-learning technique used to evaluate opinions expressed in text, disclosed significant age biases. Sentences with the adjective "young" were 66% more likely to be scored positively than identical sentences with the adjective "old" (Díaz, 2019, p. 6146). Also, in the area of face recognition, one of the most contested technologies in recent years, researchers discovered relevant differences in the outcomes of face-recognition models for predicting age and gender from photographs (Meade et al., 2019). The researchers used Convolutional Neural Networks (CNN), an advanced deep-learning technique. The model was trained on photos of celebrities from IMDb and Wikipedia, where their picture matched their age, as well as data for the general public from the UTKFace data set of face images. The results showed that age estimation was generally performing poorly on older age groups (60+), which is not surprising, as older people are a diverse group of individuals who age along different lines. Furthermore, images of older celebrities do not represent the general population. The lack of accuracy in age predictions could influence how users view themselves and older people in general. The fast-growing deployment of AI systems in contemporary societies thus reveals the new ways ageism will manifest in data-driven technologies and should thus be carefully monitored.

Discussion and conclusions

The available data, accounts and experiences of technology workers themselves, as well as expert opinions, suggest that ageism in the technology industry is alive and well. In this chapter, we have proposed a three-tier framework for conceptualising the phenomenon we labelled Silicon Valley Ageism. The framework arranges the analysis of Silicon Valley Ageism into three dimensions: (1) narratives, (2) work relations and workspaces and (3) digital products and services. We suggest that this framework can be used to analyse any type of bias in any industry and that the interrelations between dimensions can be further accentuated. The theoretical framework can serve as a facilitator for further critical research and empirical inquiries. It can furthermore provide a sound basis for tackling ageism from the policy perspective. The

World Health Organization's (WHO) large global campaign to combat ageism (WHO, 2021) recognises the IT sector as one where ageism hits very hard. Also, the recently issued WHO Policy Brief titled "Ageism in artificial intelligence for health" examines the use of AI in medicine and public health for older people, including the conditions in which AI can exacerbate or introduce new forms of ageism (WHO, 2022). This sends a strong signal that technology can have a powerful negative impact on older adults and hence needs to be critically assessed and thoughtfully designed.

The young age and the overall homogeneity of technology industry workers is a phenomenon which has already had sociocultural and economic consequences. The increasing number of individuals and organisations voicing their concern about the lack of diversity in this community shows that there is awareness of the issue. Despite this, the narratives, numbers and research we have presented in this chapter tell a different story. At the same time, in many industrialised countries, policies and practices of extending working lives are being proposed as a panacea for demographic change and changes in the labour market. The old question becomes valid again: how can this goal be attained when workers are being discriminated against at increasingly younger age? Indeed, age is being called the "silent career killer" in the technology industry (Dice, 2018). The concerted efforts of the European Union to improve the level of digital skills among European citizens under a policy framework of Digital Decade 2020–2030 (European Commission, 2021) could be thwarted in the face of what we have outlined here as Silicon Valley Ageism. Hence, the unabated consequences of ageism in technology industry go way beyond older IT workers' well-being and job prospects. They are relevant to almost all realms of our personal, professional, social and cultural lives living in connected data societies.

Indeed, Silicon Valley, as a geographical location for important technology industries, a sociocultural ecosystem, and a symbolic artefact, needs to be scrutinised and studied from a critical social perspective. In our chapter, we have focused on the expulsion of older workers more specifically, but Silicon Valley's homophily in terms of gender and race is another significant and already recognised fact which requires continued academic and advocacy-related attention. And finally, with the unparalleled rise in the impact of technology industry on our societies, the utter dominance of this sector in the entire global economic system, as well as the power of technology to create social unrest and polarisation, we can conclude that Silicon Valley needs a social theory, and it is time to start constructing it. Further development of already budding critical theory of Silicon Valley (see Cook, 2020; Rothstein, 2022), as well as re-visiting the earlier theoretical stances on the culture of Silicon Valley (see Castells, 1998), is needed to address the rising concerns about the harmful impacts of modern technology industry and its products on the workers, society at large and natural environment.

Note

1 The term "Unicorn-Start-up" refers to those companies with a valuation in excess of $1 billion.

References

Ajunwa, I. (2019). Age discrimination by platforms. *Berkeley Journal of Employment & Labor Law*, *40*(1), 1–27. https://doi.org/10.15779/Z38GH9B924.

Allport, G. (1954). *The nature of prejudice*. Addison-Wesley Pub. Co.

Andriole, S. (2018). There will be 30 technology companies in 2030, 10 in 2050, and then there will be none. https://www.forbes.com/sites/steveandriole/2017/05/25/there-will-be-20-technology-companies-in-2030-10-in-2050-and-then-there-will-be-none/#49d137d132bb

Ayalon, L., & Tesch-Römer, C. (2018). *Contemporary perspectives on ageism*. Springer Open.

Bolukbasi, T., Chang, K.-W. W., Zou, J., Saligrama, V., & Kalai, A. (2016). Man is to computer programmer as woman is to homemaker? Debiasing word embeddings. *Advances in Neural Information Processing Systems*, 285–287. https://doi.org/10.1016/B978-0-323-60984-5.00062-7

Buolamwini, J., & Gebru, T. (2018). Gender shades: Intersectional accuracy disparities in commercial gender classification. *Proceedings of Machine Learning Research*, *81*, 1–15. https://proceedings.mlr.press/v81/buolamwini18a/buolamwini18a.pdf

Butler, R. (1975). *Why survive? Being old in America*. Harper & Row.

Castells, M. (1998). The real crisis of Silicon Valley: A retrospective perspective. *Competition & Change*, *3*(1–2), 107–143. https://doi.org/10.1177/102452949800300105

Cook, K. (2020). *Psychology of Silicon Valley*. Palgrave Macmillan.

Cowgill, D., & Holmes, L. (Eds.). (1972). *Aging and modernization*. Appleton-Century-Crofts.

Díaz, M. (2019). Algorithmic technologies and underrepresented populations. *Proceedings of the ACM Conference on Computer Supported Cooperative Work*, *CSCW*, 47–51. https://doi.org/10.1145/3311957.3361857

Dice. (2018). *Dice diversity and inclusion report*. https://techhub.dice.com/2018-DI-Report-ResourceLibrary.html

Ensmenger, N. (2015). "Beards, sandals, and other signs of rugged individualism": Masculine culture within the computing professions. *Osiris*, *30*(1), 38–65. https://doi.org/10.1086/682955

European Commission. (2021). *Europe's digital decade: Digital targets for 2030*. https://ec.europa.eu/info/strategy/priorities-2019-2024/europe-fit-digital-age/europes-digital-decade-digital-targets-2030_en

Fisher, A. (2018). *Valley of genius*. Hachette Book Group.

Forbes. (2022). Elisabeth Holmes profile. https:///www.forbes.com/profile/elizabeth-holmes/.

Gallistl, V., Rohner, R., Seifert, A., & Wanka, A. (2020). Configuring the older non-user: Between research, policy and practice of digital exclusion. *Social Inclusion*, *8*(2), 233–243. https://doi.org/10.17645/si.v8i2.2607

Gibson, W. (1984). *Neuromancer*. Penguin Random House.

Gold, B. (2018). *Silicon Valley start-ups and corporate innovation*. https://doi.org/10.1007/978-3-658-19886-2

Gullette, M. M. (2017). *Ending ageism, or how not to shoot old people*. Rutgers University Press. https://doi.org/10.1080/08854300.2019.1660135

Harris, K., Krygsman, S., Waschenko, J., & Laliberte Rudman, D. (2018). Ageism and the older worker: A scoping review. *Gerontologist*, *58*(2), e1–e14. https://doi.org/10.1093/geront/gnw194

Hymowitz, C., & Burnson, R. (2016). *It's tough being over 40 in Silicon Valley*. Bloomberg. https://www.bloomberg.com/news/articles/2016-09-08/silicon-valley-s-job-hungry-say-we-re-not-to-old-for-this

Lee, K.-F. (2018). *AI Superpowers: China, Silicon Valley, and the new world order*. Houghton Mifflin Harcourt.

Levy, S. (1984). *Hackers: Heroes of the computer revolution*. Anchor Press/Doubleday.

Lyons, D. (2016). *Disrupted: My misadventure in the start-up bubble*. Hachette Books.

Manor, S., & Herscovici, A. (2021). Digital ageism: A new kind of discrimination. *Human Behavior and Emerging Technologies*, *3*(5), 1084–1093. https://doi.org/10.1002/hbe2.299

Martens, A., Goldenberg, J. L., & Greenberg, J. (2005). A terror management perspective on ageism. *Journal of Social Issues*, *61*(2), 223–239. https://doi.org/10.1111/j.1540-4560.2005.00403.x

McMullin, J., & Dryburgh, H. (2011). Gender, age, and work in the new economy. In J. A. McMullin (Ed.), *Age, gender, and work: Small information technology firms in the new economy* (pp. 3–17). UBC Press.

Meade, R., Camilleri, A., Geoghegan, R., Osorio, S., & Zou, Q. (2019). *Bias in machine learning: How facial recognition models show signs of racism, sexism and ageism*. Towards Data Science. https://towardsdatascience.com/bias-in-machine-learning-how-facial-recognition-models-show-signs-of-racism-sexism-and-ageism-32549e2c972d

Nudson, R. (2020, April 9). *When targeted ads feel a little too targeted*. Vox. https://www.vox.com/the-goods/2020/4/9/21204425/targeted-ads-fertility-eating-disorder-coronavirus

Office of the United States Attorney. (2022). *U.S. v. Elizabeth Holmes, et al.* https://www.justice.gov/usao-ndca/us-v-elizabeth-holmes-et-al

Petrie, H., & Darzentas, J. S. (2017). Older people's use of tablets and smartphones: A review of research. In M. Antona, & C. Stephanidis (Eds.), *Universal access in human–computer interaction. Design and development approaches and methods* (pp. 85–104). Springer International Publishing.

Rahman, A. A., Hamid, U., & Chin, T. (2017). Emerging technologies with disruptive effects. *Perintis E Journal*, *7*(2), 308–314.

Rosales, A., & Fernández-Ardèvol, M. (2019). Structural ageism in big data approaches. *Nordicom Review*, *40*(s1), 51–64. https://doi.org/10.2478/nor-2019-0013

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence*, *26*(5–6), 1074–1087. https://doi.org/10.1177/1354856520930905

Rosales, A., & Svensson, J. (2021). Perceptions of age in contemporary tech. *Nordicom Review*, *42*(1), 79–91. https://doi.org/10.2478/nor-2021-0021

Rothstein, S. A. (2017). *Including workers' voices in the digital transformation*. American Institute for Contemporary German Studies. https://www.aicgs.org/2017/11/including-workers-voices-in-the-digital-transformation/

Rothstein, S. A. (2022). *Recoding power: Tactics for mobilizing tech workers*. Oxford University Press. https://doi.org/10.1093/oso/9780197612873.001.0001

Sample, I. (2022). If they could turn back time: How tech billionaires are trying to reverse the ageing process. https://www.theguardian.com/science/2022/feb/17/if-they-could-turn-back-time-how-tech-billionaires-are-trying-to-reverse-the-ageing-process

Sassen, S. (2014). *Expulsions: Brutality and complexity in the global economy*. Harvard University Press. https://doi.org/10.1080/03066150.2016.1236453

Scheiber, N. (2014). The brutal ageism of tech. *The New Republic*, pp. 1–9. https://doi.org/10.1002/hast.907

Schwab, K. (2016). *The fourth industrial revolution: What it means, how to respond*. WEF. https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/

Sens Foundation. (2021, February). WebMD feature: Is there a cure for aging? https://www.sens.org/webmd-feature-is-there-a-cure-for-aging/

Sevilla, C. (2020). Everyday ageism in the tech industry. https://www.cwjobs.co.uk/advice/ageism-in-tech

Sink, J., & Bales, R. (2016). Born in the bandwidth : "Digital native" as pretext for age discrimination in hiring. *ABA Journal of Labor & Employment Law*, *31*(3), 1–14.

State of Startups. (2018). *State of startups 2018*. http://stateofstartups.firstround.com/2018/#ageism-in-tech

Statista. (2016). *Median age of employees working at selected tech and online companies as of April 2016*. Statista. https://www.statista.com/statistics/653789/average-age-of-tech-company-employees/

Stypińska, J. (2022). AI ageism: A critical roadmap for studying age discrimination and exclusion in digitalized societies. *AI & SOCIETY*. https://doi.org/10.1007/s00146-022-01553-5

Stypińska, J., & Turek, K. (2017). Hard and soft age discrimination: The dual nature of workplace discrimination. *European Journal of Ageing*, *14*(1), 49–61. https://doi.org/10.1007/s10433-016-0407-y

Svensson, J. (2021). *Wizards of the web*. Nordicom.

Sydell, L. (2014, October 17). *Silicon Valley companies add new benefit for women: Egg-freezing*. NPR. https://www.npr.org/sections/alltechconsidered/2014/10/17/356765423/silicon-valley-companies-add-new-benefit-for-women-egg-freezing

Thomas, D. (2002). *Hacker culture*. University of Minnesota Press.

Turek, K., Mulders, J., & Stypińska, J. (2022). Different shades of discriminatory effects of age stereotypes in the workplace : A multilevel and dynamic perspective on organizational behaviors. *Work, Aging and Retirement*, *8*(4), 343–347. https://www.doi.org/10.1093/workar/waac019

Turner, F. (2006). *From counterculture to cyberculture. Stewart Brand, the whole earth network and the rise of digital utopianism*. University of Chicago Press.

West, S. M., Whittaker, M., & Crawford, K. (2019). *Discriminating systems: Gender, race and power in AI*. AI Now Institute. https://ainowinstitute.org/discriminating-systems.html

WHO. (2021). *Global report on ageism*. Geneva.

WHO. (2022). *Ageism in AI for health: WHO policy brief*. Geneva.

Wiener, A. (2020). *Uncanny Valley: A memoir*. MCD Books.

Woods, T. (2020). *Live longer with AI: How artificial intelligence is helping us extend our healthspan and live better too*. Packt Publishing.

Yu, T. J., Lee, C. P., Lim, K. M., & Razak, S. F. A. (2019). AI-based targeted advertising system. *Indonesian Journal of Electrical Engineering and Computer Science*, *13*(2), 787–793. https://doi.org/10.11591/ijeecs.v13.i2

Zara, N. (2016). "Silicon Valley" writer sounds off on tech ageism. https://insights.dice.com/2016/07/12/silicon-valley-writer-sounds-off-tech-ageism/

Zhavoronkov, A., Bischof, E., & Lee, K.-F. (2021). Artificial intelligence in longevity medicine. *Nature Aging*, *1*(1), 5–7. https://doi.org/10.1038/s43587-020-00020-4

4   Technology culture as youth oriented

Jakob Svensson

This chapter departs from an outline of technology culture as having many roots and influences. The hacker is a well-known figure in the history of technology, the hippie perhaps less so. Nonetheless, the leftist and counter-cultural origins of Silicon Valley and the personal computer (PC) are still apparent today. Certain aspects of these origins, such as freedom of informa-tion, individual empowerment, and realising the future through code, have been picked up by the right wing in politics, coupling a capitalist logic of making a profit with entrepreneurship and start-up values. I have written about this elsewhere (Svensson, 2021). Technology culture is indeed biased regarding class, gender, and race (as many have underlined, see, for exam-ple, O'Neil, 2016). However, I want to focus on how technology culture, from the beginning, has been geared towards the youth. Early hacking, for example, had a teenage rebellion to it, anti-authoritarian prankish boys in, first, the computer labs of established American universities and later in the garages in middle-class Silicon Valley suburbia. The chapter thus provides a backdrop to how ageism in digital technologies can be understood and made sense from more historical and cultural perspectives.

To understand contemporary digital technologies, it is important to ac-knowledge that its culture has been influenced from many directions. This is the focus of the first part of the chapter. Its diverse roots and influences bring tensions to the fore. This will be the focus of the latter part of the chapter. In these tensions and how they are navigated, a youth orientation can be discerned. The most apparent tension is how technology's hippie roots were accommodated, first in the research labs of the US military complex in the 50s and then how their narrative of free information and holistic networks was embraced in the cheerful optimism of entrepreneurs and technology start-ups. Following this, I will outline the tension between conceiving pro-grammers as a boyish prankish elite versus being driven by more grand ethi-cal motivations. This leads to a third tension: being open versus not striving for attention. Finally, I will address the tension between believing in yourself as a programmer and being aware of your limits. This chapter thus departs from a historical perspective when discussing technology culture's present biases, most notably its youth centrism.

Short notes on empirical data gathering

The chapter is in part based on a literature review on the history of digital technology and computing and in part based on a two-and-a-half-year research project in which I researched humans, cultures, and practices behind algorithms, data and automated systems. The point of departure for this project was an identified need for a sociological study of the humans behind digital technologies. During the project, I interviewed programmers and made observations at various technology conferences, industry headquarters, and at so-called Meetups around the world (as I will explain below). I have also conducted an in-depth study of a particular algorithm developed and employed by a Scandinavian newspaper. For this chapter, only the parts of the material that connects to ageism and the culture's youth orientation will be used.

Focusing on interviews and observation, the method is ethnographically inspired. For the interview study, I adopted a mixed recruiting strategy: snowballing personal contacts and approaching programmers through LinkedIn and Meetup platforms. Both services are popular in the programming community. LinkedIn is a business and employment-oriented service mainly used for professional networking. Meetup is a service used to organise events for people with similar interests as yourself within a close geographical distance (Meetup, 2022). The platform allowed me to search for events concerning a particular topic (such as coding) within a distance you set yourself from your current location.

In total, I conducted 39 interviews all over the world: in Brazil, Denmark, Germany, India, Sweden and the US with programmers originally from Brazil, China, Denmark, Estonia, Germany, India, Israel, Lithuania, Mexico, the Netherlands, Poland, Sweden and the US. The interviews were conducted from 2018 to 2020 and included freelance programmers, in-house programmers at the newspaper, and programmers from smaller start-ups to industry giants such as Google and Facebook. 31 of the 39 interview participants identified themselves as men, one as trans, one as non-binary, and the rest as women. The youngest participants were in their early 20s, and the oldest were in their 50s. The interviews took place at the companies where participants worked, at cafés, lunch restaurants and accommodations where I stayed, and a few were conducted via Skype. Interviews were conducted in English or Swedish. The author has translated interview quotes that were in Swedish.

Apart from interviews, I have attended conferences and Meetups in Austin, Bengaluru, Berlin, Chennai, Copenhagen, Malmö, Sao Paulo, Silicon Valley and Stockholm. On Meetups, I looked for events to observe and participate in. To diversify my sample, I also wanted to target specific groups, such as Women who code Silicon Valley. Hence, the sample cannot be claimed to represent technology culture at large. In total, I attended 20 Meetups. Observations have also been conducted at four technology conferences, the newspaper, five workplaces, and two start-ups (for more details on the methodology, see Svensson, 2021).

Culture as an analytical tool

The interviews and observations have been structured around the sensitising concepts of rules, values, and imaginations. In this sense, they could label them as semi-structured and theoretically informed. The sensitising concepts have been drawn from analytical theories of culture and logics. These concepts interact with and inform each other in a dynamic circuit (Dahlgren, 2009). The argument is that a study of humans behind technologies needs to depart from a holistic approach and account for how different aspects intersect. Culture is in the minds and hearts of people, "a learned body of tradition that governs what one needs to know, think and feel to meet standards of membership" (Kunda, 2006, p. 8). Hence, it is possible to trace culture in public expressions, signs, and symbols, shared rules governing the cognitive and affective aspects of membership, and the means to express them. In this sense, following March and Olsen (1984), culture is not only about individual actors but also about structures, rules, procedures, and practices that have a bearing on (and sometimes even constrain) the individual. In my study, the individual programmers led me to the larger culture. As Giddens (1984) argues in his theory of structuration, a culture – its creation, maintenance, and reproduction – is based both on larger structures as well as on its agents. Structure and agency are mutually constitutive. In other words, by departing from the programmers in this study, I understand them as both acting *in* and *through* culture.

Breaking culture into more manageable sensitising concepts has helped structure my interviews and observations. To understand the culture, I have (following Dahlgren, 2009) observed and asked about programmers' backgrounds, identities, and group belongings. I have also found it beneficial to use Hofstede's (1991) analytical model for understanding values in a culture, which according to him, are at the very heart of a culture. These can be discerned by studying more outer layers of cultural manifestations such as symbols, heroes and rituals, or rules of the game, which according to Hofstede, can tell us a lot about a culture's core values. The sensitising concepts I have worked with are rules, values and imaginations.

Rules have been discerned by observing and interviewing how the programming is conducted. Who instructs whom, and according to what pattern? What are the different expectations when programming? What various capacities are involved when solving the problems identified that code and software could solve? How is the field of relations structured? **Values** have been studied by observing and interviewing about what education and skills are deemed necessary. But also, by asking who and what is talked of as good examples, what it means to be a good programmer? The power of **imagination** in shaping digital technologies cannot be understated. How do programmers perceive the platforms, technologies and data contexts in which their algorithms and automated systems will be used? This is about perceived technological affordances (Gibson, 1977), how digital technologies have characteristics that both enable and restrict users as they go about their everyday

life in connected data societies. What affordances do programmers imagine for the platforms they design their software for (what Nagy & Neff, 2015, label *imagined affordances*)? Imaginations have been studied through observing and interviewing how programmers perceive/imagine the technology they program as well as their end users.

It is essential to repeat that these sensitising concepts intersect and inform each other. They provided me with a rough map I brought to the sites of empirical data gathering as themes to structure interviews and observations.

How youth can be traced in technology culture's many roots and influences?

As mentioned above, programmers are both acting in and through culture. While agents in this culture, the culture affords certain behaviour. To understand its youth orientation, attending to its historical influences is appropriate. Let me start with the hippies. A special issue of Time magazine from March 1995 was labelled *Welcome to Cyberspace* (Time, 1995). It is argued that the readers should forget about anti-war protests, Woodstock, or even long hair; the real legacy of the 1960s generation was the computer revolution. The hippie origins of Silicon Valley are portrayed in the documentary series *The Silicon Valley revolution* (Tenhaven, 2016). The first people who came to the Bay area were generally left off the political spectrum. According to the documentary, the whole movement from the East to the West coast of the US was because of general dissatisfaction with big companies (most notably IBM and Microsoft) and their intolerance of young people who did not conform to their way of working.

Early technology culture was liberal in its embrace of psychedelic drugs, and computer pioneers were spiritually oriented, both in terms of their interest in Eastern mysticism and the use of psychedelics. Marijuana, peyote, and LSD offered a chance to engage in an experience of togetherness in which electronic technology played an important role (Turner, 2006). Technology, together with psychedelics, made early pioneers imagine themselves as parts of a mystical community, unveiling links between all living things and the otherwise invisible energies that they thought linked and governed the material world. The key to change was not in politics but in people's minds (Turner, 2006). Here Wiener's (1948) influential theory of *Cybernetics* and notions of the globe as a single interlinked pattern of information (McLuhan, 1964) were influential but also comforting since they suggested a possibility of global harmony. Human beings, the natural world, technological systems, and institutions were believed to be reflected in each other and examples of connected systems. Computers seemed to bring to life a countercultural dream of empowered and mindful individualism, collaborative community and spiritual communion (Turner, 2006).

The hippie generation had the opportunity to dream. The baby boomers (born between 1946 and 1964) grew up in a period of increasing affluence in

the United States. Hence, they felt safe to experiment (Tenhaven, 2016). Quite a few wanted to escape the Vietnam war and the traditionally male role of the soldier. The ones who left the East coast were comfortable enough to question their parents and tolerate differences between people (Tenhaven, 2016). As we will see in this chapter, youth rebellion and questioning of the adult world is a theme that resonates across the culture.

Anti-authoritarianism is an important theme that resonated, especially among the freelance programmers I interviewed. They underlined their freedom and the possibility of leaving a job when it did not suit them anymore or when disagreeing with their clients. The freedom of being freelance was about overseeing your own schedule and not having a boss. "I hate having a boss; seriously, I do not do well with authority", as Bart, a middle-aged Dutch programmer I interviewed in Copenhagen, phrased it (fictive names are used throughout the chapter, middle age is used when perceived between 30 and 50 years old). Similarly, Pelle – a middle-aged Swedish programmer I met in Stockholm – stated that it would be fun to work on their own projects based on his own ideas, "not being told what to do but to do on my own terms". Adam – a young programmer I had lunch with in the south Swedish town of Lund – also dreamed of his own projects (young is used when perceived below 30 years old). This list can be continued. I trace this anti-authoritarianism back to young hippies who wanted to be free and not be bossed around by parents or large companies. The legendary move from the East to the West coast was allegedly due to discontent with Microsoft or what is described as an "extreme aversion against Microsoft" (Thomas, 2002, pp. 88–89).

Here, there is a direct link between hippies and hackers. Hackers have an immense symbolic value in contemporary technology culture. It is no coincidence that I find Facebook's headquarters on *Hacker Way 1*. When shown around the premises in March 2019, I realise that the inner courtyard of Facebook's contiguous buildings is formed as an H. And when CEO Mark Zuckerberg makes announcements to the employees, it is done from the stage on this *Hacker Square*.

When Microsoft Windows was accused of hiding the workings of its systems, hackers began to couple their hacking activities with a political mission; to make information free for all. Freedom of information is thus not only connected to hippies but also an important hacker ethic. Levy (1984) states that hacking is based on access to computers, that all information should be free, that hackers generally mistrust authorities, that hacking is based on meritocracy, and that hackers are judged by their hacking and not by appearance, age or position, and finally that hackers believe in the possibility to create art and beauty in a computer. As with the hippies, hacking is based on a philosophy of sharing, openness, and decentralisation. Moreover, it is hackers' code that matters, not their age, title, or physical appearance. And to share something, it must be free; all information should be free, as the hacker ethic goes (see Levy, 1984). Young hackers thus fought for the

freedom of information and themselves in terms of independence towards authority and an adult world.

Hacking is about doing things because you can, for the sake of it, and because it is fun. In a recent account, Nagy et al. (2021) discuss the meaning of hacking today with contemporary notions such as *life hack*. They define hacking as using and manipulating systems for purposes they were not initially intended, often for exploration, play or experiment. Levy (1984) similarly writes that hackers do not always need a purpose; there is ample justification in the feeling of power, accomplishment, and to have fun, not seldom at the expense of the adult world. The hackers of the 1980s showed a general dissatisfaction with the world of adults and expressed teenage angst. This is about young people being comfortable with technology that intimidates their parents. Hacking can thus be conceived as a space in which youth (particularly boys) could demonstrate mastery and autonomy and challenge parental and societal authority. Thomas (2002) explicitly connects hacking to youth with its connotations of disruption and teenage rebellion. Indeed, young hackers' mastery of technology was often used for pranks at the expense of the adult world. Hacker culture gave rise to imaginations and fear of male teenagers trying to make their parents uncomfortable.

Today, technology culture is marinated in entrepreneurship- and start-up enthusiasm with slogans such as *invent the future, move fast and break things* and *make magic* (see Svensson, 2021). Some even argue that the most significant invention of Silicon Valley is entrepreneurial and start-up culture (see Fisher, 2018, p. 421). This is particularly evident in large companies. Facebook's work environment in Silicon Valley did not look like anything I had seen up to that point, with services and food possibilities all geared towards creating an atmosphere of play, loyalty and flat hierarchies.

In mid-size and larger companies, entrepreneurship and start-up culture is about combining paternal care with an open, informal, yet achievement-oriented environment without "the trappings of status-conscious and rule-bound bureaucracies" (Kunda, 2006, p. 67), combining the playful with the semi-serious. By using images of a family, industry start-ups and corporations metaphorically adopt the parent's substitute role and position their employees as energetic, hungry (yet sometimes unruly) kids. The family metaphor also underlines that personal and corporate goals should not be in contradiction. When talking to Ted, a middle-aged app programmer in Malmö, he mentions the *Google way* as a technique to work with the motivation of his employees. Employees are supposed to be so involved in the business and have such a responsibility that motivation is not a problem (see also the Google Way management approach, Girard, 2009).

However, this conflation of work and outside life seems to exclude "older"/middle-aged programmers in general and women in particular (see Rosales & Svensson, 2021). In my interviews, it was striking how becoming parents changed programmers' attitudes to their work and how they conducted it. For some, the decision to go freelance was to craft a work-life balance by

deciding their working hours to spend more time with their kids. As Bart in Copenhagen says, "I am very conscientious about my time and my time with my family, especially now that my daughter is young". He did not use to be like that. He used to love to spend entire days in front of the computer, getting into so-called *flow*, forgetting about time, and completely absorbed by the problem at hand.

Utopian and libertarian ideals of independence, freedom of information, and people can be found in both hippie and hacker cultures as attended to previously (see also Levy, 1984; Turner, 2006). There are more traces of hippie ideals in current entrepreneurship and technology culture's turn towards start-up ideals. The embrace of the weird and celebration of free-thinking, thinking outside of the famous box (see Turner, 2006), are important narratives also in entrepreneurship. A common thread here is a modern belief in being at the forefront, believing that programmers are changing the world for the better, which I argue has a youthful idealism and cockiness to it.

Entrepreneurship and start-up embrace of boldness, craziness and rebellion against established markets and companies go hand in hand with the culture's youth orientation. The value of being creative and solving problems rather than having experiences and routines can be connected to ageism. Nadja, a Silicon Valley programmer in her 50s, puts this quite bluntly. She does not think "experience is as valued as being creative". The young are expected to be more creative, future-oriented and less managerial. Also, Brooks (1975), in an early legendary book on programming, connects programming's allure among younger professionals to this. Young people, it is stated, tend to be more optimistic and more creative. This is about being a so-called *pioneer*, i.e., unafraid and innovative. The essence of pioneering, Levy (1984) explains, is about doing something brand new, discovery, having the courage and willingness to take risks, and making the impossible possible. This embrace of boldness, I believe, is more connoted to youth. Ted in Malmö, for example, explained that younger programmers are more motivated by new things, and embark on the most recent, latest, and coolest, what they find the most exciting now.

This also has to do with *grit*, perseverance, and not giving up. In my interviews, this was a recurring theme. If computer code sometimes does not work out the way programmers want, "you do not give up, you persevere", as young programmer Nilesh in Bengaluru explains. Newspaper in-house programmer Jakob (in his 20s) in Stockholm similarly underlines "that if you fail, you try again, and you do not give up". This is about believing that you eventually will solve the problem. American inventor Thomas Edison was often referred to in the conferences and Meetups I attended. Allegedly he should have said:" I have not failed; I have just found 100,000 ways that will not work". Indeed, grit indicates a kind of "I-can-do-it-mentality" and stubbornness, having your mindset to achieve your goal and not giving up on your ideas and yourself. There is a belief among my interviewees that the young are more inclined to become obsessed with a problem or a topic,

excessively focused on one thing, learning everything about it, and finding immense pleasure in this. Ted in Malmö tells me that good programmers had most likely played computer games as kids. And they would not stop playing until they "aced the game, found the princess, and solved the problem". Older programmers, on the other hand, are believed not to be as single-tracked as younger colleagues and are more prone to juggle many projects at the same time.

Boldness and grit signal a form of confidence that can be connected to the middle class. "I am the white middle-class man", as Lasse, a programmer in Stockholm, phrased it (emphasis in original), completely aware of the biases in the composition of the programming workforce. Indeed, hippie and hacker communities were mainly populated by the middle-class (Levy, 1984; Turner, 2006). This is evident in the symbolic value of Silicon Valley suburban garages in the culture. During my visit in March 2019, I found myself driving through endless alleys of one-story houses in suburban Menlo Park, Cupertino, and Mountain View on the hunt to spot some of the garages where it all happened. Thomas (2002) argues that suburbia provided little imagination, while the world of computers offered infinite possibilities of exploration. He refers to easily bored, self-motivated and technologically proficient white suburban middle-class boys who mastered technology and used it to demonstrate independence in front of the adult world. As Graham (2010) puts it, people move to the suburbs to have kids and live the American middle-class dream. Suburbs are deliberately designed to exclude the outside world because it contains things that could endanger the children. Then kids are sent off to spend six years "memorising meaningless facts in a world ruled by a caste of giants who run after an oblong brown ball as if this would be the most natural thing in the world, and if they balk at this surreal cocktail, they are called misfits" (Graham, 2010, p. 10).

Not surprisingly, early programming was undertaken by the educated middle class. Access to technology was not a given for everyone. Programming mostly took place at American university computer labs, accessible only to those lucky enough to have been admitted to universities with such labs. Moreover, the computer labs were really labs in the meaning of *try out spaces*, informal playgrounds, combining the social with the technological. Ensmenger (2015) talks about a sheltered but unsupervised environment that allows professional codes to be invented and developed. He describes a *frat boy culture*, informed by "friendly play, rough hostility and affection through mayhem pranks and emotional aggression" (Ensmenger, 2015, p. 61). These computer labs were spaces where young men built toys for each other, spaces inextricably linked to adolescent masculinity. Ensmenger (2015) talks about early programming as *brogramming*. Staging a contest such as the *Intergalactic Spacewar Olympics* indeed has an allure of boyish competitiveness to it, a geeky arena of competition (see Turner, 2006).

Technology culture's youth orientation is thus apparent in many of its roots and influences. When walking around industry headquarters in Silicon

Valley and Bengaluru, I hardly saw any visibly older adults (above 50 years old). When asking my interviewees if they had any older colleagues, "it depends how you define old; we have people in their 40s in my team", Sam, a young Chinese programmer having left Beijing to seek a better life in Silicon Valley, phrased it. Benjamin in Tel Aviv reveals that he, with his 38 years, was the oldest in his team. And here it seems 35 is the age programmers go from being young to old (see Rosales & Svensson, 2021). Silicon Valley's faiblesse for the youth will be further discussed in this volume's chapter on Silicon Valley Ageism (Stypinska et al., 2023).

Tensions in the culture

As I write in my book (Svensson, 2021), any attempt to understand technology culture and its people should zoom in on the tensions they give rise to. In this chapter, I will discuss these tensions with a particular focus on the culture's youth orientation and its connotations to fast change, exploration, the fresh, and the new.

The first tension (of four I will discuss) is nicely captured in the concept of *Californian Ideology*, the fusion of hippie bohemianism with the hi-technology industries of Silicon Valley, marrying business with a hippie ethos of the left. The whole idea of the Californian Ideology is to combine "the freewheeling spirit of the hippies and the entrepreneurial zeal of the yuppies" (Barbook & Cameron, 1996). Indeed, California connotes a sense of experimentation and openness to new possibilities. Here "you could get LSD fresh made from Stanford, and you could sleep at the beach at night with your girlfriend", as Apple's Steve Jobs phrased it (Fisher, 2018, p. 60). Californian Ideology believes both in the visions of the left and the right. It is thus a hybrid between the capitalism of innovation and the progressiveness of hippie culture, wired together in the faith in technology to induce change and solve all problems we as humans and our society face (so-called *technological solutionism*, see Morozov, 2013).

Freed from the institutions that structured privilege in the material world, the individual should join the society (Barbook & Cameron, 1996). Narratives of the new, fresh, with its connotations to youth, are apparent here. The *young* individual had to be liberated from *old* oppressive authoritarian forces such as the American State bureaucracy. This thinking was attractive to Republicans in the US (Turner, 2006). Although not hippies (or hackers), proponents of the so-called *new economy* shared an affection for empowering young/new technologically enabled elites, building new businesses, valuing decentralisation and personalisation and rejecting old traditional forms of governance. Young hippies' aversion to bureaucracy as a mechanistic and destructive force was coupled with a general anti-Statism of the right wing (Turner, 2006).

However, it created frictions when entrepreneurial hippies, steeped in a rebellious youth culture marked by an aversion to big old companies, started

to intermingle with corporate America. Fishers' (2018) book has some entertaining illustrations of this. Mainstream businesspeople questioned whether the future really could be invented by a young hippie "who did not even own a car" (Fisher, 2018: preface xiv). Business executives called these young hippie entrepreneurs "the great unwashed" (Fisher, 2018, p. 77). One of these strange encounters was when an investor came to the gaming company Atari dressed in a business suit and tie and met with Nolan Bushnell, one of the founders, who was dressed up in a t-shirt with the text *I love to fuck* written all over it (Fisher, 2018).

Underlying both ideas of a new economy and hippie holistic individuality is a belief in a network mode of organisation. The network became the principle of a new society with the internet as a model of an ideally decentralised and de-governmentalised society (see Turner, 2006). Power structures were supposed to be replaced by interactions between autonomous individuals and their software (Barbook & Cameron, 1996). This thinking also brought along ideas of mobile, flexible, and decentralised ways of working, something that was attractive for companies with employee liability and young entrepreneurs less motivated by employee protection in their professional careers. Right-wing politicians thus embraced digital technology with the network as their prime mode of organisation. They coupled it with ideas of liberating individual entrepreneurs, a world where young men (mostly) created their own destinies (Turner, 2006). Hippies also embraced the idea of a flattened and network type of organisation in their quest for one global unity and one human race.

Both hippies and entrepreneurs can be perceived as libertarians, underlining the importance of freedom of information for individuals. And it seems this ability to work together and listen to each other, respecting each other's expertise, is key here. "You all need to come together and work for a common goal, a common product, and to work together; you need to have a little bit of fun", as Viktor, a young programmer at the newspaper, phrased it. His mention of having fun leads me to the second tension between the pranking "dude" and the techno-missionary.

The playful prankster is sometimes represented in the darker figure of the hacker, doing things just for the sake of it, because they can and because it is fun (Thomas, 2002). This is summarised in the notion *lulz* (deviated from LOL, meaning laugh out loud). To do something *for the lulz* is used to justify ridiculous, pointless, and occasionally gratuitous behaviour. Fisher (2018) gives plenty of examples of this pranking dude, working hard but also playing hard with a peculiar sense of humour, such as delivering exploding pizzas and setting pianos on fire. Mark Zuckerberg's first business card read, "*I'm CEO … bitch*", and in the first Facebook office, they had lesbian love scenes in the restrooms and a woman warrior riding a bull. Young, mostly male, employees would walk into the office in pyjamas, and at four o'clock every afternoon, they would have a meeting about "how to get fucked" the following night (Fisher, 2018, ch. 25). This "dude" is not only connoted to the

youth but also to a heterosexual man. This environment is not particularly pleasant for women (see Chang, 2018) or anyone who does not define as a heterosexual man.

The pranking "dude" contrasts with the *techno-missionary* (as Darrah, 2001, appropriately labels them), trying to make the world a better place with the help of technology. My interview material is full of *techno-missionaries*. When asked about their life in the industry, programmers tended to highlight their more charitable work. One example is Roger, a programmer in his 50s whom I met at Google's headquarters in Mountain View. In the interview, he reflected upon his background in Africa setting up mobile services: "This is where my real passion started to emerge … and that is, and has always been, how technology can change lives for the better". Martin, a young employee at Facebook, also underlined that the most rewarding thing for him was to help others. He proudly declared how he had worked with kids with autism, people with Amyotrophic Lateral Sclerosis (ALS), and people with disabilities and how he, through one of his technological innovations, was able to give them a better life.

Technology culture indeed has a conscious and idealist side to it. The headquarters in Silicon Valley I visited all embraced environmentally friendly practices such as cycling and recycling. Google provides their employees with colourful bikes to use for free, and at Facebook, one of the many free services to their employees is a bike repair and maintenance shop attending to their employees' bikes while at work. Even in plastic-flooded India, the recycling initiatives in the IT hubs of Bengaluru were visible. In Scandinavia, companies happily broadcasted their environmentally friendly strategies as well as the support of local Pride parades. This also resonated in the technology conferences I attended. In Malmö at Öredev2018 (Öresund Developers Conference, November 2018), toilets were gender neutral, they served Eco-friendly vegan ice cream among other snacks, and the conference bag was made from renewable material, to mention a few things.

Both the techno-missionary, believing that the world can be made a better place in the future, and the pranking "dude" can be connoted with youth. As the saying goes: if you are not an idealist as young, you have no heart, but if you stay an idealist as old, you have no brains. Also, humour changes with age. Older adults are much less likely to be fans of the aggressive style of humour, laughing at the expense of others (Khazan, 2014). Youth seems to be the common denominator between the pranking "dude" and techno-missionary. What also unites the prankster and the techno-missionary is the pleasure of exploration and breaking new grounds, which connects with the pioneer previously mentioned. "We young are more eager to explore new programming languages and technical solutions", as Martin at Facebook phrased it.

A third tension is that between so-called "nerds" preferring to work alone and hyper-confident entrepreneurs (which resonates somewhat with the pranking "dude"). An interesting aspect of technology culture is its embrace

of working in the dark, undisturbed, out of the attention of the public's eye. This at the same time as they relied on a community of practice and knowledge as I will attend to later (a community and knowledge they most often accessed via their computers). Especially freelance programmers I interviewed seemed to have embraced the possibility of keeping to themselves. For example, Andri, a middle-aged Estonian programmer I met in Malmö, underlined his preference to be alone when answering the question of why he became a programmer. Indeed, many of the programmers I met were not confident entrepreneurs. Some of them told me they were shy and even felt like outsiders. Their natural habitat was in front of the computer.

In contrast to the confident entrepreneur, the computer offered a refuge where he/she could excel with his/her skills and socialise with other so-called computer "nerds" without being physically present with their bodies. For example, San Francisco-based middle-aged programmer Mark described how he "was kind of shy, queer, and did not understand school". He felt like an outcast and found comfort in going into the computer lab after school. The computer lab and the other dimension of ones and zeroes became his rescue, out of sight from his schoolmates, parents, and the adult world. This was a space where he felt he was in control and could detach himself from his physical body.

Being outsiders (nerds) resonates with the underdog position, which is highly valued in the culture. Stories of "nerds" struggling against a dominant corporate dinosaur – such as the hacker collective *Anonymous*, putting the world back in order through their computer skills or a lonely" nerd" turned accidental billionaire, as Ensmenger (2015) eloquently puts it – all allude to an underdog who against all odds programs technologies that then becomes recognised as revolutionary. Hippies, hackers, and entrepreneurs all conceive of themselves as underdogs. And as underdogs, they act from their more hidden position. The underdog is connected to thinking outside of the famous box, a general anti-authoritarianism, and a value of disruption, taking down corporate giants and wiping out whole industries. It is their work that they are recognised for, their code, rather than their persona. As referred to by Levy (1984), hacking should be based on merits, and hackers should be judged by their hacking and not by appearance, age or position in the physical world.

Even though programming seems to be a lonely profession in that programmers prefer to keep to themselves, programming as a practice is situated in a social context formed in the computer labs in the 1960s and 1970s populated by teenagers *brogramming* together. Rosenberg (2008) writes about *geek syndrome* referring to a preference for working alone, avoiding eye contact and a general difficulty reading body language. Thomas (2002) writes about hacker culture and claims that hackers have been known for their love for late-night junk food and their general slacker attitude. Ensmenger (2015) talks about this in terms of a *computer-bum phenomenon*, spending the whole night in the dark, with only the light from the computer

screen as a light source as he gets into the flow. Andri in Malmö explained that this was easier before when he was younger and did not have a family. At the same time, most programmers I interviewed knew they depended on others and built upon others' code. They need a community where their work can be recognised and acknowledged. And it seems this community is formed both by alone "nerds" and uber-confident entrepreneurs. This could be understood as particular ways of being young that have been forwarded in technology culture. And here it seems the culture is moving away from the "nerd" towards the entrepreneur. According to Chang (2018), in Silicon Valley, the "nerd" has started to give way to the entrepreneur (or "bro" as she labels him). She traces this transition to the rise of Apple and Steve Jobs. However, the image of the confident programmer goes further back than Jobs. Young programmers were photographed by Anne Liebowitz for an issue in the entertainment magazine Rolling Stone already in 1972 in a story about the legendary and arguably first interactive computer game *Spacewar!* (see Turner, 2006, p. 116). Here programmers were compared to rock stars, technologically savvy and counter-culturally cool. The hacker was no longer necessarily only a "nerd"; he (she) could also be cool. Still, part of the culture continues to thrive in the dark, in youth room-like environments, where they are hidden from the outside (adult) world, uninterested in physical appearance and only judged by their merits.

The fourth and final tension is between believing in yourself versus knowing your limits and asking for help. There are some quite big egos in the culture, not the least in connection to the culture's entrepreneurship and start-up influences. Nadja in Silicon Valley described good programming as "designing the impossible", which indeed requires some self-confidence. Similarly, Bart in Copenhagen talked about his hero Elon Musk as someone who "just does it, he asks for forgiveness later, and he is not afraid to fail". Elon Musk is known for being self-confident and believing in his ideas. To strive for attention implies believing you have something worth seeking attention for. I think this idealism and confidence can be connoted to youth.

At the same time, self-confident expert entrepreneurs depend on people willing to ask for their help. And to ask for help implies there is a community of programmers to rely on for this help. This is connected to the hacker value of sharing and building upon others' expertise, as attended to previously. It is still intriguing that a culture that celebrates the ethos of not giving up (grit) and the self-taught genius still underlines the value of asking for help. To learn, programmers need someone to learn from. The importance of Meetups does highlight this as a learning culture where programmers are eager to listen to each other and build upon each other's code and solutions. "We want to learn and have fun", as Ted in Malmö phrases it. Many of my interview participants also referred to online courses and tutorials as where they would go to learn things. In technology culture, the belief is that younger learn more quickly than older programmers. For example, Kristina, a middle-aged Polish programming student in Berlin, laments how she was

much slower with her 40 years than her classmates. "If you are going to work in tech, you are going to work in an environment where fast change is a constant", she told me.

The importance of asking for help was underlined by Hans, a middle-aged German freelance programmer based in Malmö. Ted, also in Malmö, had even tried to implement a culture in his start-up company where programmers should be quick to ask for help. Similarly, Sunil, a young Indian programmer in his 20s (relocated by his company to Berlin), declares to me how he had learned from his mistakes and how he now knew when it was time to ask for help. At the same time, Sunil underlines that he is a perfectionist and one of the best in his team concerning the systems and languages he works with. He explains that programming languages change quickly and that programmers need to "be on their toes". Many programmers mentioned fast learning in connection to the culture's youth orientation, the willingness to embrace and embark on the newest and being quick on their feet when something new is introduced.

Curiosity is crucial in navigating this tension between asking for help and still believing in yourself. Kristina, in Berlin, was clearly driven by her curiosity, leaving everything behind to embark on a new career. Similarly, Benjamin in Tel Aviv emphasises that he was a curious kid when answering my question if there was anything in his childhood that drew him into programming. This is about being interested in new stuff and not being afraid to fail. Curiosity and confidence, ready to explore new fields and ask for help in the process, are not in opposition. This resonates in accounts of early *pioneering* programmers and their curiosity for exploring and breaking new grounds. As a hacker in Thomas's (2002) book phrases it, "we explore, we seek after knowledge, my crime is that of curiosity" (Thomas, 2002, p. 97). Levy (1984) similarly describes hackers as motivated by exploration and as science-mad people "whose curiosity burned like hunger" (Levy, 1984, p. 17). Curiosity and exploration also seem to be connoted to the youth in the culture. "We young programmers in the team are just more curious and ready to explore an idea fully", as Jakob at the newspaper in Stockholm tells me, at the same time lamenting how older (middle-aged) programmers in his team are more inclined to end their workday at a particular hour to go home to their kids and families. It seems that technology culture forwards and rewards programmers willing to devote most (if not all) of their time to exploring and learning new things. Programmers who, with age (primarily), seek to split their time between their profession and, for example, their families are frowned upon, as Jakob in Stockholm (above) gives an example of.

Given this embrace of learning new things, it is interesting how formal education is frowned upon among the programmers I interviewed. Most of them stated that education was not necessary to become a good programmer. "You do not need any formal education at all, only interest", as a Lasse in Stockholm phrased it. The culture is full of legends about college students dropping out to start their businesses and making millions, such as Bill Gates

and Steve Jobs. A middle-aged programmer in Oakland discusses this as a narrative in the culture, programmers conceiving themselves as not formed by university experience. It could be argued here that universities represent an old authority. Moreover, as attended to in this chapter, programmers do not generally appreciate authorities and conceive of themselves as underdogs while still curious, young, unruly and ready to embrace change and new things.

Concluding thoughts

In this chapter, I have attempted to trace technology culture's youth orientation in its diverse roots and influences, and how programmers navigate tensions, these have given rise to. As this chapter has shown, technology culture is fundamentally geared towards the youth, structured around images of the young pioneering programmer with its connotations to the new, the fresh, the flexible (agile), the curious and the confident. The adult world represents the old and dusty, while technology is rebellious, the underdog who thinks outside of the box to change the world for the better while poking fun at each other at the same time. This matters not only for workplace relations but also for the products and services being engineered in the industry, which we increasingly depend on in connected data societies.

Let me end the chapter by shortly attending to an interesting paradox. Those young men (mostly) who have been constitutive of the culture, the hippies, and the hackers of the 60s, 70s and 80s, are now getting older. In the early years, their youthfulness shaped early technology culture. But those people are not young anymore. Rumours that you will not get hired at Google if you are over 35 are interesting, given that Google's founders, Larry Page and Sergei Brin, are turning 50 (both born in 1973). Mark Zuckerberg is approaching his 40s (he was born in 1984). Maybe this is why there is a growing interest in the aging body and how to reverse aging (as discussed in the chapter by Stypinska et al., 2023). The body has always been perceived as somewhat problematic in technology culture, from computer-bum hackers and weed-smoking hippies seeking out-of-body experiences with the help of psychedelics and computer code to contemporary high-profile artificial intelligence projects trying to replicate the human brain. A well-known example is Tegmark's (2017) ideas of *a Life 3.0*. While life 1.0 and 2.0 are about survival, replication, processing, and acting upon information, life 3.0 can even design its own hardware (i.e., the body), and voilà we will be free from an aging body and live forever. However, eternal life would make this life become meaningless, as actions here and now would lose some of their importance. Because of the finality of death, people are bound to care and be concerned with their actions here and now (see Hägglund, 2019). So let us celebrate that we are getting older, and our bodies are aging. This is also true for technology pioneers and people in the industry. It will be interesting to see if and how this will influence the industry (and culture) in the future.

References

Barbook, R., & Cameron, A. (1996). The Californian Ideology. *Science as Culture*, 6(1), 44–72. https://doi.org/10.1080/09505439609526455

Brooks, F. (1975). *The mythical man-month: Essays on software engineering*. Addison-Wesley.

Chang, E. (2018). *Brotopia: Breaking up the Boys' club of Silicon Valley*. Portfolio/ Penguin.

Dahlgren, P. (2009). *Media and political engagement. Citizens, communication, and democracy*. Cambridge University Press. https://doi.org/10.1017/S1537592711003616

Darrah, C. N. (2001). Techno-missionaries doing good at the center. *Anthropology of Work Review*, XXII(1), 28–32. https://doi.org/10.1525/awr.2001.22.1.4

Ensmenger, N. (2015). "Beards, sandals, and other signs of rugged individualism": Masculine culture within the computing professions. *Osiris*, 30(1), 38–65. https://doi.org/10.1086/682955

Fisher, A. (2018). *Valley of genius*. Hachette Book Group.

Gibson, J. J. (1977). The theory of affordances. In R. Shaw, & J. Bransford (Eds.), *Perceiving, acting, and knowing: Toward an ecological psychology* (pp. 67–82). Erlbaum.

Giddens, A. (1984). *The constitution of society: Outline of the theory of structuration*. University of California Press.

Girard, B. (2009). *The Google way. How one company is revolutionizing management as we know it*. No Starch press.

Graham, P. (2010). *Hackers & painters. Big ideas from the computer age* (2nd ed.). O'Reilly Media.

Hägglund, M. (2019). *This life. Why mortality makes us free*. Profile Books.

Hofstede, G. (1991). *Organisation och kulturer – om interkulturell förståelse*. Studentlitteratur.

Khazan, O. (2014, September). Sense of humor changes with age. A new study explains why your grandma doesn't find The Office funny. *The Atlantic*. https://www.theatlantic.com/health/archive/2014/09/our-sense-of-humor-changes-as-we-age/380954/

Kunda, G. (2006). *Engineering culture, control and commitment in a high-tech corporation*. Temple University Press.

Levy, S. (1984). *Hackers: Heroes of the computer revolution*. O'Reilly Media. https://doi.org10.1016/0267-3649(86)90036-1

March, J. G., & Olsen, J. P. (1984). The new institutionalism: Organizational factors in political life. *The American Political Science Review*, 78(3), 734–749.

McLuhan, M. (1964). *Understanding media*. McGraw-Hill.

Meetup. (2022, October 30). *Wikipedia*. https://en.wikipedia.org/wiki/Meetup

Morozov, E. (2013). *To save everything, click here. The folly of technological solutionism*. PublicAffairs.

Nagy, P., Eschrich, J., & Finn, E. (2021). Time hacking: How technologies mediate time. *Information, Communication & Society*, 24(15), 2229–2243. https://doi.org/10.1080/1369118X.2020.1758743

Nagy, P., & Neff, G. (2015). Imagined affordance: Reconstructing a keyword for communication theory. *Social Media + Society*, *July–December*, 1–9. https://doi.org/10.1177/2056305115603385

O'Neil, C. (2016). *Weapons of math destruction*. Crown Publishing.

Rosales, A., & Svensson, J. (2021). Ageism in the tech industry. Stereotypes and discrimination in a distinctly youth-oriented culture. *Nordicom Review*, *42*(1), 79–91. https://doi.org/10.2478/nor-2021-0021

Rosenberg, S. (2008). *Dreaming in code: Two dozen programmers, three years, 4,732 bugs, and one quest for transcendent software*. Crown Publishing.

Stypinska, J., Rosales, A., & Svensson, J. (2023). Silicon Valley ageism – ideologies and practices of expulsion in tech industry. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Svensson, J. (2021). *Wizards of the Web. An outsider's journey into tech culture programming and mathemagics*. Nordicom. https://doi.org/10.48335/9789188855534

Tegmark, M. (2017). *Life 3.0. being human in the age of artificial intelligence*. Vintage Books.

Tenhaven, J. (Director). (2016). *The Silicon Valley revolution* [film]. ECO Media TV-Produktion.

Thomas, D. (2002). *Hacker culture*. University of Minnesota Press.

TIME (1995). *TIME special issue: Welcome to cyberspace*. TIME USA.

Turner, F. (2006). *From counterculture to cyberculture. Stewart Brand, the whole earth network and the rise of digital utopianism*. The University of Chicago Press.

Wiener, N. (1948). *Cybernetics, or control and communication in the animal and the machine*. MIT Press. https://doi.org/10.7551/mitpress/11810.001.0001

5 The marketing of technology products for older people

Evidence of visual ageism

Loredana Ivan and Eugène Loos

Visual ageism

Media content becomes more and more visual with the advance of digital technology, and people are part of this content. It is important to question how older people in our digitising and aging society are visually represented and to which extent media convey forms of "visual ageism", a phenomenon coined by Ivan and Loos (2018, p. 164) as "the social practice of visually underrepresenting older people or misrepresenting them in a prejudiced way". In the case of stereotypical representations of old people in digital media content, cultural aspects shape the way they are portrayed. What it means to get old, including the positive and negative aspects of aging, could differ from one country to another (Cruikshank, 2013; Fry et al., 1997).

"Ageing well" and similar trends as "healthy aging"(http://www.healthy-ageing.eu/), "positive aging" (Featherstone & Hepworth, 1995), "active aging" (Riva et al., 2014; WHO, 2002) and "successful aging" (Andrews, 2009; Baltes & Baltes, 1993; Foster & Walker, 2014; Rowe & Kahn, 1997) focus on the quality of the aging experience (Orpin et al., 2013; WHO, 2014) and ultimately make people responsible for their health and wellbeing and discipline them into following ideals of perfect and ageless life (Holstein & Minkler, 2003; Katz & Marshall, 2003). Underlined by a neoliberal agenda, such discourses emphasise the individual responsible for the process of aging, which is regarded as a personal project worth pursuing to age successfully (Chapman, 2005; Loos, 2013; Orpin et al., 2013). We have previously criticised such a normative approach to aging in the visual representation of older adults (see Loos et al., 2017a).

Furthermore, visual ageism in (digital) media does include not only images that other age groups have about older people but also images older people have about themselves. There is a large body of research on internalised stereotypes (Ayalon & Tesch-Römer, 2017; Kornadt & Rothermund, 2012; Kornadt et al., 2017) and on how societal practices of representing old people are adopted by older people themselves – sometimes with negative effects on their performance in a different type of activities (i.e., visual accuracy; technology appropriation), on their health and wellbeing (see Levy et al., 2021).

We face a paradox in the way older people are visually represented in the media: On the one hand, the over-homogeneity of older people's visual portrayals derived from and reinforces our internalised stereotypes about old age (Lester & Ross 2003; Loos, 2013); and on the other hand, the empirical evidence showing the fact the older we grow, the more diverse we get as a group, a phenomenon called "aged heterogeneity" (see for example Stone et al., 2017). People could be rather unaware of the age heterogeneity phenomenon and caught in their prejudices about how older age might look like.

Equally important is to study visual ageism in cross-cultural contexts; approaching digital media content created and distributed for and with an older audience in mind. In previous studies, we explore visual portrayals of older adults in different countries, trying to reveal the role of cultural factors. In one study (Loos et al., 2017a), we investigated the way older people are visually represented on the websites of the organisations for older people in seven European countries (Finland, Italy, the Netherlands, Poland and Romania, Spain and the UK). We used an analytical approach based on visual content analysis inspired by the dimensional model of the national cultural differences proposed by Hofstede (1991; 2001; 2011). We investigated the role of two Hofstede cultural dimensions: Individualism/Collectivism (IDV) and Masculinity/Femininity (MAS) and described the characteristics of the "aging well" discourse in the visual representations of older people and how such discourse differed in the investigated countries.

Visual ageism: Previous work

The results demonstrated that in all seven countries, older people were mostly visually represented as healthy/active; while the cases in which the visual content represented older people as frail/passive were fewer, which is consonant with the "aging well" discourse and in line with the results of another explorative study previously conducted in the Netherlands by Loos (2013). As for the role of cultural context, there were differences between the analysed countries in the visual content, especially for the percentage of visual items describing frailty/passivity in later life. Such results confirm the general logic of online media to favour positive over negative content (see Klinger & Svensson, 2018). Particularly on the websites from the UK, Poland and Romania, we found more visual content (30%) accounting for frailty/passivity than on the website from Finland (4%), for example, consistent with the idea of cultural differences in the way older people are portrayed. Our data also showed that in most cases, older people tend to be represented together with others in the photographs on the websites of organisations for older people. A possible explanation could be that this visual representation is consistent with the mission of such organisations – to bring individuals together. Still, the percentage of visual content coded as "older people together with others" significantly varied from country to country.

In a more recent study (Loos et al., 2022), the authors revealed the visual ageism of public organisations' websites in Denmark, the Netherlands and the UK: the overuse of third-age (young older) connoting health and activity as opposed to physical incapacity and vulnerability. Such visual portrayals enhance the risk of misrepresentation and fail to represent age heterogeneity. That particular study draws attention to visual signs produced by public organisations and the way they are distributed and consumed by the heterogeneous target group of older people. After all, the analysis of "visual ageism" should also take into account the perspective of the consumers and the perspective of those involved in selecting and distributing certain visual items about and with older adults.

We previously investigated visual ageism in traditional media (Loos & Ivan, 2018). We reviewed empirical studies on print and television advertisements and television programs conducted since 1950 in Europe and North America and concluded that: "over time, media representations of older people have moved from visual under - and misrepresentation (negative images) to more positive depictions" (Loos & Ivan, 2018, p. 166). We found that print and television advertisements started the transition towards a more positive visual representation of older people during the last decade of the 20th century; followed by television programs some years later. Our study showed a continuous underrepresentation of the oldest-old in traditional media over time.

Similarly, Ylänne (2021) conducted a content analytic comparison between two corpora of adverts (221 ads from 1999 to 2004 and 313 ads from 2011 to 2016) showing the depiction of older adults in the advertisements from UK magazines. The study found a relative consistency in the product categories, linking older adults with the health domain and a decline in the humorous portrayals of older adults from 1999 to 2016. This particular study confirmed the fact that advertising and marketing strategies are in line with the aspirational third-age discourse and imagery, contributing to the marginalisation of the oldest adults and a normative portrayal of later life which Ylänne (2021, p. 1) described as "ageless".

Current study

Aim and research questions

The current study presents a systematic literature review of research studies conducted during the past ten years (2011–2021) to reveal the visual portrayals of older adults in advertising and marketing strategies for technological products. We proceeded to a systematic search of four scientific databases which are largely used nowadays by scholars from the social sciences: Web of Science, Scopus, ProQuest and Science Direct. While Web of Science aggregates articles, especially from top-ranked journals, ProQuest was selected by the fact that the content is easily accessible to the academic community and openly available online.

The systematic literature review aim was to find possible evidence of visual ageism in the studies having a focus on advertisement and technology. We particularly looked at research studies that included information about older adults (no specific age limit), regardless of whether such studies investigated stereotypes or just the presence and the characteristics of the older persons in the visual content (video or photo content) of different technological products. We treat "technology" as a broader term and include various references to technological products, from mechanical technologies (for example, automotive and watches) to Internet-based technologies (for example, tablets and assistive technologies). The goal was two answers two research questions:

RQ1. *What are the visual portrayals of older adults in the advertising for different technology products, as resulting from studies conducted during the past ten years? We looked for indications of visual ageism – in a sense that older people were underrepresented, stereotypical represented or represented in peripheral roles.*

RQ2. *What are the visual portrayals of older adults in the marketing strategies for different technologies, as resulting from studies conducted during the past ten years? Here we want to explore the association between older adults and certain types of technologies*

In addition to the two research questions described above, we explore potential contextual aspects in the way older adults are visually represented, and we search for socio-cultural differences, differences in methodologies, and also what age group is investigated in the studies showing evidence of older adults' presence in technology products' advertisements. In doing so, we shed light on the interest in the current literature on the topic of visual ageism and technology and indicate gaps in which we need further development.

Method

Searching procedure

The search for articles was limited to peer review articles written in English or have a title and an abstract in English during the time frame 1.01.2011–1.11.2021. In all four databases, Web of Science, Scopus, Science Direct and ProQuest, we used three sets of keywords: *advertisements and technology*; *older people and technology advertisements*, and *older people and stereotypes in advertising*. For the first set of keywords, "advertisements and technology", we added a filter using *older people* and *marketing strategies* to narrow the search to those articles which were more pertinent for our review. However, this supplementary filter was not used if the resulting entries were relatively small in number (below 100). Table 5.1 presents the results of our search on all four databases and also the final corpus assessed to search for information regarding older adults' portrayals in the marketing

Table 5.1 The process of selection of the publications included in the analysis (2011–2021, articles)

	Web of Science	Scopus	Science Direct	ProQuest (peer-reviewed articles, scholarly journals)
Keywords 1 Advertisements and technology	*(n = 2119)* (n = 12) – using "older adults" as a filter; (n = 80) – using "marketing strategies" as a filter	*(n = 2369)* (n = 65) – using "older adults" as a filter; (n = 403)–using "marketing strategies" as a filter	*(n = 16382)* (n = 2907) – using "older adults" as a filter; (n = 4529) – using "marketing strategies" as a filter	*(n = 34,242)* (n = 6260) – using "older adults" as a filter; (n = 10,890) – using "marketing strategies" as a filter
Main domains	Computer Science (n = 836) Engineering & Software (n = 561) Telecommunication (n = 272) Business (n = 175) Communication (n = 102)	Computer Science (n = 1132) Engineering (n = 661) Social Sciences (n = 571) Business (n = 321) Medicine (n = 217) Mathematics (n = 213) Arts and Humanities (n = 190) Decision Sciences (n = 137)	Computer Science & Informatics (n = 2058) Business & *Consumers (n = 822) *Social & Behavioural Sciences (n = 396) Psychology (n = 254) Decision & Forecasting (n = 268) Energy Policy (n = 139)	Environment & Sustainability (n = 1248) PloS One (science, technology, and medicine) (n = 1016) BMJ (medical research) (n = 326) Scientific Report (Nature Publisher) (n = 324) Sensors (n = 322) *Journal of Medical Internet Research (n = 303) *European Journal of Marketing (n = 28)

(*Continued*)

Table 5.1 (Continued)

	Web of Science	Scopus	Science Direct	ProQuest (peer-reviewed articles, scholarly journals)
Keywords 2 Older people and technology advertisements	(n = 23)	(n = 15)	(n = 5283) Computer Science (n = 213) *Business and Consumer (n = 208) *Social & Behavioural Sciences (n = 111)	(n = 9322) Environment & Sustainability (n = 409) PloS One (science, technology, and medicine) (n = 333) BMJ (medical research) (n = 177) Scientific Report (Nature Publisher) (n = 73) Sensors (n = 35) *Journal of Medical Internet Research (n = 172) *BNC Public Health (n =117) *Sex roles (n = 33) *European Journal of Marketing (n = 28) *Technology & Culture (n = 28) *Gerontology (n = 23)
Keywords 3 Older people and stereotypes in advertising	(n = 21)	(n = 13)	(n = 1095) *Business and Consumer (n = 87) *Social and Behavioral Sciences (n = 63)	(n = 2170) *Sex roles (n = 43) *Environment & Sustainability (n= 70) *PloS One (science, technology, and medicine) (n = 31) *Aging & Society (n = 17)
Total articles evaluated	(n = 136)	(n = 469)	(n = 1218)	(n = 2274)
Total articles selected after the initial evaluation	(n = 16)	(n = 15)	(n = 18)	(n = 95)

* Only articles from these domains were analysed.

and advertising strategies for technology products. A broader meaning of the term "technology" has been used in our assessment going from the mechanic technologies (for example, cars and household appliances) to Internet-based technologies (e.g., websites, apps) and communication devices (e.g., tablets, computers, smartphones). Also, health-related technologies and surveillance technologies were included. We acknowledge the fact that some technologies have a broader audience, whereas others have an older audience in mind (as is the case of health-related technologies).

Corpus

Articles found in the four databases vary considerably in terms of number, with a higher number of entries in Science Direct and ProQuest databases, as compared to Web of Science and Scopus. As a result, we limited our evaluation to fields close to social sciences and business & consumer. In total, a relatively large number of articles were considered: Web of Sciences (136); Scopus (469); Science Direct (1218) and ProQuest (2274). An initial evaluation was done on all these items (N = 4097 articles) by reading the abstracts and selecting the relevant ones for the final review. First, we discarded the articles which appeared more than once, resulting in a distinct corpus of 3064 articles that were screened using mainly the abstract. In some cases, we proceeded in screening the entire article for clarifications. We selected articles based on the following criteria: (1) to include data or indications about older people and (2) to mention aspects regarding marketing strategies, advertisements, and communication strategies concerning technology. Based on the conjunction of the two criteria, a final corpus of 144 articles was reviewed by reading them entirely and selecting the ones in which information about the visual representation of older people about technology was present.

Table 5.2 presents the final corpus of 20 articles that meet the following criteria: (1) they present data regarding visual representations of older adults (irrespectively to the age used to define old age); and (2) they include in the findings data regarding the way older people were portrayed in relation with technology (the concept of "technology" was used in broader sense-from mechanic technology to communication devices). Consistent with the way we defined *visual aging*, we found articles in which older people were depicted in terms of characteristics, roles, and activities. We then coded the final corpus to reveal the way older people are visually represented in the advertising and marketing strategies for technology products and whether there is any evidence for visual ageism. Here we have to specify the fact that we investigated research studies in which visual representation of older adults have been considered regardless if the focus of those studies was advertising and marketing strategies for technology products or for different product categories (in which technology products were described as one of the categories among others).

Table 5.2 Older people representations in marketing strategies and advertisements for technology products (2011–2021)

Author/year/database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Prieler et al. (2011)/Web of Science	Video representations advertisements (Japan)	Gender representation of older people (50+)	Automobiles/related products	Quantitative content analysis, corpus selected from five commercial TV stations in Japan	Older women are more underrepresented compared to older men (two times less present)	• Evidence of visual ageism in terms of roles • Stereotypic roles for women – automobiles/related products – women in major roles 1.3 % (the lowest); men in major roles 4.5% (relatively good representation) • Older people were more present in food/beverage advertisements (men) and in cosmetics/hygiene (women)
Baumann and de Laat (2012)/Science Direct	Video (primetime television advertising, public and commercial broadcasting, Canada)	Gender representation of older people (50+)	Electronics, automotive & telecommunications	Quantitative and qualitative content analysis	• Women are more underrepresented compared to men • Older men more portrayals on jobs; older women at home • Older men – in positions with authority	• Technology was associated with the presence of old men but not of old women. Still, their positions lack authority (except from electronics)

(*Continued*)

Table 5.2 (Continued)

Author/year/ database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Clarke et al. (2014)/ Science Direct	Visuals (images) (six widely read North American male-oriented magazines)	Older men representation (50+)	Watch (old technology) versus modern technology	Qualitative content analysis & visual textual analysis Corpus from Esquire, GQ Maxim Men's Health, Men's Journal and Zoomer	• Preference for younger men/ older people rather absent • When present – celebrities • Healthy and happy	Old technology – masculinity was associated with craftsmanship and refused to embrace technological innovation Modern technology – "smartly dressed and smiling older couple sitting in front of a laptop computer" (p. 30) – third age, successful ageing
de-Andrés-del Campo and de-Lima-Maestro (2014)/ Web of Science/ Scopus	Visuals (images) (advertisements in magazines, Spain)	Older people representation	No specific (communication technologies)	Quantitative and qualitative content analysis (advertisements aimed directly or indirectly to seniors)	Products and services are very differentiated by gender Older people are rather absent the magazine advertisements, especially those who are very old (80+). Those 60–70 are more present	• Institutional adver-tisements are more progressive than the commercial ones and also showing old people using the new technologies

Table 5.2 (Continued)

Author/year/database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Chen (2015)/ Web of Science	TV advertisements (UK & Taiwan)	Stereotypes of old people	One category analysed (computer/ communication products)	Quantitative and qualitative content analysis	Overall older people in Taiwan were presented as more vulnerable, prone to health services and dependent; In the UK, they were presented as more healthy and fit In both cases, the portals were ageist (positive ageist in the UK; negative ageist in Taiwan)	The number of ads with older people of computer/ communications products – relatively small (5.4%) as compared with other categories of products and similar in the UK and Taiwan Health or medicine (35%) Food or drinks (22%) Beauty & hygiene (9%) Finance & insurance (8%)

(*Continued*)

Table 5.2 (Continued)

Author/year/database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Hoppe et al. (2015)/ Web of Science	Video representations advertisements (two commercial, two public broadcasting networks in Germany)	Older people representation (50+)	Tables, mobile phones, vacuum cleaners, cars	Quantitative and qualitative content analysis (commercials having older actors)	Older people are related to food, prescription drugs and health, insurance and hygiene products – underrepresented in TV commercials but presented in positive attributes	More balanced representation of older people on different products 5.3% commercial for technology (mobile phones & vacuum cleaners) 5.3% commercial for cars-some were presented in commercials associated with technologies used for health services (e.g., tablets
Loos et al. (2017b)/ ProQuest	Video representation (digital game, Netherlands)	Older people representation	Digital games	Semiotic and narratology	Rigid distinction between "digital natives" and "digital immigrants"	The impact of "digital immigrant" metaphor in the way older adults relate with the digital world

Table 5.2 (Continued)

Author/year/ database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Prieler et al. (2015)/ Web of Science	Video representations advertisements (Japan)	Older people representation	Home electric appliances/ audio-visual equipment	Quantitative content analysis, corpus selected from five commercial TV stations in Japan	What has changed between 1997 and 2007 Older people are more present; presented in more favourable way, but still in minor roles	• Evidence for visual ageism (roles) • More present in advertisements for food and beverages • No differences in the presence of older people in advertising on technology products between 1997 and 2007 (4.8% versus 4.9%) • Small percentage of commercials depicting older people & technology (bellow 5%)
Prieler et al. (2017a) / Web of Science	Video representations advertisements (Japan)	Gender representation of older people	Home electronic appliances/AV equipment, automobile/ related products	Quantitative content analysis, corpus selected from five commercial TV stations in Japan	What has changed between 1997 and 2007 Gender differences were more present in 2007 than in 1997	The presence of older people in advertising about technology even less in 2007, compared to 1997

(*Continued*)

Table 5.2 (Continued)

Author/year/ database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Prieler et al. (2017b)/ Web of Science	Video representations advertisements (Hong Kong, Japan, South Korea)	Older people representation (50–64; 65+)	Mobile phones or providers Automotive/ transportation	Quantitative content analysis, corpus selected from main commercial TV stations in all three countries	Older people are highly underrepresented Older men clearly outnumber older women. • Older people tend to be shown in major roles (especially men)	Number of commercials in which people are associated with technologies varies between the three countries Mobile phones (0% Hong Kong, 5.2% Japan, 14.7% South Korea) Automotive (0% Hong Kong, 19.3% Japan, 8.5% South Korea)
Vulpe (2017)/ ProQuest	Video representation (advertising, Romania)	Older people representation (65+ age display)	Tablets, smartphones and computers Internet-based technologies	Qualitative content analysis	• 5 portrayals of older adults, among which *high-tech elderly* – least represented in the corpus	*High-tech elderly* category – commercials which portrayed old people who were familiar with technology and the use of digital devices • Older people represented in the private sphere. Technology was incorporated into the lifestyle stereotypically associated with older people

(*Continued*)

Table 5.2 (Continued)

Author/year/ database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Bentley et al. (2018)/ ProQuest	Older people critics of visual representation in advertisements (UK)	Marketing strategies for older adults	Telecare technologies	Semi-structured individual interviews (65+)	• Strategies should be focused on benefits and not on risks of using telecare • Positive messages are more appreciated	Advertising should present less stigmatised options than presenting older people as technological retrogrades
Persaud et al. (2018)/Web of Science/ Scopus/ ProQuest	Video advertisements (on websites)	Gender representation	Technology advertisements from top technology companies: Apple, AT&T, Hewlett-Packard, Verizon, Microsoft, Comcast, Dell, Intel, and Google	Quantitative and qualitative content analysis Company's websites were used to select the videos	Elderly characters, both male and female – least visible characters	• Association between technology masculinity, youth and whiteness • "Older men and women are not shown using technology, instead they appear to be indifferent to its use and existence" (p. 149) • Elderly characters are always accompanied by younger characters • "In scenes with elderly characters, technology is nowhere to be seen and/or the activities these characters engage in do not require its use" (p. 149)

(*Continued*)

Table 5.2 (Continued)

Author/year/ database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Christensen (2019)/ ProQuest	Visual representation of (images on a website) Denmark	Photos of older adults	Website of an advocacy group for older people	Visual analysis (qualitative & narrative)	Digitalisation and computer use are presented as enjoyable pastime & an activity which requires attention	Only two photos with older people in digital contexts depicting only men
Kowalewska, K. and Grodzki, E. (2019)/ ProQuest	Video representations (prim time commercials US & Poland)	Older people representation (55+)	Online finance/ social network sites/phone services	Qualitative content analysis Commercials from public TV in Poland & ABC and CBS in the US	Women prevailed in Poland and home & cooking activities Men prevailed in the US and diverse activities	Older people are more associated with drugs, food & financial services Less present in association with technology/more present in the US
Monteiro Machado and Pedro Sousa (2019)/Web of Science/ ProQuest	Video Advertisements on Facebook & YouTube (Brazil)	Stereotypes of old people	No specific (communication technologies)	Qualitative content analysis	Positive representations but also ageism: • Disconnected from reality • Difficulty in using technology and in social interactions – old fashion clothing • Typical body posture	• Older people repre- sented losing touch with reality, hav- ing difficulties with technology

Table 5.2 (Continued)

Author/year/ database	Forms of representation	Main focus	Technology	Methodology	Findings	Older people portrayals
Vermeer et al. (2019)/ ProQuest	Visuals (images) on websites for surveillance technologies	People with dementia	Surveillance technologies (products from the UK, Sweden and the Netherlands)	Quantitative & qualitative content analysis	Portrayal of people with dementia as a "problem to be managed" has been – people with dementia in the same class as wallets, keys, young children, dogs or prisoners	• The social imaginary of the fourth age • Products are solely designed for and used by carers • Older people with dementia are disregarded as human technology users
Muñoz (2020)/ Web of Science	Video (primetime television advertising, Puerto Rico)	Older people representation	Technology is not specific & automobiles	Quantitative and qualitative content analysis (two weeks, four TV channels)	• Stereotypic representation, mostly in commercials about medicine, food, finances	• No presence in commercial about technology • Modest presence in commercial about automobiles
Vermeer et al. (2020)/Web of Science/ Scopus	Video representation advertisements (UK, Sweden, Netherlands)	People with dementia	Surveillance technologies	Qualitative content analysis/semiotic discourse analysis	People with dementia are seen as objects and tracked as children, pets and possessions	• Only one person was represented as interacting with technology • Older people with dementia are disregarded as human technology users
Freiesleben et al. (2021)/ ProQuest	Visual representation of older people with cognitive difficulties by business experts	Marketing strategies for older adults	Locative technologies/ assistive technologies	Focus groups • Flyers of two commercially Available GPS watches were discussed	Product advertising in a stereotypical way – an important barrier	Advertising messaging and visuals should be non-stigmatising, stressing the value for optimising the autonomous mobility

Our analysis offered a general image of the type of studies in which such topic was approached (main focus and methodology) and also about what type of technology was associated with older adults (as resulting from the studies we analysed).

Findings

Evidence for visual ageism in marketing strategies of technology products

The studies included in the final corpus of analysis (see Table 5.2) show evidence of visual ageism, particularly when we consider the roles older people are playing in the description associated with different technologies. For example, Prieler et al. (2015) noticed that older adults' visual representations in the technology advertisements presented in Japanese commercial television channels show no change during ten year-time (1997–2007) and that older people, in general, are depicted in small, peripheral roles. Furthermore, Prieler et al. (2017a) noticed that older people tend to be even more underrepresented in commercials regarding technology products when they compare 1997 with 2007. The same was found by Baumann and de Laat (2012) when they studied primetime television advertising on both public and commercial broadcasting in Canada: when older people were present in commercials about technology, they were placed in positions that lacks authority (except for electronics). We will discuss further that there is some type of technologies that are more inclined, in the advertising and marketing strategies, to be associated with older adults.

Although visual ageism was more evident when older people's roles were analysed, there is evidence of visual ageism in terms of characteristics associated with them as technology users – stereotypic descriptions of older adults as being no-technologically skilled or non-preoccupied with technology. Still, such depictions are more common to older women than to older men and are very common when it comes to older people having cognitive impairment.

Studies in which gender roles were examined (Baumann & de Laat, 2012; Prieler et al., 2011, 2017a) show the fact that older women tend to be more stereotypically visually represented as associated with beauty and hygiene products (Prieler et al., 2011) and they are less associated with technology products, as compare to older men (Baumann & de Laat, 2012; Christensen, 2019; Prieler et al., 2011, 2017a, 2017b). Also, other studies show evidence of the association of technology with masculinity, at least when older people are portrayed (Christensen, 2019; Clarke et al., 2014). As Persaud et al. (2018) mentioned, technology tends to be associated with masculinity, youth, and whiteness.

Besides the gender differences in the portrayals of older people in relation to technology, visual ageism is merely present when talking about older adults with cognitive impairment. Some of the studies investigated the representation of older people with dementia in relation to technology (Vermeer

et al., 2019; Vermeer et al., 2020) and they concluded that older people with dementia are disregarded as human technology users. Instead, they are represented as a "problem to be managed" by technology and objectified by putting them in the same category as wallets, keys, children, dogs or prisoners. Visual ageism in the case of older adults suffering from cognitive impairment seems to be even stronger than for older adults in general. The technology products, in such situations, are solely "designed for" and "visualised as" used by carers, whereas older people with cognitive difficulties remain "the objects" to technology. Vermeer et al. (2019) described the process of visual ageism in such cases as resulting from a social imagination of the fourth age.

The visual ageist representation of older people with cognitive difficulties is admitted by business experts when they talk about locative and assistive technologies (Freiesleben et al., 2021). The focus group discussions with such experts revealed that they are aware of the fact that the advertising industry is using stereotypical representations of older adults for such products, and they also estimate that this might be even an important barrier in marketing for assisted living technologies. Interestingly enough, they coin for non-stigmatising visuals, stressing the value of assistive technologies for autonomous mobility.

The visual representations of people disentangling with technology are also common for older adults in general, even the portrayals are not as explicit as in the case of older people with cognitive difficulties. As Loos et al. (2017bnoticed, referring to online games, there is a rigid distinction between "digital natives" – the young and "digital immigrants" – the older persons, in the marketing strategies. The same study underlined the impact of the "digital immigrant" metaphor in the way older people are represented in the digital world and with the new communication and information technologies. The impact of the "technology immigrant" metaphor is also found in the study of Monteiro Machado and Pedro Sousa (2019) on video advertisements distributed on Facebook and YouTube in Brazil: older people were presented as losing touch with reality or having difficulties in using technology.

In their analysis of technology advertisements from top technology companies (using websites of Apple, AT&T, Hewlett-Packard, Verizon, Microsoft, Comcast, Dell, Intel and Google), Persaud et al. (2018) found that "older men and women are not shown using technology, instead, they appear to be indifferent to its use and existence" (p. 149). They also noticed that when older characters are present, they are always accompanied by younger characters (who normally play an expert role). Also, when such video representations have scenes in which only old characters are presented, "technology is nowhere to be seen and/or the activities these characters engage in do not require its use" (p. 149).

Not all studies show portrayals of older adults as unskilled or disentangled with technology. For example, the study of Vulpe (2017), analysing video representations of older adults in advertising presented in Romania, focusing on tablets, smartphones, and computers, found that one of the portrayals of

older adults is "high-tech elderly" – familiar with the digital devices. However, the author mentioned the fact that such portrayal is the least common in the corpus she analysed and when such characters appear, they are represented in private spaces and not in public ones. Therefore the conclusion was that *high-tech elderly* visual representation reinforces lifestyle stereotypes associated with older adults.

Still, we lack studies in which older people's perceptions are researched asking them to express their views on the visual representations of older people in commercials and marketing strategies about technology. We found only one article in which such an aspect was investigated (Bentley et al., 2018), focusing on telecare technologies and using semi-structured interviews with people 65 years and above in the UK. This particular study confirmed the fact that older adults have a critical perception of advertisements regarding telecare technologies by considering them as a way of visually representing older adults as being technological retrogrades. The same study indicated that older adults would like marketing strategies in this sector to focus more on positive messages, on benefits, and not on risks and should present a less stereotypical portrayal of older adults.

Type of technologies associated with older adults

When looking at the type of technologies older people are visually associated with in commercials and marketing strategies, the results of studies analysed here show the fact that they tend to be more linked with mechanical technologies (for example, cars), with electronics and general with old technologies, at least in the advertisements where they are more present, and in prominent roles (e.g., expert, main characters), or depicted positively. In many cases, such associations with old technologies are typical for older men but not for older women. Our review shows that, in the case of old technologies, the association with masculinity is more explicit as compared to the new technologies. Prieler et al. (2011), for example, found that video representations of older adults in advertisements in Japan had significantly more men in major roles (4.5%) in association with automobiles and related products than women in major roles (1.3%). Baumann and de Laat (2012), analysing primetime advertising at public and private TV broadcasting in Canada, also found that electronics, automotive, and telecommunication were more associated with the presence of older men but not of older women. They also revealed the fact that in the case of older men, their presence in association with electronics was accompanied by authority, which was not the case for automotive or telecommunication products. Muñoz (2020), using an analysis of primetime advertising in Puerto Rico, found that older adults are absent from the commercials on technology in general, but they show a modest presence in commercials for automobiles.

Also referring to television advertisements, Chen (2015) found that the number of ads with older people in computer and communication products

(new technology) was relatively small in the UK and Taiwan (5.4%), as compared to other categories of products (for example health and medicine – 35%, food, and drinks – 22%). The same was found in Japan (Prieler et al., 2015) – where the percentage of older people in technology-related advertisements was below 5%. In this particular study, rather old technologies were considered: home electric appliances and audio-visual equipment. Prieler et al. (2015) also showed the fact that the percentage of older adults remained relatively unchanged (below 5%) over ten years (1997–2007). They later mentioned that the association between older people and technology products even decreased in 2007, compared to 1997 (Prieler et al., 2017a), when they analysed three types of technologies: home electronic appliances, audio-video equipment, and automobile.

In a study conducted by Clarke et al. (2014) using visual images from North American male-oriented magazines, the visual representation of older people with old and new technologies is better illustrated. The authors explicitly analysed watches (as old technology) versus laptops (new technology) and the way older people were visually represented. They found that in the case of old technology, the association was more with masculinity and craftsmanship – as an opposition and a refusal of technological innovation, whereas the modern technology was visually represented in couples – people smartly dressed and smiling in front of the laptop/computer (p. 30) – typical exponents of successful aging rhetoric.

Visual ageism and contextual aspects: The need for further developments

When analysing how older people were depicted in advertising and marketing strategies of technology products, we found some evidence that would need further exploration.

First, our findings indicate that when studying visual representations of older adults in advertisements and marketing strategies, gender issues appeared and older men tend to be more present and associate especially with old technology, as compared to older women (Christensen, 2019; Clarke et al., 2014). In addition, older men appeared more often in authority positions in such advertisements than women (Baumann & de Laat, 2012). Still, the fact that visual ageism in such cases is not only gendered but also associated with whiteness (as claimed by Persaud et al., 2018) was not investigated (at least not in the studies we revised here). It is worth exploring to which extent visual representation of older persons in associating with technology holds some nuances in regards to characters having different ethnic and racial backgrounds. Even the absence of such characters in commercials and marketing strategies about different technology products could be an interesting finding.

Second, the corpus we analysed here is quite rich in terms of countries in which those studies have been conducted: commercials from the Western

world, but also from Asia, South America, and Eastern Europe, but it was not the purpose of the current chapter to illustrate differences of visual ageism for technology products between different countries. The list of the countries presented in Table 5.2 resulted directly from the selected articles, and it is not necessarily relevant to infer something about country differences. Still, visual representations of older adults in marketing strategies and advertisements about technology products might be quite different from one country to another, possibly about values associated with old age in a respective country and also to the role different technologies might have played in that society during the years. Three examples from our corpus point out the importance of considering the country context in future analysis.

First, in the study of Kowalewska and Grodzki (2019), in which commercials presented on television in Poland and the US were compared, the authors found that older people were more present with technology products (online finance, social network sites and phone services) in the US than in Poland.

Second, the study conducted by Hoppe et al. (2015) investigated the video representations of older adults in advertisements presented in Germany (public and commercial broadcasting networks). Both new technologies (tablets, mobile phones), but also more traditional mechanic ones (cars, vacuum cleaners) were analysed and the authors found a more balanced representation of older adults on different technology products (about 5% for each), with no particular indication of an association of older adults with old technologies. Indeed, when it was the case of the new technologies (e.g., tablets) – these were more associated with the health domain (stereotypical for older adults), but the portrayals of older adults with technology, in general, indicated more positive images, which "technology can be learned".

The third example, Prieler et al. (2017b), presented the results from a content analysis on video advertisements in three Asian countries: Hong Kong, Japan and South Korea and the results show noticeable country differences. For example, older people were present in mobile phone advertisements in 14.7% of the corpus in South Korea, 5.2% in Japan and 0% in Hong Kong. Also, in the case of automotive, older people were present in 8.5% of the corpus of South Korea, 19.3% in Japan, and 0% in Hong Kong. We could speculate on the role of mobile technology in South Korea or the Japanese tradition in the automotive industry. Usually, we found no explanation for country differences in the studies regarding the association of older adults with some technologies more than with others and also no systematic preoccupation to compare different cultural contexts.

One important result is the fact that with only two exceptions (Prieler et al., 2017b Vulpe, 2017) in which also the visual representations of older adults over 65 years of age were considered, in all the other studies, we are talking about people 50 years and above – so relatively young-older. Note that in some studies, the age was not specified. This means that our findings indicate the visual representations of relatively young older adults in

advertisements and marketing strategies of technology products but are not an indication of how the oldest-old are visually represented. Consequently, the two studies of Vermeer and collaborators (2019, 2020) are the only analysis of the visual image of the fourth agers in advertisements on technology – the oldest-old are not the users of technology but the "objects" of technology surveillance and assistance, with no autonomy and power of decision. Indeed the two studies show the visual representations of older people with cognitive difficulties, but they indicate how fourth age might be visually imagined by the specialists in marketing when they promote different technological products for this age group. Also, our findings indicate that we are probably facing a relative absence of older old characters from the visual representation of technology products (see Ivan & Cutler, 2021). Marketing specialists might have a relatively young audience in mind when they envisage strategies to promote different technology products and 50+ could be used as a threshold in defining old age, and not 65+ (which is a retirement age in many countries). Marketers could ignore the oldest old audience as they normally perceived people 50 years and above as being simply an "old and homogeneous" group – an idea largely criticised in the current literature (see, for example, Ivan et al., 2020).

Also, we noticed that the common methodology of the studies we reviewed was content analysis (qualitative and quantitative), whereas in some studies, semiotic analysis or visual analysis was used (Clarke et al., 2014; Vermeer et al., 2019; Vermeer et al., 2020). Indeed this is the preferred approach when considering the visual representation of older adults in commercials (see Loos & Ivan, 2018), but the lack of triangulation in the studies we presented here poses serious limitations on how to generalise the findings. In only two studies, interviews were used: (Bentley et al., 2018) – in which they analysed the perceptions of older adults on the telecare technologies advertisements; and Freiesleben et al. (2021) – in which marketing experts' opinions were investigated by the use of focus groups. It might be that older adults are more sensitive to some visual portrayals presented in technology product commercials than another.

Understanding visual ageism lies not only in describing the content of visual representations but also in revealing how this content is perceived and evaluated by the older adults themselves. The same is valid for marketing experts: some visual representations of older adults might be only implicit social imagery of old age, whereas others might be strategic deliberated actions targeting certain consumers.

Nevertheless, we noticed the imbalance distribution of the corpus in the fourth databases we searched here for the analysis: Web of Science, Scopus, Science Direct, and ProQuest (see Table 5.1). In the case of Web of Science, we started from n = 2119 entries – the smallest number from the four databases and we end up having 11 articles in the final analysis (see Table 5.2), which will be more than half of our corpus. By comparison, 9 articles from our final corpus were from the ProQuest database, when starting from an

initial n = 34,242 entries. Note that we found some articles in more than one database and this is mentioned in Table 5.2, which describes the main findings. The relatively small number of articles we analysed here is not a limitation of the current study but rather a representation of the lack of interest in the way older people are visually represented in studies on marketing for technology products. Ultimately, this might be an indicator of a relatively stereotypical view of the way researchers from social sciences investigate visual representations of older adults: mainly in the advertising content presented on television, using a content analysis classic approach.

Conclusions

The current chapter describes the way older adults are visually portrayed in advertising and marketing strategies about technology products. We found evidence of visual ageism: older people are associated merely with mechanic technologies (e.g., auto motives) and not with new technologies. When they are visually represented in using different technology products, they tend to be accompanied by the young (who play advisory roles), playing secondary roles or they are represented in stereotypical settings (for example, at home) and stereotypic domains (technology for health).

Although the depictions in terms of characteristics vary a lot, from visual content (videos or photos) in which older adults are described as technophobic, and unskilled in using technology, to visual content in which they are represented as being able to handle the new communication devices, some nuances of visual ageism need to be considered. First, the intersection between ageism and sexism: we found more positive visual portrayals of older men as compared to older women when technology advertisements were considered: men tend to be more represented in connection to technology and even "experts" of some technologies – for example, electronics or cars. Still, the "expert" role is normally associated with traditional technologies or mechanic ones. On the contrary, older women tend to be absent from such portrayals and when visually represented – they are more associated with new technologies in couples, or the technology is nowhere to be seen.

Second, when technology is associated with older adults, it is part of the general successful-aging discourse: relatively young older adults (55+), happy in couples, being successful in mastering the new devices but also their aging process. We found a contrast between such portrayals of relatively young old and the portrayals of older adults with cognitive difficulties, for example – who were disregarded as human technology users by putting them in the same category as wallets, keys, children, dogs or prisoners. In such cases, the technology is "visualised as" used by carers, while older adults remain completely out of it.

Third, the current investigation opens the discussion of the importance of social and cultural values and the role of prescripts, as advertisements are often reflections of the societal discourses, in this case on what it means

to be old and what the role is of technology in different parts of the world. Although some studies in the corpus we analysed here showed differences between the marketing strategies they investigated comparatively, in two or three countries, the choice of the countries was *ad libitum* and there was hardly any attempt to offer in-depth explanations for the differences found between countries. This is also because the majority of the studies used qualitative and quantitative content analysis – an approach that leaves little room for such explanations. In some instances, we advanced some reflections over the country differences, more in a speculative way, arguing, for example, that finding more older adults in commercials for cars in Japan than in other neighbouring countries might have to do with the history and the importance of the car industry in Japan. In many of the analysed studies, the use of interviews with potential consumers or with the experts who participated in the creation of the advertisement campaigns would have helped to move from speculations to consistent explanations.

Nonetheless, the current chapter shows there is some preoccupation to investigate the way older people are portrayed in the advertising domain, and this has been shown by the relatively large number of studies we begin with when we search in the four databases. Still, when we narrowed the search to studying older adults' visual portrayals in advertisements and marketing strategies about technology, the corpus remained rather small (144 entries during the past 10 years), showing there is a relatively little preoccupation with the topic.

We could wonder why it is even important to study visual ageism in advertisements about technology. For sure, the distinction between technology laggards (the old) and the technology savvy (the young) might have negative consequences in a nowadays society marked by the pervasiveness of new technologies and an increased percentage of the older population. At least in the few studies in which marketing specialists were approached (see Freiesleben et al., 2021 in our corpus), we have seen that experts are aware of the importance of including less ageist portrayals of older adults when technology is visually presented and being more age inclusive. Also, older consumers expect this to happen (see Bentley et al., 2018) and they generally criticise the stereotypical representations of older age in marketing strategies. We believe that more studies focusing on how different advertising visual content is perceived by older consumers will complement understanding the content analysis approaches. The need for such triangulation in data might be important to understand the interplay between different models of aging and different social representations of technology and the way they are reflected in the choice of a particular visual content.

Acknowledgement

References

Andrews, M. (2009). The narrative complexity of successful aging. *International Journal of Sociology and Social Policy – Special Issue on Theorizing Aging Studies*, *29*(1–2), 73–83. https://doi.org/10.1108/01443330910934736

Ayalon, L., & Tesch-Römer, C. (2017). Taking a closer look at ageism: Self-and other-directed ageist attitudes and discrimination. *European Journal of Ageing*, *14*(1), 1–4. https://doi.org/10.1007/s10433-016-0409-9

Baltes, P. B., & Baltes, M. M. (1993). *Successful aging: Perspectives from the behavioural sciences* (Vol. 4). Cambridge University.

Baumann, S., & de Laat, K. (2012). Socially defunct: A comparative analysis of the underrepresentation of older women in advertising. *Poetics*, *40*(6), 514–541. https://doi.org/10.1016/j.poetic.2012.08.002

Bentley, C. L., Powell, L. A., Orrell, A., & Mountain, G. A. (2018). Making telecare desirable rather than a last resort. *Ageing & Society*, *38*(5), 926–953. https://doi.org/10.1017/S0144686X16001355

Chapman, S. A. (2005). Theorizing about aging well: Constructing a narrative. Canadian Journal on Aging/La Revue Canadienne du Vieillissement, 24(1), 9–18. https://doi.org/10.1353/cja.2005.0004

Chen, C. H. (2015). Advertising representations of older people in the United Kingdom and Taiwan: A comparative analysis. *The International Journal of Aging and Human Development*, *80*(2), 140–183. https://doi.org/10.1177/0091415015590305

Christensen, C. L. (2019). Visualizing old age: Photographs of older people on the website of the DaneAge Association. *Nordicom Review*, *40*(2), 111–127. https://doi.org/10.2478/nor-2019-0036

Clarke, L. H., Bennett, E. V., & Liu, C. (2014). Aging and masculinity: Portrayals in men's magazines. *Journal of Aging Studies*, *31*, 26–33. https://doi.org/10.1016/j.jaging.2014.08.002

Cruikshank, M. (2013). *Learning to be old: Gender*, *culture, and aging*. Rowman & Littlefield Publishers.

de-Andrés-del Campo, S., & de-Lima-Maestro, R. (2014). Critical analysis of government vs. commercial advertising discourse on older persons in Spain/Análisis crítico del discurso publicitario institucional/comercial sobre las personas mayores en España. *Comunicar*, *21*(42), 189–197. https://doi.org/10.3916/C42-2014-19

Featherstone, M., & Hepworth, M. (1995). Images of positive aging. A case study of retirement choice magazine. In M. Featherstone, & A. Werneck (Eds.), *Images of aging: Cultural representations of later life* (pp. 29–47). Routledge.

Foster, L., & Walker, A. (2014). Active and successful aging: A European political perspective. *The Gerontologist*, *55*(1), 83–90. https://doi.org/10.1093/geront/gnu028

Freiesleben, S. D., Megges, H., Herrmann, C., Wessel, L., & Peters, O. (2021). Overcoming barriers to the adoption of locating technologies in dementia care: A multi-stakeholder focus group study. *BMC Geriatrics*, *21*(1), 1–17. https://doi.org/10.1186/s12877-021-02323-6

Fry, C. L., Dickerson-Putman, J., Draper, P., Ikels, C., Keith, J., Glascock, P., & Harpending, H. C. (1997). Culture and the meaning of a good old age. In J. Sokolovsky (Ed.), *The cultural context of aging: Worldwide perspectives* (pp. 99–124). Bergin and Garvey.

Hofstede, G. H. (1991). *Cultures and organizations: Software of the mind*. McGraw-Hill.

Hofstede, G. H. (2001). *Culture's consequences: Comparing values, behaviors, institutions, and organizations across nations*. Sage.

Hofstede, G. (2011). Dimensionalizing cultures: The Hofstede model in context. *Online Readings in Psychology and Culture*, *2*(1), 8–25. https://scholarworks.gvsu.edu/orpc/vol2/iss1/8/

Holstein, M. B., & Minkler, M. (2003). Self, society, and the "new gerontology". *The Gerontologist*, *43*(6), 787–796. https://doi.org/10.1093/geront/43.6.787

Hoppe, T., Tischer, U., Philippsen, C., & Hartmann-Tews, I. (2015). Presentation of age(ing) and elderly people in TV commercials. *Zeitschrift fur Gerontologie und Geriatrie*, *49*(4), 317–326. https://doi.org/10.1007/s00391-015-0923-y

Ivan, L., & Cutler, S. J. (2021). Ageism and technology: The role of internalized stereotypes. *University of Toronto Quarterly*, *90*(2), 127–139. https://doi.org/10.3138/utq.90.2.05

Ivan, L., Loos, E., & Tudorie, G. (2020). Mitigating visual ageism in digital media: Designing for dynamic diversity to enhance communication rights for senior citizens. *Societies*, *10*(4), 76–89. https://doi.org/10.3390/soc10040076

Katz, S., & Marshall, B. (2003). New sex for old: Lifestyle, consumerism, and the ethics of aging well. *Journal of Aging Studies*, *17*(1), 3–16. https://doi.org/10.1016/S0890-4065(02)00086-5

Klinger, U., & Svensson, J. (2018). The end of media logics? On algorithms and agency. *New Media & Society*, *20*(12), 4653–4670. https://doi.org/10.1177/1461444818779750

Kornadt, A. E., & Rothermund, K. (2012). Internalization of age stereotypes into the self-concept via future self-views: A general model and domain-specific differences. *Psychology and Aging*, *27*(1), 164–172. https://psycnet.apa.org/doi/10.1037/a0025110

Kornadt, A. E., Voss, P., & Rothermund, K. (2017). Age stereotypes and self-views revisited: Patterns of internalization and projection processes across the life span. *Journals of Gerontology Series B: Psychological Sciences and Social Sciences*, *72*(4), 582–592. https://doi.org/10.1093/geronb/gbv099

Kowalewska, K., & Grodzki, E. (2019). The representation of mature adults in TV commercials: A cross-cultural content analysis of portrayals in Poland and the US. *Annales. Etyka w Życiu Gospodarczym*, *22*(1), 103–118. https://doi.org/10.18778/1899-2226.22.1.06

Lester, P. M., & Ross, S. D. (Eds.). (2003). *Pictures that injure. Pictorial stereotypes in the media*. Praeger Publishers.

Levy, B. R., Chang, E., Lowe, S., Provolo, N., & Slade, M. D. (2021). Impact of media-based negative and positive age stereotypes on older individuals' mental health during the COVID-19 pandemic. *The Journals of Gerontology: Series B*, *20*(20), 1–6. https://doi.org/10.1093/geronb/gbab085

Loos, E. F. (2013). Designing for dynamic diversity: Representing various senior citizens in digital information sources. *Observatorio (OBS*)*, *7*(1). https://doi.org/10.15847/obsobs712013639

Loos, E., & Ivan, L. (2018). Visual ageism in the media. In L. Ayalon, & C. Tesch-Roemer (Eds.), *Contemporary aspects on ageism* (pp. 163–176). Springer.

Loos, E. F., Ivan, L., Fernández-Ardèvol, M., Sourbati, M., Ekström, Wilińska, M., Carlo, S., & Schiau, I. (2017a). Aging well? A cross-country analysis of the

way older people are visually represented on websites of organizations for older people. *Journal of Comparative Research in Anthropology and Sociology*, *8*(2), 63–83.

Loos, E., Kubiński, P., & Romero, M. (2017b). The representation of older people playing a digital game in the short film "Pony Place": A semiotic and narratological analysis. *Journal of Comparative Research in Anthropology & Sociology*, *8*(2), 43–62.

Loos, E., Ivan, L., Sourbati, M., Xu, W., Christensen, C. L., & Ylänne, V. (2022). Visual ageism on public organisations' websites in V. Ylänne (Ed.), *Ageing and the media international perspectives* (pp. 113–132). Policy Press.

Monteiro Machado, C., & Pedro Sousa, J. (2019). Stereotypes of old age: Views on the elderly in Brazilian advertising. *Medijske studije*, *10*(2), 69–88. https://doi.org/10.20901/ms.10.20.4

Muñoz, M. R. (2020). Mujer, edad e invisibilidad en los anuncios televisivos en Puerto Rico. *Chasqui: Revista Latinoamericana de Comunicación*, *145*, 311–326.

Orpin, P., Walker, J. H., & Boyer, K. (2013) Developing evidence-based policy in aging well. In *The 20th IAGG world congress of gerontology and geriatrics*. http://ecite.utas.edu.au/88608

Persaud, S., Grauerholz, L., & Anthony, A. K. (2018). Gendered representations and portrayals in technology advertisements: Exploring variations by age, race, and ethnicity. *Gender Issues*, *35*(2), 137–152. https://doi.org/10.1007/s12147-017-9191-z

Prieler, M., Ivanov, A., & Hagiwara, S. (2017a). The representation of older people in East Asian television advertisements. *The International Journal of Aging and Human Development*, *85*(1), 67–89. https://doi.org/10.1177/0091415016677972

Prieler, M., Kohlbacher, F., Hagiwara, S., & Arima, A. (2011). Gender representation of older people in Japanese television advertisements. *Sex Roles*, *64*(5–6), 405–415. https://doi.org/10.1007/s11199-010-9923-y

Prieler, M., Kohlbacher, F., Hagiwara, S., & Arima, A. (2015). The representation of older people in television advertisements and social change: The case of Japan. *Ageing & Society*, *35*(4), 865–887. https://doi.org/10.1017/S0144686X1400004X

Prieler, M., Kohlbacher, F., Hagiwara, S., & Arima, A. (2017b). Gender portrayals of older people in Japanese television advertisements: Continuity or change? *Asian Women*, *33*(1), 25–47.

Riva, G., Marsan, P. A., & Grassí, C. (2014). *Active ageing and healthy living. A human-centered approach in research and innovation as source of quality of life*. IOS Press.

Rowe, J., & Kahn, R. (1997) Successful aging. *The Gerontologist*, *37*, 433–440. https://doi.org/10.1093/geront/37.4.433

Stone, M. E., Lin, J., Dannefer, D., & Kelley-Moore, J. A. (2017). The continued eclipse of heterogeneity in gerontological research. *The Journals of Gerontology: Series B*, *72*(1), 162–167. https://doi.org/10.1093/geronb/gbv068

Vermeer, Y., Higgs, P., & Charlesworth, G. (2019). Marketing of surveillance technology in three aging countries. *Quality in Ageing and Older Adults*, *20*(1), 20–33. https://doi.org/10.1108/QAOA-03-2018-0010

Vermeer, Y., Higgs, P., & Charlesworth, G. (2020). Selling surveillance technology: Semiotic themes in advertisements for aging in place with dementia. *Social Semiotics*, *8*(2), 1–22. https://doi.org/10.1080/10350330.2020.1767399

Vulpe, S. N. (2017). From sick elderly to super-grandparents. A typology of elderly representations in Romanian video advertising. *Journal of Comparative Research in Anthropology and Sociology*, *8*(2), 115–148.

WHO. (2002) Active ageing: A policy framework. http://www.who.int/ageing/publications/active_ageing/en/

WHO. (2014). "Ageing well" must be a global priority. http://www.who.int/mediacentre/news/releases/2014/lancet-ageing-series/en/

Ylänne, V. (2021). UK magazine advertising portrayals of older adults: A longitudinal, content analytic, and a social semiotic lens. *International Journal of Ageing and Later Life*, *15*(1), 7–38. http://dx.doi.org/10.3384/ijal.1652-8670.1700

6 Human-computer interaction research on ageism

Essential, incipient and challenging

Sergio Sayago

Human-computer interaction (HCI) is an interdisciplinary field of inquiry concerned with the design, development, and evaluation of (all manners of) digital technologies for human use. HCI is also concerned with the study of factors, from psychological to socio-cultural, that determine our interaction with these technologies. HCI evolves in response to changes in the technological landscape and user base (Grudin, 2012, 2017; Harper et al., 2007). Over the last few years, HCI research has shifted from a technology-oriented to a human-centred view (Bannon, 1991; Himmelsbach et al., 2019). This is denoted by, for instance, a turn to human values (Harper et al., 2007), socially just design (Dombrowski, 2017; Constanza-Chock, 2021), feminist HCI (Bellini et al., 2018), anti-oppressive design (Smyth & Dimond, 2014), engagement with underserved communities (Erete et al., 2018; Harrington, 2020), and ageing (Sayago, 2019; Vines et al., 2015).

Ageism refers to the stereotypes (how we think), prejudice (how we feel), and discrimination (how we act) directed towards others or oneself based on age (Ayalon & Tesch-Römer, 2018; Iversen et al., 2009; World Health Organization, 2021). For example, "older persons miss a word or fail to hear a sentence and they are charged with 'getting old', not with a hearing difficulty" (Palmore, 1999, p. 4). Older and young adults might be denied a job only for their age, regardless of their ability (Stypinska, 2021; World Health Organization, 2021). Ageism is a global challenge (World Health Organization, 2021). Unlike other "isms", such as racism and sexism, ageism is socially acceptable, strongly institutionalised, largely unchallenged (Ayalon & Tesch-Römer, 2018; Iversen et al., 2009; Officer et al., 2016), and affects everyone (Palmore, 2015), especially older adults (Rosales et al., 2023). A detailed discussion on ageism can be found in Chapter 1. This chapter argues that ageism fits in with the human-centred turn in HCI, as digital technologies can perpetuate and amplify spirals of exclusion and loss of autonomy for older adults (Rosales et al., 2023). Thus, examining discourses on ageism within HCI research – and doing so in a book devoted to ageism in data (and ageing) societies – is timely and relevant.

This chapter examines a significant body of human-computer interaction (HCI) research into ageism. The analysis draws on a non-systematic literature review of studies addressing ageism published in high-impact HCI journals

and conferences. This chapter also draws on the author's HCI research with older adults (c. 400) to provide a more detailed picture of how ageism manifests itself in everyday technology use. This research was conducted over the last decade (starting in 2010) in the south and north of Europe.

This chapter addresses three research questions (RQs):

- Why is ageism a relevant topic for HCI research (RQ1)?
- HCI research into ageism. What has been done thus far? (RQ2)?
- Where do we, HCI scholars – and interdisciplinary researchers interested in ageism and digital technologies – go from here (RQ3)?

The results indicate that ageism is an important topic of interest in HCI research. Ageism, both implicit and explicit, is (almost) pervasive in the experiences of technology use of many older adults. However, the results show that ageism has received much less research attention within HCI than other "isms", such as sexism and racism, despite a growing ageing population. HCI research on ageism is mainly devoted to older adults, overlooking other age groups. Besides, much of this research is relatively recent (i.e., published in the last five years) and geared towards the West. The results also indicate that no previous study focused on taking stock of HCI research on ageism has been published in relevant HCI venues. The results suggest that there is a significant gap to be filled, and much remains to be done.

The main contributions of this chapter are three:

- This chapter extends previous (and growing) research on ageism, which is well illustrated in this edited volume, by enriching the technological perspective. It complements other chapters of this book (Amaral & Flores, 2023; Comunello et al., 2023; Garavaglia et al., 2023; Kania-Lundholm, 2023) by examining HCI research on ageism and showing how ageism manifests itself in the everyday experiences of technology use, from e-mail systems to programming, of older adults over extended periods of time.
- This chapter deepens and widens the turn to a human-centred view of HCI by addressing ageism, which, as the introductory chapter of this volume summarises, is deeply embedded in society and operates on both an institutional and interpersonal level (Rosales et al., 2023).
- This chapter contributes to HCI research on ageing by analysing a topic that could be regarded as a core issue in this area, as older adults are currently the most affected by ageism (Rosales et al., 2023), but that has surprisingly been largely ignored.

Background

This section is organised as follows. Firstly, it provides a very brief overview of some aspects of ageism that are especially relevant for this chapter. The first three chapters of this edited collection provide a more comprehensive

overview of ageism. Secondly, this section focuses on key aspects of older-adult HCI research and the author's works that are related to the chapter.

Ageism

New or old?

The COVID-19 pandemic has accentuated the exclusion of and prejudice against older adults (Ayalon et al., 2021; Gilbert & Ricketts, 2008). It has also brought a resurgence of messages on social media that exhibit ageism against older adults (Meisner, 2021). Yet, it is worth noting that ageism is not new. The term "ageism" was coined in 1969 (Butler, 1969).

Hardwired or extraneous?

People tend rather automatically to categorise others along three major dimensions: race, sex and age (Cuddy & Fiske, 2002). Human functioning requires cognitive categorisation because of information overload. Humans need to simplify and categorise, and we cannot avoid this process. Once formed, categories are the basis for regular and usually unquestioned prejudgment. For example, young people tend to be stereotyped as thinking that "they know everything" (World Health Organization, 2021), whereas older adults are stereotyped as being cranky, depressed, unable to learn, unattractive and useless (Lytle & Levy, 2019). Ageism tends to be overlooked because it is hardwired (Nelson, 2002; Palmore, 1999), i.e., ageism is integrated into everyday practices. We tend to perceive out-groups as less variable than in-groups. It is relatively common – for young and middle-aged people – to perceive all older people to be alike (Cuddy & Fiske, 2002). However, as soon as we over-generalise older adults' characteristics, we neglect the differences among them. Consequently, we treat them stereotypically (Ayalon & Tesch-Römer, 2018).

HCI research, older adults and ageing

Overview of the field

Ageing has become a significant research area in HCI relatively recently, with the first studies published in the 1990–2000s (Sayago, 2019; Vines et al., 2015). Population ageing – i.e., the increasing share of older adults in the population – and the profound influence of digital technologies on the world have prompted much of this research.

As discussed in Sayago (2019), a significant amount of HCI research on older adults can be characterised by (i) understanding and compensating for the impact of age-related changes in functional abilities on older adults' interactions with digital technologies, (ii) providing them with something they

do not have or must improve, with either technology specifically designed for them, or adapted, simplified versions of existing ones and (iii) helping them to live as independently as possible and age-in-place with assistive technologies.

A growing number of studies have started to provide alternative perspectives – less negative and paternalistic – on HCI research with older adults. For example, studies look into the transition from older adults as passive consumers of digital content to active creators of both digital contents and technologies (e.g., Lazar et al., 2017; Reuter et al., 2020). Other studies portray them as critical adopters of technology (Barros et al., 2021), challenging widespread (and mostly negative) views of older adults as non-avid or uninterested users. Ongoing research is also reframing technologies like assistive robots to promote more positive views of ageing and improve technology adoption (Lee & Riek, 2018), challenging HCI discourses on ageing, rendering older adults as asexual individuals (Kannabiran et al., 2020) and exploring how HCI can avoid perpetuating ageism and sexism towards women as they age by going beyond the medicalisation of menopause (Lazar et al., 2019; New et al., 2021).

Overview of the author's research

Over the last decade (starting in 2010), the author (along with his and her colleagues) has examined technology use by older adults with different sociocultural backgrounds. Participants included older men and women interested in digital technologies. They had mild-to-moderate age-related changes in functional abilities, low levels of educational attainment (primary and secondary school), and different levels of previous experience in using computers. The participants were originally from several regions of Spain, Scotland and England.

The author's research adopted an ethnographic and participant observational perspective for two main reasons. Firstly, the author deems it key to study technology use as it happens, i.e., in out-of-laboratory conditions and over extended periods of time, as interactions are always situated, take time to develop, and are context-dependent. Secondly, this approach addresses the question of which of the problems older adults encounter are due to a lack of technology skills or ageing, as those due to ageing are expected to be prevalent in the next generation of older adults (Sayago et al., 2011).

Technologies include e-mail systems (Sayago & Blat, 2010), online social networks (Righi et al., 2012), computer programming (Sayago & Bergantiños, 2021) and digital games (Sayago et al., 2016). Some of these technologies were selected because the participants wanted to use them, while others were introduced by the author for research purposes. Methodological aspects related to technology design with the participation of older people have also been examined (Righi et al., 2018).

The studies have been conducted in adult education centres and computer clubhouses in different EU cities, such as Barcelona and Madrid (in Spain) and Dundee (in Scotland).

Manifestations of ageism

Manifestations of ageism in several aspects of the experiences of technology use of the older adults who participated in these studies, from attitudes and practices to instruction and learning materials, are outlined next.

The participants felt they were lagging behind in society because of their chronological age. Nevertheless, a desire to feel and be more digitally and socially included was a strong motivation for them to learn to use digital technologies. They did so – or, in terms of (Kania-Lundholm, 2023), they coped with the culture of connectivity – in ways that challenged stereotyped (and mostly negative) visions of older adults when it comes to digital technologies, such as older adults are not interested in computers or unable to learn to use them (Sayago et al., 2013). The participants were able to learn and use digital technologies. They also decided which technologies they did not want to use and informed the design of yet-to-be-created ones (Righi et al., 2018). Over time, most of them became active and creative creators, mainly if provided with appropriate instruction. Key elements of such an instruction included acknowledging that older adults come into an educational activity with a wealth of life experience, which determines to a great extent their learning process; that their orientation to, and motivation for learning, is always life-centred; and that they aim to be in control of their learning process (Sayago et al., 2013). Some participants even became peer teachers in the computer activities in the centres.

Participants tended to report being afraid of using computers because their children told them (explicit ageism) that they could break them – that is, the computers they have at home. Their children were also often regarded as bad teachers, as they were not patient enough and did not teach them (e.g., speaking very fast, not explaining the why of things) how to use computers or smartphones. Participants acknowledged that this behaviour came naturally to their children (implicit ageism), as they had hectic lives and did not have much time to spare with their parents.

Participants regarded online instructional materials (e.g., tutorials) as very difficult to understand. Such an evaluation was especially evident in the case of computer programming (Sayago & Bergantiños, 2021). Most online resources, from tutorials and videos to learning computer programming and programming languages, are seldom designed by taking into account the needs and interests of older people. This shortage reinforces the claims about technology culture being geared towards the young made in (Stypinska et al., 2023; Svensson, 2023) and extends them by showing that this youth orientation not only happens in the digital industry but also in instructional materials. When these online materials and books about computers are designed exclusively for older people, the participants considered them to be "insulting". Why only for older adults? (Righi et al., 2017).

Literature review

The literature review (Sayago, 2022) was conducted in early 2022. The literature review included conference and academic journals written in English as they constitute the main venues of HCI research publication.

With respect to conference papers, the author conducted a keyword-based search in the ACM Digital Library. This academic database was selected because it is particularly relevant for this chapter. Most HCI conference proceedings – and from other areas of computing – are published in this database. To keep the search as broad as possible, the keyword "ageism" was used anywhere (i.e., title, abstract, authors' keywords and body of the paper) in the ACM Full-Text Collection. The cut-off year of publication was 2021. This search yielded 90 publications. The author read all of them. Ageism was the core topic of 7 publications and a secondary topic of 18 (e.g., ageism emerged from the data or was mentioned in passing or as an example). Ten papers were excluded. These papers were not research publications (e.g., letters and technical opinions). Finally, the remainder of the publications (N = 55) did not address ageism.

With respect to journal papers, the author conducted keyword-based searches in high-impact HCI journals according to the Journal Citation Reports (JCRs 2020 edition, Computer Science and Cybernetics Category) of the Web of Science. Although there are journals related to HCI that are not featured in the JCRs, the papers published in journals listed in the JCRs, especially in the first half of the ranking (Q1, Q2), are widely regarded as of high quality. The author searched within each journal (anywhere, as he did in the conference papers) using the keyword "ageism". Papers published until 2021 inclusive were considered to carry out a broad search. This search yielded approximately 4000 papers. From the title, abstract and authors' keywords of these papers, ageism was a central topic in only one of them.

To deepen further the review, the author conducted a keyword-based search in the conference proceedings of Human Aspects of IT for the Aged Population published by Springer. This international conference is devoted to older adults and digital technologies. From the title, authors' keywords and abstract of the papers published in the two most recent proceedings at the time of writing this chapter (2020–2021) of this conference, the author found 6 (from a total of 171) papers addressing ageism. The publication period was set to 2020–2021, hoping to include papers published during, and as a result of, the first waves of the COVID-19 pandemic.

Key findings

The main results of the literature review are organised as follows. The amount of research attention paid to ageism and other "isms" such as racism and sexism is briefly compared. This is followed by an analysis of what user groups are considered in HCI research on ageism. Finally, an overview of HCI research into ageism is provided.

Ageism versus other "isms": Ageism is lagging behind

Ageism has received much less research attention in HCI (and Computing) than other "isms". For example, a search for "racism" in the ACM Full-Text Collection, following the same criteria as that stated above, yielded approximately 940 results. The same search for "sexism" yielded c. 500 results. Ageism clearly lags behind with 90 results.

In other areas, ageism has also received less attention than other "isms". For example, in SCOPUS, a search for the term "ageism" in the title, abstract and keywords list, with no publication-range limits, yielded approximately 4000 results. These results are publications in several areas, from Ageing studies to Sociology. The same search for "sexism" and "racism" yielded approximately 10,000 and 35,000 results, respectively.

These findings confirm and extend previous results. Ageism still has not received the same research attention as other "isms". This claim holds true in HCI too.

Ageism mostly towards older people; other age groups are overlooked

Rosales and colleagues (2023) argue that even though ageism affects different ages, older adults suffer the most from ageism. This trend is exacerbated within HCI research since the papers analysed in this literature review focused almost exclusively on older adults. This evidence reinforces the results presented above. It shows that discourses of ageism within HCI research are not only superficial, especially compared to other "isms", but also partial since much HCI research on ageism has concentrated on one (very large and growing, though) age group.

HCI research on ageism (towards older adults): An overview

The publications outlined below reveal different ways in which older adults experienced first-hand ageism online during the COVID-19 pandemic. Other publications show that older adults articulated a collective narrative on ageism and devised ways of fighting against it to raise public awareness way before the pandemic. Ageism is implicit and explicit in online discourses, as most of the chapters of this volume show in one way or another. Other studies lay emphasis on artificial intelligence and algorithms amplifying ageism and other forms of bias and on research and design methods, which are not free from ageism either. Strategies for fighting ageism have been put forward. HCI research on ageism has primarily been conducted with older adults in the West (Europe, the UK and the US and Canada).

Experiencing ageism and raising public awareness mediated by technologies

Lazar et al. (2017) describe how older bloggers living in the US and the UK articulate a collective narrative on ageism as it appears in their lives, develop a community with anti-ageist interests, and discuss strategies to navigate and

change societal views and institutions. The participants advocate a view that takes into account the complexity and positive aspects of older adulthood and criticises stereotypical notions that focus exclusively on losses that occur with age.

Sin et al. (2021) examine older adults' adoption of communication technology in light of the COVID-19 pandemic in Canada. A series of interviews revealed that the pandemic motivated many older adults to learn new technology and become more tech-savvy to stay connected with others. When describing their online experiences during the pandemic, ageism became visible, e.g., "the organisers [of the meetings] assumed that around ten people would be too old to use Zoom, so they gave up on them" (Sin et al., 2021, pp. 380–389) and led to digital exclusion.

Reuter and Liddle (2020) reflect on the potential of audio and radio technology to include older adults in citizen dialogue and promote community engagement through both digital and non-digital elements of the production process. Participants (older adults in the UK) voiced their intentions to use the LLARC (Later Life Audio and Radio Co-operative) as a tool to heighten awareness of ageism in public discourse as well as within the broadcasting industry.

Rosell and Verges (2021) examine the impact of ageism on the e-leisure of older adults in Chile, finding that older adults with higher ageism levels reported less self-efficacy for technology use and thus had less involvement in e-leisure activities.

Online discourses: Ageism is implicit and explicit

Cuvalo (2020) discusses the concepts of ageism and media generations in Croatia and argues that ageism is implied in the bulk of research on generational differences in media use. Santos et al. (2020, 2021) show that ageism is not only implicit but also explicit in online content and discourses.

Santos et al. (2020) analyse the complexity, nonlinearity and hybridity of online representations of men and age. By focusing on how Portuguese-speaking Twitter users represent older men in their posts, the results show that when patriarchal discourses intersect with ageism, they tend to perpetuate stereotypes, hindering egalitarian relationships concerning age and gender. Santos et al. (2021) also found that ageism and patriarchy are pivotal in the politics of the #manosphere – one of the most visible faces of online misogyny (Santos et al., 2021, p. 420) – with a harmful impact on age and gender identities.

Xu (2021) argues that online representations of older adults generated by public sector organisations have emphasised the brighter side of later life while failing to reflect actual conditions experienced by older people. These representations have contributed to forming a new form of ageing and creating a model for what defines an older person, leading to visual ageism.

Artificial intelligence and algorithms: Far from being neutral

Ko et al. (2020) and Leeuwen et al. (2020) argue that data and algorithms amplify racism, sexism, ageism, and other forms of inequity, injustice and bias. Kim et al. (2021), Díaz et al. (2019) and Park et al. (2021) confirm it.

Kim et al. (2021) focus on facial emotion recognition (FER) technology and evaluate how six emotions (anger, disgust, fear, happiness, neutrality and sadness) are correctly detected by age group in four commercial FER systems. The results show that the systems most accurately perceived emotion in images of young adults and least accurately in images of older adults. "As more and more older adults use and interact with intelligent systems, it is imperative to further consider the implications of these results for FER technology designed for use on the general public" (Kim et al., 2021, p. 642).

Similar results and claims are discussed in Díaz et al. (2019), which addresses age-related bias in sentiment analysis in online blog-based discussions in the US and UK. The analysis of the treatment of age-related terms across 15 sentiment analysis models revealed significant age bias in algorithmic output; for example, sentences with "young" adjectives are 66% more likely to be scored positively than the same sentences with "old" adjectives.

Park et al. (2021) point out that a critical component for creating inclusive AI systems that work for a diverse user group is ensuring the representation of diverse populations in the data used to train and test ML (machine learning) models. Park et al. (2021) discuss whether the AI data sets used today to represent the older adult population, a group subjected to ageism. The authors find that the representation of older adults aged 65+ in popular data sets used to train AI systems for facial analysis is severely lacking, while that of the oldest-old adults aged 85+ is almost none.

Lee and Riek (2018) address assistive robots and argue that many older adults (in the US) have adverse reactions towards this AI-infused technology since the framing of technology tends to present stereotyped images of ageing. Assistive robots can propagate the message that ageing is a problem for older adults (and the public) and potentially reinforce ageism in society (Lee et al., 2019). This promotion of ageism by focusing on age-related limitations in design is not only specific to assistive robots but also technology design in general (Kannabiran et al., 2020; Knowles et al., 2021; Lazar et al., 2019).

Research and design methods: Are not free from ageism

Fernández-Ardèvol et al. (2020) point out that social groups remain invisible or inaccessible for particular methods of research. Such is the case of the older old when the interest is in their digital practices from a quantitative perspective, which reinforces ageism. This kind of aged-based discrimination, more subtle than explicit, appears to sustain ageist attitudes in a particular social practice that, in turn, shape the way academia, decision-makers, and society, in general, are able to look at given social phenomena.

Oberschmidt et al. (2020) extend this conclusion by arguing that in co-design processes, methodological decisions might still have some implicit ageist assumptions, such as focusing on challenges and not on strengths. Erete et al. (2018) and Harrington (2020) go one step further by claiming that many methods do not account for the challenges faced by communities that have systematically experienced discrimination due to unfair policies and social practices.

Fighting ageism: Several strategies

Knowles et al. (2021) argue that the lack of interest by the technological sector in designing for the older adult market contributes to implicit ageist messaging that older adults are not worthy of investment. Thus, more attention by this sector to older adults is needed.

Education is key to fighting ageism, especially by adopting an intersectional approach (Ko et al., 2020; Kumar & Karusala, 2019), as ageism does not exist in a vacuum. In this sense, Folkins et al. (2020) provide evidence that engaging young people in narratives (through serious games) is an effective way to address the negative biases that exist in society towards people who live in nursing homes.

Erete et al. (2018) acknowledge that HCI scholars should admit that they do not have a blueprint for how to engage with all communities. In addition to using a language that resonates with the community and is easily understood, researchers often have goals, assumptions and even expected project outcomes before partnering with community members, who might have different goals and opinions. "Why do you keep saying this project is for older people? This could be for the entire neighbourhood!" (Righi et al., 2017, p. 21).

To strengthen diversity in HCI research, Himmelsbach et al. (2019) recommend analysing data without overemphasising, naturalising, and homogenising, as doing so reproduces the notion of the dominant groups as a standard (Choo & Ferree, 2010). We should seek similarities to other groups as well as differences within a group and problematise the "mainstream", especially if we aim to give voice to marginalised groups (Himmelsbach et al., 2019). New et al. (2021) point out that the voices of older women (in this study, women over 45 years) should be heard further, especially when it comes to taboo issues like menopause. The use of chronological age as a way of bounding a group around skills and abilities is illustrative of broader societal attitudes towards older adults and is implied ageism (Vines et al., 2015).

Discussion

This chapter aimed to examine an essential body of HCI research on ageism because doing so could make several contributions. To attain the chapter's objective, three RQs dealing with key issues, such as motivation, current

research and future perspectives, have been addressed. This has been done by drawing on a literature review and the author's research. The results, which are discussed below, confirm the achievement of the chapter's objective.

Why is ageism a relevant topic for HCI research (RQ1)?

On the one hand, the overview of ageism provided in this chapter, and in the first three of this volume, might lead some of us to believe that ageism is tangentially related to HCI. Why? HCI scholars aim to do good with technology. On the other hand, the results indicate that ageism, both implicit and explicit, is (almost) pervasive in the experiences of technology use of many older adults. The results also indicate that ageism is very well alive in, for instance, the online realm and emerging technological developments facilitated by AI and algorithms. In addition, tackling ageism fits in with, and potentially enriches, the turn to human-centred issues in HCI research by emphasising "uncritical normativity" (Rosales et al., 2023). Moreover, and perhaps, most importantly, at least for this author, HCI research and scholars can contribute to fostering or minimising ageism, as it cuts across almost everything the field is concerned with. Thus, the reasons for conducting HCI research on ageism are manifold and relevant.

HCI research into ageism – what has been done thus far? (RQ2)?

If one agrees that ageism is an important topic for HCI research, then it follows that ageism should receive much research attention. The results show that this is not the case. Ageism has received considerably less research attention in HCI than other "isms". HCI research on ageism is mainly geared towards older adults, overlooking other age groups. Moreover, this research has been conducted with older adults in Europe, the UK, the US and Canada.

While these findings might not be new if they are seen from the perspective of previous literature on ageism, the results presented in this chapter unveil and partially fill an important and timely gap in HCI. Also, these results show that what has been found and discussed in other areas of knowledge holds true in HCI too.

Even though the literature review has not been systematic, which might be considered a limitation that future studies can address, the results presented herein spark future research, as discussed next.

Where do we, HCI scholars – and interdisciplinary researchers interested in ageism and digital technologies – go from here (RQ3)?

The first and perhaps more important step is acknowledging the need to conduct further HCI research on ageism. Ageism is relevant, and HCI should not turn a blind eye to it. As it is done with other important (social) issues, such as ageing and gender, workshops, special issues in journals, and conference

sessions devoted to ageism could raise awareness and stimulate further research on this topic.

Ongoing HCI research on ageism could be deepened and extended by looking into why ageism happens in the realm of digital technologies. By doing so, HCI research on ageism could be less descriptive, strengthening its theoretical aspect. For example, the Terror Theory, within which older adults can be seen as a reminder of one's mortality and vulnerability (Solomon et al., 1991), along with the increasing and almost global phenomenon that societies promote the notion of youth as the preferred state (Knowles et al., 2021), might account for associating ageism with older people. Future research can confirm or reject it.

Ageism is negative and positive, implicit and explicit, self-directed or other-directed, and can be expressed at different levels (São José & Amado, 2017). Ageism does not exist in a vacuum. Thus, there is a need and opportunity for future research to go beyond the surface and delve into ageism, i.e., the degree to which its different components manifest themselves in people's interactions with digital technologies and its intersection with other elements of identity (e.g., gender, socio-economic status).

In methodological terms, there is a need to include ageism within researchers' code of practice, as we (researchers) can foster or minimise ageism in our research practices. There is also a need to promote the avoidance of ageism from a peer review perspective because loneliness and loss of cognitive functioning are not all that matters (Vincent, 2023). Also, the more opportunity we have to include older adults, especially the oldest ones, who are mostly overlooked at every stage of the research process, the less likely we are to foster ageism in our research (Garavaglia et al., 2023) and in technology design (Mannheim et al., 2022). Cultural diversity and user groups with different age ranges should also be considered, as ageism might or might not manifest itself in the same way all over the globe, but it certainly affects all of us, regardless of our chronological age. Measuring ageism might also be important to quantify the magnitude of this phenomenon (Ayalon et al., 2019), and to evaluate the effectiveness of strategies and technologies to fight it.

Conclusion

HCI research on ageism is essential, incipient, and challenging. HCI research on ageism is essential because stereotypes, prejudices, and discrimination towards people because of their age affect almost everything that HCI is concerned with. HCI research can contribute to reducing or minimising them. HCI research on ageism is incipient because most studies have been published in the last five years and carried out with or considered mostly older adults in the West. HCI research on ageism is challenging because ageism is deeply embedded in society. Further HCI research on ageism is warranted.

Acknowledgements

References

Amaral, I., & Flores, A. M. M. (2023). Challenging gendered and ageing normative stereotypes on Instagram. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Ayalon, L., Chasteen, A., Diehl, M., Levy, B. R., Neupert, S. D., Rothermund, K., Tesch-Römer, C., & Wahl, H. W. (2021). Aging in times of the COVID-19 pandemic: Avoiding ageism and fostering intergenerational solidarity. *The Journals of Gerontology – Series B*, *76*, E49–E52. https://doi.org/10.1093/geronb/gbaa051

Ayalon, L., Dolberg, P., Mikulioniené, S., Perek-Bialas, S., Rapolienė, G., Stypinska, J., Willinska, M., & Fuente-Núñez, V. (2019). A systematic review of existing ageism scales. *Ageing Research Reviews*, *54*, 100919.

Ayalon, L., & Tesch-Römer, C. (Eds.). (2018). *Contemporary perspectives on ageism*. Springer Open.

Bannon, L. J. (1991). From human factors to human actors: The role of psychology and human-computer interaction studies in system design. In J. Greenbaum, & M. Kyng (Eds.), *Design at Work: Cooperative Design of Computer Systems* (pp. 25–44). Lawrence Erlbaum Associates.

Barros, B., Clarke, R., Holmquist, L., & Vines, J. (2021). Circumspect users: Older adults as critical adopters and resistors of technology. In *CHI Conference on Human Factors in Computing Systems (CHI '21)*, May 8–13, 2021, Yokohama, Japan. ACM, New York, NY, 14 pages. https://doi.org/10.1145/3411764.3445128

Bellini, R., Strohmayer, A., Alabdulqader, E., Ahmed, A. A., Spiel, K., Bardzell, S., & Balaam, M. (2018). Feminist HCI: Taking stock, moving forward, and engaging community. In *Extended Abstracts of the 2018 CHI Conference on Human Factors in Computing Systems*. p. SIG02. https://doi.org/10.1145/3170427.3185370

Butler, R. N. (1969). Age-ism: Another form of bigotry. *Gerontologist*, *9*, 243–246. https://doi.org/10.1093/geront/9.4_Part_1.243

Choo, H. Y., & Ferree, M. M. (2010). Practicing intersectionality in sociological research: A critical analysis of inclusions, interactions, and institutions in the study of inequalities. *Sociological Theory*, *28*(2), 129–149. https://doi.org/10.1111/j.1467-9558.2010.01370.x

Comunello, F., Mulargia, S., & Iericitano, F. (2023). "Forever young?" Digital technology, ageism and the (non-) ideal user. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Constanza-Chock, S. (2021). *Design justice. Community-led practices to build the worlds we need*. MIT Press.

Cuddy, A., & Fiske, S. (2002). Doddering but dear: Process, content, and function in stereotyping of older persons. In T. D. Nelson (Ed.), *Ageism. Stereotyping and prejudice against older persons* (pp. 3–27). MIT Press.

Cuvalo, A. (2020). Ageism and media generations in the Croatian post-socialist context. In: Gao, Q. & Zhou, J. (Eds.), *Human aspects of IT for the aged population. Technology and society. HCII 2020.* Lecture Notes in Computer Science (Vol. *12209*) (pp. 17–28). Springer. https://doi.org/10.1007/978-3-030-50232-4_2

Díaz, M., Johnson, I., Lazar, A., Piper, A. M., & Gergle, D. (2019). Addressing age-related bias in sentiment analysis. In *IJCAI International Joint Conference on Artificial Intelligence.* pp. 6146–6150. https://doi.org/10.24963/ijcai.2019/852

Dombrowski, L. (2017). Socially just design and engendering social change. *Interactions*, *24*, 63–65. https://doi.org/10.1145/3085560

Erete, S., Israni, A., & Dillahunt, T. (2018). An intersectional approach to designing in the margins. *Interactions*, 66–69. https://doi.org/10.1145/3194349

Fernández-Ardèvol, M., Rosales, A., & Morey, F. (2020). Methods matter: Assessment of the characteristics of a sample to analyse digital practices and social connectedness in later life. In Gao, Q. & Zhou, J. (Eds.), *Human aspects of IT for the aged population Part 3.* In 6th International Conference, ITAP 2020 Held as Part of the 22nd HCI International Conference, HCII 2020, pp. 58–69. LNCS Springer. https://doi.org/10.1007/978-3-030-50232-4_5

Folkins, C., Read, E., Mundee, J., Birk, M. V., & Bateman, S. (2020). A serious game for promoting positive attitudes towards nursing homes among youth. In *CHI PLAY 2020 – Proceedings of the Annual Symposium on Computer-Human Interaction in Play.* pp. 484–498. https://doi.org/10.1145/3410404.3414253

Garavaglia, E., Caliandro, A., Sala, E., Melis, G., & Zaccaria, D. (2023). Contrasting ageism in research on older people and digital technologies: A methodological reflection. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it.* Routledge.

Gilbert, C. N., & Ricketts, K. G. (2008). Children's attitudes toward older adults and aging: A synthesis of research. *Educational Gerontology*, *34*, 570–586. https://doi.org/10.1080/03601270801900420

Grudin, J. (2012). Introduction: A moving target – the evolution of human-computer interaction. *The human-computer interaction handbook: Fundamentals*, *evolving technologies and emerging applications* (pp. xxvii–lxi). https://doi.org/10.1201/b11963

Grudin, J. (2017). *From tool to partner: The evolution of human-computer interaction*, Synthesis Lectures on Human-Centered Informatics. Morgan and Claypool. https://doi.org/10.2200/S00745ED1V01Y201612HCI035

Harper, R., Rodden, T., Rogers, Y., & Sellen, A. (Eds.). (2007). *Being human: Human computer interaction in the year 2020.* https://www.microsoft.com/en-us/research/publication/being-human-human-computer-interaction-in-the-year-2020/

Harrington, C. N. (2020). The forgotten margins. *Interactions*, *27*, 25–29. https://doi.org/10.1145/3386381

Himmelsbach, J., Schwarz, S., Gerdenitsch, C., Wais-Zechmann, B., Bobeth, J., & Tscheligi, M. (2019). Do we care about diversity in human computer interaction: A comprehensive content analysis on diversity dimensions in research. In *Conference on Human Factors in Computing Systems – Proceedings.* pp. 1–16. https://doi.org/10.1145/3290605.3300720

Iversen, T. N., Larsen, L., & Solem, P. E. (2009). A conceptual analysis of ageism. *Nordic Psychology*, *61*(3), 4–22.

Kania-Lundholm, M. (2023). Coping in the culture of connectivity: How older people make sense of living with digital ageism. In A. Rosales, M. Fernández-Ardèvol &

J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it?* Routledge.

Kannabiran, G., Hoggan, E., & Koefoed Hansen, L. (2020). Somehow they are never horny! In *DIS 2020 Companion – Companion Publication of the 2020 ACM Designing Interactive Systems Conference*. pp. 131–137. https://doi.org/10.1145/3393914.3395877

Kim, E., Bryant, D., Srikanth, D., & Howard, A. (2021). Age bias in emotion detection: An analysis of facial emotion recognition performance on young, middle-aged, and older adults. In *AIES 2021 – Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society*. Association for Computing Machinery, pp. 638–644. https://doi.org/10.1145/3461702.3462609

Knowles, B., Hanson, V. L., Rogers, Y., Piper, A. M., Waycott, J., Davies, N., Ambe, A. H., Brewer, R. N., Chattopadhyay, D., Dee, M., Frohlich, D., Gutierrez-Lopez, M., Jelen, B., Lazar, A., Nielek, R., Pena, B. B., Roper, A., Schlager, M., Schulte, B., & Yuan, I. Y. (2021). The harm in conflating aging with accessibility. *Communications of the ACM*, *64*, 66–71. https://doi.org/10.1145/3431280

Ko, A. J., Oleson, A., Ryan, N., Register, Y., Xie, B., Tari, M., Davidson, M., Druga, S., & Loksa, D. (2020). It is time for more critical CS education. *Communications of the ACM*, pp. 31–33. https://doi.org/10.1145/3424000

Kumar, N., & Karusala, N. (2019). Intersectional computing. *Interactions*, *26*(2), 51–54.

Lazar, A., Diaz, M., Brewer, R., Kim, C., & Piper, A. M. (2017). Going gray, failure to hire, and the ick factor: Analyzing how older bloggers talk about Ageism. In *Proceedings of the ACM Conference on Computer Supported Cooperative Work*, CSCW, pp. 655–668. https://doi.org/10.1145/2998181.2998275

Lazar, A., Su, N. M., Bardzell, J., & Bardzell, S. (2019). Parting the Red Sea: Sociotechnical systems and lived experiences of menopause. In *Conference on Human Factors in Computing Systems – Proceedings*. pp. 1–16. https://doi.org/10.1145/3290605.3300710

Lee, H. R., Cheon, E., De Graaf, M., Alves-Oliveira, P., Zaga, C., & Young, J. (2019). Robots for social good: Exploring critical design for HRI. In *ACM/IEEE International Conference on Human-Robot Interaction*. IEEE, pp. 681–682. https://doi.org/10.1109/HRI.2019.8673130

Lee, H. R., & Riek, L. D. (2018). Reframing assistive robots to promote successful aging. *ACM Transactions on Human-Robot Interaction*, *7*, 1–23. https://doi.org/10.1145/3203303

Leeuwen, C. V., Smets, A., Brussel, V. U., Jacobs, A., & Ballon, P. (2020). Blind spots in AI: The role of serendipity and equity in algorithm-based decision-making. *SIGKDD Explorations Newsletter*, *23*(1), pp. 42–49.

Lytle, A., & Levy, S. R. (2019). Reducing ageism: Education about aging and extended contact with older adults. *The Gerontologist*, *59*(3), 580–588. https://doi.org/10.1093/geront/gnx177

Mannheim, I., Wouters, E. J. M., Köttl, H., van Boekel, L., Brankaert, R., & van Zaalen, Y. (2022). Ageism in the discourse and practice of designing digital technology for older persons: A scoping review. *The Gerontologist*, gnac144. https://doi.org/10.1093/geront/gnac144

Meisner, B. A. (2021). Are you OK, boomer? Intensification of ageism and intergenerational tensions on social media amid COVID-19. *Leisure Sciences*, *43*(1–2), 56–61. https://doi.org/10.1080/01490400.2020.1773983

Nelson, T. (Ed.). (2002). *Ageism. Stereotyping and prejudice against older persons*. MIT Press.

New, K., Gormally, A., Friday, A., & Hazas, M. (2021). "We can send a man to the moon but we can't control the temperature in our office"; a considerate approach to workplace thermal comfort by older women. In *Conference on Human Factors in Computing Systems – Proceedings*. https://doi.org/10.1145/3411764.3445127

Oberschmidt, K., Grünloh, C., Tunç, S., Van Velsen, L., & Nijboer, F. (2020). You can't always get what you want: Streamlining stakeholder interests when designing technology-supported services for active and assisted living. In *ACM International Conference Proceeding Series (OzCHI)*. pp. 649–660. https://doi.org/10.1145/3441000.3441040

Officer, A., Leoni, M., Wu, D., Nash, P., Thiyagarajan, J., & Beard, J. (2016). Valuing older people: Time for a global campaign to combat ageism. *Bulletin of the World Health Organization*, *94*, 710–710A. http://dx.doi.org/10.2471/BLT.16.184960

Palmore, E. (1999). *AGEISM. Negative and positive*. Springer.

Palmore, E. (2015). Ageism comes of age. *Journal of Gerontology: B Psychological and Social Sciences*, *70*, 873–875. https://doi.org/10.1093/geronb/gbv079

Park, J. S., Bernstein, M. S., Brewer, R. N., Kamar, E., & Morris, M. R. (2021). Understanding the representation and representativeness of age in AI data sets. *AIES 2021 – Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society*. Association for Computing Machinery, pp. 834–842. https://doi.org/10.1145/3461702.3462590

Reuter, A., & Liddle, J. (2020). The Later Life Audio and Radio Co-operative. In 9th International Conference on Software Development and Technologies for Enhancing Accessibility and Fighting Info-exclusio*n*. pp. 153–157. https://doi.org/10.1145/3439231.3439237

Reuter, A., Scharf, T., & Smeddinck, J. (2020). Content Creation in Later Life: Reconsidering Older Adults' Digital Participation and Inclusion, *Proc. ACM Hum. Comput. Interact.*, *4* pp. 1–23. https://doi.org/10.1145/3434166

Righi, V., Sayago, S., & Blat, J. (2012). Older people's use of social network sites while participating in local online communities from an ethnographical perspective. *CIRN 2012 Community Informatics Conference: "Ideals meet Reality"*, 7–9 November, Prato, Italy, ISBN: 978-0-9874652-0-7.

Righi, V., Sayago, S., & Blat, J. (2017). When we talk about older people in HCI, who are we talking about? Towards a "turn to community" in the design of technologies for a growing ageing population. *International Journal of Human-Computer Studies*, *108*, 15–31.

Righi, V., Sayago, S., Ferreira, S. M., Rosales, A., & Blat, J. (2018). Co-designing with a community of older learners for over 10 years by moving user-driven participation from the margin to the centre. *CoDesign: International Journal of CoCreation in Design and the Arts*, *14*(1), 32–44. https://doi.org/10.1080/15710882.2018.1424206

Rosales, A., Fernández-Ardévol, M, & Svensson, J. (2023). *Digital Ageism. How it Operates and Approaches to Tackling it*. Routledge.

Rosell, J., & Verges, A. (2021). The impact of ageism on the e-leisure of older people in Chile. In Q. Gao & J. Zhou (Eds.), *Human aspects of IT for the aged population. Technology Design and Acceptance*. HCII 2021. Lecture Notes in Computer Science, vol 12786. Springer. https://doi.org/10.1007/978-3-030-78108-8_17

Santos, S., Amaral, I., Basílio, R., & Brites, M. J. (2021). Debunking the #Manosphere: An exploratory analysis on patriarchy and ageism within the digital realm. In Q. Gao & J. Zhou (Eds.), *Human aspects of IT for the aged population. Technology Design and Acceptance*. HCII 2021. Lecture Notes in Computer Science(), vol 12786. Springer, https://doi.org/10.1007/978-3-030-78108-8_31

Santos, S., Amaral, I., & Brites, M. J. (2020). Masculinities and ageing: Deconstructing online representation among Portuguese speaking users. In Q. Gao & J. Zhou (Eds.), *Human aspects of IT for the aged population Part III*. In 6th International Conference, ITAP 2020 Held as Part of the 22nd HCI International Conference, HCII 2020, pp. 89–101. LNCS Springer. https://doi.org/10.1007/978-3-030-50232-4_7

São José, J. M. S., & Amado, C. A. F. (2017). On studying ageism in long-term care: A systematic review of the literature. *International Psychogeriatrics*, *29*, 373–387. https://doi.org/10.1017/S1041610216001915

Sayago, S. (Ed.). (2019). *Perspectives on human-computer interaction research with older people*. Springer Human-Computer Interaction Series.

Sayago, S. (2022). List of papers of the literature review. https://unidisc.csuc.cat/index.php/s/t84rmvHG1IBWCuT

Sayago, S., & Bergantiños, A. (2021). Exploring the first experiences of computer programming of older people with low levels of formal education: A participant observational case study. *International Journal of Human-Computer Studies*, *148*. Article Number: 102577. https://doi.org/10.1016/j.ijhcs.2020.102577

Sayago, S., & Blat, J. (2010). Telling the story of older people e-mailing: An ethnographical study. *International Journal of Human-Computer Studies*, *68*, 105–120.

Sayago, S., Forbes, P., & Blat, J. (2013). Older people becoming successful ICT learners over time: Challenges and strategies through an ethnographical lens. *Educational Gerontology*, *39*(7), 527–544.

Sayago, S., Rosales, A., Righi, V., Ferreira, S., Coleman, G., & Blat, J. (2016). On the conceptualization, design and evaluation of appealing, meaningful and playable digital games for older people. *Games and Culture*, *11*(1–2), 53–80.

Sayago, S., Sloan, D., & Blat, J. (2011). Everyday use of computer-mediated communication tools and its evolution over time: An ethnographical study with older people. *Interacting with Computers*, *23*(5), 543–554.

Sin, F., Berger, S., Kim, I., & Yoon, D. (2021). Digital social interaction in older adults during the COVID-19 pandemic. *Proceedings of the ACM on Human-Computer Interaction*, *5*(CSCW2), Article 380 (October 2021), 20 pages. https://doi.org/10.1145/3479524

Smyth, T., & Dimond, J. (2014). Anti-oppressive design. *Interactions*, *21*(6), 68–71. https://doi.org/10.1145/2668969

Solomon, S., Greenberg, J., & Pyszczynski, T. (1991). A terror management theory of social behavior: The psychological functions of self-esteem and world-views. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. *24*, pp. 91–159). Academic Press.

Stypinska, J. (2021). Ageism in AI: New forms of age discrimination in the era of algorithms and artificial intelligence. In *Proceedings of the 1st International Conference on AI for People: Towards Sustainable AI,* CAIP 2021, 20–24 November 2021, Bologna, Italy. http://dx.doi.org/10.4108/eai.20-11-2021.2314200

Stypinska, J., Rosales, A., & Svensson, J. (2023). Silicon Valley ageism – ideologies and practices of expulsion in tech industry. In A. Rosales, M. Fernández-Ardèvol

& J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it?* Routledge.

Svensson, J. (2023). Technology culture as youth oriented. In A. Rosales, M. Fernández-Ardèvol & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it?* Routledge.

Vincent, J. (2023). Life stage or age? Reviewing perceptions of oldest ICT users. In A. Rosales, M. Fernández-Ardèvol & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it?* Routledge.

Vines, J., Pritchard, G., Wright, P., & Olivier, P. (2015). An age-old problem: Examining the discourses of ageing in HCI and strategies for future research. *ACM Transactions on Computer-Human Interaction*, *22*, 1–27.

World Health Organization. (2021). *Global report on ageism*. Licence: CC BY-NC-SA 3.0 IGO.

Xu, W. (2021). Online representations of older people generated by public sector organisations. In Q. Gao, & J. Zhou (Eds.), *Human aspects of IT for the aged population Part I*. In 6th International Conference, ITAP 2021 Held as Part of the 22nd HCI International Conference, HCII 2021, pp. 459–471. LNCS Springer. https://doi.org/10.1007/978-3-030-50232-4

7 Age bias on the move

The case of smart mobility

Maria Sourbati

In this chapter, I investigate age bias in smart mobility to demonstrate the roles of transport systems, information and communication technologies (ICTs), data and sensors in promoting or impeding mobility for all. In particular, I focus on age discrimination in the unequal access to new mobility and transport services afforded to older populations. My conceptualisation of bias aligns with Vincent's analysis of ageism in research (Vincent, 2023), which highlights issues arising out of a lack of representation, misunderstood assumptions, and prejudices leading to bias in the research design, the samples and tools used. Acknowledging the complex relationships between digital technology design and use and age discrimination as described by the concept of "digital ageism" (Cutler, 2005; Ivan & Cutler, 2021), I use the term "age bias" here for three main purposes. First, drawing on the work of Butler (1969), I investigate discriminatory institutional processes in transport policy and planning as a component of ageism towards older adults; while the corporeality of ageing bodies should not be downplayed (Higgs & Gilleard, 2020), "age-biased" smart transport services designed for non-disabled younger adults risk constraining older adults, further worsening their social and economic position. Considering the spatial and mobility-related aspects of social exclusion more abstractly, this chapter recognises that transport problems can be a significant barrier to social inclusion (Cass et al., 2005). Second, I use the term to expand the focus of the investigation beyond the "digital divide" perceived in terms of individuals' (non-)use of ICTs (Sourbati, 2010). Third, I use the term to de-emphasise how ageism can function as a barrier to the adoption and use of digital technologies (Köttl & Mannheim, 2021; McDonough, 2016) instead analysing smart mobility and transport as public infrastructure in the smart city (Sourbati, 2020) and in societies that are highly saturated with digital technologies.[1]

My research question concerns age discrimination and social (in)equality in smart mobility: how do new smart transport services provide (or fail to provide) for the mobility of older adults? I address this question through a review of policy initiatives intended to promote smart mobility solutions in London, using document analysis (Bowen, 2009) and a brief case study of journey planning (Sourbati, 2020). These documents were selected from

the websites of Transport for London and the Mayor of London in the second half of 2021.[2] Analysed using the interview technique (O'Leary, 2004, p. 180), the documents were treated as potential "respondents" to my research inquiries about the types of smart transport technologies and services introduced, their potential users, and the data informing their design and operation. After reviewing contemporary debates concerning mobility, transport, ICTs and data in the first part of this chapter, I draw on those debates and this document analysis to discuss the socio-cultural logics that inform the design of these services (macro-level) and their interaction with digital data generated through ICT use (micro-level). I maintain a particular focus throughout on issues of age equality. In the following sections, I introduce the chapter's key concepts, present my approach to the study of smart mobility as a digital ecosystem, and apply this conceptual framework to selected examples from London's smart transport infrastructures; in so doing, I both illuminate age-related bias and indicate the potential for more age-inclusive mobility for all. The final section concludes the analysis. The chapter thus delineates opportunities for improving older adults' mobility in our smart cities while arguing for a design and policy framework that includes them and other marginalised social groups.

Mobility, smart mobility and old age

Understood in relation to embodied practices of movement (Merriman & Pearce, 2017) and to individual well-being, mobility can be defined as the ability to choose both where and when to travel and the activities in which one participates outside the home in everyday life (Nordbakke, 2013). Mobility is often considered "a prerequisite for citizens to have independence and participate in activities, access services, and form social relations" (Levin, 2019, p. 2). Transport mobilities are resource-dependent and embedded in their material conditions, including conditions of policy and physical space (Arup et al., 2015, p. 33). Following Levin (2019, p. 3), I understand mobility to involve not merely the movement of bodies in the transport system but also "desires, abilities, and resources, which are only partly observable and may be investigated indirectly by observing their manifestations" (see also Smith, 2009). The value of mobility is not limited to its role in helping people access destinations or other people (Metz, 2000); beyond its instrumental value in allowing individuals to carrying out activities that fulfil their practical needs, the very capacity to do so – and to do so in various ways – is a key aspect of well-being (Sen, 2004) and is essential to social inclusion (Pangbourne et al., 2010). Cass et al. (2005) describe "access" to mobility as "the ability to negotiate space and time so as to accomplish practices and maintain relations that people take to be necessary for normal social participation". Thus, mobility has not only instrumental value but also serves social or affective needs (e.g., the need for independence) and aesthetic needs (e.g., the need for "the journey itself"; Musselwhite & Haddad, 2010). These functions can

be understood as the intrinsic value of mobility (Durand & Zijlstra, 2020, p. 24) – a value that has become increasingly evident during the COVID-19 pandemic.

Mobility reflects people's daily activity patterns, as well as their optimisation of the available transport choices (Transport for London (TfL), 2019, p. 62), and must be considered in relation to this activity. Historically, the demand for travel is derived from people's needs to access other people, places, and services at some geographical distance. As multiple ICTs are integrated into every aspect of daily life that can be digitalised (Gray & Rumpe, 2015, p. 1319), internet access becomes a new context for mobility. Online, we can access services, visit virtual places, and meet people remotely, and such remote access options can enable participation in activities without the need to travel; furthermore, digital ICTs – such as web-based maps and travel planners, as well as transport services that conduct booking and payment online – are increasingly necessary for the organisation of travel in physical space. At the same time, the availability of transport services and freedom of travel constitute another context for mobility. In an urban environment, one can travel by foot, bicycle, scooter, motorcycle, mobility scooter, (shared) taxi, (shared/rented/owned) car or by public transport (land- or water-based). This chapter focuses on smart, public and shared modes of transport.

Smart mobility services combine digital technologies and data and are commonly accessible to the end user through applications on their smartphones. Collectively, digital public transport services, ride-hailing, micromobility (e.g., e-scooters and e-bikes, which can be used for shorter journeys and "last mile" transfer to or from public transport), and on-demand car rental offer new approaches to transport that can be more sustainable and inclusive. From a user perspective, smart mobility brings opportunities as well as new challenges (Durand & Zijlstra, 2020; Durand et al., 2021). These services, introduced through the "retrofitting" of existing infrastructures (including pedestrian crossings, journey planners, and parking spaces) or designed as new applications, can be more environmentally friendly while also producing beneficial outcomes for a range of different groups. According to Gassmann et al. (2019), the goals of smart mobility services are sustainable, innovative, and secure transportation systems, access to diverse transportation modes, availability throughout an entire city, the inclusion of non-motorised transportation, and the integration of ICTs into transportation systems. Digitalisation in transport services is often seen as a central contribution towards more sustainable mobility patterns (Durand & Zijlstra, 2020, p. 23). At the same time, owing to issues of digital literacy, device ownership, access to digital connectivity (broadband), and privacy concerns, some individuals are either unable or unwilling to interact with such digital transformations. As summarised by Liu et al. (2021), "smartphone-based new mobility services only favour those who already have convenient access to services and have further excluded and marginalised disadvantaged populations".

In this new environment of digital mobility, access to online connectivity and real-time data are prerequisites for making decisions about how and when to connect, from choosing which mobility mode to use for travel to determining whether a "virtual" engagement such as "e-shopping" is more suitable. As the AECOM London 2070 report asserts, urban transport in the near future will be facilitated by a universal "internet of things" (IoT) as well as by artificial intelligence (AI)-processed sensor data "to inform the seamless alignment and full integration of travel networks and journey management" (AECOM 2021, p. 61). This shift towards digital media in transport allows for the flexible use of different innovative transport options. Digital ICTs, especially smartphones, are used to switch flexibly between newly interconnected mobility services, including both "old" modes such as public transport (bus, train or ferry) and new services such as car- and bike-sharing (Groth, 2019). A popular contemporary example Is mobility-as-a-service (MaaS), in which a range of transportation modes including ride-hailing, micro-mobility, and on-demand car rental can be integrated into a service that is accessible "on demand" (see, e.g., Standage, 2021).

Older adults travel less than younger people across all modes of travel, often replacing a private car after retirement with walking and the use of public transport, especially buses (Foresight 2019). A study of ten capital cities in Europe[3] found that public transport and walking are the most frequently used modes of transport among older adults aged 65+ years, who are less likely to have cars (Arup et al., 2015; LaPlante & Kaeser, 2007). A review of studies on the transport and travel needs of older people by Luiu et al. (2017) shows that "at least one-third of older people report unmet travel needs"; "women and the oldest older (75 years old and above)", as well as those without car access, report these needs the most (Luiu et al., 2017). Despite the importance of public transport to older adults' mobility – a capacity that could be considered a fundamental right – few studies have been conducted on the topic. The role and potential of smart transport for older adults is currently under-researched despite its growing importance as societies worldwide urbanise, digitalise, and age. Although there is a growing body of research on the use of smart services such as ride-hailing, micro-mobility, and digital journey planners, this literature is mostly focused on the younger generation; older people and other "transport-disadvantaged" groups (disabled people most notably) have not been prioritised in research and policy development (Liu et al. 2021; Loos et al., 2020).

Mobility digital ecosystem

Smart mobility can be conceptualised as a digital ecosystem (Loos et al. 2020) comprising mobility practices, data, digital networks, material/physical geographies and digital devices and access. Such an approach integrates an examination of digital media technologies and transport systems, considering both the socio-cultural logics informing the design of their material structures and

the data extracted through these ICTs (Leavy et al., 2020). Smart mobility relies on digital networks, in addition to mobile physical objects (travelling on land, on water and in the air) and people, and involves large-scale data collection and analysis (Jeekel, 2017). The systems involved combine physical, digital and data infrastructures. These include intelligent transport systems, where networked ICTs are applied to existing mobility systems, such as sensors in public roads and parks; IoT solutions, which are built into public and private transportation modes such as buses and cars; and citizens' use of networked ICTs (e.g., traffic management), data, and new mobility services (Smith, 2009). Over roughly the past 15 years, transportation has been embedded with digital ICTs (Cohen-Blankshtain & Rotem-Mindali, 2016; Gössling, 2018).

Historically, electronic communication technologies and motorised transport have been routinely contextualised in terms of one another (Popp, 2011).[4] Today, mobile ICTs can be understood as resources for transport mobility; examples include route-planning applications, electronic payment of transport fares, and travel navigators such as GPS devices and web-based maps. Older groups have been especially disadvantaged in this respect. As the contributions in this volume demonstrate, research into the use of smart mobile ICTs by older adult groups is both limited and fragmented (Fernández-Ardèvol et al., 2019a, p. 12). Older adults are frequently considered a minority in digital communications systems in terms of both access to and use of ICTs. Although the generational location of one's birth cohort does not usefully explain differences in engagement with media technologies (Gilleard et al., 2015, p. 2), age – along with income and education – remains a main demographic factor corresponding to inequality of digital access, skills and ICT use in societies with high internet diffusion (Dutton & Reisdorf, 2017).

Recently, the relationship between perceived ease of smartphone use and access to smartphone-based services has prompted discussions about the social consequences and equity implications of access to new mobility services (see Groth, 2019; Pangbourne et al., 2020; Zhang et al., 2020). The COVID-19 pandemic has foregrounded the significance of ICT access for mobility services including public transport, micro-mobility modes and e-hailing (e.g., applications such as Uber), as well as a range of other essential public services such as health and social care and education. As a result, it has emphasised the intersection of inequalities in transport and communications experienced by older adults. The study by Liu et al. (2021) found that the use of smartphone-based services had an influence on the perception of service accessibility and transport equity for older people and other disadvantaged groups during 2019–2020.

In addition to its effect on service access, mobile ICT use has profound social consequences owing to its role in ongoing datafication. Data are routinely generated as a side effect of activities related to digital media (Breiter & Hepp, 2018, pp. 387–388). Connected ICTs such as mobile phone leave "footprints" of media use that compile archives of digital traces, and this

data stock is an emerging concern in the context of discrimination and inequality issues. In smart mobility networks, for instance, data gaps can occur through uneven processes of automated data collection; while mobility data are captured by public transport, MaaS providers, mobile apps and other means, the increasing datafication of mobility happens unevenly in relation to age. Thus, existing datasets "do not provide a combination of relevant data at the required granularity to understand the interrelationship between digital capabilities/skills, age and geography that is needed for considering [inclusive] transport in the age of smart mobility" (Sourbati & Behrendt, 2021). As the range of digital ICT and IoT applications increases, our cities and transport systems – along with the data generated through mobile ICT use – become more instrumental in providing data for digital AI application development (Abduljabbar et al., 2019). As a result, both the role of these data and our expectations for AI's usefulness are likely to continue to grow.

The use of training data by AI raises related concerns about the perpetuation of age bias and ageism (Rosales & Fernández-Ardèvol, 2019b, 2020). Given that AI learns from labelled datasets, it absorbs any prejudices, misconceptions and failures embedded in these datasets into its algorithmic decision-making, which could thus have a profound effect on human rights.

Accordingly, algorithms that are capable of developing bias-free training datasets and statistical models that incorporate the digital media practices of broader population segments (see Rosales and Fernández-Ardèvol 2019b) are required to develop all age-inclusive smart transport services.

In a digital mobility ecosystem, individual mobile ICT use, a city's digital infrastructures (e.g., wireless internet and sensors), and its material geographies and built environments (e.g., its road and pavement systems, traffic lights, parks and city centres) all have consequences for transport and mobility more generally. Their construction and regulation shape both the effects caused by existing spatial arrangements on transport systems and organised movement and the new spaces created by smart ICTs (Asher et al., 2012).

Examples from London

In this section, I review selected examples of legacy, retrofitted and new smart transport services in London to demonstrate how age bias in their design and operation can be a challenge – or an opportunity – for older adults' mobility. Discussing a range of examples including pedestrian infrastructure, journey-planning apps and online maps, data infrastructure, and new electric micromobility modes, I illustrate emerging issues of age equality and inclusion in smart mobility that will have to be addressed by new policy. Several factors make London a particularly relevant case study. The city has a steadily increasing population of older residents and a multi-modal public transport infrastructure that offers concessionary and free travel provisions for children and pensioners; at the same time, it is a leader in the development of open data and smart transport services. According to the latest available *Travel in*

London report issued by TfL (2019), older adult groups have grown at the highest rate among London's resident demographics since 2001. The group of residents aged 45–59 years has grown approximately 2.5 percent per year, while the group of residents over 65 years has also seen a steady growth of roughly 2 percent per year (TfL, 2019, p. 45). London's public transport network comprises buses, underground and overground trains, trams, and river boats. Cycling is encouraged through the addition of cycle lanes and as of 2022, e-scooters are undergoing trials to become the latest addition to the network. All London residents of pensionable age (currently those residents aged 65 years and over) can apply for a Freedom Pass, which allows its holder to use TfL services for free on weekends and bank holidays, as well as after 9:00 AM on weekdays. Children under 16 can travel for free across all modes of public transport (Transport for London, n.d.-a, n.d.-d).

Pedestrian crossing lights and adaptive signalling control systems

The walk to and from users' access point to public transport, commonly referred to as "door to vehicle" or "first/last mile" travel, is a necessary component of mobility for public transport users of all ages (Daniels & Mulley, 2013). However, pedestrian crossing lights that regulate urban traffic flow use age-biased designs and demographic information data that discriminate against older pedestrians (Sourbati, 2020). In the road traffic control system used to time pedestrian crossing and traffic lights both in the UK and internationally, the default speed assumed for pedestrians is 1.2 metres per second (m/s), which equates to 75 metres per minute or 4.5 kilometres per hour (Crabtree et al., 2014, p. 5). This default value was established in the early 1960s (LaPlante & Kaeser, 2007) when the average age was much lower than today's and traffic was significantly lighter and less complex. Like other urban infrastructure built after the Second World War, the default traffic control algorithm favours motor vehicles over pedestrians (Foresight 2019, p. 67); at the same time, it operates on the assumption that all pedestrians are younger, able-bodied adults. While the average pedestrian walking speed required to complete a crossing before traffic lights turn green for vehicles can be achieved by competent young adults, research has shown that the walking speed of 76 percent of men over 65 years and 85 percent of women over 65 years is slower than the default speed of 1.2 metres per second (Asher et al., 2012). As such, although it is still widely used at traffic lights, this default walking speed is higher than the speed that can be achieved by a significant and growing proportion of the population. Most pedestrians over 65 years of age are thus unable to safely cross the road in time owing to constraints imposed on their mobility by traffic control systems.

In an attempt to correct for this vehicle bias, TfL is conducting trials on smart technologies that will detect the number of pedestrians at a crosswalk and vary the time they have to cross a road; testing on new intelligent adaptive traffic control signalling systems began in London in 2020. According

to a press release published by Intelligent Transport Systems UK, the new Real Time Optimiser (RTO) system, developed jointly by TfL and Siemens Mobility, changes how these timings are optimised by considering data on all road users rather than just motor vehicles, including information on cycling, walking and freight movements (Hutton, 2020). Although details about the datasets and statistical systems used are not publicly available, this system shows how more inclusive AI-operated systems can be built by considering the full range of transport users; such systems could therefore be used to address age bias by varying the assumed walking speeds of pedestrians.

Journey planners

In addition to its use in traffic control systems, the default value of 1.2 m/s is used to calculate average pedestrian speed in many popular digital applications. To illustrate the average pedestrian walking speeds calculated by the three most popular city navigation and journey-planning applications – TfL Journey Planner, Google Maps, and Citymapper – I have used the example of a 1.8-km walk from London's Waterloo station to London Bridge station (Sourbati, 2020). Google Maps uses the standard 1.2 m/s as their default walking speed internationally. In contrast, TfL Journey Planner includes a selection of three walking speeds: "average" (1.2 m/s), which corresponds to the industry standard for an average adult up to 65 years; "slow" (0.8 m/s), corresponding to the average speed for adults aged 65–80 years (see Arup et al., 2015: 50); and "fast" (1.4 m/s). Citymapper, the second most popular travel application in London, uses a value similar to TfL's "fast" value. TfL's own TfL Go app and Journey Planner provide accessibility services and travel tools such as maps, wayfinding, and real-time audio/visual information on the move. Users of the TfL Go app can search for the best routes between stations, bus stops, piers, and other places of interest, as well as between addresses or postcodes. Journeys can be planned in real time or in advance, and several route customisation options are available; users can choose between the fastest routes, routes with the fewest changes, more eco-friendly routes, routes with the least walking involved, routes with assisted travel, and other options (Transport for London, n.d.-e). Of the three apps, only the one from TfL offers options that more realistically reflect different walking capabilities ("slow", "average", and "fast") and that would be suitable for slower-moving older adults – and slower-moving persons more generally. In contrast, Citymapper and Google Maps are biased by design towards "fast-moving" younger adults.

TfL digital data and mobility apps

At the time of writing, the latest draft of the "Emerging Technology Charter for London" (Mayor of London LondonAssembly, 2021) encourages local authorities, public services, and technology companies to improve their

implementation of technology in the UK capital by following four principles: "Be open", "Respect diversity", "Be trustworthy with people's data" and "Be sustainable". TfL's emphasis on diversity as a fundamental principle demonstrates an emerging recognition of human rights issues in digital and smart city services; under the public sector equality duty, public bodies establishing new technologies or services are required to carry out their functions with due regard to the objectives of the Equality Act 2010 (Public sector equality duty – GOV.UK, n.d.). As the charter states, such public bodies should consider "the impact the technology may have on any existing services", so that "if the new technology replaces an existing service then provision should be made for continued access to this service by people who do not have either the required device or skills to access it by the new route". In addition, they should consider "any potential bias, notably but not exclusively racial bias arising from the data, system or decision", and "if certain groups are excluded from the benefit of new technologies, the technology should have a clear reason why it does not serve these groups" (Mayor of London LondonAssembly, 2021). Although age is not listed in the charter as an area of discrimination or potential bias, the call for provision of "continued access" shows a concern for technology and network access that would be especially relevant to older groups, as these groups often possess the oldest models of smartphones and, as a result, face increased difficulty in updating applications and downloading new ones (Rosales & Fernández-Ardèvol, 2016).

Provision and re-use of open data

Since July 2019, TfL has collected depersonalised data through its wireless network; depersonalised data are also acquired from ticketing systems through the use of TfL Oyster card and debit card payments, which provide a subject's journey history along with personal details of London residents. These data, along with existing connection data from Wi-Fi enabled London Underground stations, have been used to provide insights into collective travel patterns and changes over time. According to the TfL website, these data provide several benefits, allowing TfL to "understand how regular and less frequent customers use stations", to inform customers about how busy stations are, and to make improvements to transport services. At the same time, these data allow data subjects – that is, the passengers paying with TfL Oyster or credit cards – to receive "better information to help them plan their journeys and avoid congestion" while enabling TfL to "manage disruptions and events more effectively" and "make better transport planning decisions - for example about timetables, station designs and major station upgrades" (Transport for London, n.d.-f). The description of benefits for older passengers who use the 60+ Oyster Freedom Pass has a markedly different focus, however, as the emphasis shifts from optimisation of mobility, improvements to travel planning, and the experience of travel towards safety and fear of crime. According to the TfL website, data extracted through the 60+ Oyster

Freedom Pass are used to inform service plans for "reducing all crime and anti-social behaviour on and around the public transport network", "creating crime and anti-social behaviour strategies", "targeting crime and disruption hotspots to better coordinate and deploy policing resources" and "reducing fear of crime and improving public confidence in the safety of the journeys they make in the capital" (Transport for London, n.d.-b). The role of such a discursive strategy in promoting inclusion through mobility is questionable, as the focus on crime can perpetuate a view of concessionary travel card holders – both old and young – as vulnerable and marginalised.

The significance of the TfL datasets for mobility and inclusion spreads beyond the TfL network to encompass the city's smart transport infrastructure. All TfL public data or open data[5] are made freely available through application programming interfaces (APIs), static data files and feeds for software developers to use in their own services. Thus, TfL's open data approach allows for the third-party development of applications that can access information about transport services across a wide variety of smartphone platforms. Google and Citymapper are using these data, as are Waze, Twitter Bus Checker, Bus Times and Mapway, among others (Deloitte for Transport for London, 2017).

Shared micro-mobility

Micro-mobility services such as battery-assisted bikes (e-bikes) and scooters (e-scooters) are another component in London's smart mobility. Since June 2021, electric scooters have been available to rent as part of a trial in several London boroughs (Camden, City of London, Ealing, Hammersmith and Fulham, Kensington and Chelsea, parts of Lambeth, Richmond upon Thames, Southwark, Tower Hamlets and Westminster) (Transport for London, n.d.-c). E-scooter renters are required to download an app on their smartphone and complete a registration process and mandatory in-app training, which itself requires an adequate level of digital skills. As a new phenomenon in urban transport, micro-mobility is viewed as a response to problems associated with traffic congestion, energy consumption, and environmental impact. According to the city of London, micro-mobility "has the potential to provide a clean, convenient and efficient transport alternative, and may bring particular benefits in first and last mile journeys, connecting public transport to journey start and end points" (London Transport Committee, 2020). TfL has mainly promoted smart commuting by e-scooter and e-bike in tourist and business districts to provide employees and visitors with more sustainable modes of travel. When discussing micro-mobility in relation to older groups, however, safety issues are prioritised instead; much like the digital footprints of concessionary Oyster cards discussed above, e-bikes and e-scooters are currently represented as a potential hazard to older adults. According to the London Transport Committee (2020, p. 9), vehicles left on the pavement "can have particularly negative consequences for older people and people with disabilities, such as the visually impaired".

Discussion and conclusions

In this chapter, I have reviewed examples of smart mobility services, highlighting areas of opportunity, as well as biases and related issues of equity faced by older adults. The analysis can be applied to other transport-excluded and disadvantaged groups, such as young people and people with disabilities. TfL's collection of mobility data and smart services demonstrate emerging areas of opportunity, including the improved provision of service and increased accessibility to a range of groups with different characteristics and needs, the creation of innovative applications to help integrate first and last mile travel and the encouragement of alternative mobility modes. A growing number of journey-planning applications have helped make people's journeys more efficient, convenient, and comfortable. Travel information plays an important facilitating role in mobility practice; when used in conjunction with shared mobility services, information can make a range of modes including cycling and walking more accessible to older groups and thus produce health and environmental benefits. Research has found that older adults with higher levels of mobility attribute that mobility to carefully pre-planning their trips through the use of information (Lindsay et al., 2012). Travel information can also encourage people to choose a different mode of travel than their default option, leading to a reduction in habitual car trips (Ormerod et al., 2015, pp. 26–27). Lack of travel information can be a key barrier to getting out and about for older adults. Smart mobility technologies have the potential to improve equity and access to transportation while also promoting diversity and inclusion as they are not limited in any absolute sense by transit infrastructure.

Along with these opportunities for improvement, however, there is an emerging risk that more "covert" forms of digital inequality will develop, as can be seen in what Durand and Zijlstra refer to as "automation and algorithmic processing features of digitally-based transport services" (Durand & Zijlstra, 2020, p. 4; Durand et al., 2021). Groups who rarely access wireless networks with their smartphones – such as older users of transport services currently – are not registered in the data gathered (such as in the public Wi-Fi data collected by TfL) and thus remain invisible in these new services. These emerging areas of exclusion pertain to which data are or are not collected (Sourbati & Behrendt, 2021), as well as to the ways in which data are used. Two important dimensions affect inclusivity in digital access to smart mobility. First, access to digital ICTs is not shared equally; smartphone-based mobility services favour those who already have convenient access to said services in terms of both physical proximity and one's ability to use a digital service. For shared mobility services such as ride-sourcing, taxi e-hailing and car and bike sharing, digital is not only the default option, but it is also frequently the only option (Pangbourne et al., 2020). Without digital technologies such as smartphones and credit cards, these digitally based transport modes are usually inaccessible (Groth, 2019; Pangbourne et al., 2020). As

a result, smartphone-based shared mobility services "have further excluded and marginalised disadvantaged populations, which urgently require policy interventions" (Liu et al., 2021). Second, the datasets harvested from these devices do not represent all transport users, but only those who use mobile ICTs; these discrepancies can then exacerbate existing data equity issues in the design of future services and algorithm training. As seen in the examples reviewed in this chapter, the collection, analysis and proliferation (as open data) of public and shared transport data can be used both to retrofit infrastructures (e.g., modification of timings for pedestrian crossing lights) and to create new services. Just as shared mobility practices can provide significant information on mobility, unaddressed data gaps for groups whose mobility is not captured in digital data or provided for by smart services will bear consequences for the future of urban transport (Vecchio & Tricarico, 2019), including the design and regulation of a variety of new services accessed through smartphone technology: public buses and trains, ride-hailing, micro-mobility and on-demand car rental. As Pangbourne et al. (2020) and Durand et al. (2021) argue, a "technological gentrification" of transport could emerge, which would further exclude disadvantaged groups such as older adults.

Current trends in the intersection between ageing and datafication expect digitalisation to indicate that issues such as data gaps will have ongoing effects on social inclusion, despite the current policy emphasis on well-being and sustainability. Policy attention and research into the interplay between digital inequality and transport disadvantage is required, as is research into underlying cultural biases. Embedded age biases against older adults can be seen as a relationship of cultural assumptions about age and technology use in the design of a digital service (Sourbati & Loos, 2019) and of available datasets (Rosales & Fernández-Ardèvol, 2019b; Sourbati & Behrendt, 2021) and are reflected in common misconceptions about the generational use of ICTs, which are then frequently repeated in public and policy debates. The digitalisation of mobility services may add to existing disadvantages and thereby exacerbate them, but it may also mitigate other forms of disadvantages. Attempts to map lower levels of access to digital ICTs on to digital datasets and smart mobility services may also increase inequalities experienced by excluded older – or younger, or poorer – groups. As Durand and Zijlstra (2020) explain, "These features may exclude – intentionally or not – groups of people that are already disadvantaged in some way, for instance by shunning poorer neighbourhoods because of a supposedly lower profitability" (Durand & Zijlstra, 2020: 4; see also Durand et al., 2021).

These issues, which are only partly transport-specific, must be addressed through policy and planning before the technology is widely deployed (Fleming, 2018). Some of these issues are endemic to investment in accessibility; increased accessibility to older and disabled people has not been a measurable policy outcome, unlike safety, congestion and environmental impacts, and

therefore "cannot inform future transport policy, or the infrastructure specifications in design codes, because its success at meeting the needs of older and disabled people is not captured at site-specific or project-specific levels" (Burdett et al., 2021, p. 1597). As a result, the problem remains "invisible" to policy professionals (Burdett et al., 2021, p. 1598), thereby leading to further age bias in transport policy and design. This invisibility is reinforced by the so-called "I-methodology", which relies on personal experience, whereby the designers consider themselves as representatives of the user (Akrich, 1995), and results in user representations that unintentionally resemble the designers themselves.

As demonstrated in this volume, wider inequalities of digital access and ICT use stem from deeply entrenched assumptions and cultures of age discrimination. Unless the ways in which age(ist) bias can be reproduced through service (including digital application) design and data bias are recognised and acted upon, modes of mobility such as walking or public transport may be discouraged, resulting in harmful effects to public health, the environment, and social inclusion. The data biases of travel applications, particularly insofar as they concern the lived experiences of older groups and other excluded and disadvantaged populations, "feed into a wider subjective sense that these experiences are undervalued or [un]acknowledged, which ultimately exacerbate feelings of inadequacy, vulnerability and frustration" (Thornham, 2019, p. 181). It is, therefore, essential to understand the social roots of systemic inequities in transport and mobility, many of which derive from twentieth-century age-related biases. Further study of older adults and smart mobility, using both theoretical and empirical research to consider all kinds of mobility practices, modes of transport, digital devices, and (access to) services, will play a crucial role in achieving this end.

Notes

1 For a critique of fixed conceptualisations of age and ICT use and of attempts to bridge the "digital divide" by addressing ageism, see Beneito-Montagut et al. (2023) this volume.
2 The search queries used were: (Ageing OR older people OR elderly OR pensioner) AND London AND ((smart AND (transport OR mobility OR buses OR trains OR city)) OR ("micro-mobility" OR micromobility) OR ("e-scooters" OR "electric scooters") OR (cycling OR "e-cycling" OR "electric cycles")).
3 The cities included in the study were: Amsterdam, Berlin, Brussels, Copenhagen, Dublin, Lisbon, London, Paris, Madrid, Milan (Arup et al., 2015).
4 During the interwar period of the twentieth century, the new media technologies of radio and moving images and the new transportation technologies of the automobile and air travel were "[c]onsistently paired" in public discourse as the prime agents behind the proliferation of modes of connection and contact between people and places (Popp, 2011, p. 460). This aligns with the conception of communication as "organised movement and action" (Sterne, 2006, p. 118) in the early years of communications studies.
5 Defined as data that are available to everyone to access, use and share.

References

Abduljabbar, R., Dia, H., Liyanage, S., & Bagloee, S. A. (2019). Applications of artificial intelligence in transport: An overview. *Sustainability (Switzerland)*, *11*(1).https://doi.org/10.3390/su11010189

AECOM. (2021). *London 2070 – Home*. https://publications.aecom.com/london-2070/

Akrich, M. (1995). User representations: Practices, methods and sociology. In A. Rip, T. J. Misa, & J. Schot (Eds.), *Managing sociology in society: The approach of constructive technology assessment* (pp. 167–184). Pinter.

Arup, Help Age International, Intel, & Systematica. (2015). *Shaping ageing cities. 10 European case studies*. https://www.arup.com/perspectives/publications/research/section/shaping-ageing-cities

Asher, L., Aresu, M., Falaschetti, E., & Mindell, J. (2012). Most older pedestrians are unable to cross the road in time: A cross-sectional study. *Age and Ageing*, *41*(5), 690–694. https://doi.org/10.1093/ageing/afs076

Beneito-Montagut, R., López-Gómez, D., & García-Santesmases, A. (2023). Technological ageism in a sheltered housing for older people: An intersectional approach. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Bowen, G. A. (2009). Document analysis as a qualitative research method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Breiter, A., & Hepp, A. (2018). The complexity of datafication: Putting digital traces in context. In Hepp A., Breiter A. Hasebrink, U. (Ed.), *Communicative figurations. Transforming communications in times of deep mediatization – Studies in cross-media research* (pp. 387–405). Palgrave Macmillan. https://doi.org/10.1007/978-3-319-65584-0_16

Burdett, B., Witten, K. Willing, E. Ameratunga, S. (2021) 'Inclusive access in transport policy and practice: Views of New Zealand transport practitioners', *Case Studies on Transport Policy*. Elsevier Ltd, 9(4), pp. 1593–1599. doi: 10.1016/J.CSTP.2021.08.008.

Butler, R. N. (1969). Age-ism: Another form of bigotry. *The Gerontologist*, *9*(4_Part_1), 243–246. https://doi.org/10.1093/GERONT/9.4_PART_1.243

Cass, N., Shove, E., & Urry, J. (2005). Social exclusion, mobility and access. *Sociological Review*, *53*(3), 539–555. https://doi.org/10.1111/j.1467-954X.2005.00565.x

Cohen-Blankshtain, G., & Rotem-Mindali, O. (2016). Key research themes on ICT and sustainable urban mobility. *International Journal of Sustainable Transportation*, *10*(1), 9–17. https://doi.org/10.1080/15568318.2013.820994

Crabtree, M., Lodge, C., & Emmerson, P. (2014). *A review of pedestrian walking speeds and time needed to cross the road*. https://www.livingstreets.org.uk/media/1796/review-of-pedestrian-walking-speeds-report-v4b-280814-docx-2.pdf

Cutler, S. J. (2005). Ageism and technology. *Generations: Journal of the American Society on Aging*, *29*(3), 67–72. https://www.jstor.org/stable/26555416

Daniels, R., & Mulley, C. (2013). Explaining walking distance to public transport: The dominance of public transport supply. *Journal of Transport and Land Use*, *6*(2), 5–20. https://doi.org/10.5198/jtlu.v6i2.308

Deloitte for Transport for London. (2017). *Assessing the value of TfL's open data and digital partnerships*. https://content.tfl.gov.uk/deloitte-report-tfl-open-data.pdf

Durand, A., & Zijlstra, T. (2020). *The impact of digitalisation on the access to transport services: A literature review.* https://english.kimnet.nl/publications/pub-lications/2020/06/29/the-impact-of-digitalisation-on-the-access-to-transport-ser-vices-a-literature-review

Durand, A., Zijlstra, T., van Oort, N., Hoogendoorn-Lanser, S., & Hoogendoorn, S. (2021). Access denied? Digital inequality in transport services. *Transport Reviews*, *42*(1), 32–57. https://doi.org/10.1080/01441647.2021.1923584

Dutton, W. H., & Reisdorf, B. C. (2017). Cultural divides and digital inequalities: Attitudes shaping internet and social media divides. *Information, Communication & Society*, 1–21. https://doi.org/10.1080/1369118X.2017.1353640

Fernández-Ardèvol, M., Rosales, A., Loos, E., Peine, A., Beneito-Montagut, R., Blanche, D., Fischer, B., Katz, S., & Östlund, B. (2019). *Methodological strate-gies to understand smartphone practices for social connectedness in later life* (pp. 46–64). https://doi.org/10.1007/978-3-030-22015-0_4

Fleming, K. L. (2018) 'Social Equity Considerations in the New Age of Transporta-tion: Electric, Automated, and Shared Mobility', *JSPG*, *13*(1). Available at: www.sciencepolicyjournal.org (Accessed: 25 February 2022).

Foresight. (2019). *A time of unprecedented change in the transport system.* https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/780868/future_of_mobility_final.pdf

Gassmann, O., Böhm, J., & Palmié, M. (2019). *Smart cities: Introducing digital in-novation to cities* (p. 341). Emerald Publishing Limited.

Gilleard, C., Jones, I., & Higgs, P. (2015). Connectivity in later life: The declining age divide in mobile cell phone ownership. *Sociological Research Online*, *20*(2). https://doi.org/10.5153/sro.3552

Gössling, S. (2018). ICT and transport behavior: A conceptual review. *International Journal of Sustainable Transportation*, *12*(3), 153–164. https://doi.org/10.1080/15568318.2017.1338318

Gray, J., & Rumpe, B. (2015). Models for digitalization. *Software & Systems Mod-eling*, *14*(4), 1319–1320. https://doi.org/10.1007/S10270-015-0494-9

Groth, S. (2019). Multimodal divide: Reproduction of transport poverty in smart mobility trends. *Transportation Research Part A: Policy and Practice*, *125*, 56–71. https://doi.org/10.1016/J.TRA.2019.04.018

Higgs, P., & Gilleard, C. (2020). The ideology of ageism versus the social imaginary of the fourth age: Two differing approaches to the negative contexts of old age. *Age-ing & Society*, *40*(8), 1617–1630. https://doi.org/10.1017/S0144686X19000096

Hutton, P. (2020, December 5). *TfL and Siemens deliver UK-first next generation traf-fic signal technology in London – ITS United kingdom: Better transport through technology.* ITS UK. https://its-uk.org.uk/tfl-and-siemens-deliver-uk-first-next-generation-traffic-signal-technology-in-london/

Ivan, L., & Cutler, S. J. (2021). Ageism and technology: The role of internalized stere-otypes. *University of Toronto Quarterly*, *90*(2), 127–139. https://doi.org/10.3138/UTQ.90.2.05

Jeekel, H. (2017). Social sustainability and smart mobility: Exploring the relation-ship. *Transportation Research Procedia*, *25*, 4296–4310. https://doi.org/10.1016/j.trpro.2017.05.254

Köttl, H., & Mannheim, I. (2021). Ageism & digital technology: Policy measures to address ageism as a barrier to adoption and use of digital technology. *EuroAgeism Policy Brief.* https://doi.org/10.5281/ZENODO.4744286

LaPlante, J., & Kaeser, T. P. (2007). A history of pedestrian signal walking speed assumptions. 3rd Urban Street Symposium: Uptown, Downtown, or Small Town: Designing Urban Streets That Work, pp. 1–8, June 24–27, Seattle, Washington.

Leavy, S., O'Sullivan, B., & Siapera, E. (2020). Data, power and bias in artificial intelligence. *ArXiv*. http://arxiv.org/abs/2008.07341

Levin, L. (2019). How may public transport influence the practice of everyday life among younger and older people and how may their practices influence public transport? *Social Sciences*, *8*(3), 96. https://doi.org/10.3390/socsci8030096

Lindsay, S., Jackson, D., Schofield, G., & Olivier, P. (2012). Engaging older people using participatory design. *Proceedings of the 2012 ACM Annual Conference on Human Factors in Computing Systems – CHI '12*. p. 1199. https://doi.org/10.1145/2207676.2208570

Liu, Q., An, Z., Liu, Y., Ying, W., & Zhao, P. (2021). Smartphone-based services, perceived accessibility, and transport inequity during the COVID-19 pandemic: A cross-lagged panel study. *Transportation Research Part D: Transport and Environment*, *97*. https://doi.org/10.1016/J.TRD.2021.102941

London Transport Committee. (2020). *Transport now and in the future | London City Hall*. https://www.london.gov.uk/about-us/london-assembly/london-assembly-publications/transport-now-and-future-0

Loos, E., Sourbati, M., & Behrendt, F. (2020). The role of mobility digital ecosystems for age-friendly urban public transport: A narrative literature review. *International Journal of Environmental Research and Public Health*, *17*(20). https://doi.org/10.3390/ijerph17207465

Luiu, C., Tight, M., & Burrow, M. (2017). The unmet travel needs of the older population: A review of the literature. *Transport Reviews*, *37*(4), 488–506. https://doi.org/10.1080/01441647.2016.1252447

Mayor of London LondonAssembly. (2021, September 23). *An emerging technology charter for London | GLA*. https://www.london.gov.uk/publications/emerging-technology-charter-london

McDonough, C. C. (2016). The effect of ageism on the digital divide among older adults. *Gerontology & Geriatric Medicine*, *2*(1), 1–7. https://doi.org/10.24966/GGM-8662/100008

Merriman, P., & Pearce, L. (2017). Mobility and the humanities. *Mobilities*, *12*(4), 493–508. https://doi.org/10.1080/17450101.2017.1330853

Metz, D. H. (2000). Mobility of older people and their quality of life. *Transport Policy*, *7*(2), 149–152. https://doi.org/10.1016/S0967-070X(00)00004-4

Musselwhite, C., & Haddad, H. (2010). Mobility accessibility and quality of later life. *Quality in Ageing*, *11*(1), 25–37. https://doi.org/10.5042/QIAOA.2010.0153

Nordbakke, S. (2013). Capabilities for mobility among urban older women: Barriers, strategies and options. *Journal of Transport Geography*, *26*, 166–174. https://doi.org/10.1016/j.jtrangeo.2012.10.003

O'Leary, Z. (2004). *The essential guide to doing your research project*. SAGE Publications, Inc.

Ormerod, M., Newton, M. R., Phillips, J., Musselwhite, A. C., Mcgee, S., & Russell, R. (2015). *How can transport provision and associated built environment infrastructure be enhanced and developed to support the mobility needs of individuals as they age ?* Government Office for Science.

Pangbourne, K., Aditjandra, P., & Nelson, J. (2010). New technology and quality of life for older people: Exploring health and transport dimensions in the UK context. *4*(4), 318–327. https://doi.org/10.1049/iet-its.2009.0106

Pangbourne, K., Mladenović, M. N., Stead, D., & Milakis, D. (2020). Questioning mobility as a service: Unanticipated implications for society and governance. *Transportation Research Part A: Policy and Practice*, *131*, 35–49. https://doi.org/10.1016/J.TRA.2019.09.033

Popp, R. (2011). Machine-age communication: Media, transportation, and contact in the interwar United States. *Technology and Culture*, *52*(3), 459–484. https://www.jstor.org/stable/23020642?seq=1#metadata_info_tab_contents

Public sector equality duty – GOV.UK. (n.d.). Retrieved 8 September 2022, from https://www.gov.uk/government/publications/public-sector-equality-duty

Rosales, A., & Fernández-Ardèvol, M. (2016). Smartphones, apps and older people's interests: From a generational perspective. *Human-Computer Interaction with Mobile Devices and Services (MobileHCI'16)*, 491–503. https://doi.org/10.1145/2935334.2935363

Rosales, A., & Fernández-Ardèvol, M. (2019a). *Smartphone usage diversity among older people* (pp. 51–66). https://doi.org/10.1007/978-3-030-06076-3_4

Rosales, A., & Fernández-Ardèvol, M. (2019b). Structural ageism in big data approaches. *Nordicom Review*, *40*, 51–64. https://doi.org/10.2478/nor-2019-0013

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence: The International Journal of Research into New Media Technologies*. https://doi.org/10.1177/1354856520930905

Sen, A. (2004). Capabilities, lists, and public reason: Continuing the conversation. *Feminist Economics*, *10*(3), 77–80. https://doi.org/10.1080/1354570042000315163

Smith, A. E. (2009). *Ageing in urban neighbourhoods: Place attachment and social exclusion*. Polity.

Sourbati, M. (2010). "Non-users" in the information society: Learning from the older generations. In J. Gebhart, H. Graif, L. Raycheva, C. Lobet-Maria, & A. Lasen (Eds.), *Experiencing broadband society* (pp. 107–120). Peter Lang.

Sourbati, M. (2020). Age and the city: The case of smart mobility. In *Lecture notes in computer science (including subseries lecture notes in artificial intelligence and lecture notes in bioinformatics): Vol. 12209 LNCS* (pp. 312–326). Springer. https://doi.org/10.1007/978-3-030-50232-4_22

Sourbati, M., & Behrendt, F. (2021). Smart mobility, age and data justice. *New Media and Society*, *23*(6), 1398–1414. https://doi.org/10.1177/1461444820902682

Sourbati, M., & Loos, E. F. (2019). Interfacing age: Diversity and (in)visibility in digital public service. *Journal of Digital Media & Policy*, *10*(3), 275–293. https://doi.org/10.1386/jdmp_00003_1

Standage, T. (2021, August 3). The lost history of the electric car – and what it tells us about the future of transport | Motoring | The guardian. *The Guardian, Technology*. https://www.theguardian.com/technology/2021/aug/03/lost-history-electric-car-future-transport

Sterne, J. (2006). Transportation and communication: Together as you've always wanted them. In J. Packer, & C. Robertson (Eds.), *Thinking with James Carey: Essays on communication, transportation, history*. Peter Lang.

Thornham, H. (2019). Algorithmic vulnerabilities and the datalogical: Early motherhood and tracking-as-care regimes. *Convergence: The International Journal of Research into New Media Technologies*, *25*(2), 171–185. https://doi.org/10.1177/1354856519835772

Transport for London (TfL). (2019). *Travel in London Report 12*. https://content.tfl.gov.uk/travel-in-london-report-12.pdf

Transport for London. (n.d.-a). *11–15 Zip Oyster photocards – transport for London*. Retrieved 19 November 2022, from https://tfl.gov.uk/fares/free-and-discounted-travel/11-15-zip-oyster-photocard?intcmp=55575

Transport for London. (n.d.-b). *60+ Oyster photocard – transport for London*. Retrieved 19 November 2022, from https://tfl.gov.uk/corporate/privacy-and-cookies/60-oyster-photocard

Transport for London. (n.d.-c). *Electric scooters – transport for London*. Retrieved 19 November 2022, from https://tfl.gov.uk/modes/driving/electric-scooter-rental-trial

Transport for London. (n.d.-d). *Freedom pass – transport for London*. Retrieved 19 November 2022, from https://tfl.gov.uk/fares/free-and-discounted-travel/freedom-pass

Transport for London. (n.d.-e). *Plan an accessible journey – transport for London*. Retrieved 19 November 2022, from https://tfl.gov.uk/transport-accessibility/plan-an-accessible-journey

Transport for London. (n.d.-f). *Wi-Fi data collection – transport for London*. Retrieved 19 November 2022, from https://tfl.gov.uk/corporate/privacy-and-cookies/wi-fi-data-collection

Vecchio, G., & Tricarico, L. (2019). "May the force move you": Roles and actors of information sharing devices in urban mobility. *Cities*, *88*, 261–268. https://doi.org/10.1016/J.CITIES.2018.11.007

Vincent, J. (2023). Life stage or age? Reviewing perceptions of oldest ICT users. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Zhang, M., Zhao, P., & Qiao, S. (2020). Smartness-induced transport inequality: Privacy concern, lacking knowledge of smartphone use and unequal access to transport information. *Transport Policy*, *99*, 175–185. https://doi.org/10.1016/J.TRANPOL.2020.08.016

8 Challenging gendered and ageing normative stereotypes on Instagram

Inês Amaral and Ana Marta M. Flores

The ageing trend in Europe has been intensifying over the last two decades. The way people age is exceptionally heterogeneous, diverse and full of various asymmetries, as reported, for example, by Fernández-Ballesteros et al. (1999), Fonseca (2005), Mair (2013) or Amaral et al. (2021). Studies have shown that the diversity of personal experiences and socio-cultural complexity influence the ageing process (Daniel et al., 2015). Homogeneous representations of the ageing process assume that older people are identical to the age criterion, which blurs the heterogeneity that characterises the ageing process. Furthermore, this homogenisation usually happens from retirement onwards, considering several age groups in one single category (Amaral et al., 2018). These assumptions contribute to ageism that is validated and legitimised by political and media representations (Robinson et al., 2008).

The generalisation of the ageing process is a fallacy demonstrated by critical scholars (Cabral et al., 2013; Paúl, 2005), which provide evidence that social, cultural, and economic differences are set aside due to this homogenisation of various social groups at various levels. There are ethnic, age, gender and socio-economic disparities that contribute to the diversity of the ageing experience (Daniel et al., 2012). Furthermore, feminist scholarship contends that intersecting systems of oppression (Edström, 2018) are conditioning people's lives from an intersectional perspective. People should be understood according to their, among other things, gender, race and class (Crenshaw, 2017) and as individually different. The World Health Organization (WHO) (2002) forecasts multiple factors that influence the ageing process and are decisive and pervasive to people. According to the WHO (2002), the ageing process is determined by personal dynamics, behavioural aspects, gender, race and class issues, habits and culture, health systems and social services, social and political environment and economic variables. Although the ageing of the population is one of the issues of our times and one of the main challenges societies face, media and social representations tend to mirror public policies of the older population as a homogeneous group.

This chapter is grounded on a triple understanding on the ageing population, intersectionality, and the Internet's role as a mediating technology for quality of life and autonomy. We depart from an understanding of social

media representations of the self as a possible means to enhance the autonomy of older people (Sackmann & Winkler, 2013). This perspective contrasts with a growing body of literature that evaluates digital skills and practices, taking little notice of technology as a variable in studying ageing and the quality of life of ageing individuals (Caliandro et al., 2021).

Considering that digital collective narratives (as will be explained below) of posts on social media platforms (Amaral et al., 2021) enhance multiple representations of social groups, this chapter analyses how collective narratives on Instagram may convey or contest gendered ageing normative perspectives. The aim is to map and analyse how Instagram collective narratives through co-hashtag networks on active ageing depict ageing femininities and masculinities across Portuguese and Spanish language communities.

Both countries are traditional societies and very rooted in Catholic values, and these two nations have progressive legislation regarding gender equality and justice (Subtil & Silveirinha, 2017). Also, although these are languages geographically distributed all over the world, their countries of origin, Portugal and Spain, have an ageing population. Portugal, in 2019, already had 22% of the population over 65 years old, while Spain brings a rate of 19%. According to data from Eurostat (2019), the projection of older people in 2050 will be 34% for Portugal and 33% for Spain.

Instagram was launched in 2010, with the integration of geolocation and the possibility of posting photos, among other improvements that have been developed over the years, introducing vocabularies increasingly present in users' routines, such as IGTV (Instagram TV, for the feature of long videos), Stories (for disposable stories), Reels (a type of parallel feed, from photos to short videos) and popular hashtags. 61.9% of users on the platform are between 18 and 34 years old, while only 2.1% of profiles are from people over 65 years old (Statista, 2022). Considering the culture of use on Instagram is linked to the culture of younger age groups, it is interesting to understand if there are and how narratives linked to older people appear, even if from a non-neutral input as active ageing (#envelhecimentoativo or #envejecimientoactivo). Thus, the research question that guides this chapter is "How are gender and ageing depicted in collective narratives on Instagram?"

Gendered ageing: Gender and age intersecting on media and social media

Digitalisation and ageing processes coexist. In fact, the number of older adults has grown significantly in recent decades, and the older population is increasingly using technologies in their daily lives. At the same time, societies are being faced with a so-called digital divide (Garavaglia et al., 2023), which may be defined into three levels: (1) the divide between those with access to digital technologies and those without; (2) the divide between individuals with the skills to make use of technologies and those without these aptitudes (Attewell, 2001; Hargittai, 2001); and (3) finally, a third level concerns gaps

in individuals' proficiency in interpreting the uses of digital technologies in their offline daily life (Van Deursen & Helsper, 2015). The digital divide also impacts the older population (Norris, 2001) mainly because they lack knowledge (Loos & Romano Bergstrom, 2014).

In this context, studies on generations and technological generations (as will be explained below) are essential to the way digital intersects with the phenomenon: the intergenerational relationships it promotes (Brites et al., 2021) and the way older people use technologies (Loos, 2011). The concept of "generation" (Vincent, 2023) is promising for explaining economic, social, political and cultural changes where gender is intersectional. Based on theories of generation (Mannheim, 1997; Ryder, 1965) and adaptation of technology in everyday life, the concept of "technology generation" developed by German sociologists in the early 1990s (Sackmann et al., 1994; Weymann & Sackmann, 1993) who defined a *technology generation* as groups of birth cohorts whose experience with technology is differentiated by social change (Gilleard, 2004; Ryder, 1965; Sackmann & Winkler, 2013).

The concept of technological generations is important for this research because it considers social changes in the access and use of technological tools. In this sense, it allows the grouping of several generations and combats the stereotyping and homogenisation of age groups.

Furthermore, Mannheim (1952) argues that a generation can be defined in three levels: (i) "generational site" – which refers to "generation status" attending to socio-cultural experiences and opportunities; (ii) "generational actuality" – which considers how the experiences of a generation are linked by group interpretations; (iii) "generational units" – the idea of groups of people who are the same age and have been affected by the same issues facing their generation, such as an economic crisis for example (Amaral & Brites, 2019). Corsten (1999) recognises the idea of self-referent between people of the same generation but challenges the idea of standard generations. Instead, Corsten (1999) argues that collective memory and the idea of "we sense" can be understood intergenerationally, attending that it systematises social and historical experiences lived individually or collectively, which allows the identification of different generations (Amaral et al., 2020).

As age intersects with gender identities, a growing body of literature highlights the heterogeneity of individual ageing pathways (Cabral et al., 2013; Daniel et al., 2012; Paúl, 2005). Nevertheless, societies are still anchored to ageist and patriarchal systems, which promote power relations that enhance social hierarchies based on a normative perspective of age and gender. This means that people over 65 are labelled as old and, therefore, supposedly lacking the same skills as younger generations, thus ignoring the diversity of ageing pathways and the fact that digitalisation now permeates most generations of older adults as the digitalisation of society and work began in the 1990s.

As stated before, ageing is also represented differently if gender is considered. Men, women, and non-binary people age differently, attending to their diverse experiences and contexts (Simões et al., 2021). Therefore, patriarchal and ageist

systems can be defined as discriminatory regimes that cross with hierarchical social categories that create ideals of masculinities and femininities validated by media (Santos et al., 2020, 2021). These symbolic representations of older people as a homogeneous group anchored to the traditional roles of gender are widespread by mainstream media and echoed in social media (Amaral et al., 2021).

Collective narratives in social media derive from a symbolic universe of constructed meaning and social sharing (Amaral & Daniel, 2018). Furthermore, "social media uses, and imaginaries rely on collective narratives across hashtags streaming" (Amaral et al., 2021, p. 339). From the appropriation of the affordances of social media platforms and their intersection in a multi-platform logic (Omena & Amaral, 2019), users take part in conversations and disseminate content using hashtags that index information to streams, which can be understood as collective narratives.

Processes of production and reception construct systems of representation. In this sense, representation is never neutral (Hall, 1985) since people have ideas, values, attitudes, and beliefs (Crenshaw, 2017). The socially shared meaning takes, thus, questions of power and, above all, power relations over social meanings. Therefore, there are no true or false representations of gender but somewhat different ways of looking at the world. As far as gender and age issues are concerned, these ways are often biased (Simões et al., 2021).

Media representations co-constitute social constructions of social identities (Amaral et al., 2019; Woodward, 2000). Therefore, representations validated by media accentuate or attenuate stereotypes about people or social groups. Several studies show the power of popular and mainstream media in influencing perceptions about older people (Gerbner et al., 1980), as well as the ability to symbolically "annihilate" social groups because of their age (Gerbner, 1972; Gerbner & Gross, 1976) or gender (Tuchman, 1978). The concept of "symbolic annihilation" was postulated by Gerbner and Gross (1976) to demonstrate how media representations can conceal an underrepresentation of social groups, which contributes to social inequalities. In the same line of reasoning, Tuchman (1978) argues that "symbolic annihilation" affects women from a triple perspective by trivialising, omitting or condemning this social group. In this sense, "symbolic annihilation" conditions the participation of social groups in society and promotes stereotyping around their social relations and practices. It is precisely in this context that several studies point to the stereotyping of popular media representations of older people (Kessler et al., 2004; Loos & Ivan, 2018; Robinson et al., 2008; Vernon et al., 1991), especially considering gender (Edström, 2018; Simões et al., 2021; Thompson & Langendoerfer, 2016) and the ageing body (Clarke, 2010; Whelehan, 2013; Woodward, 2006). These media representations reinforce the man/woman binary, the man in public space and the woman in private space, that structures patterns of representation of older people in social visibility associated with dependency and interdependence, illness and loneliness (Daniel et al., 2015).

Traditional media performances tend to influence collective digital narratives that convey stereotypical discourses about older people, particularly the

discourse of "empowerment" from "active ageing". This perspective ignores the individual particularities of older people and seeks to portray them as "non-active", promoting that they age "actively" (Amaral et al., 2019). This discourse, although well-intended, often falls into the fallacy of productivity from an economistic approach. Older men are presented as politicians, people in charge of large companies and women are represented in markedly sexist experiences, such as being housewives or artisans, evidencing this pattern of representation (Amaral et al., 2019; Raycheva et al., 2018). In the neoliberal rhetoric, the idea is projected that "active ageing" (Vincent, 2023) is the solution for markedly ageing societies, considering economic sustainability. Even so, this new political discourse of ageing as productive, healthy, successful, positive, and active can metamorphose the representational field of old age by mitigating the negative charge that mainstream media traditionally attribute to it.

Social connectivity, promoted by the new tools of digitally mediated interaction, introduces new modalities of sociability non-geographical based on social media and social networking platforms structured to promote relationships around content. In this sense, the new "connectors" of networks are metadata such as hashtags. Users are now connected by social ties in large-scale networks, transforming online social interaction and group formation. Furthermore, "hashtag networks in social media (e.g., on Twitter or Instagram) describe structures that allow the analysis of conversational interactions as networks of users that produce sociability - interaction phenomena or the capacity for the foundation of groups and the construction of networks supported in social relations" (Amaral et al., 2021, p. 338).

The social media narratives identified in Instagram echo campaigns against ageism with slogans of "revolution", "power" and "survival", making an appropriation of activism. These narratives assume age as the element that induces the idea of diversity and integration in inclusive societies. In this chapter, we seek to analyse collective narratives in Portuguese and Spanish language from the expression "active ageing", seeking to understand social representations from an intersectional gendered lens.

Method

To analyse how the collective appropriation of active ageing occurs on the Instagram platform, we adopted the approach of collecting posts that use the hashtag of active ageing in Portuguese (#EnvelhecimentoAtivo) and Spanish (#EnvejecimientoActivo).

The appropriation of hashtags can be considered a barely moderated online social phenomenon with different intertwined characteristics. These may be exemplified by the grammatisation of platforms and the culture of use. The grammatisation of platforms is the traceable interaction structures and collective forms of activity, for instance, likes or comments (Gerlitz & Rieder, 2018; Omena & Amaral, 2019). The culture of use is the appropriations made by users that are conditioned and rearranged by these same grammars of action in each environment (Burgess & Green, 2009; Omena et al., 2020).

To analyse collective appropriations of hashtags, a co-hashtag analysis was conducted based on a specific hashtag that provides data on how topics relate to others. Furthermore, "it is considered a co-hashtag when two hashtags appear in the same post. Therefore, in this type of network, a node is a hashtag and an edge[1] is a co-occurrence" (Amaral et al., 2021, p. 340).

Understanding how users respond to a particular theme makes this study unusual and rich regarding the circulation and appropriations related to a theme that brings awareness to older people and to their vitality. Therefore, this chapter aims to identify and examine how Instagram collective narratives through co-hashtag networks illustrate ageing and gender across Portuguese and Spanish language communities. Thus, "How are gender in an intersectional understanding and ageing depicted in collective narratives on Instagram?" is the research question that guides this chapter.

The methodological procedures[2] applied in this research bring together a range of techniques and tools adapted to the Instagram platform. Initially, a series of exploratory queries were conducted to understand better what appropriations are made as themes related to senior citizens on Instagram in the Portuguese and Spanish-speaking communities. After some manual exploration of Instagram, #EnvelhecimentoAtivo and #EnvejecimientoActivo (Active Ageing) were the two hashtags that aggregate images that allowed us to answer our research question in both languages better. Data extraction was performed on the same random day (9 February 2022) for both hashtags via PhantomBuster's[3] Hashtag Extractor module. This tool offers a series of data collection plans via social platforms' API. The timeframes[4] of the dataset were 18 June 2021 to 9 February 2022 for #EnvelhecimentoAtivo and 19 March 2020 to 9 February 2022 for #EnvejecimientoActivo. The files were imported into Google Spreadsheets[5] for data cleaning, engagement calculation and extraction of the images from URLs. Then, hashtags were extracted from the description of the posts to (a) calculate the related frequency; and (b) extract a network of hashtags' associations. To build the network of extracted co-tags, we used Table2net[6] (médialab Sciences Po), an online tool that creates a network graph in a. csv file. From the file extracted in PhantomBuster, we added a column only with the hashtags published in each post. With that. csv, we defined an undirected network (one node type), the hashtags as nodes and the PostIDs as edges.

After exporting the resulting network graphs as a GEXF file, we visualised them in Gephi[7] software. The network #EnvelhecimentoAtivo, in Portuguese, consists of 5366 nodes (hashtags) and 74,174 edges (posts). The hashtag #EnvelhecimentoAtivo is repeated 3024 times and in addition to 5462 co-tags published simultaneously. In Spanish, the network #EnvejecimientoActivo consists of 7053 nodes (hashtags) and 96,345 edges (posts). The hashtag EnvejecimientoActivo is repeated 2999 times and in addition to 7205 co-tags published in parallel. Aiming to better understand the relevance of the posts through the repetitions of the co-tags, the nodes that repeated less than 50 times were removed. Thus, the hashtag #EnvelhecimentoAtivo has 153 nodes and 3634 edges, and the network analysed of the hashtag #EnvejecimientoActivo now has 114 nodes with 2148 edges.

For this, each hashtag's total number of repetitions was calculated, creating communities based on modularity. These connections also showed thematic clusters focused on similar tags, as we will see in the results section.

To complement the analyses, we conducted a visual examination of the posts. By listing the URLs of the images, it was possible to extract all the photo files with the DownThemAll[8] tool. To visualise the complete set of images obtained for both datasets, we used ImageSorter.[9] This software plots images, thus allowing us to identify visual patterns.

The process of visual and thematic analysis of all Instagram images published related to the tags in Portuguese and Spanish was performed in two steps: (1) exploratory qualitative browsing and identification of patterns in the two sets of images – analysed separately – and (2) manual selection of posts that fit the post themes based on the theoretical framework of active ageing. It was possible to find very similar categories for both empirical corpora, be it #envelhecimentoativo or #envejecimientoactivo. The categories that most stood out visually were (a) Health, (b) Motivation, (c) Activity (Similar to #envelhecimentoativo or #EnvejecimientoActivo – Active Ageing), (d) Wellness, (e) Campaigns and (f) Instagram grammars.

Results

#EnvelhecimentoAtivo dataset has a total of 679 videos, 2190 images and 8132 carousel – a gallery of up to 10 items that can bring either only photos, videos or both combined. On the other hand, the search for #Envejecimiento-Activo obtained 2253 photos, 462 videos and 1020 carousels. The final dataset for the visual analysis resulted in 3183 photos for #EnvelhecimentoAtivo and 3273 images for #EnvejecimientoActivo.

Tables 8.1 and 8.2 show the ten most common co-hashtags and frequency for both hashtags in analysis, which are connected to the categories analysed in visual and network analysis.

Table 8.1 Top ten most used hashtags along to #EnvelhecimentoAtivo (active ageing in Portuguese)

Hashtag	Frequency
#envelhecimentosaudavel (#healthyageing)	1453
#idosos (#olderpeople)	1258
#envelhecimento (#ageing)	1236
#gerontologia (#gerontology)	1091
#geriatria (#geriatrics)	896
#longevidade (#longevity)	832
#terceiraidade (#olderage)	733
#idoso (#olderadult)	568
#qualidadedevida (#qualityoflife)	545
#envelhecerbem (#ageingwell)	536

Table 8.2 Top ten most used hashtags along to #EnvejecimientoActivo (active ageing in Spanish)

Hashtag	Frequency
#envejecimientosaludable (#healthyaging)	1082
#salud (#health)	861
#adultosmayores (#olderadults)	832
#AdultoMayor (#OlderAdult)	615
#envejecimiento (#ageing)	613
#ClubCuidadorPositivo (#PositiveCaregiverClub)	475
#personasmayores (#olderpeople)	464
#fun	434
#AliadosPositivos (#PositiveAllies)	415
#bienestar (#wellbeing)	409

Besides the visual patterns (Figure 8.1), it is also interesting to understand which groupings of hashtags correspond to thematic categories to standardise the posts. For this, we calculated the total number of repetitions of each hashtag, and we selected all those which were repeated 50 times or more in the dataset. With this, it was possible to identify in both datasets six very similar categories, namely: (a) Health, (b) Motivation, (c) Activity (similar to #envelhecimentoativo or #EnvejecimientoActivo – Active Ageing), (d) Wellness, (e) Campaigns and (f) Instagram grammars. In Figure 8.1, we can see a parallel with the categories identified both visually and in hashtag clustering for the Portuguese and Spanish datasets.

In the (a) Health category, we selected posts and tags related to disease prevention, medical information, physical exercises or health professionals. In (b) Motivation, we identified posts that prioritise self-help content, psychological advice, encouragement and a sense of community. Category

Figure 8.1 Visual references for each category for both public datasets.

(c) Activity gathers similar versions of the hashtags that originated the search. In (d) Wellness, we selected posts and tags that focus on mental health, alternative therapies and exercises to help have a better quality of life. Finally, in (e) Campaigns, various campaigns were identified with themes such as legal guidelines, educational content and reinforcing the power of senior citizens. Furthermore, some hashtags are used parallel to some (f) Instagram grammar, such as post description, location, services and actions such as repost or follow, instagood tags and special holidays.

Regarding the graphic contents, we observed that most of the posts contain lettering with basic information about the topic being discussed in that specific post. The images that stand out in quantity are often pictures of older citizens from stock photos (image databases), creating a reasonably homogeneous pattern with people with white hair, open smile and lighter skin colour, reinforcing an idea of what it looks like and what it means to be active at this age. We should mention concern about the greater use of images, photography or illustration with white women or heteronormative couples and Caucasian men alone. In some instances, the collective representation of both hashtags, regardless of language or geographical region, seems to reproduce the gender role of women as caregivers or as responsible in a family environment in being willing to take care of themselves and others while at the same time being within age-specific standards of beauty. Therefore, considering the gender perspective, there is a binary logic with a higher prevalence of women who are portrayed in traditional gender roles as caregivers or associated with beauty issues. Sexual identities are also often denied to older people. Queer or non-heteronormative identities are associated with younger people, turning older generations into "asexuals". Nevertheless, empirical evidence has shown the opposite (Rosati et al., 2021). Regarding topics such as sexuality or sexual orientation diversity, we did not identify any posts in any of the datasets which contribute to a silent erasure of sexual life in older people or the existence of LGBTQIA+ groups over 60 years old.

The normalisation of a single type of "old age" goes against the heterogeneity, diversity and various asymmetries with which older people present themselves (Amaral et al., 2021; Fonseca, 2005; Fernández-Ballesteros et al., 1999; Mair, 2013). Nevertheless, on the other hand, there are some interesting movements of representativeness and political actions in these collective narratives. Examples are didactic posts about prejudice against older people (ageism), posts against the infantilisation of older people and the celebration of when the WHO gave up classifying old age as a disease in the new ICD 11 version (International Classification of Diseases), which started in January 2022.

Indeed, both hashtags were not the same. It was possible to observe some differences between the Portuguese and Spanish language posts, starting with the number of posts extracted and the period they covered. Considering that several locations speak these languages, a great diversity of countries was observed, with prominence for Brazil and Portugal in #EnvelhecimentoAtivo and Spain, Colombia and Chile for #EnvejecimientoActivo. However, it is

important to note that not all posts provide the location, 36.9% in Portuguese and 24.1% in Spanish.

Furthermore, we observed that content in Portuguese is mostly appropriated by health professionals, clinics and service providers in this niche to promote themselves commercially. On the other hand, although it also makes some commercial use of the platform, the content in Spanish aims to create new uses with the content it publishes, such as introducing memory and logic games in the post itself as a measure to encourage memory exercise for older people. It was also observed that part of the posts is focused on senior entrepreneurship or even senior empowerment as an alternative to supplement insufficient pensions while motivating older people to feel "useful".

Considering co-relation networks between the hashtags (Figures 8.2a,b), it is possible to identify specific thematic clusters. The diameter of the #EnvelhecimentoAtivo network is 2, which means that the size of the social system is not significant and that it takes two paths to connect the two most distant nodes. The average path length in this co-hashtag network is 1691. The modularity[10] of a network measures the strength of a community, considering the degree of distribution. This agglomerative method detects communities, defined as groups of nodes that are internally more densely connected than the rest of the network. The modularity of the network is 0.215 and presents five communities.

Although six qualitative categories were identified for the co-tags, the analysis of the co-tag network allows us to observe that these categories merged into five large semantic communities (clusters) when considering their modularity properties. In #EnvelhecimentoAtivo (Table 8.3), community 1 is well-centred on understanding being active while doing regular physical activity and exercise under professional guidance. Community 5, as we can also see on the Spanish-language network (Table 8.4), brings proximity of gender and motivation to the theme of ageing.

Conclusion

This chapter analysed how collective narratives on Instagram, through specific hashtags, represented "active ageing" from a gendered perspective. Therefore, we examined whether communication networks between Portuguese and Spanish-speaking communities perpetuate or challenge normative perspectives of gender and ageing. From a triple understanding of ageing, gender roles, and the internet as a mediating and facilitating technology for quality of life, the chapter sought to answer the research question, "How are gender and ageing depicted in collective narratives on Instagram?".

By relating both analyses conducted in this chapter – the visual analysis of the posts and the related tags network analysis – we observe thematic categories that overlap and complement the perception of the context of gender and ageing in Portuguese and Spanish-speaking communities through Instagram. We observe that categories such as those of community 5 of
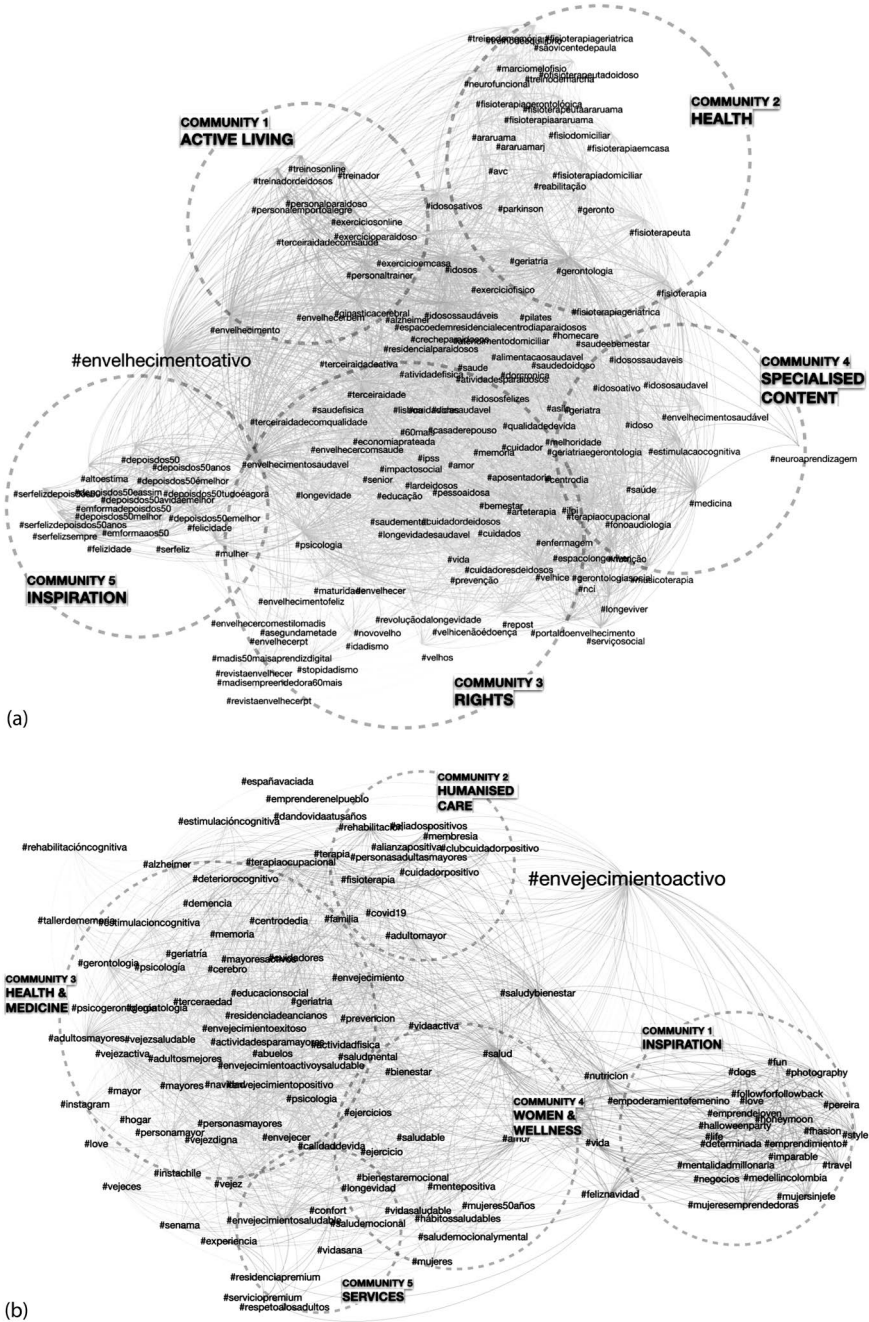
Figure 8.2 (a) Thematic clusters in #EnvelhecimentoAtivo co-hashtag network.
(b) Thematic clusters in #EnvejecimientoActivo co-hashtag network.

Table 8.3 Communities in #EnvelhecimentoAtivo hashtag

Community	Modularity	Theme	Examples
1	0.215	*Active living* Understanding being active while doing regular physical activity and exercise under professional guidance.	#personalparaidoso ("personal" as in personal trainer for older people) #treinadordeidosos (#olderpeopletrainer) #ginasticacerebral (#braingymnastics) #terceiraidadecomsaude (#healthythirdage) #exercicioemcasa (#exerciseathome) #trainingonline #exerciciosonline (#onlineexercises)
2		*Health* Focused on the scope of physiotherapy, especially as a measure of rehabilitation and dementia.	#fisioterapiageriatrica (#geriatricphysiotherapy) #neurofuncional (#neurofunctional) #fisioterapiaemcasa #fisiotarapiadomiciliar (physiotherapy at home) #fisioterapeuta (#physiotherapist) #fisioterapiagerontológica (#physiotherapygerontological) #avc (CVA, cerebrovascular accident) #parkinson #treinodeequilibrio (#balancetraining) #reabilitação (#rehabilitation) #treinodememória (#memorytraining)

(*Continued*)

Table 8.3 (Continued)

Community	Modularity	Theme	Examples
3		*Rights* Politicised pattern or linked to the rights of the older people and on active ageing.	#velhicenãoédoença (#oldageisnotadisease)
			#aposentadoria (#retirement)
			#impactosocial (#socialimpact)
			#ipss (Private Social Solidarity Institutions, in Portugal)
			#envelhecimentosaudável (#healthyageing)
			#idososfelizes (#happyoldpeople)
			#longevidadesaudável (#healthylongevity)
			#revolucaodalongevidade (#longevityrevolution)
			#idosoativo (#activeoldperson)
4		*Specialised content* Promotional use of a post specialised in content for the older people, which promotes campaigns related to senior entrepreneurship.	#revistaenvelhecer (#ageingmagazine)
			#madis50maisaprendizdigital (#madis50plusdigitallearner)
			#envelhecerpt (#ageingpt, PT as in Portugal)
			#envelhecercomestilomadis (#ageingwithstylemadis)
5		*Inspiration* Brings proximity of gender and motivation to the theme of ageing, especially on women empowerment.	#mulher (#woman)
			#emformaaos50 (#fitat50)
			#depoisdos50tudoéagora (#after50everythingisnow)
			"#felizidade" (#happyage as a reference to similar word "felicidade", which means happiness in Portuguese)
			"#altoestima" (a possible typo with self-esteem or a pun on high self-esteem)

Table 8.4 Communities in #EnvejecimientoActivo hashtag

Community	Modularity	Theme	Examples
1	0.256	*Inspiration* Major focus on motivation and inspiration, interestingly focused on women, along with Instagram engagement hashtags in English.	#empoderamentofemenino (#femaleempowerment) #mujeresinjefe (#womeninchief) #mujeresempreendedoras (#entrepreneurwomen) #determinada (female word for #determined) #imparable (#unstoppable) #fun #style #dogs #travel
2		*Humanised care* Homogeneous cluster focused on a positive and constructive view of the older people caregiver with an approach was related to humanised care.	#alianzapositiva (#positivealliance) #cuidadorpositivo (#positivecaregiver) #aliadospositivos (#positiveallies) #clubcuidadorpositivo (#positivecaregiverclub)
3		*Health and medicine* Focus on the health and care side from a more medical perspective. It also gathers tags similar to network input.	#gerontologia (#gerontology) #geriatría #geriatria (#geriatrics) #psicologia (#psychology) #alzheimer #deteriorocognitivo (#cognitiveimpairment) #estimulacióncognitiva (#cognitivestimulation) #cerebro (#brain) #memoria (#memory) #vejezsaludable (#healthyoldage) #envejecimientoactivoysaludable (#activeandhealthyoldage) #envejecimientoexitoso (#successfulageing) #vejezdigna (#dignifiedoldage)

(*Continued*)

Table 8.4 (Continued)

Community	Modularity	Theme	Examples
4		*Women and wellness* As community 1, the cluster 4 also highlights tags related to women. It also shows a thematic focus on mental health.	#mujeres (#women) #mujeres50anõs (#women50years) #saludemocional (#emotionalhealth) #saludemocionalymental (#emotionalandmentalhealth) #mentepositiva (#positivemind) #bienestaremocional (#emotionalwellbeing) #vidasana (#healthylife)
5		*Services* Presents a very commercial logic with support service and care for older people with a premium perspective.	#servicepremium (#premiumservice) #residenciapremium (#premiumresidence) #confort (#comfort) #experiencia (#experience)

#EnvelhecimentoAtivo and community 1 of #EnvejecimientoActivo focus on the empowerment of older people, as well as visually emerging in category (b) Motivation of the thematic analysis. The same happens with the themes of well-being, health, medical care and humanised health services. As for gender, the Spanish community presents greater female representation with the community of co-tags related to well-being and the positioning of the older woman as active and responsible for her life in different aspects, whether economic, health or independence.

The results of the two datasets and networks of co-tags analysed are similar and reveal the perpetuation of hegemonic femininities and masculinities anchored to traditional gender roles and a heteronormative logic. In contemporary logic, "active ageing" is presented as healthy and standardised, perpetuating social inequalities. Age is intertwined with gender, race and class issues. From a normative perspective, the people presented are white, middle or upper class and represent traditional gender roles. The posts analysed reveals a dual perspective: on the one hand, they address care-takers and, in this case, present proposals focused on ageing as dependent on services; on the other hand, they also address the old adults themselves by proposing memory games, teaching exercises to do at home, valuing achievements related to the rights of older people, promoting campaigns against ageist stereotyping.

Furthermore, we observed that the categories of Wellness and Motivation have a narrative directed to the older people themselves, with particular attention to mental health, physical balance, and the signs of an active and aware person capable of taking care of herself/himself. In the Health category, we found a normativity of the older person as someone who needs to be cared for, especially in Portuguese-speaking communities. In contrast, this category focuses more on diseases and health professionals specialising in geriatrics in Spanish communities. In the context of the Campaigns category, we verified that there is a triple focus: (1) caregivers; (2) in the empowerment rhetoric very anchored to the post-feminism and economist post-modernity paradigm with expressions such as "women empowerment"; and (3) campaigns that deconstruct the ageist prejudice.

Another interesting aspect to observe is how other Instagram grammars (location, image description, choice of expressions to generate greater engagement) are also appropriated in hashtags. In the Spanish scenario, we identified a more robust use of posts and a variety of co-tags related to this category. However, it creates a narrative more focused on services and sales in the Portuguese community.

Finally, it is not surprising that dozens of other tags are similar to #EnvelhecimentoAtivo (n = 27) and #EnvejecimientoActivo (n = 16) since in the culture of using the platform, it is common to use variations of the same theme.

In general, along with the narratives represented through images and words, it is noted as an opening to the perception that older people can and should be in charge of their care and that they can find in technology – in this case, represented by the use of the Instagram platform itself, as an ally in combating social exclusion and prejudice against the older people.

The binary logic in the Portuguese and Spanish languages is evident, and it is still a prevalent practice to use the terms in masculine gender to address all genders. In this sense, the collective uses in the hashtags of both datasets reflect the descriptive terms that are mostly masculine, for instance, "#idoso" (#olderperson), "#saúdedoidoso" (#healthofolderperson), "idososaudável" (#healthyolderperson), "cuidador" (#caregiver), "novovelho" (#newold) or in Spanish, "#adultomayor" (#olderperson) or "CuidadorPositivo" (#PositiveCaregiver). On the other hand, as already mentioned, there are some hashtags used only and specifically for women, such as the cases of "#mulher" in Portuguese (#woman), "#mujeres" (#women) and "#mujeresinjefe" (#womeninchief) in Spanish, among others.

Considering that the construction of thousands of posts indexed by hashtags on Instagram (n = 7626) is minimally supervised or filtered, it makes it even more interesting to understand, organically, the story being told when one observes the phenomenon closely. An explicit narrative is communicated, and another one is invisible. Even when considering the platform's limitation in providing more posts and the specific period that the datasets comprise (2020–2022), it is still possible to have a grounded and meaningful perception of how the representation of ageing femininities and

masculinities across Portuguese and Spanish-speaking communities develops. Few movements challenge Eurocentric, traditional or normative standards. In the analysis set, it is possible to see that the story of ethnic, gender and socio-economic diversity is not being told.

Notes

1 Edge is the connection between nodes in a network.
2 All the posts analysed were collected from open and public accounts on Instagram.
3 https://phantombuster.com
4 Instagram's API (application programming interface) allows a limited number of hashtag extractions per occasion. The difference in dates between hashtags is because their usage differs in frequency.
5 https://www.google.com/sheets/about
6 https://medialab.github.io/table2net
7 https://gephi.org
8 https://www.downthemall.net
9 https://imagesorter.software.informer.com
10 A network's modularity measures a community's strength by taking into account degree distribution. This agglomerative method detects communities by extracting specific characteristics. Communities are defined as groups of nodes that are internally densely more connected than the rest of the network. Each node is included in only one community.

References

Amaral, I., & Brites, M. J. (2019). Trends on the digital uses and generations. In *Proceedings of INTED2019 Conference* (pp. 5109–5115). IATED.

Amaral, I., & Daniel, F. (2018). The use of social media among senior citizens in Portugal: Active ageing through an intergeneration approach. *Lecture Notes in Computer Science*, *10926*, 422–434. https://doi.org/10.1007/978-3-319-92034-4_32

Amaral, I., Daniel, F., & Abreu, S. G. (2018). Policies for gender equality in Portugal: Contributions to a framework for older women. *Revista Prisma Social*, 22, 346–363.

Amaral, I., Santos, S. J., & Brites, M. J. (2020). Mapping intergenerational masculinities on Instagram. *Lecture Notes in Computer Science*, *12209*. https://doi.org/10.1007/978-3-030-50232-4_1

Amaral, I., Santos, S. J., Daniel, F., & Filipe, F. (2019). (In)visibilities of men and aging in the media: Discourses from Germany and Portugal. *Lecture Notes in Computer Science*, *11593*, 20–32. https://doi.org/10.1007/978-3-030-22015-0_2

Amaral, I., Santos, S. J., Simões, R. B., & Brites, M. J. (2021). Digital aging: Reinforcing normative masculinities on Instagram. *Lecture Notes in Computer Science*, *12786*, 335–348. https://doi.org/10.1007/978-3-030-78108-8_25

Attewell, P. (2001). Comment: The first and second digital divides. *Sociology of Education*, *74*(3), 252–259. https://doi.org/10.2307/2673277

Brites, M. J., Amaral, I., Simões, R. B., & Santos, S. J. (2021). Generational perspectives on EU documents tackling disinformation. *Lecture Notes in Computer Science*, *12786*, 349–360. https://doi.org/10.1007/978-3-030-78108-8_26

Burgess, J., & Green, J. (2009). *YouTube: Online video and participatory culture*. Polity Press.

Cabral, M. V., Ferreira, P. M., Silva, P. A. D., Jerónimo, P., & Marques, T. (2013). *Processos de envelhecimento em Portugal: usos do tempo, redes sociais e condições de vida*. Fundação Francisco Manuel dos Santos.

Caliandro, A., Garavaglia, E., Sturiale, V., & Di Leva, A. (2021). Older people and smartphone practices in everyday life: An inquire on digital sociality of Italian older users. *The Communication Review*, *24*(1), 47–78. https://doi.org/10.1080/10714421.2021.1904771

Clarke, L. H. (2010). *Facing age: Women growing older in anti-aging culture* (Vol. *1*). Rowman & Littlefield Publishers.

Corsten, M. (1999). The time of generations. *Time & Society*, *8*(2–3), 249–272.

Crenshaw, K. W. (2017). *On intersectionality: Essential writings*. The New Press.

Daniel, F., Antunes, A., & Amaral, I. (2015). Representações sociais da velhice. *Análise Psicológica*, *33*(3), 291–301. https://doi.org/10.14417/ap.972

Daniel, F., Simões, T., & Monteiro, R. (2012). Representações sociais do «envelhecer no masculino» e do «envelhecer no feminino». *Ex aequo*, 26, 13–26.

Edström, M. (2018). Visibility patterns of gendered ageism in the media buzz: A study of the representation of gender and age over three decades. *Feminist Media Studies*, *18*(1), 77–93. https://doi.org/10.1080/14680777.2018.1409989

Eurostat (2019). New publication 'Ageing Europe – looking at the lives of older people'. https://ec.europa.eu/eurostat/documents/2995521/10163480/1-18102019-AP-EN.pdf/43eb8f07-e498-d587-0dc2-73427589dfb7

Fernández-Ballesteros, R., Fresneda, R. M., Martínez, J. I., & Zamarrón, M. D. (1999). *Qué es la psicología de la vejez*. Biblioteca Nueva.

Fonseca, A. M. (2005). *Desenvolvimento humano e envelhecimento*. Climepsi.

Garavaglia, E., Caliandro, A., Sala, E., Melis, G., & Zaccaria, D. (2023). Contrasting ageism in research on older people and digital technologies: A methodological reflection. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Gerbner, G. (1972). Violence in television drama: Trends and symbolic functions. In G. Comstock, & E. Rubinstein (Eds.), *Media content and controls vol. 1 of television and social behavior* (pp. 28–187). U.S. Government Printing Office.

Gerbner, G., & Gross, L. (1976). Cultural indicators: The social reality of television drama. Unpublished manuscript. Annenberg School of Communications, University of Pennsylvania.

Gerbner, G., Gross, L., Signorielli, N., & Morgan, M. (1980). Television violence, victimization, and power. *American Behavioral Scientist*, *23*(5), 705–716.

Gerlitz, C., & Rieder, B. (2018). Tweets are not created equal: Investigating Twitter's client ecosystem. *International Journal of Communication*, *12*, 528–547.

Gilleard, C. (2004). Cohorts and generations in the study of social change. *Social Theory & Health*, *2*(1), 106–119. https://doi.org/10.1057/palgrave.sth.8700023

Hall, S. (1985). Signification, representation, ideology: Althusser and the post-structuralist debates. *Critical Studies in Media Communication*, *2*(2), 91–114. https://doi.org/10.1080/15295038509360070

Hargittai, E. (2001). Second-level digital divide: Mapping differences in people's online skills. *arXiv preprint cs/0109068*. https://doi.org/10.48550/arXiv.cs/0109068

Kessler, E. M., Rakoczy, K., & Staudinger, U. M. (2004). The portrayal of older people in prime time television series: The match with gerontological evidence. *Ageing & Society*, *24*(4), 531–552. https://doi.org/10.1017/S0144686X04002338

Loos, E. (2011). Generational use of new media and the (ir)relevance of age. In F. Colombo, & L. Fortunati (Eds.), *Broadband society and generational changes* (pp. 259–273). Peter Lang.

Loos, E., & Ivan, L. (2018). Visual ageism in the media. In L. Ayalon, & C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism* (pp. 163–176). Springer.

Loos, E., & Romano Bergstrom, J. (2014). Older adults. In J. Romano Bergstrom, & A. J. Schall (Eds.), *Eye tracking in user experience design* (pp. 313–329). Morgan Kaufmann.

Mair, C. A. (2013). European older adults' social activity networks in national context: A cross-national exploration of national cultural, policy, and economic characteristics. In C. Phellas (Ed.), *Aging in European societies* (pp. 61–81). Springer.

Mannheim, K. (1952). *Essays on the sociology of knowledge*. Routledge.

Mannheim, K. (1997). *Diagnosis of our time: Wartime essays of a sociologist* (Vol. *3*). Psychology Press.

Norris, P. (2001). *Digital divide: Civic engagement, information poverty, and the internet worldwide*. Cambridge University Press.

Omena, J. J., & Amaral, I. (2019). Sistemas de leitura de redes digitais multiplataforma. In J. Omena (Ed.), *Métodos digitais* (pp. 121–140). ICNOVA.

Omena, J. J., Rabello, E. T., & Mintz, A. G. (2020). Digital methods for hashtag engagement research. *Social Media + Society*, *6*(3). https://doi.org/10.1177/2056305120940697

Paúl, C. A. (2005). Construção de um modelo de envelhecimento humano. In C. Paúl, & A. Fonseca (Eds.), *Envelhecer em Portugal*, *psicologia saúde e prestação de cuidados* (pp. 21–41). Climepsi.

Raycheva, L., Tomov, M., Amaral, I., Petrovic, I., Vukelic, M., & Čizmić, S. (2018). Ageing women in the media mirror maze. In S. Angova, L. Stoyko, P. Todorov, I. Hristov, S. Tsankova, M. Ossikovski, M. Nikolova, & I. Valchanov (eds.) *Media environment, public and strategic communication* (pp. 39–47). UNWE Publishing House.

Robinson, T., Gustafson, B., & Popovich, M. (2008). Perceptions of negative stereotypes of older people in magazine advertisements: Comparing the perceptions of older adults and college students. *Ageing & Society*, *28*(2), 233–251. https://doi.org/10.1017/S0144686X07006605

Rosati, F., Pistella, J., Giovanardi, G., & Baiocco, R. (2021). Queer generativity in lesbian, gay, and bisexual older adults: Personal, relational, and political/social behaviours. *Journal of Community & Applied Social Psychology*, *31*(6), 673–689. https://doi.org/10.1002/casp.2529

Ryder, N. B. (1965). The cohort as a concept in the study of social change. *American Sociological Review*, *30*, 843–861. https://doi.org/10.1007/978-1-4613-8536-3_2

Sackmann, R., Weymann, A., & Hüttner, B. (1994). *Die technisierung des alltags: Generationen und technische innovationen*. Campus-Verlag.

Sackmann, R., & Winkler, O. (2013). Technology generations revisited: The internet generation. *Gerontechnology*, *11*(4), 493–503. https://doi.org/10.4017/gt.2013.11.4.002.00

Santos, S. J., Amaral, I., & Brites, M. J. (2020). Masculinities and ageing: Deconstructing online representations among Portuguese speaking users. *Lecture Notes in Computer Science*, *12209*, 89–100. https://doi.org/10.1007/978-3-030-50232-4_7

Santos, S. J., Amaral, I., Simões, R., & Brites, M. J. (2021). Debunking the #Manosphere: An exploratory analysis on patriarchy and ageism within the

digital realm. *Lecture Notes in Computer Science*, *12786*, 420–429. https://doi.org/10.1007/978-3-030-78108-8_31

Simões, R. B., Amaral, I., Santos, S. J., & Brites, M. J. (2021). New media, old misogyny: Framing mediated Madonna on Instagram from an ageing perspective. *Lecture Notes in Computer Science*, *12786*, 430–442. https://doi.org/10.1007/978-3-030-78108-8_32

Statista. (2022). Distribution of Instagram users worldwide as of April 2022, by age group. Available at https://www.statista.com/statistics/325587/instagram-global-age-group

Subtil, F., & Silveirinha, M. J. (2017). Planos de igualdade de género nos media: Para uma (re)consideração do caso português. *Media & Jornalismo*, *17*(30), 43–61. https://doi.org/10.14195/2183-5462_30_3

Thompson, E. H. Jr, & Langendoerfer, K. B. (2016). Older men's blueprint for "being a man". *Men and Masculinities*, *19*(2), 119–147. https://doi.org/10.1177/1097184X15606949

Tuchman, G. (1978). *Making news: A study in the construction of reality*. The Free Press. https://doi.org/10.2307/2578016

Van Deursen, A. J., & Helsper, E. J. (2015). The third-level digital divide: Who benefits most from being online?. In Van Deursen, A. J. A. M., Helsper, E. J., Robinson, L., Cotton, S. R., & Schulz, J. (Eds.), *Communication and information technologies annual – studies in media and communications* (Vol. *10*, pp. 29–52). Emerald Group Publishing Limited. http://doi.org/10.1108/S2050-206020150000010002

Vernon, J. A., Williams, J. A. Jr, Phillips, T., & Wilson, J. (1991). Media stereotyping: A comparison of the way older people women and men are portrayed on prime-time television. *Journal of Women & Aging*, *2*(4), 55–68. https://doi.org/10.1300/J074v02n04_05

Vincent, J. (2023). Life stage or age? Reviewing perceptions of oldest ICT users. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Weymann, A., & Sackmann, R. (1993). Modernization and the generational structure. Technological innovation and technology-generations in East and West Germany. In H. A. Becker & P. L. Hermkens (Eds.), *Solidarity of generations: Demographic, economic and social change, and its consequences: Proceedings of a symposium* (pp. 721–744). Thesis Publishers. https://doi.org/10.1108/eb013249

Whelehan, I. (2013). Ageing appropriately: Postfeminist discourses of ageing in contemporary Hollywood. In J. Gwynne & N. Muller (Eds.), *Postfeminism and contemporary Hollywood cinema* (pp. 78–95). Palgrave Macmillan. http://doi.org/10.1057/9781137306845_6

WHO. (2002). *Active ageing – a policy framework*. World Health Organization.

Woodward, K. (2000). Identidade e diferença: Uma introdução teórica e conceitual. In T. T. Silva (Ed.), *Identidade e diferença: A perspectiva dos estudos culturais* (pp. 7–71). Vozes.

Woodward, K. (2006). Performing age, performing gender. *NWSA Journal*, *18*(1), 162–189.

9 Technological ageism in a sheltered housing for older adults

An intersectional approach

Roser Beneito-Montagut, Andrea García-Santesmases and Daniel López-Gómez

Ageism functions as a key concept to understand how older age is socially produced and the reasons for older people's devalued social status. In its production, there are social imaginaries that particularly relate to being old (Baltes & Smith, 2003; Gilleard & Higgs, 2018) and their interest, ability and skills to use technologies (Gilleard et al., 2015). Social imaginaries of ageing are a set of values, norms, institutions, policies and cultures that society produces and apply to old age. At least two imaginaries are configuring the contemporary notions of old age (Laslett, 1994). On the one hand, an optimistic and positive image associated with a Third Age that is typically enacted in active and healthy ageing ideas. This imaginary supports the idea that the s. XXI older people are technogenarians (Joyce and Loe, 2010; Mort et al., 2013), or people who are competent in the use of technologies, have full access to them and can even be considered technological "innovators" (Östlund, 2011; Peine et al., 2014). This imaginary questions the stereotype of seniors as technological laggards, and by contrast, defines the second imaginary. This is associated with the notion of the Fourth Age, which defines later life as gloomy and unhealthy, and characterised by institutionalised, dependent and disengaged older people. The old-old are usually considered uninterested in technology, unable to use them due to their frail condition or their outdated skills. The technogenarians studied before are often the "economically privileged baby boomers" (i.e., Joyce & Loe, 2010; Neven, 2015) that better enact the technological and active ageing imaginaries, typical of the Third Age (Gilleard & Higgs, 2013).

During recent years, gerontechnology research has been interested in uncovering the imaginaries of ageing produced in the design and use of digital technologies (Loe, 2010; López et al., 2010; Neven, 2010), including the forms of ageism these imaginaries naturalise that, as a result, exclude older people (e.g., Joyce & Loe, 2011). Recent literature on the latter aspect follows the premise that there is a corresponding complex relationship between ageism and technology (Cutler, 2005). It spans interrelated areas regarding technology design (Fernández-Ardèvol & Ivan, 2015; Mannheim et al., 2019), policy (Köttl & Mannheim, 2021), use or not use (Loos et al., 2020), social changes – such as citizenship and digital exclusion (Amaral & Daniel, 2016),

internalised imaginaries (Ivan & Cutler, 2021; Köttl et al., 2021) and discourses (Loos & Ivan, 2018). This body of work looks for either way of deconstructing self-ageism (Köttl et al., 2021) or bridging the digital divide by reducing ageism (Köttl & Mannheim, 2021). It points out the need to consider that age in isolation is not a factor affecting adoption and use (Ivan & Cutler, 2021).

In line with this, we believe there is more to this story that can be unpacked by considering the imaginaries of ageing as intersected by gender and socio-economic conditions. The chapter applies an intersectional sensibility to notice forms of technological ageism and understand how older people situate themselves as technologically able/unable in quotidian situated practices. An intersectional experience (Crenshaw, 1989) is inherent to the problems of exclusion and discrimination of older people (Calasanti & Giles, 2018; Calasanti & King, 2015), and its acknowledgement is crucial to reveal their subjectivities and social positions in relation to technology. Exploring the intersectional dynamics and emerging differences can shed light on the "processes and mechanisms by which subjects mobilize (or choose not to mobilize) particular aspects of their identities in particular circumstances" (Nash, 2008). At the same time, social imaginaries affect these contextual subjectivities. The potential of intersectional discrimination is entangled with the prevailing social imaginaries and may enact identification or resistance (Staunæs & Søndergaard, 2011). Hence, exploring the experience of older people from an intersectional perspective is fundamental to understanding the ways in which techno-ageism, as a form of exclusion by age, is done. So far, research on older people's technology access and use has barely started to take an intersectional approach (for an exception, see Tsatsou, 2021), although it has recognised the multifaceted character of older people's technological engagements (e.g., Katz & Gonzalez, 2016; Mubarak, 2015; Tsatsou, 2011).

To fill that gap, we explore how older peoples' subjectivities are produced in their interactions with technologies and others and illustrate key processes in the current enactment of the ageing techno-imaginaries. The chapter brings to the debate about techno-ageism the idea that older people are not only the beneficiaries or dupes of technologies in relation to age (differentiating between the "old-old" and the "young-old"), instead, we need to look at the crossroads of the imaginaries of old age, and explore how factors such as low-income, gender and life trajectories relate to their technological engagements (Kania-Lundholm, 2023; Vincent, 2023).

The significance of age to the use of technology and the encroached techno-imaginaries are explored using the discussions and situated relational dynamics between older women and a young researcher in a cinema club. It took place in a sheltered housing accommodation for older people where they were living. This cinema club was part of a longer qualitative study within an international research project[1] that investigated the fundamental changes in the contemporary experience of later life at the intersection of digital infrastructures, place and the experience of "being connected". Specifically,

we studied the media ecologies of older people for social connection in three housing arrangements for older people in Barcelona: people living independently at home, in sheltered housing for older people (which includes services but not care) and in nursing homes. The cinema club was part of the fieldwork in the second housing arrangement.

In what follows, first, the research strategy and process are presented. Second, the chapter explores how the older women living in a sheltered housing,[2] from now called the Valleys, are and how they relate to technology and other people. Then, it moves on to analyse not only how older women's subjectivities are played out in their narratives and experiences of technological use but also how these narratives make sense in life trajectories profoundly intersected by gender and social status. We bring together the discussion about the need to consider the factors that intersect with age in the study of technologies and integrate the study of intersectional ageism in the study of ageing (Levy & Macdonald, 2016) with technologies. The final section concludes with a summary of the main findings.

The cinema club as a research strategy

This chapter is mainly a reflection on the results and interactions with 14 older women in a cinema club. It was designed as an initial strategy to facilitate access to informants within the study about digital social connectedness in sheltered housing, part of the BConnect@Home project. The cinema club took place in the Valleys, a public sheltered housing facility for older people of the Barcelona City Council Housing Agency. They are a group of 76 self-contained flats with some services: a warden (who helps with multiple chores), social alarm and cleaning, as well as communal areas (common room and roof terrace) and social activities organised by the residents or the manager. To access The Valleys, residents must be at least 65 years old, not having long-term care needs (being independent) and have a low annual income. Most residents are women (73% of the 84 people living in the community) because they become more vulnerable to economic hardship in later life (Mirowsky & Ross, 1999). In fact, all the potential participants were women who had to move because their former houses were ill-adapted to their needs, and they were suffering from long-standing or recent economic problems due to the 2008 economic crisis and cuts in other social benefits.

We basically came up with the idea of watching together and discussing a TV series to motivate conversations about digital technologies in their daily life. Our intention was to attract all the women who regularly participate in activities at the Valleys, including the oldest women living in the community and the non-users of digital technologies. For this reason, the cinema club was presented to the Valleys' community as another of the regular activities that were taking place in the common area. It was framed as an opportunity to discuss social relationships in later life (Figure 9.1).

Figure 9.1 Poster to announce the cinema club.

Pragmatically, the research started by negotiating with the manager access and announcing the cinema club to all the residents (Figure 9.1). It took place over four consecutive weeks (from the 7th to the 28th of November 2018) plus a feedback session (5th of December 2018). 14 women attended the cinema club, and 10 of them attended every session. Each Wednesday afternoon for a month, we watched together one episode of the American TV show *Grace and Frankie*, followed by a discussion about particular quotidian scenes that were displayed in the episode, especially around gender and technology. Each session had the same structure, first, we allowed some time for chit-chat and catching up, then we watched the episode, followed by a conversation. They lasted around two hours. They were scheduled at 17.30, and we provided a snack of juices and biscuits to create a relaxed and informal environment to watch the show. We also had a final session on the 5th of December to openly discuss the imaginaries about age, tech and gender with the participants. Only the two last sessions were audio-recorded to avoid the potential discomfort that being recorded can cause (Nordstrom, 2015). Andrea, the researcher in the field, took extended notes from each session, and the recorded sessions were transcribed. With the participants, the researcher also drew conceptual maps (i.e., Figure 9.3) during the third session. The maps gave a holistic idea of what they understand as technology, where and when (space) they use those technologies, for what and with whom. She

didn't identify all participants on every occasion, as we prioritised the natural flow of the conversation to the detriment of a detailed register of the speaker since the objective was to reproduce a natural conversational situation. Indeed, the participants that are identified (with pseudonyms) in this chapter continued participating in the next steps of the research project, and because of that, we have more information about them. This strategy also permitted side one-to-one conversations with participants and the concierge, other residents and the centre manager, facilitating a holistic approach that spans beyond the conversations held during the cinema club.

The participants voluntarily attended the sessions of the cinema club they wished. They were informed of the aims of the project, how the data would be collected and managed and by whom verbally and via an information sheet. We obtained verbal consent to participate. Their participation was confidential, and the project assured anonymity. We use pseudonyms for the participants and the sheltered accommodation community. As part of the ethical treatment, we presented the initial results to them during the last session so that they could have a say in our interpretations. The research project received ethical approval of the corresponding ethics committee.[3]

We chose this TV series because *Grace and Frankie* is about the everyday life experiences of two women in their 70s and their ex-husbands, including issues about (in)dependency, health, body beauty, active ageing, family relationships, gender and sexuality. This TV show attempts to defy older women's representations in media (Pereira & Gutiérrez San Miguel, 2019), and although technology appears, it is not the central focus. Through the two female characters, it puts into the fore innovative gender and age issues in mainstream media, and it was a good trigger to open the conversations about ageing with technology. The socio-economic backgrounds of the two female characters of the series and the participants of the cinema club were very different, and that fact also generated some comments.

Our technology definition was rather loose, and initially, we talked about any kind of technology that they use in their everyday life: including washing machines, microwaves and telephone landlines, that were later mixed with smartphones, tablets, social media technologies, laptops and robots. During the discussions, it was challenging to bring the focus of the conversations to technology. The participants preferred to talk about relationships and engage in quotidian chit-chat and joking. Hence, we needed to reflect carefully about how to bring technology into the conversations (López-Gómez & Sanchez-Criado, 2021). It was not implicitly introduced in the early discussions. The first two discussions were unstructured and loose, while the last two were slightly more focused on technology. We started to talk about social connectedness and relationships, and slowly, week after week, we gently introduced the topic of technology (Figure 9.2).

Not pointing at technology in the first place aimed to circumvent potential drawbacks that the reproduction of certain old age and technological imaginaries could imply for our study. Firstly, introducing the research project in

Figure 9.2 Room setup.

the Valleys as technological would have put many participants off because the residents were, according to the manager of the Valleys, "not very technological". Given that new technology imaginaries are gendered and predominantly man-oriented (Cockburn & Ormrod, 1993) – which especially applies to people of participant's generation (born between the 1930s and 1950s), the risk of attracting only a few men in a community mostly inhabited by women would have been too high. In fact, the room where the cinema club finally took place was intended to be the computer room. But as the "residents weren't very interested" in technology, the manager decided to remove the computers and refurbish the room to stimulate social activities that were more appealing for them. Since then, a group of women who have been living in the community since it was founded meet up in the room regularly to carry on a series of activities (such as yoga, mandalas' colouring, memory classes, singing and so on).

Secondly, we didn't want to enter the field setting the idea that the project was to study fancy digital technologies that they probably don't know, are not interested in or cannot afford. That could have reproduced a common selection bias in technology studies that favours samples of middle class and well-educated people (Rosales & Fernández-Ardèvol, 2020; Vincent, 2023). With this strategy, we sought to attract the cinema club users of all types of technology as well as non-users (not only the early adopters or the most tech-savvy).

Thirdly, we sought to avoid starting the fieldwork by positioning them (and ourselves) in the dichotomic imaginary about technology expertise that assumes that the youngest generations (in our case, the researcher in the field) hold the technological know-how and the authority to determine how to use them (Beneito-Montagut, et al. 2023).

Technology appears as another element in people's relations. Hence, our focus is not strictly on technology per se but on being old and participants' unique discrimination and power experiences when confronted with technologies. Technology is just an element through which ageism and age are done and undone. From the exploration of woman's intersectional subjectivities, we discuss technological ageism to make visible that, similarly to the way that age imaginaries are defined by constructs of age, gender and class, technological ageism affects older people in different ways depending on their gender and class and not only because of being "old".

How are the Valleys' women?

The group of 14 women who participated in the cinema club form a cohesive group within the community. They currently have a low pension income (as per the requirement to access the sheltered accommodation) and are over 65. Their chronological age range is varied. The youngest are in their 70s, and there are three participants aged 90, 94 and 96. They all have basic education. Half of them worked in low-skilled jobs (i.e., shop attendant and cleaner), others worked in medium-skilled jobs (i.e., secretary, marketing sales and trainer, radio operator), while there were some stay-at-home mums. Most of them were married and had children, while nearly everyone currently lives alone either because they are separated or, in most cases, widows. There are only two of them who live together with another older woman, they are sisters and both single. Their experiences with technologies are varied and diverse, too. They all acknowledge having a telecare system, but only one of them uses it outside the flat because "we all think about us as young". Some also intensively use smartphones, "she takes it even to the toilet", but the technologically engaged group among them is rather small.

In the remainder of the chapter, we show both that the women living in the Valleys are technologised and use a broad array of technologies – smart or not, new or old, digital or analogue – to remain meaningfully connected. And how their subjectivities as old women are crossed by various entangled factors such as gender, life trajectory and their roles as woman. While remaining attentive to the techno-imaginaries of old people, firstly, we explore how age is done with technologies and the co-shaping of women's subjectivities. Secondly, we do the same in relation to gender and to other factors, such as professional career, that emerged as relevant for their subjectivities. Thirdly, we discuss how the construction of age is intersected by other factors for the Valleys' women and what kind of techno-ageism is produced.

The younger, the "techier"

> When I brought up the topic of technology, I seemed to perceive a certain defensive position, like the young woman is already judging that we [the older women] don't use anything. And when I positioned

myself as 'low-tech, even reluctant', they relaxed. That was clear with the topic of WhatsApp, they all said that they all used it from the beginning as if to say what do you think?, to which I replied: oh yeah? From the beginning? Well, I resisted a lot, I don't like being so connected. I don't have an analogue mobile, but almost. Although, the group of about 5 older ones later told me that they did not use it before nor now.

(Andrea's field notes, 14-11-2018)

In this quote, the imaginary of the old techno user is ingrained into participants' subjectivities, and it is present in the relational dynamics with Andrea since the beginning. In the first instance, non-technological participants did not openly reveal that they did not use WhatsApp (Rosales & Fernández-Ardèvol, 2016). They only disclosed that when Andrea positioned herself as low-tech and not interested in technologies. Yet, for others, presenting themselves as technologically engaged and skilled in their interactions with a younger and educated woman seemed to build up on their subjectivities as old but "not that old", as we will see below.

In the group, the younger ones are considered the technological experts (Lana 76 and Pilu 73 years old). They try everything that falls in their hands, engage in social media platforms and are keen and proud to do it (Figure 9.3). They are in charge of the media communication channels (i.e., WhatsApp group), common room set up and organise the Valleys' activities. Sometimes they even teach the other residents. They materialise with
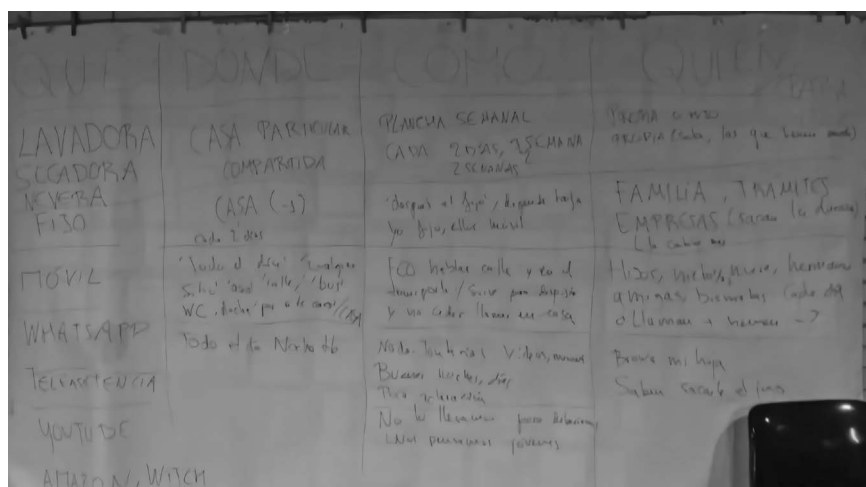
Figure 9.3 Ecology of technologies that women participating in the cinema club used.

their engagements with technology, the young techno imaginary and engage technologies as a youthfulness treat. These two and a few more of them had a professional career. Pilu still works as a trainer in marketing. Lana teaches memory and singing in the Valleys and constantly uses YouTube and searches information online. On the other side, there is a group formed by the old-old (Sarita is 89 years old and her sister Mamen is 96, Angustias is 90 and Maria is 94 years old). They don't use digital technologies and often had not-skilled or low-skilled jobs previously to retirement. They didn't participate much during the sessions, not because they didn't turn up, on the contrary, they came to nearly all the sessions, it was just because they let the younger lead the discussions. Likewise, they mainly use the landline and mobile phones for making calls.

Another stance that illustrates these tensions to resist or embrace the imaginary that relates technology to being young (or vice versa) happened when one of those technologically engaged women took the role of technological assistant during the cinema club. Pilu took the lead and helped Andrea to set up the computer and the projector, and in Andrea's words, "she feels deceived when she is not needed". She was one of the youngest of the group, and the others let Pilu took control and considered her the tech expert. She was the one who helped every other woman in the group when they had technology issues. When they were directly asked who provides tech support, the response was unanimous "Pilu or the warden".

These two models of technological engagement are articulated around the old-young and the old-old and have particular meanings for age. These doings were curiously observed in the group organisation of the common room and their embodied positions in the space as well. Pilu was in charge of organising a circle of chairs when we shifted from watching the series to talking about it. They sat in a circle arranged by age: the young ones on the left and the older ones on the right and closer to Andrea. The kind of chair and its position should help the oldest to access and participate in the discussions. The younger old women in the group regulated and managed both the access to technology and interactions with others in the physical space too.

But the confirmation of the presence of this youth imaginary arose with the women's pride expressions for an unexpected turn during the cinema club. Lana, another of the youngest, taught Andrea how to use and update the WhatsApp status:

> There is some confusion because I don't understand what they mean because, in fact, I didn't know that there was the option of posting photos and documents in your WhatsApp status. Seeing that I didn't understand, she offered to explain it to me. I took out my phone, walked over, and she showed it to me. I expressed a real surprise. They all laughed and some even clapped at the fact that it was the old woman who taught me.
>
> (Andrea's field notes 21-11-2018)

The laughs and the claps that the situation provoked are expressions of pride and praise over an old woman teaching technology to a young woman. As if this was something completely unforeseen and unimaginable, contrary indeed to the expectations produced by normalised imaginaries.

An interesting issue related to their subjectivities as technologised older adults relates to the meanings embedded in particular technologies and how these meanings relate to the techno-imaginaries explored in this chapter. In one of the participants words:

Woman 3: "We, the ones who participate vs. the old people who stay all afternoon in front of the TV, doing nothing, or waiting for their children, without leading their own lives and socialising".

Digital technologies are seen as tools to do stuff, keep up to date, be active and continue with contemporary life. They counteract more passive technologies, mainly television. The Valleys' women have the idea that television "consumes you, locks you up at home, and makes you passive while going down to socialize forces you to dress up and keep connected to the world". The television appears as a technology that connects to the broader society but loses connectedness potential when opposed to more active technologies. Thus, the television is associated with technology for old, passive people and digital technologies (smartphones, tablets, social media and so on) are related to youthfulness and active ideas.

Thus, being active and passive is very much related to specific technological uses, being digital or just a TV consumer, which defines the participants as young-old or old-old within the community. But as shown by the participants, it is not only a matter of technological use, but on the social activities, these uses enable or disable. For them, engaging in the social activities organised in the community means being active. As it is getting out of the flat and spending time with other people in the common areas, which is possible because some of them are digitally active and literate and involve those who are less so. However, as we will see, performing young-old and old-old imaginaries of later life through technological use (active/passive ascriptions to digital technology) is very much intersected by gendered life trajectories (such as occupation before retirement) that are also marked by socio-economic factors.

The Valleys women's technological engagements

Pilu: I own a computer.
Andrea: What do you do?
Pilu: I still have a mini job. I am a sales trainer, one day per week I meet the sales team to push the sales up. […] I also play Rummy, silly stuff, and browse around what other people write to me. But the most stuff I used to do ten years ago, and I really liked to do, such as using chats, I don't like it anymore.

Woman 1: The same happens to me [referring to not engaging in chat rooms].

Pilu: I am interested in medical topics, for instance, when I listen to somebody talking about brain ischaemia, I am interested in logging in and learning about it. If I listen to something on TV, drugs that come out, I type that on the computer.

The group of old women that engage with technology, as said before, are those who had a past linked to the labour world. They show a greater interest in new technologies, not only to communicate with their close networks but as a way of being connected with the current world. They followed the news, both through TV and social media. Likewise, they use the internet to search about diverse topics. For example, Lana, who is divorced and lives alone, is a radio broadcaster, and she relishes being up-to-date and informed of current affairs and politics. Her technological engagements support Lana's continued performance as a professional woman even after retirement. She uses technological devices, computers and smartphones and many applications (i.e., Twitter, Facebook, Skype, YouTube, Google, Amazon Prime, DAZN and so on).

Lana: "But I got married, so they wouldn't let me continue working on the radio station. I didn't want to get married. (…) I mean … I had … I have …, having a résumé like the one I have, my last years of pension contributions were peanuts. (…) Online, I like see what's going on, what others have or haven't sent to me. Gossip (…) I log in on Facebook, Twitter, and I alternate one, two, three (…) and I am getting pieces of news".

As seen, the technological engagements of the women who reject the imaginary of older users are diverse and related to their professional careers (Majon-Valpuesta et al., 2022). Moreover, gender is enacted through the emancipation process that was connected to working outside the home, that somehow is made visible in their relationship with digital technologies.

However, on the other side, for many other participants, when asked directly about technologies, the first that they mention are domestic technologies (iron, washing machine, dryer and so on) (Figure 9.3). Similarly, they mentioned the landline phone before talking about mobile phones (as further discussed somewhere else in López-Gómez et al., 2021). While talking broadly about technologies, it transpired that they use connectedness technologies as part of their normalised roles as caring women (in this occasion, as wives, friends, mothers and grandmothers). This technology role as a caring tool applies to digital technologies and non-digital technologies. For example, they send memes to relatives because it is understood as emotional work, similarly as they wash their children's clothes. It is a feminised way of caring.

An example of the emotional work that came up in the discussions is congratulating relatives and friends on their Birthdays and sending reminders to the rest of the network (i.e., mostly family) of Birthdays and other relevant

dates. The participants explained how they perform this role, incorporating technological tools:

Woman 2: What I do is at the beginning of the year, I write down the Birth-days dates on the mobile phone calendar. I write them down by heart, of my children, my siblings, my daughter-in-law …

Woman 3: Me too

Woman 5: Me too

Woman 1: I used to tell my children that it was someone else's Birthday, not these days. Now they have alerts. Before it was me who let them know them.

Woman 3: I send a WhatsApp to the whole family first thing in the morning (to notify of a Birthday)

The understanding of both domestic and digital technologies as tools to care about and for others (Cockburn, 1997; Gibson et al., 2021; Larsson & Stark, 2019) (also for self-care, but we do not discuss this because it is not the focus of this chapter) translates to the conceptualisation of gendered mediated emotional work. Moreover, we observed that the kind of relationships that each woman sustained with particular others also influenced the technologies that are used (or not) to keep in touch with them. 5 out of the 14 participants recognised that they have never used digital technologies. They only use mobile phones or landlines to keep in touch with their kin and friends, while relationships with the other women in the community are mainly sustained face-to-face. The kind of relationships that they sustain and the already set means of communication don't necessitate smartphones or digital technologies. As seen, except those five, the other participants use digital technologies to some extent. On the other hand, the most technologised participants use video conferencing and many other social media platforms, because their children and grandchildren are living abroad (e.g., Baldassar et al., 2016; López-Gómez et al., 2021). They use WhatsApp with kin, too, as well as with the other women in the community and more broadly. There are three of them who own and regularly use laptops and computers as well.

Keeping in touch and caring about others, which entails sustaining the social bonds (family, affection, care, and womanhood), is an emotional work normalised as their duty as women. In any case, many of them, especially those with children, felt that they had to be "alert" to the landlines and mobile phones "just in case …", and be always on call. Pragmatically, it means carrying the phone with them all the time, "she even goes to the toilet with the phone"; keeping the ringtone on, even in places and social situations where they are supposed to be switched off, such as a GP appointment, during the night, and so on. This "always alert" culture is interpreted by the women as a duty related to their gendered role within the family and becomes part of their subjectivity. But others, the less technologised, don't feel the need to do mediated emotional work or be always on.

Angustias: "Why do I need to contact my daughter if I know that she is coming to visit me later? Why do I need to say something on the WhatsApp channel if we are meeting in the common room in the late afternoon?"

It is not by chance that the ones who presented themselves unequivocally as technologised are the same ones who were blunter in their feminist positions (as emancipated, working and independent women) and the youngest in the community. However, the distinction between those who did mediated-care work and those who didn't is more ambiguous and complex than whether they are technology engaged or not. What is clear is that their role as caring women or not pervades their technological engagements.

Another way in which we were able to observe their subjectivities as women in relation to technology was around "female chatter" in the Valleys. As one of the participants stated, "here, we are over the moon to talk our heads off". And another one:

Woman 4: TV and down here [community common room] "radio macuto", that's our way of staying informed.
Woman 1: (…) I am not nosy; we gather every afternoon here [common room] and talk about everything. Someone comes and that's enough to be aware of everything; and to have people with whom to talk, in this environment we have plenty of social contact.

The common room, a physical space and the WhatsApp channel became spaces for socialisation and the reference to the existence of "radio macuto" which alludes to a Spanish phrase referring to the source of rumours and gossip, reinforces this idea.

"Radio macuto" in this context is a female hybrid process between the physical space of the common room and the online space of WhatsApp. The common space is feminised as well. It is a space of female socialisation and the ways of relating in them have been stigmatised and defined contemptuously as "female chatter" (Juliano, 1992), which is reviled as a form of superficial, stupid or even evil communication. This is perceptible when we compare The Valleys' women socialisation with the men's one. Men had their own relational spaces and online communication channels in the community and didn't participate in women's regular encounters nor in the WhatsApp groups. Instead, they relate in "masculine" spaces and activities. When they use the common room, they do so to watch football and no women would turn up to watch the games with them, the same way that no man would turn up to women's daily meetups.

Therefore, women's life trajectories, professional careers before retirement and caring roles are related with their technological engagements, which in turn are entangled with their diverse roles as women. Hence, the relationship between old age and technology, and its consequent social imaginaries, is

not the only factor that co-shapes older people's technology uses; it is also intersected by diverse ways of being an old woman. Neither being old nor being a woman can be considered unidimensional factors, they are intersected with each other and with, particularly in this case, life trajectories and their gendered roles as, for instance, emancipated (or not) women.

Discussion

We have seen that older women's technology engagements are complex, multifaceted and entail different ways of performing their subjectivities. Their technological engagements do not relate to ageing imaginaries but are defined by gendered life trajectories and status in society too.

For the Valleys' women, using digital technologies entails attributes related with youthfulness and being active and enacts a rejuvenated way of being connected to the broader society. Those who present themselves as most "technological" and interested in digital technology are those who intensively use digital technologies. They are the youngest and produce their subjectivities through their technological engagements. Participation in social media and using technologies for these women are associated with being more active and younger. On the contrary, not using digital technologies or watching TV is associated with passivity and being older. Thus, certain technologies and acts are associated with being old and add to the production of ideas about what it is to be old. The participants associate digital technologies with an active life. "Active ageing" ideas are related to engagement in a broad range of activities, as many of the participants do. This claim for no passivity has been problematised for endorsing and perpetuating the values of youthfulness (Grenier, 2012) and therefore adding to a normalised idea of ageing (Meersohn Schmidt & Yang, 2020; Williams et al., 2012). To sum up, we suggest that the social imaginary of being young and active is not only produced by the ability to do things but also by the ability to engage with particular technologies and not others. It could be said that for these women using new technologies rejuvenates in two senses, keeps them active and gives them a young appearance, similarly to what contemporary technologies of the body do (Brooks 2010; Marshall 2010).

Besides, our analysis shows that the youthfulness associated with these technological uses, which characterises Lana and Pilu practices, has much to do with their life trajectories as women struggling to develop a professional career and emancipate from traditional female roles and social positions. Using and being interested in digital technologies takes on an added value for those who associate their subjectivity with ideas that reject traditional female roles (home, care, domestic and manual work), dominant for the generation of post-civil war Catalan women. Due to this, the use and interest in technologies enact an imaginary of ageing that is very much associated with a cultural shift in their generation. Breaking with the traditional values of their parents and resisting traditional gendered roles marked their life trajectories

and differentiated them from other women (Majon-Valpuesta et al., 2022). In the 70s, these forms of resistance characterised the emergence of the youth as a distinguished cultural group, being later what typified the generational culture of baby boomers and defined old age according to the imaginary of the Third Age (Gilleard & Higgs, 2008). Thus, the mode in which older women at the Valleys engage with technology and present themselves as technological users could not only be interpreted based on the ageing imaginaries of old-young and old-old but also paying more attention to the intersection with gender imaginaries that are profoundly manifest in their life trajectories. These two imaginaries of age are, moreover, a source of ageism themselves because older women, in their technological engagements are constantly confronted with youthfulness as the aspiration and norm. Their digital practices, in turn, reify the ageing and gender imaginaries, and technology becomes a tool for the production of the Third Age (young-old).

Finally, we found additional intersections between age and gender. Most of the women in the Valleys find the availability of digital technologies useful to perform renewed care and emotional roles. As in previous studies, women value connectedness technologies and phones because social connectedness is important for them (Loe, 2010). The care connections with their most intimate relationships are related to their social position as caregivers, and this work is often invisible and even more so when it is technologically mediated. As seen, this care work is not limited to domestic tasks and care for others, but, as Di Leonardo (1987) already stated, has a third dimension: kin work or caring about. The mediated forms of care that we have seen are invisible not only in everyday life but in technology studies too (with few exceptions Baldassar, 2016; Beneito-Montagut et al., 2021). Sometimes their digital care work is even considered unnecessary or devalued – substituted by determined technological affordances such as Birthdays alerts. The devaluation of the care work that comes with keeping in touch seems even more unnecessary when it is made by older women. Yet, it is devalued within the Valley's women who also appreciate and value more the work linked to the technological expertise, skills and ability to control technologies than care work. Similarly, to the association of TV to the old-old imaginary, in this case, the non-digital technologies for caring about (i.e., not-smart phones, washing machines and landlines) are associated with being old, while technological expertise and skills are rejuvenating. Moreover, we can add the devaluation of gendered ways of relatedness. The common room of the community together with the women WhatsApp group are feminised spaces. Both support gendered ways of doing relationships among the participants that flow from the physical space of the common room to the WhatsApp group. This kind of relationality is associated with "female chatter" (Juliano, 1992) (i.e., gossip, sharing photos and commenting on the WhatsApp women's group) and is made invisible and discredited.

Thus, we believe that in the techno-imaginaries about old age prevails the appreciation of higher levels of digital literacy and ability to use technology,

which becomes the norm of how an old technogenarian should be. This is problematic and produces additional sources of ageism because normative women roles and social positions are undervalued and suppose another discrimination for not engaging in masculine ways of using technologies.

Situating the results of this research in the discussion about techno-ageism, this chapter illustrates how the age factor never functions alone, instead is intersected by other dimensions.

Conclusions

To answer the questions about how technological ageism is produced, in this chapter, we turned up to the social imaginaries of ageing that are entangled in women's technological engagement. The analysis of the cinema club field notes, transcripts and maps has illustrated that the configuration of the socio-technical imaginaries, besides entailing a certain set of distinctions around ageing related to the Third and Fourth Ages, are intersected with ideas about women's social positions.

The research strategy assumed that the main interest of the residents was in social relationships and daily life rather than technology and that technology would appear as relevant only if it became a support or obstacle to establishing social relationships. Whether due to the effect of the research strategy or not, the fact is that it was largely so. Nevertheless, the relational dynamics of the cinema club also showed to what extent our plan reproduced or dismissed in the participants' certain imaginaries associated with the use of technology. We were surprised that there were indeed a few highly technological women who quickly took up a leadership position, even displacing the "young" researcher. We expected that technology would be a matter linked to relationships and above all to care and emotional work. And although this was noticed, we found ourselves confronted with our own imaginaries by Pilu and Lana's technological practices. They used technology not as instruments for just gendered work but it was rather a matter of interest in its own shake, a reason for exploration, growth and learning related to their social position as emancipated women. Technology became a way of doing feminism.

Based on this work, we advocate a more intersectional view in the research on technological ageism. Regarding intersectionality in technological ageism, we have shown that analysing age is not enough to understand how older women co-constructed their subjectivities as able/unable in relation to technologies. Looking at age as an isolated factor among this group would not give a complete picture of what's going on and how this group of low-income women relates to technology. Indeed, their gendered social positions and life trajectories are very much related to how they use or not-use technologies. Thus, if we want to understand the exclusions and discriminations related to technology use by older people, we need to look at other factors beyond age. As we've seen, discriminations come from other dimensions too, that are

related with being a low-income woman with a particular life trajectory. For the Valleys' women, ageism is produced for being old, a woman that prefers determined feminised uses of technology over to others, or because they do feminism by using technology "like a man".

Eventually, the excessive optimism of the Third Age and the technogenarian concept become a source of ageism. By contrast, they define the second imaginary that is associated with the notion of the Fourth Age, framed by deficiencies and technological dis-ableness. We have shown that this can be problematised as well and conceptualised as a theoretical form of ageism.

Notes

1 "Being Connected" at Home – Making use of digital devices in later life (BCONNECT@HOME – Ref. PCIN-2017-080) was a 36 months (2018–2021) research project funded by the JOINT PROGRAMMING INITIATIVE "MORE YEARS, BETTER LIVES involving the Universitat Oberta de Catalunya, Utrecht University, Trent University and KTH Stockholm. The research took place in The Netherlands, Spain, Sweden and Canada.

2 The definition of sheltered housing or accommodation that we use is "a type of 'housing with support', which older people can rent" (Age UK, 2022) (https://www.ageuk.org.uk/information-advice/care/housing-options/sheltered-housing/; https://www.independentage.org/get-advice/your-home-and-housing/types-of-housing/sheltered-housing; last accessed 22nd August 2022).

3 Universitat Oberta de Catalunya (UOC) Ethics Committee.

References

Amaral, I., & Daniel, F. (2016). Ageism and IT: social representations, exclusion and citizenship in the digital age. In Zhou J, Salvendy G, editors, *Human Aspects of IT for the Aged Population. Healthy and Active Aging: Second International Conference, ITAP 2016, Held as Part of HCI International 2016 Toronto, ON, Canada, July 17–22, 2016, Proceedings, Part II 2* (pp. 159–166). Springer International Publishing.

Baldassar, L. (2016). De-demonizing distance in mobile family lives: Co-Presence, care circulation and polymedia as vibrant matter. *Global Networks*, *16*(2), 145–163.

Baldassar, L., Nedelcu, M., Merla, L., & Wilding, R. (2016). ICT-based co-presence in transnational families and communities: Challenging the premise of face-to-face proximity in sustaining relationships. *Global Networks*, *16*(2), 133–144.

Baltes, P. B., & Smith, J. (2003). New frontiers in the future of aging: From successful aging of the young old to the dilemmas of the fourth age. *Gerontology*, *49*(2), 123–135.

Barbosa Neves, B., & Casimiro, C. (2018). *Connecting families?: Information & communication technologies, generations, and the life course*. Policy Press.

Beneito-Montagut, R., & Begueria, A. (2021). "Send me a WhatsApp when you arrive home": Mediated practices of caring about. In A. Peine, B. Marshall, W. Martin, L. Neven, *Socio-Gerontechnology* (pp. 119–132). Routledge.

Beneito-Montagut, R., Begueria, A., & Cassián, N. (2023). It's not just about learning, it's all about relationships: The social connectedness of digital practices in later life. *The Sociological Review*. https://doi.org/10.1177/00380261221144154

Brooks, A. T. (2010). Aesthetic anti-ageing surgery and technology: women's friend or foe? *Sociology of Health & Illness*, 32(2), 238–257.

Calasanti, T., & Giles, S. (2018). The challenge of intersectionality. *Generations*, 41(4), 69–74.

Calasanti, T., & King, N. (2021). Beyond successful aging 2.0: Inequalities, ageism, and the case for normalizing old ages. *The Journals of Gerontology: Series B*, 76(9), 1817–1827.

Crenshaw, K. (2013). Demarginalizing the intersection of race and sex: A black feminist critique of antidiscrimination doctrine, feminist theory and antiracist politics. In *Feminist legal theories* (pp. 23–51). Routledge.

Cockburn, C. (1997, May) Domestic technologies: Cinderella and the engineers, *Women's studies international forum 20*, (3), 361–371.

Cockburn, C., & Ormrod, S. (1993). *Gender and Technology in the Making*. SAGE Publications Ltd.

Cutler, S. (2005). Ageism and technology. *Generations*, 29(3), 67–72.

Di Leonardo, M. (1987). The female world of cards and holidays: Women, families, and the work of kinship. *Signs: Journal of women in culture and society*, 12(3), 440–453.

Fernández-Ardèvol, M., & Ivan, L. (2015). Why age is not that important? An ageing perspective on computer anxiety. In *International Conference on Human Aspects of IT for the Aged Population*, pp. 189–200. Springer.

Gibson, M., Hjorth, L., & Choi, J. H. J. (2021). Introduction: Caring media futures. *International Journal of Cultural Studies*, 24(4), 557–566.

Gilleard, C., & Higgs, P. (2008). The third age and the baby boomers. *International Journal of Ageing and Later Life*, 2(2), 13–30.

Gilleard, C., & Higgs, P. (2013). The fourth age and the concept of a 'social imaginary': A theoretical excursus. *Journal of aging studies*, 27(4), 368–376.

Gilleard, C., & Higgs, P. (2018). Gender and the social imaginary of the fourth age. In *Ageing, diversity and equality: Social justice perspectives* (pp. 48–65). Routledge.

Gilleard, C., Jones, I., & Higgs, P. (2015). Connectivity in later life: The declining age divide in mobile cell phone ownership. *Sociological Research Online*, 20(2), 1–13.

Grenier, A. (2012). *Transitions and the Lifecourse: Challenging the Constructions of 'growing Old'*. Policy Press.

Ivan, L., & Cutler, S. J. (2021). Ageism and technology: The role of internalized stereotypes. *University of Toronto Quarterly*, 90(2), 127–139.

Ivan, L., Loos, E., & Bird, I. (2020). The impact of 'technology generations' on older adults' media use: Review of previous empirical research and a seven-country comparison. *Gerontechnology*, 19(4), 1–19.

Joyce, K., & Loe, M. (2010). A sociological approach to ageing, technology and health. *Sociology of health & illness*, 32(2), 171–180.

Juliano, D. (1992). *El juego de las astucias: Mujer y construcción de modelos sociales alternativos*. Horas y Horas la Editorial.

Kania-Lundholm, M. (2023). Coping in the culture of connectivity: How older people make sense of living with digital ageism. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Katz, V. S., & Gonzalez, C. (2016). Community variations in low-income Latino families' technology adoption and integration. *American Behavioral Scientist*, 60(1), 59–80.

Köttl, H., Gallistl, V., Rohner, R., Ayalon, L. (2021). "But at the age of 85? Forget it!": Internalized ageism, a barrier to technology use. *Journal of Aging Studies*, *59*, 100971. http://doi.org/10.1016/j.jaging.2021.100971

Köttl, H., & Mannheim, I. (2021). *Ageism & digital technology: Policy measures to address ageism as a barrier to adoption and use of digital technology*. EuroAgeism.

Larsson, C. W. & Stark, L., (2019). Rethinking gender and technology within intersections in the Global South. In J. Hearn (Ed.), Routledge *advances in feminist studies and intersectionality* (pp. 1–22). Routledge.

Laslett, P. (1994). The third age, the fourth age and the future. *Ageing & Society*, *14*(3), 436-447.

Levy, S. R., & Macdonald, J. L. (2016). Progress on understanding ageism. *Journal of Social Issues*, 72(1), 5–25.`

Loe, M. (2010). Doing it my way: Old women, technology and wellbeing. *Sociology of Health & Illness*, *32*(2), 319–334.

Loos, E., & Ivan, L. (2018). Visual ageism in the media. In Ayalon, L., Tesch-Roemer, C., Eds, *Contemporary perspectives on ageism* (pp. 163–176). Springer.

López-Gómez, D., Beneito-Montagut, R., & García-Santesmases, A. (2021). No future for care without new digital media? Making time(s) for mediated informal care practices in later life. *International Journal of Cultural Studies*, *24*(4), 637–654.

López, D., Callén, B., Tirado, F., & Domenech, M. (2010). How to become a Guardian Angel? Providing safety in a home telecare service. In A. Mol, I. Moser, & J. Pols (eds.), *Care in Practice: On Tinkering in Clinics, Homes and Farms* (pp. 71–89). transcript Verlag.

López-Gómez, D., & Sanchez-Criado, T. (2021). Civilising technologies for an ageing society? The performativity of participatory methods in socio-gerontechnology. In A. Peine, B. Marshall, W. Martin, L. Neven (Eds)*, Socio-gerontechnology* (pp. 85–98). Routledge.

Majon-Valpuesta, D., Perez-Salanova, M., Ramos, P., & Haye, A. (2022). "It's impossible for them to understand me 'cause I haven't said a word": How women baby boomers shape social participation spaces in old age. *Journal of Women & Aging*, *34*(3), 277–293.

Mannheim, I., Schwartz, E., Xi, W., Buttigieg, S. C., McDonnell-Naughton, M., Wouters, E. J. M., & van Zaalen, Y. (2019). Inclusion of older adults in the research and design of digital technology. *International Journal of Environmental Research and Public Health*, *16*(19), 3718.

Marshall, B. L. (2010). Science, medicine and virility surveillance:'sexy seniors' in the pharmaceutical imagination. *Sociology of health & illness*, *32*(2), 211–224.

Meersohn Schmidt, C., & Yang, K. (2020). Controlling active ageing: a study of social imaginaries of older people in Chile. *Ageing & Society*, *40*(7), 1428–1454.

Mirowsky, J., & Ross, C. E. (1999). Economic hardship across the life course. *American Sociological Review*, 548–569.

Mort, M., Roberts, C., & Callén, B. (2013). Ageing with telecare: care or coercion in austerity? *Sociology of health & illness*, *35*(6), 799–812.

Mubarak, F. (2015). Towards a renewed understanding of the complex nerves of the digital divide. *Journal of Social Inclusion*, *6*(1), 71–102.

Nash, J. C. (2008). Re-thinking intersectionality. *Feminist review*, *89*(1), 1–15.

Neven, L. (2010). 'But obviously not for me': robots, laboratories and the defiant identity of elder test users. *Sociology of health & illness*, *32*(2), 335–347.

Neven, L. (2015). By any means? Questioning the link between gerontechnological innovation and older people's wish to live at home. *Technological forecasting and social change*, *93*, 32–43.

Nordstrom, S. N. (2015). Not so innocent anymore: Making recording devices matter in qualitative interviews. *Qualitative Inquiry*, *21*(4), 388–401.

Peine, A., Rollwagen, I., & Neven, L. (2014). The rise of the "innosumer"—Rethinking older technology users. *Technological forecasting and social change*, *82*, 199–214.

Peine, A., Marshall, B. L., Martin, W., & Neven, L. (2021). *Socio-gerontechnology: Interdisciplinary critical studies of ageing and technology*. Routledge.

Pereira, A. C., & Miguel, B. G. S. (2019). Grace and Frankie: Who's Afraid and Who Laughs with These Two Not-Poor-and-Even-Less-Old-Ladies. *Studies in Visual Arts and Communication*, *6*(2), 12.

Östlund, B. (2011). Silver Age Innovators: A New Approach to Old Users. En F. Kohlbacher & C. Herstatt (Eds.), *The Silver Market Phenomenon* (pp. 15–26). Springer, Berlin Heidelberg.

Quan-Haase, A., Mo, G. Y., & Wellman, B. (2017). Connected seniors: How older adults in East York exchange social support online and offline. *Information Communication and Society*, *20*(7), 967–983. http://doi.org/10.1080/1369118X.2017.1305428

Rosales, A., & Fernández-Ardèvol, M. (2016). Beyond WhatsApp: Older people and smartphones. *Romanian Journal of Communication and Public Relations*, *18*(1), 27–47.

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence*, *26*(5–6), 1074–1087. http://doi.org/10.1177/1354856520930905

Staunæs, D., & Søndergaard, D. M. (2011). Intersectionality: A theoretical adjustment. *Theories and methodologies in postgraduate feminist research*, 45–59.

Tsatsou, P. (2011). Digital divides revisited: what is new about divides and their research? *Media, Culture & Society*, *33*(2), 317–331.

Tsatsou, P. (2022). Vulnerable people's digital inclusion: Intersectionality patterns and associated lessons. *Information, Communication & Society*, *25*(10), 1475–1494.

Vincent, J. (2023). Life stage or age? Reviewing perceptions of oldest ICT users. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Williams, S. J., Higgs, P., & Katz, S. (2012). Neuroculture, active ageing and the 'older brain': problems, promises and prospects. *Sociology of health & Illness*, *34*(1), 64–78.

10 Coping in the culture of connectivity

How older adults make sense of living with digital ageism

Magdalena Kania-Lundholm

There is a meme that has been circulating the internet for a while. It pictures an older grey-haired lady leaning towards the computer screen holding her reading glasses so she can see what it says. The caption reads: "Tracking my cookies? They'll never get my recipe!" This meme, like many of the others that have mushroomed online in recent years, adopts a familiar theme. It relies on the idea that older adults and new technologies do not necessarily go together and, implicitly, that the culture dominated by the imperative of connectivity and being always "on" is mostly inhabited by and belongs to the young. Memes like this one are seemingly informed by stereotypical understandings of older adults and technology, portraying them as not, particularly tech-savvy, dependent on assistance and support and generally not interested in learning and acquiring new skills. Put simply, such stereotypes imply that older adults and new technologies are often mutually exclusive categories.

As Pickering (2015) suggests, stereotyping is a way of both representing and judging people in fixed and unyielding terms. Rather than being viewed as complex individuals with distinct qualities, stereotyped portrayals reduce people to a fixed category and the limited narrative that informs it. Often these categories come with homogenising and confining attributes that are difficult to question. Recent research shows that older adults are reluctant to use technology because of the threat of confirming ageist stereotypes that define them as incapable or incompetent (Mariano et al., 2021). Stereotype threat may thus be an important barrier to technology acceptance and usage in late adulthood. Such stereotypical representations, however, do not occur in a vacuum. They are part of a specific cultural context in which they are evoked, reproduced and disseminated.

The goal of this chapter is to explore and understand how older adults cope with everyday life in a culture of connectivity or, to be more precise, how older users of technology navigate and negotiate everyday life in an ageist culture and in an unfamiliar context where digital technologies and progressively more expansive digitalisation have often been considered the new normal. Ageism is a form of discrimination that has been defined as the expression of negative behaviours or attitudes towards individuals based solely on their age (Butler, 1969, see also Rosales et al., 2023 in this volume).

   This chapter departs from the idea that both cultural and structural forms of ageism are an integral part of the culture of connectivity. It applies a cultural sociological perspective that investigates the processes of meaning-making that people attach to their practices and interactions (Spillman, 2020). Instead of investigating, for instance, how the media represents older adults and how the technology industry discriminates against them, this chapter looks at how older adults *themselves* navigate and negotiate everyday life in a culture of connectivity, how they make sense of embedded power relations and understand the notion that in this culture, the social world often discriminates against them by parodying their use and understanding of digital technologies. It asks:

- How do older adults understand and experience life with digitalisation and digital technologies?
- How do they respond to some stereotypical representations of older adults and digital technologies?

This chapter begins with a definition of culture and a discussion of the conundrum or paradox often present within it of connectivity/disconnection. It then moves on to address the problem of ageism in the culture of connectivity followed by a discussion of the empirical material and method employed in the study. The results are presented under the headings of three distinct themes, such as self-ageism, the "we/them" distinction and responding to ageist stereotypes, that were identified during the analysis. They are then discussed along with some concluding remarks that suggest that getting older in a digital culture implies living and coping with digital ageism.

The paradox of an "ordinary" culture of connectivity

By linking the materiality of language to social relations, Raymond Williams (1958) has demonstrated that *culture is ordinary* for everyone and not only for the elite. He points out that culture's ordinariness lies in its materiality. This can refer, for instance, to the proliferation of objects in everyday life, such as coffee mugs or clothes, or even mobile devices and services like telephones, laptops or streaming websites like Netflix and Spotify. These "things" fill our lives but are often taken for granted. Williams' understanding of culture as material means that any analysis of culture or cultural practices, ideas, values or forms needs to consider the social conditions behind the production and circulation of objects, products and services and the importance of language as co-constitutive of those conditions. As McGuigan and Moran (2014) argue, "language strains and changes at the limits to enable new ways of seeing and acting; [it] is stretched and adapted in order to accommodate and create new practices and experiences" (p. 173). Such an understanding of culture is based on the perception of language as "built into our living" (McGuigan & Moran, 2014,

p. 173). McGuigan and Moran use as an example the concept of "social class". The concept not only indicates the way we *describe* social relations but also how we *order* and organise them. In other words, the materiality of culture encompasses both the material objects that surround us and the way we approach, think, and talk about them. This understanding of culture invites the reflection that stereotypical understandings of certain groups, such as older people, for instance, do not solely refer to biases against them and their exclusion on a personal or individual level. They also encompass structural and institutional practices, some unintentional, such as a lack of representation or wider cultural biases and assumptions. When it comes to culture of connectivity, then, these assumptions could include the idea that older adults are not interested in computers or digital devices, that they are not particularly tech-savvy or willing to learn new skills and are not interested in innovation and progress. Consequently, if we implicitly assume that culture of connectivity and new media technologies belong to the young, then older adults are automatically labelled "outsiders". They become "strangers" in their own culture, a culture which potentially puts them at risk of discrimination based on their age. Simply put, they become victims of *ageism* (WHO, 2021).

In her 2013 book *The Culture of Connectivity: A Critical History of Social Media,* José van Dijck describes, by focusing on five particular media platforms, how social media has altered the networked media landscape. She emphasises the fact that social media has become an intrinsic element of mediated culture that, in turn, has deep political, economic and cultural implications (Van Dijck, 2013). Regarding the last of these implications, van Dijck argues that a *culture of connectivity* has developed and has become an intrinsic element of everyday life. She defines this as, among other things, a blurring of the boundaries between public and private life and normalisation of what she names "the platformed sociality", namely the "coded structures [that] are profoundly altering the nature of our connections, creations, and interactions" (Van Dijck, 2013, p. 20). Culture of connectivity can therefore be understood as an everyday context that is different from the period prior to the advent of digital media. It is now an environment where the nature of social connections, human interactions, and sociality are primarily informed by the organisation of social exchange based on neoliberal economic principles such as effectivity, privatisation, resourcefulness, individualisation and commercialisation (Van Dijck, 2013, p. 21). For instance, the technological innovation of "sharing", "liking" and "following" buttons has transformed these physical actions into social values, which have, in turn, affected "cultural practices and legal disputes" (Van Dijck, 2013, p. 20). The dominant principles of economic exchange make connectivity and staying online' a source of pressure, both from peers and social networking platforms alike. In other words, in a connected culture, *connectivity* becomes a social value and is almost perceived as a necessity. Being connected is simply taken for granted.

In a similar fashion, Brubaker (2020) suggests that *digital hyperconnectivity* is a condition where everyone is connected, at least potentially, to everyone else. This type of connectivity constitutes a relatively new phenomenon that has characterised the past decade and is tightly related to the rise of smartphones and social media networking platforms. Brubaker (2020) argues that, alongside the rise of new obligations, expectations, and anxieties, we are facing the transformation of both social relations and cultural practices. Techno-social systems, for example, are driving the transformation of the social self and the cultural practices associated with identity such as a variety of cultural and social practices objectifying, quantifying, producing, regulating, and governing the self (Brubaker, 2020, p. 771). As one example of this, Brubaker (2020) recalls the early debates about the internet and virtual online realities from the late 1980s and 1990s. At the time, many scholars pointed out the *potentially* emancipating characteristics of "virtual reality" and its power to overcome social hierarchies and challenge traditional controls over bodies, gender, race, and age through, for instance, participation in virtual communities and role-playing games. However, in today's world, the digital is not a separate reality. Rather, it is an inherent part of everyday life. The digital environment and the material world are mutually interdependent and interwoven with each other. This means that the social hierarchies and inequalities related to the body, gender, race and age that are evident in the physical environment are just as likely to be reproduced in an online context as well as through digital products and services. "Going online" is hardly ever a way of truly escaping our physical and material reality as well as discrimination and inequality that surround us.

At the same time, I would like to suggest that this culture of connectivity as we know it can be characterised by a certain paradox. This paradox is inscribed in two separate discourses, each of which claiming connectivity as a cultural imperative. On the one hand, because of the overwhelming presence of connectivity and an increasing awareness of the negative impact of digital technologies on health and well-being, there is a growing scholarly and public discussion on online disconnection and social media refusal (Hesselberth, 2018; Light, 2014;Portwood-Stacer, 2013, Syvertsen, 2019). On the other hand, alongside the idea of increasing digitalisation as the engine behind numerous social, political, and economic developments, there is a perspective which advocates increased global access to the internet as well as the development of ever more online-based commercial and public services. One line of research views the development of policy interventions that encourage digitalisation as a positive and transformative force in societies, particularly those technologies which have practical applications for use by older adults (Fozard & Wahl, 2012).

These paradoxical discourses of connecting and disconnecting, in turn, encourage two mutually exclusive approaches to connectivity and digitalisation. The imperative *to disconnect* stems from the idea that there is too much information and social media in our lives and that to stay focused

and satisfied we need to, at least temporarily, remove ourselves from digital connections to reconnect with ourselves and our lives (Sutton, 2017). The ability to disconnect, its necessity even, is defined as a matter of regaining and maintaining individual control and is often supported by commercial actors and technology developers (Beattie & Cassidy, 2020). The imperative *to connect,* however, is supported by the idea that policy-driven interventions to increase connectivity and digital engagement can potentially contribute to overcoming existing social and economic inequalities (Selwyn & Gorard, 2005). This is particularly the case with vulnerable and/or marginalised groups, such as ethnic minorities, people with disabilities and the elderly. Older adults have been portrayed by the media, by research and in other public debates as a rather homogenous group that is neither particularly tech-savvy nor particularly willing to learn how to use digital technologies. The concern has been that this group has the greatest difficulty with digitalisation and that their exclusion from key service infrastructures could have a negative impact on their mental health and well-being (.Russell, 2011; Seals et al., 2008).

In both cases, however, these imperatives are informed by the techno-deterministic logic of solutionism (Morozov, 2013), where technology (or its temporal refusal) becomes the remedy for both digital technology "overusers" and non-users like. At the same time, in recent years, media and communication scholars have begun to question and destabilise the norm of digital connectivity by suggesting, for example, that digital engagement and online disconnection be approached as a continuum with a variety of forms of digital engagement, rather than use/non-use or on/offline sharp dichotomy (Kuntsman & Miyake, 2019). In a similar vein, scholars have started to investigate older people's agency and the process of co-constitution of aging and technology with the aim of challenging the image of older adults as digital laggards (Peine & Neven, 2019; Wanka & Gallistl, 2018). This research has aimed to nuance the negative discourse surrounding older adults and digitalisation, as suggested by the interventionist and solutionist logic, but also to point out that people (dis)engage with technology in multiple, sometimes contradictory, ways. This research focuses more on the users themselves, their habits, and cultural practices. It suggests that by nuancing the picture of technology use beyond the binary logic of use/non-use, a more complex view on engagement with technology, in general, can be reached. However, by focusing solely on users, these investigations have provided a rather limited understanding of the context of such practices, namely the culture and structures in which they operate. If we agree with the notion that social reality is reflected in the digital realm, we must also confront the idea that social inequalities, structures and hierarchies are reflected there as well. It is more frequently the young who are associated with the imperative of staying connected, of having the technological skills that need constant development and improvement and to whom much of the marketing power of the technology industry is directed.

Digitalisation and connectivity in Sweden

From an international perspective, a person counts as "internet user" if they access the internet at least once every three months (see: www.itu.int). It is therefore important to acknowledge the national context of this study, namely Sweden, and its high-quality internet coverage and use over almost the entire country. According to the report, which measures internet use on an annual basis, in 2020, 96 per cent of the Swedish population have used the internet at one time or another, and 93 per cent connected to it daily. This data makes Sweden one of the most connected countries in the world. Internet use among older Swedish adults (76+) has also been growing, increasing from around 43 per cent in 2015 to 73 per cent in 2020. In the *Digital Strategy for Sweden* (2017), the Swedish government set itself the goal of becoming *the* best in the world when it comes to the use of digitalisation and the opportunities it brings. Followed by this strategy, in 2018, an Agency for Digital Government has been established with the mission to promote digitalisation of public administration and sustainable welfare society for all its citizens. According to an OECD report titled "Reviews of Digital Transformation: Going Digital in Sweden", also from 2018, Sweden has led the world in digitalisation, showing, among other indicators, high levels of technology use and trust in technological devices and networks (OECD, 2018). This process of digitalisation has implied the development of an extensive digital infrastructure followed by a proliferation of online services, such as digital banking, e-commerce, social insurance services and others. From a sociological perspective, however, digitalisation is not only a process of technological advancement but also, perhaps even more importantly, a process of *social* transformation. While it brings with it both advancement, innovation and development, it is also marked by some challenges, such as for instance digital inclusion and digital literacy. Access to the Internet as well as a set of digital literacy skills available to all citizens, regardless of their age, social status and economic background have been among such challenges addressed relatively early on during the late 1990s in Sweden.

For instance, in 1997, inspired by similar initiatives in the USA, *SeniorNet Sweden* (SNS) was established. Their motto "Older people teach older people digital communication and internet" departs from the idea that digital education by and for older adults is more accessible and effective. Today, the network includes about 50 different clubs across the country providing education and information about digital communication technologies and their use. Additionally, the network also emphasises the importance of social connection for their members, which, in the spirit of their motto, implies the mutual support and inclusion of older adults. The question of digital inclusion has been high on the public agenda in Sweden as well. The national campaign for increased digital inclusion, named *Digidel2013*, has set the goal to facilitate internet use and participation in digital development of society, including access to services, information, education and entertainment.

During the three years between 2010 and 2013, the number of citizens over 16 years of age who never or very seldom use the internet has decreased from 1.7 million to roughly about half a million and has continuously been going down since then (Swedes and the Internet, 2020). Digitalisation and digital inclusion have also been named priorities in terms of building a sustainable and democratic society in Sweden (Nordqvist, 2019). Among other prominent actors of digitalisation in Sweden is *The Swedish Internet Foundation*, an independent, private foundation that in its mission emphasises the work for the positive development of the internet in Sweden, provision of stability in the Swedish internet infrastructure and spread of knowledge about the internet and electronic communication. The foundation also releases an annual report, "Swedes and Internet", documenting internet habits and online media consumption and use among Swedes. These initiatives are only a few examples to show that digitalisation and connectivity have been an important motor behind innovation and change as well as technological, economic and social development in Sweden.

Against this background, it is important to mention that with the ambition of becoming world's leader of digitalisation, online connectivity and knowledge of how to use digital, online devices in Sweden are not only valued as such but also to a large extent normalised and taken for granted. In practice, this means that social groups that potentially could fall behind the rapid digital development, such as older adults, became targeted relatively early on, as the case of SNS illustrates. This also means, however, that those groups experience, to some extent, pressure to acquire certain sets of digital skills and knowledge to "keep up" with social and cultural development (Kania-Lundholm, 2019; Olsson & Viscovi, 2020). Because of its relation to social media and social networking sites, which are mostly used by the younger population, culture of connectivity in Sweden is also strongly associated with the youth. Consequently, when it comes to the relationship between older adults and technology, digital ageism (Manor & Herscovici, 2021) finds fertile ground in the context of the culture of connectivity. This is due to the combination of both stereotypical representations of older adults as "digital immigrants" (Prensky, 2001, cf. Sorrentino, 2018) *and* discriminatory practices that are inscribed in the system of power relations within the technology industry that has itself perpetuated those practices. When "being online" and tech-savvy is normalised as a practice defining the young and online connectivity is taken for granted, the culture of connectivity can be described as more than just a context where the nature of interaction and sociability has been altered. It can also be described as a profoundly *ageist culture*. As discussed earlier, the aim of this chapter is thus to explore how older adults based in Sweden manage their everyday lives in the *culture of connectivity,* or to be more precise, how older users (and non-users) of digital technology negotiate everyday life in this culture. This chapter seeks to understand how older adults make sense of the embedded power relations within the digital world and how they perceive the fact that the social world in digitally

networked societies often discriminates against them and their ability to use and understand digital technologies.

Method and material

The empirical basis for this study comes from a research project that focused on exploring older people's understandings and experiences of digital technologies and how older adults relate to their own understandings of aging and old age. The material comprises the transcripts of six focus group interviews that were conducted in Sweden in the autumn of 2017. The interviews were conducted in Swedish and transcribed verbatim. Each focus group had approximately 4–6 people, giving a total sample of 30 participants between the ages of 68 and 88. The 18 women and 12 men were recruited through several associations for older adults located in central Sweden. To account for the inevitable variety of digital experiences within the sample, participants were asked to answer a brief questionnaire to assess their level of technology use. Those who said that they owned a desktop computer and/or tablet and checked emails and online news daily were labelled *users*. Those who went online a few times a week were described as *seldom users*. Those who said that they did not own a digital device and never searched for information online were categorised as *non-users*. The sampling strategy was informed by three aspirations: first, to challenge the binary use/non-use division that has informed some of the early research on digital inequalities and gaps; second, to acknowledge that the context of digitalisation (and culture for that matter) is relevant for all social actors, regardless of their levels of engagement with digital technologies; and third, to give voice to potentially marginalised groups while avoiding stigmatisation. Given this national context for digitalisation and digital acceptance, the analytical approach adopted by this study has been inspired by the theoretical underpinnings of critical discourse analysis (CDA), although no specific analytical tool or protocol was adopted. The term "discourse" refers here to socially reproduced knowledge and social reality; meaningful, often normatively reproduced, practices are constructed within and through discourse (Wodak, 2013). From a discursive point of view, focus groups are sites of reproduction of socially and culturally embedded ways of giving meaning and thinking. Thus, the interview material used in this study was approached as a source of normative, dominant discourses pertaining to digitalisation and technology use among older adults. The analysis carried out on this material involved a close reading of the interview transcripts in which the material was coded. The codes were then used to further inform the emerging three main discourses (for a more detailed discussion of the method used here, see Kania-Lundholm, 2019). The results presented in this chapter are derived from a secondary analysis of that part of the data corpus that focused specifically on the research questions relating to, firstly, how older adults understand and experience digitalisation in their everyday lives, and secondly, how they respond to and experience stereotypical

representations of the relationship between older adults and new technologies circulating in some Swedish press. It is important to note that a relatively small sample and its corresponding small data corpus are always at risk of "never being more than illustrative" (Barker, 2008, p. 165). This sample is by no means representative of older Swedish users of the internet and digital devices. Nevertheless, given that relatively few studies have focused on experiences of older (non-)users, it provides an idea of how some members of this group understand and experience life with and in the culture of connectivity, especially given that this culture is often associated with youth.

To facilitate discussion during the interviews, which lasted about 70–80 minutes each, the study participants were presented with broad, open questions about the digitalisation of society. For instance, participants were asked, "Do you remember your first encounter with computers?" and "What do you think about the idea of a paperless society?" Additionally, to prompt more spontaneous reactions and interactions, participants were asked to comment on a selection of headlines from national Swedish newspapers about older people's often negative experiences with digital technologies. In the following section, several extracts from the empirical material will be presented to illustrate some of the study's key themes and findings. These extracts have been translated from the original Swedish by the author and participant anonymity has been ensured using nicknames. This study has been vetted and approved by the Swedish Research Ethics Agency (nr 2016/080).

Self-ageism and internalised stereotypes

When reflecting upon their engagement with various digital devices, the participants in this study often described themselves in a specific manner. Namely, they employed a discourse of *self-ageism*, informed by the perception that when it comes to engagement with technology, old age is often synonymous with dependence, especially in the form of tech support. For instance, Anna (74, Group 6), is an occasional, seldom user who describes "feeling old" as directly related to the issue of assistance. She says, "It is probably what you feel as an older person, that you need help with many things". Anna means that the experience of ageing implicitly involves the need of help from others, especially when it concerns issues that she does not have knowledge of nor the skills to fix by herself. This shortfall in knowledge and skills includes, as she says, "many things" for Anna, such as assistance with paying bills online or updating the software on her computer. Similarly, Ingrid (71, Group 4), also a seldom user, when asked about how she dealt with the problems that can arise when a computer or mobile phone does not work the way it should, says: "Yes, there is the support that you can call … but they talk so fast. So, I start talking slower and calmer, and say: "Sorry, I am old, I do not understand anything about computers". These experiences reflect what scholars have previously discussed as forms of digital ageism. One of the most important aspects of digital ageism is that it often departs

from a *stereotypical image* of an older person or group of older people, often in regards to their conduct in the digital world (cf. Rosales & Fernández-Ardèvol, 2020, Manor & Herscovici, 2021). Consequently, older adults in the digital world are often represented and perceived as not particularly tech-savvy and dependent on the technical help of their friends or relatives. This digital ageism can take an even more negative form when such stereotypical and ageist representations of older adults' digital capabilities are internalised and appropriated by older adults themselves. According to Bodner (2009), one of the sources of digital ageism is the ageist attitudes older adults have against their *own* group. In other words, older adults can often be self-ageist, adopting negative, ageist perceptions about themselves and their peers. This is, for instance, when Ingrid is describing the experience of getting in touch with IT support services, who she feels are not adjusted to clients like her because they "speak so fast". She then refers to "being old" as a reason for asking them to speak slower. Both Anna and Ingrid suggest that in certain contexts and circumstances, older adults feel that extra help because of their age is justified, especially when unfamiliar technical issues and their solutions are involved.

Other participants in the study also demonstrated feelings of insecurity and unease around their age which they expressed as a synonym for falling behind and requiring assistance from others. As Barrie et al. (2021) suggest, the negative portrayals of older adults' digital literacy skills are often deeply ingrained in society. Ageism is often *self-acquired* and is often expressed as a sense of feeling "too old" for engagement with "new" technologies. Barrie et al. also argue that the attitudes older adults acquire about technology, and thus their potential engagement with and desire to learn more about these, are shaped by ageism within wider society which they themselves have internalised. In this study, it was the occasional or non-users of technology who expressed attitudes to their age in both problematic and typically ageist terms. By using such self-ageist stereotypes, these participants reduced, simplified and to some extent even exaggerated their relationship (both real and imagined) to and with digital technologies. Consequently, such self-ageist discourse becomes a type of self-fulfilling prophecy where participants are "too old" to bother and cannot be bothered because they feel too old. In a culture of connectivity, where engagement with technologies and online networking and maintenance of social relationships is not only considered a value but is often taken for granted, this discourse could easily render marginal older users of technology vulnerable.

We/them

Another discourse informed by the stereotypical self-ageist perception that participants in this study evoked relates to the distinction between the categories of "us" versus "them", the "old" and the "young". As Hall (2013) argues, stereotyping is a signifying practice that deploys a strategy of "splitting"

(p. 247). Namely, it divides the normal and the acceptable from the abnormal and the unacceptable. The practice of stereotyping then becomes a matter of fixing the boundaries between closure and exclusion and maintaining the symbolic order. Maintaining order in the context of the culture of connectivity often means discursively emphasising that digital culture is "young" and focused on novelty. It means, for instance, the importance of continuous updates, renewing and innovative practices. This is how Britta (75, Group 3), an occasional user, describes her children's reaction to the mobile phone she owns:

Britta: I have one like that (which is) 10 years old.
Interviewer: Yes, the one with the buttons?
Britta: Yes, and then the kids say: No, but mom, you have to get a new phone because this one is so old … it's ten years old, but I say: No, I can still make calls with it!

Britta's children have challenged her for having an "old phone", one that she herself was satisfied with since it worked and could make calls. This example illustrates, however, that the splitting between acceptable and unacceptable is not really between Britta and her grandchildren but rather between the understanding of what makes for a good mobile phone. An "old phone" is something that Britta understands as needing replacement, regardless of its functionality. This distinction between what older adults and their children do and do not value is rather sharp in the analysed material, particularly when it comes to the relationship with digital technologies. What for older adults is perceived as useful and well functioning is often considered "old" and unattractive by younger users. On the other hand, what younger users might perceive as a useful upgrade in the form of a new and "better" mobile phone, can be seen by older users as potentially threatening and problematic. There is also the possibility that older adults' more conservative attitudes towards innovation come from the self-internalised stereotypes of old age, as discussed above. This is not to say that older users are not able to benefit from innovation and innovative solutions, but rather that their understandings and experiences of digital technologies are the results of already existing attitudes, which they end up inadvertently perpetuating. Furthermore, the problem of ageism in a culture of connectivity is often reinforced when different actors do *not* consider the needs, habits, uses, values or interests of older people. This can be the result of, for instance, the technology industry and its prevalent assumptions about age.

As Rosales and Svensson (2021) suggest in their study on ageism in the technology industry, ageism is often reinforced by stereotypes of older adults and the common assumption that "most users are young, and hence that the design and development of products and services is best handled by young tech workers" (p. 87). These assumptions are also reinforced by the widespread social representation that older adults are not necessarily interested in

technology use and innovation, which to some extent, existing research has confirmed (cf. Hakkarainen, 2012). Consequently, there is a bias when the technology industry designs and markets its products and services, namely that they are developed by young people and directed towards them. This bias or splitting between "young" and "old" takes the form of differentiation between the two categories: those who "master the digital world details and those who are less familiar with them". This, in turn, "creates a dichotomous distinction between users and non-users, giving each category a distinctive narrative" (Manor & Herscovici, 2021, p. 7). When connected to age, these categories can serve as self-ageist or internalised explanatory frames and, as such, become reinforced in a fixed "us" versus "them" distinction. However, it is important to mention that these user/non-user categories can also be flexible and context embedded. They can be employed as a signifying practice to evoke different age groups' values regarding the relationship to and experience with, for instance, technological devices. They can also be employed to evoke different "others" *within* the older age group, such as the social categories of ethnicity and class, something my previous research has shown (cf. Kania-Lundholm & Torres, 2015). As such, the "we/them" category can serve to reinforce discriminatory practices – like ageism – in the culture of connectivity. Nevertheless, the participants in this study not only confirmed the presence of self-ageist discourses informed by negative stereotypes among older adults, but they also actively challenged some of the social representations and stereotypical categorisations that are made about them.

Who gets cheated online? Responding to media stereotypes

The participants in this study frequently complained about the fact that they were no longer able to purchase tickets at the train or bus station because it is now only possible to do this online via an app. Some expressed disappointment about the fact that it has become more difficult to meet a medical doctor in person because they are encouraged to consult a phone-based healthcare service first. Others questioned the relevance of carrying and using cash since most financial services and transactions now take place online. To start a discussion of media representation of older adults and their portrayal in debates related to digital technologies, during the focus group interviews, participants were shown published headlines from some of Sweden's leading daily newspapers that dealt with the issue of digitalisation and age. The headlines were published between 2013 and 2015 and read: "An older couple was denied flights and train due to new technology", "One million older adults excluded from the digital society", and "Only older adults get cheated on the net". Participants' reaction to these headlines was interesting, particularly because the phrasing implicitly referred to ageist stereotypes about older adults and new technologies.

   The headline about older adults being more vulnerable to online cheating provoked a reaction from participants in all six focus groups. The opinion

was clear that susceptibility to cheating was not a matter of old age. Participants felt that anyone could fall victim to online fraud. For instance, the occasional users Kristoffer (72, Group 2) and Leon (70, Group 2), both felt this was not an age-related issue.

Interviewer:	How do you relate to headlines like this that present older adults as excluded? Do you think it is an issue for older people?
Leon:	No. They [the fraudsters] don't care whether you are old or not.
Kristoffer:	I believe that anyone can be cheated online, you do not need to be older, young people can certainly be cheated on.

Kristoffer and Leon agreed, therefore, that online fraudsters are looking to cheat anyone, regardless of age. Ada (75, Group 6) expressed a similar opinion when she commented that the information behind those headlines must have been a "myth". Likewise, both the occasional user Ingrid (71) and the non-user Katja (78) in Group 4 suggested that young people can fall for fraudulent online claims in the same way as older people:

Ingrid:	Those who get cheated online might as well be young.
Katja:	I also think so, it could happen to anybody.

These excerpts illustrate that media headlines containing stereotypical representations of older adults as digitally vulnerable, excluded and prone to online fraud did not resonate well with participants. On the contrary, the older adults in this study distanced themselves from these representations and, to some extent, even contested them. For instance, they represented online fraud as a more general social problem and contested its association with old age. It is important to note that these contestations were expressed during the same interview situation, where participants also acknowledged the difficulties they experience with a digitalised society. This points to the fact that their experiences and understandings of digitalisation and of living in a culture of connectivity are informed by complexity and ambivalence. By distancing themselves from at least some ageist stereotypes about older adults and technology, the participants in this study have suggested that digitalisation potentially brings challenges to *all* social groups, regardless of age.

Discussion: Ageing with digital culture and living with digital ageism

Digital inclusion and participation are among the prerequisites for a well-functioning and sustainable digital society. For older adults and other social groups who struggle with the challenges digitalisation presents, Sweden's policy of widespread digitalisation has required a radical change in their ways of doing things and, to some extent, the adoption of new norms and practices.

In other words, digitalisation has obliged many older adults in Sweden to enter a new and unknown territory and culture. This means that, regardless of their digital skill level, their experience of using computers and the frequency with which they do so, all the participants in this study have experienced digital transformation to the extent that it has impacted their everyday lives. Tech-savvy or not, older users of technology must deal with digital ageism at some point.

The goal of this chapter has been to explore and understand how older adults cope with and navigate their everyday lives in a *culture of connectivity*, which, as argued earlier, is a condition characterised by a paradoxical relationship to connectivity and informed by ageist understandings of the relationship between humans and digital technologies. The two research questions addressed first, how older adults understand and experience life with digitalisation and digital technologies (RQ1) and second, how older adults respond to some stereotypical representations of older adults and digital technologies (RQ2). The analysis has shown that there are at least three discursive ways of navigating the digital reality of an (ageist) connectivity culture. First, it is by discursively employing self-ageism built on the notion that older adults and "new" technologies do not go hand in hand and that older people are not particularly tech-savvy. Second, and related to the first, is by discursively employing the "we/them" category based primarily on age, namely between "us" the older people and "them", the youth, which could possibly serve to reinforce discriminatory practices – like ageism – in the culture of connectivity. Third, navigating the culture of connectivity *also* implies discursive distancing from, at least, some of the stereotypical representations of older adults and digital technologies, particularly those based on the assumptions that older adults are more prone to online scamming as compared with other social groups and categories. Consequently, when it comes to the first research question, the analysis in this chapter illustrates older adults understand and experience life with digitalisation and digital technologies in terms of coping and dealing with this, relatively new circumstances, at least on the discursive level. This means that they cope with their everyday lives in this culture by discursively reproducing and internalising some of the self-ageist stereotypes that circulate about them, such as requiring help, assistance and support when fixing technical devices and dealing with other IT-related issues and by appropriating and reproducing the "we/them", "old/young" age category. This process where older adults appropriate some of the ageist stereotypes can be identified as part of *ageing with and in the digital culture* of connectivity.

When it comes to the second research question, namely responding to some of the stereotypical representations about older adults and digital technologies, it could be argued that evoking ageist stereotypes can be both a way of making sense of the complexity of the world and culture we live in and a way of discriminating against certain groups like older people. Within a culture of connectivity, digital ageism informs a set of discriminatory practices on both the individual- and the structural levels and assumes older adults are

not particularly "fit" for the requirements of our "connected times". However, this process of *living with digital ageism* also means that older adults can and do challenge and distance themselves from some ageist stereotypes, like the one that suggests that older adults are particularly vulnerable to online fraud and scamming. In other words, coping in a culture of connectivity implies the need to navigate between acceptance while discursively reproducing of some ageist stereotypes on the one hand and distancing oneself from them on the other. Ageing with digital culture also means that, as Wanka and Gallistl (2018) poignantly argue, the social and cultural practices of later life, including various engagements with digital technologies, and to some extent also the social construct of age itself, need to be reframed.

Conclusion

Based on the analysis and discussion in this chapter, I would argue that ageing with digital culture also implies living with digital ageism. For older people, ageing with digital culture implies the daily practice of navigating and negotiating the meaning of their relationship with digital technologies and the norms and values that come with it. It also implies that meanings are never fixed but are rather context embedded. It could also be argued that, left to itself, a culture of connectivity could expand beyond the limits of social networking sites to encompass the idea of connectivity as not only positive and desired but also as taken for granted. Connectivity also encompasses digitalisation as a socially transformational force that affects different social groups. As a normalised and publicly accepted culture, it is also a profoundly ageist culture. It is also important to clarify that, as mentioned already in the methods section, this study and its results refer to non-users and seldom occasional users only and not the entire population of older people. One could assume that perhaps proficient older users might cope differently with ageism and its consequences. Last but not least, the results discussed in this chapter should also be contextualised in light of a recent study by Ackerman and Chopik (2021), who point out the cultural variation in attitudes towards older adults. They suggest that while ageing is generally perceived as something inevitable and a part of everyone's life, it is also viewed differently around the world and in different environments. They found that countries with a collectivistic ethos were less associated with age bias than those which were highly individualistic and often fixated on youth and individual independence, a tendency which takes the form of, for instance, a strong emphasis upon maintaining a youthful appearance. Sweden is considered by some as "the most extreme country in the world" (Lindenfors, 2016) and an example of a highly individualistic and secular culture. It follows, therefore, that it is also an ageist culture. A valuable contribution of future research would be, for example, to investigate the relationship between country-specific values, the levels of digitalisation and the bias against older adults.

References

Ackerman, L. S., & Chopik, W. J. (2021). Cross-cultural comparisons in implicit and explicit age bias. *Personality and Social Psychology Bulletin*, *47*(6), 953–968. https://doi.org/10.1177/0146167220950070

Barker, M. (2008). Analysing discourse. In M. Pickering (Ed.), *Research methods for cultural studies*. Edinburgh University Press, 150–174.

Barrie, H., La Rose, T., Detlor, B., Julien, H., & Serenko, A. (2021). "Because I'm old": The role of ageism in older adults' experiences of digital literacy training in public libraries. *Journal of Technology in Human Services*, *39*(4), 379–404. https://doi.org/10.1080/15228835.2021.1962477

Beattie, A., & Cassidy, E. (2020). Locative disconnection: The use of location-based technologies to make disconnection easier, enforceable and exclusive. *Convergence*. https://doi.org/10.1177/1354856520956854

Bodner, E. (2009). On the origins of ageism among older and younger adults. *International Psychogeriatrics*, *21*(6), 1003–1014. https://doi.org/10.1017/S104161020999055X

Butler, R. N. (1969). Age-ism: Another form of bigotry. *The Gerontologist*, *9*, 243–246.

Brubaker, R. (2020) Digital hyperconnectivity and the self. *Theory and Society*, *49*, 771–780, https://doi.org/10.1007/s11186-020-09405-1

Fozard, J. L., & Wahl, H.-W. (2012). Age and cohort effects in gerontechnology: A reconsideration. *Gerontechnology*, *11*(1), 10–21.

Global report on ageism. Geneva: World Health Organization, 2021. Licence: CC BY-NC-SA 3.0 IGO.

Hakkarainen, P. (2012). "No good for shovelling snow and carrying firewood": Social representations of computers and the internet by elderly Finnish non-users. *New Media & Society*, *14*(7), 1198–1215. https://doi.org/10.1177/1461444812442663

Hall, S. (2013). The spectacle of the "other". In S. Hall, J. Evans, & S. Nixon (Eds.), *Representation* (2nd ed.). SAGE.

Hesselberth, P. (2018). Discourses on disconnectivity and the right to disconnect. *New Media & Society*, *20*(5), 1994–2010.

Kania-Lundholm, M. (2019). Slow side of the divide? Older non-users discussing social acceleration, social change and digital exclusion, special issue on Inequalities and divides in digital cultures. *Digital Media & Society*, *5*(1), 85–104.

Kania-Lundholm, M., & Torres, S. (2015). The divide within: Older active ICT users position themselves against different "others". *Journal of Aging Studies*, (35), 26–36. https://doi.org/10.1016/j.jaging.2015.07.008

Kuntsman, A., & Miyake, E. (2019). The paradox and continuum of digital disengagement: Denaturalising digital sociality and technological connectivity. *Media, Culture & Society*, *41*(6), 901–913.

Light, B. (2014). *Disconnecting with social networking sites*. Palgrave Macmillan.

Lindenfors, P. (2016). Sweden is the most extreme country in the world. *The Local*. https://www.thelocal.se/20160719/sweden-is-the-most-extreme-country-in-the-world/, retrieved 9 March 2022.

Manor, S., & Herscovici, A. (2021). Digital ageism: A new kind of discrimination. *Human Behavior and Emerging Technologies*, *3*(5), 1084–1093. https://doi.org/10.1002/hbe2.299

Mariano, J., Marques, S., Ramos, M. R., Gerardo, F., Lage da Cunha, C., Girenko, A., Alexandersson, J., Stree, B., Lamanna, M., Lorenzatto, M., Mikkelsen, L. P., Bundgård-Jørgensen, U., Rêgo, S., & de Vries, H. (2021). Too old for technology? Stereotype threat and technology use by older adults. *Behaviour & Information Technology*. https://doi.org/10.1080/0144929X.2021.1882577

McGuigan, J., & Moran, M. (2014). Raymond Williams and sociology. *The Sociological Review*, 62(1), 167–188. https://doi.org/10.1111/1467-954X.12138

Morozov, E. (2013). *To save everything, click here: Technology, solutionism, and the urge to fix problems that don't exist*. Allen Lane.

Nordqvist, E. (2019). "Delaktighet i en digital tid. En rapport från digitaliseringsrådets kansli" (Digital inclusion in digital times. The report from Agency for Digital Government). Digitaliseringsrådet.se, accessed 2022-10-26.

OECD. (2018). *OECD reviews of digital transformation: Going digital in Sweden*. OECD Publishing, Paris. http://dx.doi.org/10.1787/9789264302259-en

Olsson, T., & Viscovi, D. (2020). Who actually becomes a silver surfer? Prerequisites for digital inclusion. *Javnost – the Public*, 27(3), 230–246. https://doi.org/10.1080/13183222.2020.1794403

Peine, A., & Neven, L. (2019). From intervention to co-constitution: New directions in theorizing about aging and technology. *The Gerontologist*, 59(1), 15–21.

Pickering, M. (2015). Stereotyping and stereotypes. In A. D. Smith, X. Hou, J. Stone, R. Dennis & P. Rizova (Eds.), *The Wiley Blackwell encyclopedia of race, ethnicity, and nationalism* https://doi.org/10.1002/9781118663202.wberen046

Portwood-Stacer, L. (2013). Media refusal and conspicuous non-consumption: The performative and political dimensions of Facebook abstention. *New Media & Society*, 15(7), 1041–1057.

Prensky, M. (2001). Digital natives, digital immigrants part 1 *On the Horizon*, 9(5), 1–6.

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence*, 26(5–6), 1074–1087. https://doi.org/10.1177/1354856520930905

Rosales, A., & Svensson, J. (2021). Perceptions of age in contemporary tech. *Nordicom Review*, 41(1), 79–92. https://doi.org/10.2478/nor-2021-0021

Rosales, A., Svensson, J., & Fernández-Ardèvol, A. (2023). Digital ageism in data societies. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Russell, H. (2011). Later life ICT learners ageing well. *International Journal of Ageing and Later Life*, 6(2), 103–127.

Seals, C. D., Clanton, K., Agarwal, R., Doswell, F., & Thomas, C. M. (2008). Lifelong learning: Becoming computer savvy at a later age. *Educational Gerontology*, 34, 1055–1069.

Selwyn, N., & Gorard, J. (2005). Whose internet is it anyway? Exploring adults' (non)use of the internet in the everyday life. *European Journal of Communication*, 20(1), 5–26.

Sorrentino, P. (2018). The mystery of the digital natives' existence: Questioning the validity of the Prenskian metaphor. *First Monday*, 23(10). https://doi.org/10.5210/fm.v23i10.9434

Spillman, L. (2020). *What is cultural sociology?* Wiley.

Sutton, T. (2017). Disconnect to reconnect: The food/technology metaphor in digital detoxing. *First Monday*, 22(6). https://doi.org/10.5210/fm.v22i6.7561

Swedes and the Internet (*Svenskarna och Internet*). (2020). https://svenskarnaochin-ternet.se/rapporter/digitalt-utanforskap-2020/internetutveckling-och-uppkop-pling/, accessed: 2022-08-04.

Syvertsen, T. (2019). *Digital detox: The politics of disconnecting*. Emerald Publishing.

Van Dijck, J. (2013). *The culture of connectivity. A critical history of social media*. Oxford University Press.

Wanka, A., & Gallistl, V. (2018). Doing age in a digitized world – a material praxeol-ogy of aging and technology. *Frontiers in Sociology*, *3*, 6.

Williams, R. (1958/1989). Culture is ordinary. In R. Williams (Ed.), *Resources of hope: Culture, democracy, socialism* (pp. 3–14). Verso.

Wodak, R. (Ed.). (2013). *Critical discourse analysis*. Sage.

11 Tackling ageism in socio-technical interventions

An actor-network analysis of Digital Storytelling workshops with care home residents

Sarah Wagner and Akiko Ogawa

Digital Storytelling has been gaining interest in gerontological research to encourage social participation (Alexandrakis et al., 2020; Hausknecht et al., 2019) and intergenerational understanding (Hewson et al., 2015; Loe, 2013). Digital Storytelling involves the production of a 2- to 5-minute-long video story comprised of still images timed to the storyteller's narration as a voiceover. As a practice, Digital Storytelling was designed to enhance the storyteller's sense of agency by enabling them to become the author of their own life events (Lambert, 2013). Digital Storytelling workshops with older adults perhaps have been most impactful as education tools. When used in gerontology education, Digital Storytelling has been found to heighten students' empathy towards older generations (Hewson et al., 2015; Loe, 2013). However, older old individuals with complex care needs are typically excluded due to workshop design and location (Alexandrakis et al., 2020, p. 13; Hausknecht, 2018, pp. 489–490; Hewson et al., 2015, p. 140).

In this chapter, we examine how Digital Storytelling in care home contexts can both confront and reproduce forms of deep-seated ageism and the social imaginaries associated with later life (see Higgs & Gilleard, 2021). We reflect on Digital Storytelling workshops we conducted with six 80+-year-old care home residents in Nagoya, Japan and Victoria, British Columbia, Canada. The workshops aimed to support participants to share their life experiences and, in this way, to strengthen their sense of agency within the care home context. We draw on participant observation and evaluation interviews with workshop facilitators, staff and participants to describe how the material conditions of our Digital Storytelling workshops influenced older care home residents' levels of agency. Our interest in this chapter is to examine how a socio-technical intervention that takes participant empowerment as its aim still can be undermined by forms of age discrimination. Our analysis forges connections between key factors that influence older adults' levels of agency within socio-technical interventions.

Examining care home residents' agency in intervention studies is particularly relevant as most communication media studies in care homes have been intervention-oriented (Wagner, 2022). Moreover, studies

show that it has been challenging to meaningfully involve older adults in socio-technical interventions in general. A review of 40 empirical studies that involved older users in technology design found that the majority portrayed participants in terms of age-related deficiencies, upheld stereotyped views of older adults' technological needs and failed to provide meaningful forms of participation (Fischer et al., 2019). It thus comes as no surprise that socio-technical interventions targeted at older adults have had disappointing outcomes (Peine et al., 2015) and that their positive impacts on aims such as enhanced social engagement often are not lasting (Chen & Schulz, 2016).

By aiming to give voice to participants, Digital Storytelling has the potential to overcome the shortcomings of an "interventionist logic" (Peine & Neven, 2019). Intervention studies targeted at older adults typically address issues of physical and cognitive decline, reconfirming stereotypes about age-related deficiencies (Givskov & Deuze, 2018; Peine et al., 2015). The interventionist approach typical to ageing and technology studies not only (re-)establishes ageing as inherently negative but also positions older adults as outside of technological change and reduces socially and culturally diverse processes of ageing to what can be easily measured (Katz & Marshall, 2018; Peine & Neven, 2019). Whereas youth's technological innovations are followed and elaborated on, older adults' creative uses of and unique needs for technologies have been overshadowed by intervention-oriented studies that address stereotyped notions of old age decline. This is particularly the case in care home contexts where there have been very few everyday life studies that involve residents' perspectives (Fernández-Ardèvol et al., 2017). This trend in research agendas reflects widespread ageist ideas about the incapacity of care home residents to exercise choice or voice (Gilleard & Higgs, 2017).

The social imaginary of the care home resident as frail, inactive, and impaired starkly contrasts public discourses about successful ageing (Higgs & Gilleard, 2021). In many countries, "active", "successful" or "healthy" ageing policies have encouraged older adults to engage in physical exercise and social activities. Such policies typically target recent retirees and individuals who are physically capable (e.g., Government of B.C., 2021; Ministry of Health, Labour and Welfare of Japan, 2022) and aim to prevent the need for long-term care (e.g., Ministry of Health, Labour and Welfare of Japan, 2016b). Successful ageing paradigms have received a host of critiques as they not only reduce diverse understandings of well-being in later life to a normative standard but also invisibilise the role of social and economic inequalities in determining old age outcomes (Comunello et al., 2023; Katz & Calasanti, 2015). By placing the onus on individuals to achieve a healthy, independent old age, narratives of successful ageing may underlie or justify policies that fail to provide services for those deemed to be "unsuccessfully" ageing. That is, when old age frailty is characterised as the result of individual choices, there is a reduced social responsibility to address the very real influences

of poverty, discrimination, and health inequalities on well-being in later life. Moreover, that physical and cognitive deterioration are so strongly associated with residential care, old age care policies and practices can fail to address residents' individual social needs or recognise their social agency (Wagner, 2022).

Social isolation in institutional care has been long-recognised as a detriment to health and well-being (Cotterell et al., 2018; Prieto-Flores et al., 2011). In both Canada and Japan, the shortcomings of large institutional care settings have been gaining increasing policy attention (see Health Standards Organization, 2021; Ministry of Health, Labour and Welfare of Japan, 2016b). In Canada, numerous media reports have documented poor living conditions, neglect and emotional and physical abuse in institutional care (Estabrooks et al., 2020). While there has been growing interest in small home-like settings (Wada et al., 2020), publicly funded long-term care sites in British Columbia on average have over 90 beds (own calculation based on data provided in Office of the Seniors Advocate in B.C., 2021). In Japan, home-like, community-based care models have been a key component of the long-term care system since its reform in 2000 (Ministry of Health, Labour and Welfare of Japan, 2016a). Small-scale sites, often housing fewer than 20 residents, are integrated with other community-based services and day programs. This provides a more home-like setting coupled with opportunities for residents to regularly leave the facility, which contrasts the large, institutional care settings typical in British Columbia.

The workshops discussed in this chapter were conducted in three very different care settings: a small privately run care home on the outskirts of Nagoya; a large, publicly funded long-term care site in Victoria, British Columbia; and a mid-sized, high-end care home in the city centre of Nagoya (see Table 11.1). The workshops also span two very different long-term care systems with diverging strategies to promote social engagement. Whereas the long-term care system in Japan pairs small, home-like settings with community-run day programs, the funding system in British Columbia delivers on-site recreational programs at typically larger care settings. Rather than comparing long-term care contexts or workshop outcomes, this chapter *juxtaposes* (Marcus, 1995) three uniquely designed workshops with the intent of drawing connections that may have relevance across institutional and cultural settings. By bringing together the unique challenges faced in these contextually diverse workshops, we develop much-needed insights into how care home residents can be included meaningfully in socio-technical interventions. More specifically, our analysis outlines how the empowering potentials of Digital Storytelling are contingent on participants confronting forms of age discrimination that reverberate through technologies, care services, facilitators' expectations, and participants' own self-perceptions.

Methodology

Workshop design

We used a collaborative Digital Storytelling method designed by Ogawa and colleagues (Ogawa & Ito, 2010; Ogawa & Tsuchiya, 2017) that weaves together the participant's story through a series of ice-breaking and discussion sessions. The workshops are designed to support individuals who find it difficult to narrate their life experiences or voice their opinions. The facilitator works with the participant to uncover the "seeds" of stories such as untold experiences, frustrations, and small questions. The digital story results from the discussion and interview sessions of the "pre-story space", or the portion of the workshop where the facilitator and participant collaboratively develop a story by piecing together the participant's narrations. The completed story is owned by the storyteller, who chooses if and how it will be shared. The workshops conclude with a preview event where participants are invited to share their stories. In this project, we catered the format of our workshops (summarised in Table 11.1) to participants' preferences and staff needs at the care sites.

Workshop 1 was conducted over three weeks in November 2020 at a small residential facility housing 16 residents on the outskirts of Nagoya City in Japan. The workshop involved three female residents: 82-year-old "Kiyama-san", 95-year-old "Aikawa-san" and 88-year-old "Hamasaki-san".[1] Each participant was paired with an undergraduate informatics student. The workshop was conducted through three in-person meetings and one online meeting and concluded with a preview event. The preview

Table 11.1 Characteristics of the Digital Storytelling workshops

	Workshop 1	*Workshop 2*	*Workshop 3*
Location of care home	City centre Nagoya, Japan	City centre Victoria, Canada	Suburbs Nagoya, Japan
Size of care home	16 beds	115 beds	48 beds
Workshop format	Blended (Face-to-face meetings + video calls)	Virtual (Phone calls + video calls)	Virtual (Video calls)
Participants[1]	Kiyama-san, 82 years Aikawa-san, 88 years Hamasaki-san, 95 years	Theodore, 83 years Rupert, 83 years	Inoue-san, 88 years
Facilitators	3 undergraduate students	First author	3 graduate students

was attended by six residents, three staff members, the three facilitators, and the authors. The participants' stories were shown on a large television screen and the facilitators and participants were invited to provide comments.

Workshop 2 was conducted in an online format in January and February 2021 with two 83-year-old men ("Theodore" and "Rupert") residing at a 115-bed care facility in Victoria, BC, Canada. The first author facilitated the workshop. Meetings were conducted individually by both phone call and video call. Participants' stories were shared in two preview events. The first preview was hosted at the care site in Canada and was attended in person by a staff member and four residents. In addition, three of the participants' family members, the authors, and two graduate students at Nagoya University attended online. A second preview was hosted online and combined the stories from Workshops 2 and 3.

Workshop 3 was conducted online in February and March 2021 with an 88-year-old man residing at a 48-bed care facility in central Nagoya, Japan. This workshop paired one participant with three graduate informatics students. The facilitators and authors met with the participant and a staff member by video call over three meetings. The participant's digital story was presented at an online international preview event in March 2021 and was attended by facilitators, Workshop 2 and 3 participants, staff from Inoue-san's facility, the authors, and an academic colleague.

Actor-network approach

Research approaches from Science and Technology Studies have earned attention in gerontology fields as a middle ground between gerontechnology, with its focus on technology design, and the social and cultural approaches of ageing studies (Peine et al., 2015). Actor-network theory (ANT), best known for its equal ontological treatment of human and non-human actors, seeks to understand the mechanics of power and agency (Latour, 2005; Law, 1992). From an actor-network perspective, the task of social inquiry is to trace *how* material elements interact to produce what we typically take for granted as given objects or social actors (Latour, 1996). Rather than starting with an object of inquiry, such as an institution or a group of social actors, and looking at its effects, ANT wants to understand how objects continually gain reality through their material attachments. An actor-network approach is about examining in detail the interactions of material elements and the ways in which they (re-)produce the relative influence of different actors such as humans, discourses and technologies.

In engaging with an actor-network analysis in this research, we examine how the material components of our workshops – from human contact and spoken words to handwritten notes and digital interfaces – produced and/or destabilised the participants as storytellers. In this way, we intend to build

an understanding of the material conditions of participant agency within the workshops. The ANT approach, most importantly, instructs our analysis in two ways. First, it asks us to overcome our ontological judgments about what kinds of things can impact the workshop outcome. In this respect, we look beyond human actors to examine the roles of screens, video-calling architectures, and notepads. Second, it provides a material way of understanding the impacts of context or space. In an actor-network approach, the "context" has reality insofar as it acts within the network. Along these lines, we do not disregard the workshop room as a background setting but trace the actions and interactions of the room's elements. In our results section, these interactions take centre stage and frame much of our analysis. By examining the relations between elements of the workshops' technologies, built environments, and human interactions, we aim to develop a rich understanding of the factors that (dis-)enabled participants to influence the workshop process.

Research methods

Our analysis draws on four types of data. (1) Participant observation notes. The first author attended all in-person and virtual sessions and took detailed notes about the actions and interactions of participants, facilitators, staff, technologies, built environments, and material objects. (2) Evaluation interviews with participants. Facilitators conducted short interviews (5 to 20 minutes) with participants following the previews. Participants were asked to reflect on what they had learnt and valued about the workshop, as well as the challenges or difficulties they had experienced. (3) Facilitator reflections. Student facilitators submitted an evaluation sheet following the preview. Student facilitators also partook in two planning meetings with the authors, where their reflections on the story-making process were recorded. The first author's reflections as the facilitator of Workshop 2 were included in the participant observation notes. (4) Staff reflections. Staff members partook in short evaluation interviews (3 staff from Workshop 1) or completed a short, written questionnaire (8 staff from Workshops 2 and 3). Our analysis draws on the reflections of staff, facilitators, and participants, as well as detailed observations about human interactions, devices, and built environments in the workshops. All research documents were analysed using an inductive, thematic coding approach. The data analysis software MAXQDA (VERBI Software, 2019) was used for organizational purposes.

In what follows, we arrange our findings across two parts. The first part examines tensions in the story-making process with a particular interest in the interactions of the workshops' material components, while the second part considers evaluations of the workshop outcomes. The discussion section brings these findings together to analyse the mechanisms of age discrimination within the workshops.

Co-creating a story

Tensions over story content

Most facilitators and viewers expected older adults to produce triumphant stories about their past achievements. Most participants, however, wanted to talk about economic hardships, ill health, death, family problems, or the difficult experience of moving into long-term care. For example, Workshop 1 participant Kiyama-san mostly spoke about her economic troubles and the difficulties she had in her youth trying to find enough food. The facilitator, however, was most interested in her happy recollections of family gatherings. In our planning meetings, the other student facilitators also explained they were hesitant to focus the stories on hardships. The experiences described by participants in Workshop 1's initial meeting conflicted with what the facilitators were hoping to represent. In the subsequent meetings, Workshop 1 facilitators elicited further details about the topics that participants wanted to talk about and the stories they created drew connections between the participants' past hardships and their present-day situation.

Following Workshop 1's preview event, staff commented that the stories were "darker" than they had expected. A male staff member explained,

> It would have been nice to have something bright and cheerful. The stories were maybe a bit heavy. It would be good to add some colourful photos instead of old black and white photos which make us feel down. … The participants' narration sounded very serious but not everything was so dark and heavy. I think it would be good to focus on some happy experiences and include those in the story.

In Workshop 3, the facilitators also wanted to emphasise happy memories and achievements from the participant's youth. After the first meeting, each facilitator had in mind a different achievement they felt should be the focus of the story. Yet, Workshop 3's participant, Inoue-san, had also talked about his hardships in the present, the death of his wife, the difficult decision to move into long-term care, and his fear of dying alone. The story was lengthened in the second meeting as Inoue-san wanted the story to bring together his difficulties with his achievements. One of the facilitators explained, "[Inoue-san] had a strong will, and so when he felt uncomfortable, he clearly said, 'No, no, I don't want it that way,' so I think we made a story that was true to his intentions".

Participants in Workshop 2 also expressed clear ideas on what they wanted to portray in their stories. Theodore and Rupert wanted to draw attention to their hardships to show resilience. They also wanted to share experiences from their everyday lives in long-term care and their stories addressed what love is like in one's later years and the experience of social isolation. At the preview, where participants showcased their stories, an audience member

commented, "In our society we don't really think about the really old people. This [the Digital Storytelling] is really important to talk about what their lives are like in long-term care". The stories created by Theodore and Rupert did not present the expected legacy stories. Rather, their stories brought attention to later life frailty, and Theodore's story directly confronted the death taboo. He explained, "The end result, the message, is actually about my last days sort of thing".

While some participants wanted to use their digital stories to talk about dying, this generated discomfort and tension in the pre-story space. For example, Workshop 3 facilitators did not want to include imagery that was symbolic of death, such as a photo of falling leaves. A facilitator explained, "I am hesitant to put such a negative image that reminds us of death in an 80-year-old's story". Being able to confront and challenge taboos around death was an empowering moment for Theodore. Getting experiences such as these included in the story required participants who were engaged in the story-making process.

Engaging participants through person-person and person-object relationships

Sometimes, it was challenging for the facilitators to develop rapport with the participant and to understand their experiences. This was particularly the case in Workshop 1, where the participants often did not tell linear narrations, nor did they always remember what was discussed at previous sessions. A Workshop 1 facilitator explained that she found it difficult to understand the participant, Hamasaki-san, as she described events out of order and moved between topics unexpectedly. Yet, at the same time, the facilitator explained that she appreciated Hamasaki-san's efforts to explain in detail what life was like in her youth. In the in-person meetings, Hamasaki-san used dramatic hand gestures and leaned in close to the facilitator to try to help the facilitator understand her experiences. Her hand gestures added a sense of ownership over her words, and she repeatedly and enthusiastically talked about "my digital story". The online meeting did not change her level of engagement; she used hand gestures to describe her points, leaned in close to the screen, and contradicted the facilitator when she did not agree or wanted different photos.

While Hamasaki-san brought energy and contradiction to all phases of the story-making, another participant of Workshop 1, Kiyama-san, entered each meeting with a low level of engagement. She gave short, quiet replies to the facilitator and often looked away or down. As the meetings progressed, it was her interactions with material representations of her storytelling that engaged her. When the facilitator wrote Kiyama-san's experiences on sticky notes, she reached out to touch the ones of interest. As the story started to take on a material form, she became more invested and began to elaborate on her experience, speaking louder and more freely. Later in the meeting,

she held the facilitator's phone as he showed her photos of his own family. As Kiyama-san touched the photo of the facilitator's sister on the screen, her understanding of the facilitator was heightened, and they continued to talk freely beyond the session's end.

In the latter half of an in-person meeting in Workshop 1, one end of the room was loud and lively as Hamasaki-san and Kiyama-san teased and contradicted the facilitators, while at the other end of the room, Aikawa-san and her facilitator built up a quiet, emotive bond while looking through a photo book of a famous festival in her hometown. One of the facilitators later reflected on the story-making process in Workshop 1 as follows.

> Each facilitator had a completely different view on the information given and a different way of asking questions. I feel that if we had been assigned to work with different people, their stories would have been completely different.

How engaged participants were in the meetings and how active they were in presenting their own positions and standpoints shaped the level of agency they had in the co-creation of their story. Participant engagement was impacted not only by person-to-person relationships but also by material manifestations of the story and by interactions with other participants and staff. In addition to the touching of notes and papers, interactions with other participants incited Kiyama-san to engage in the project. She expressed nervousness along with laughter as she looked ahead to her story being shared in front of the other participants. Similarly, for Workshop 3 participant, Inoue-san, the opportunity to describe his life in front of an audience animated him. He smiled and chatted freely as he introduced the student facilitators and authors to objects in his room, his books, a photo of a festival, and his large television and computer. Surrounded by these objects, Inoue-san had the confidence to voice his opinions.

As in Workshop 3, Workshop 1 participants interacted with material objects in their room during the online meeting, and this helped them to engage in the video call. As in the in-person meetings, Workshop 1 participant, Kiyama-san, became more involved in the online meeting after she handled physical papers related to the story. Staff helped her take out a few pages of printed personal photos. She waved the papers around as she spoke, leaned in closer, and showed a photo of herself to the screen. While she had started the meeting sitting far back from the screen, quietly staring ahead, her physical interaction with printed photos prompted her to focus on the screen and chat, joke, and even interrupt the facilitator to provide further information. The touching of photos was an important way for participants to connect with the story and express their opinions. While Workshop 1 participant, Aikawa-san, did not have any printed photos, she touched the photos displayed on the tablet screen as she informed the facilitator that the images of fishing nets were not the right type.

Having staff present during the online meetings provided an opportunity for in-person interactions that helped to refocus the participant on the activity. Aikawa-san, for example, sat very close to the staff member, with shoulders touching, which seemed to provide her with a sense of support, while Kiyama-san teasingly batted her papers at the staff member. These interactions created a relaxed and supportive physical environment within which participants felt they could express their opinions or even contradict the facilitator. In Workshop 2, staff were not present at the meetings, and the participants' levels of engagement relied more on their interactions with the facilitator and on the mode of communication. While Workshop 2 participant, Rupert, spoke more freely over the phone, Workshop 2's other participant, Theodore, was more engaged and open over video call. The unique ways these two participants interacted with these technologies are discussed in the next section.

Negotiating remote contact

Workshops 2 and 3 involved participants who regularly used the Internet. Workshop 2 participant, Theodore, for example, had bought a tablet in response to the social distancing measures. He explained,

> I was a dinosaur in the area of electronics and so I've only had this one for a couple of months now, but I wasn't afraid of it. I just didn't understand any of it. So I just put it aside and just waited thinking if I don't understand it, I don't need it. And that's when I realized that I didn't pay attention to what these things really were, and, I tell you, what an advantage it can be … I'm having a whole lot of fun with it. It opens up a whole new thing for me. I don't get bored around here anymore. … I can make my own activities. Like this morning, I'm just playing Crib [Cribbage] with the machine.

Theodore's tablet allowed him to see old video clips, play games, listen to music that he hadn't heard in years, and talk with his daughter. While both Workshop 2 participants had their own Internet-enabled devices, the workshop began with a phone call to allow for direct contact with participants without burdening staff time. The phone call with Theodore, however, also required staff assistance. Theodore usually communicated with others using his tablet and was not accustomed to receiving phone calls. After the phone call connection was made with staff help, the first meeting covered topics introduced by the facilitator. Theodore's descriptions over the phone were more factual than emotional. For the second meeting, staff helped Theodore set up a Zoom video call. When speaking by video call, Theodore reflected intimately on his life events and took direction in leading the conversation. Later, Theodore explained that video call was a more intimate form of communication for him than phone call and that he had never liked the phone.

The other Workshop 2 participant, Rupert, regularly used Skype to call family members, so a Skype call was planned for the second meeting. However, this turned out to be challenging as Skype requires users to first share their profiles. Rupert's tablet was not set up to receive emails, and his Skype profile was not connected to the email address that he knew. After many failed attempts, the second meeting was also conducted by phone call.

In both phone call meetings, Rupert spoke quickly and unfiltered, and he shared his emotions. For the third meeting, staff helped Rupert to start a Zoom call on his tablet. The mood of the conversation changed significantly. Rupert was more formal and composed; he spoke slowly and more factually. Later he explained that he was "learning the habit of speaking carefully, deliberately" as he was concerned that his way of speaking was not understandable. The Zoom app changed the interaction between the participant and facilitator as it showed the participant himself, a man with Parkinson's. Rupert explained, "I am standing there, with these hands shaking, twitching around and talking... [On the Zoom call] I can see myself and see my own words".

Workshop 1 participants also reacted to the self-objectification brought about by digital devices. When meeting in person, the participant Hamasaki-san enjoyed hearing the facilitator tell her story in front of the group; she laughed and joked with staff and provided more details with pride. She was not, however, interested in hearing her own voice played back to her. She agreed to say only a few short phrases for the recording. The facilitator explained, "The story we made is a fusion of [Hamasaki-san]'s voice and my voice. By using the two voices together, I feel that I was able to create a work that reminds people of both the present and the past".

Digital devices presented new forms of interacting with oneself and with others and created new kinds of challenges when trying to connect. All video calls in this research required staff mediation. In Workshop 2, staff set up the Zoom calls with a Meeting ID provided by the facilitator and then left the room. This allowed for long, rambling conversations, and with Theodore, a level of openness and warmth as in a face-to-face meeting. He explained, "We're communicating from this distance from Canada to Japan … and it's just like you're here in the room when we're talking". Yet, without staff help, Theodore could not connect by Zoom and this was a task not recognised in staff workload. The coordinating staff member explained,

> I thought that I would have to sit with both [Theodore] and [Rupert] during their Zoom calls with Sarah and I kept thinking 'How am I going to fit that into my daily schedule?!' Honestly though, it flowed so easily … and it just became part of my day-to-day tasks for the past month.

In Workshops 1 and 3, staff attended all online meetings. Staff presence created a different kind of impact on participant engagement; it provided in-room familiarity and physical contact, as discussed above. Yet, staff presence

also limited opportunities for the facilitator and participant to build a unique relationship. Moreover, staff presence put limits on the conversational flow as meetings were scheduled with pre-defined time limits. Staff at all three care homes had tight schedules that did not include designated time for digital support. A staff member of Workshop 2's care home explained,

> The main challenge that I can see happening for this kind of activity in a long-term care setting would be there not being a person to ensure that these Zoom calls happen and can be scheduled and set up for the resident. Most likely the Resident won't be able to connect to Zoom themselves or remember how to do it each time, so you would need to have that one staff member be diligent and efficient.

Promising outcomes

Redefining oneself

Some participants felt the workshop incited them to develop a new perspective on their own lives. Rupert explained, "It clarified things to formulate my impression of everything that's happened. It has been very good for me to put the things in words that I wanted to talk about and have thought about. I'm very happy, very glad to have made that video". Rupert's story sent the message to others "not to give up, not to despair". He explained,

> You know, your life becomes whittled down, so it's like you're losing freedom of all kinds. If you want to go out and take a walk, you can't do that. But for fresh air, there's a little garden here I go to. … I'm able to find things to do here, meaningful things to do. Exercise classes. Gradually things are starting to come back in again, in spite of the close down, the lockdown, here. So, I feel optimistic.

Sending his message to others helped him to find meaning in his own life events and to look ahead with optimism. Similarly, a Workshop 1 facilitator explained about the participant, Kiyama-san, "It was interesting that [Kiyama-san] felt that she could learn more about her own life by listening to her [own] story". While some staff felt the stories were too "dark and heavy", as discussed above, others described the importance of reminiscing for understanding oneself. The workshops provided a space for residents to reflect on the difficult memories they usually do not have an opportunity to talk about. Staff explained,

> The students were listening to stories that we don't usually hear about. The residents were telling them things they don't talk about with us. … It's good now to see that they are thinking about such things, and it also makes the residents themselves feel nostalgic.

Aikawa-san reported that the most valuable part of the workshop for her was the nostalgia she felt. While Aikawa-san was happy to share her story at the preview, it was deleted thereafter upon the request of family members who did not want to bring attention to her hardships. The story confronted her family's expectations for a positive, legacy story. Aikawa-san, however, appreciated the opportunity to reflect on her past and share her experiences. She explained, "I remembered about the past. It made me nostalgic. Tears came to my eyes".

While the nostalgia Aikawa-san felt impacted her significantly, other participants reported that the story-making process had little impact on their own thinking or emotional state. Hamasaki-san explained, "In this activity in general, it was good to look back and remember the old days. There was no change in my thinking during the activity, but I felt nostalgia telling my story about fish". Similarly, Theodore explained, "I just expressed what I feel and have seen about my past and so on. So, it hasn't really had any change in my thinking here or anything". Theodore explained that he regularly reflects on his own life – "I have been reminiscing, and that sort of thing, nostalgia" – so the story-making process did not bring up new emotions or thoughts.

Influencing others

What was important about the workshop for Theodore was the opportunity to share his message with others. He explained, "It was more about bringing it out, you know what I think about into the open". As discussed above, his story influenced audience members as it made them stop to think about everyday lives in long-term care and confront their own ideas about death. The story also had an emotional impact on his family members at the preview. He explained, "They [his daughters] seemed to really enjoy it. [One of his daughters] was moved to tears".

As Theodore, Rupert enjoyed the opportunity to influence others. He explained,

> [In the video] I was bringing encouragement to people when my whole body was moving and twitching around. It's very strange … A Parkinson's guy twitching around and telling you to be optimistic and positive. I think it makes an impression on people.

Rupert had been worried that people would not be able to understand him: "I am pleased with the impression it had on other people. Everybody else had understood me. I thought I was not speaking very coherently, but apparently, I was". Being able to see his message understood and have an impact on others gave Rupert confidence. He spoke with enthusiasm and pride about his story. Other participants also gained energy, which was noted by staff. For example, a staff member from Workshop 3 explained, "[Inoue-san's] voice and way of talking is more energetic now [since the workshop]".

The most impactful part of the stories for a Workshop 1 staff was their portrayal of the diverse personal histories of care home residents.

> There's a massive difference between being 98 and being 70. You know just how the quality of life was different in people's childhoods, and that was truly hard for the students [facilitators] to understand ... Most people will think that 98 is about the same as 80... It makes you realize that we tend to think of the elderly as a uniform group.

Other staff from Workshop 2 and 3 reported that the stories impacted their own way of thinking. For example, Workshop 2 staff explained, "I learnt that life is too short and to be more grateful for life. To be able to wake up each day, be healthy and breathe".

Deepening connections

Some staff felt they could understand the participants better after seeing their stories. A staff member who watched Inoue-san's story explained,

> I learned about his feelings and love for his wife and the reason why he decided to come to the facility. I know that he buys flowers every week and placed them on his wife's grave, but I didn't realize his love for her. Watching this video, I was reminded that each resident has their own history. ... Now that I know more about his life, I will be able to talk to him deeply and take better care of him.

Similarly, another staff from Workshop 3 explained, "I'm sure I'll talk to [Inoue-san] much more than before. Also, I came to admire him. So, we'll be able to have a better conversation with deeper understanding". For a staff member who attended Workshop 1's preview, the stories created a feeling of shared reminiscence: "I liked it a lot as we were able to look back on the memories together and it felt like we were able to share them together".

Discussion

The digital stories granted new forms of agency to participants within the care home context: participants recognised their own capacity as storytellers, and staff developed an understanding of participants' subjective viewpoints. The workshops resulted in stories that were influential, and that made participants feel they could influence others. By authoring their own life events, participants showed the uniqueness of both their life experiences and their present-day needs. In this way, their stories confronted the pervasive ageist portrayals of care home residents as uniformly frail and void of social desires (see Gilleard & Higgs, 2017). There were, however, some limitations on participant involvement in the pre-story space. In this discussion section,

we draw attention to three types of interactions that destabilised participant agency within the workshops.

First, facilitators had their own expectations for what older adults *should* express in a story. "Legacy" stories that account the individual's life achievements are common outcomes in Digital Storytelling projects with older adults (Hausknecht et al., 2019). When participants' stories touched on negative sentiments and experiences, facilitators wanted to talk about happy events and viewers wanted more colourful and cheerful photos. Benevolent forms of ageism, such as simplified explanations and "thoughtful" decision-making on one's behalf, are common in care home contexts (Lenchuk & Swain, 2010). From an outside perspective, creating a legacy story is an important end-of-life achievement, but from the perspective of the participant, storytelling is something to experience – an opportunity to re-experience and communicate subjectively significant and often difficult sentiments and worries. Storytelling about negative circumstances often results in nostalgia – a positive feeling which brings subjective pleasure (Alexandrakis et al., 2020). While participants sought out this opportunity, their subjective interests for their stories were at times downplayed or overridden. As Gilleard and Higgs (2017) point out, care home residents' capacity for voice and choice is undermined by widely held stereotypes about cognitive decline and impairment. In this research, residents' abilities to lead the story-making process were further limited by the inaccessibility of video-making software due to the short timeframe and mostly online format of the workshops. Future work would benefit from a longer-term, in-person format to enable residents to have direct involvement with video-making technologies.

Second, online communication within the workshops required staff mediation. The communication devices available to participants created a series of challenges that restricted participants from spontaneously contacting facilitators. Video-call applications require profiles or Meeting IDs to be shared and entered within the app's system. Cordless phones would not connect unless a button was pushed, but with another phone, that same button, if pushed, could disconnect the incoming call. Staff support was needed but also limited by staff work schedules and funding policies that do not designate staff hours for technology support. Government funding programs did not cover basic communication services at the care homes, such as Internet access and personal telephone connections, nor did they cover staff support with digital devices. As long-term care is strongly associated with physical and cognitive decline, government funding for residential care tends towards managing dependency rather than recognising and fostering residents' social agency (Wagner, 2022). In our online workshops, the lack of funding for communication technology support in residential care put limitations on the time length and spontaneity of communications with residents, revealing the everyday challenges residents face to connect with those outside the care home. This speaks to the need for more inclusive communication support policies to counter the digital and social exclusion of care home residents and, furthermore, reveals

the systemic forms of ageism at play in policy contexts where active ageing and old age care prevention are a priority (e.g., Government of B.C., 2021; Ministry of Health, Labour and Welfare of Japan, 2016b, 2022).

Third, the technical architecture of video calls brought to the forefront participants' own negative conceptions of old age, frailty, and disability. In the era of selfies (Souza et al., 2015), it is not surprising that video-calling services default to "show self" mode. Interacting by video call becomes a conversation between the self as subject and object. The self-objectification brought about by digital devices reduced participants' confidence and limited their involvement in workshop discussions. For example, Rupert was cautious when talking over video call because he could see himself "a Parkinson's guy twitching around", and Hamasaki-san did not want her story told by an old voice but a young one. Digital playbacks confronted participants with representations of themselves and their own ageist and ableist assumptions. This brought about reservations and a reduced sense of confidence during the story making phase but presented an opportunity for the revaluation of an aged self at the preview event. In the final story, Rupert no longer saw his aged, disabled body as deficient or flawed; instead, he felt that this was precisely what brought power to his message.

To achieve meaningful outcomes, participants first needed to influence the story-making process through their mediated interactions with digital devices. This required active engagement in the pre-story meetings. For some participants, being able to physically touch the story heightened their involvement in the project. As the story gained some "durability" (Law, 1992) as it was recorded on notes and papers, this incited participant engagement. For other participants, the presence of a staff member or familiar objects in the room gave them the confidence to contradict the facilitator. In other cases, it was interactions with a larger group that energised the participants or a bond with the facilitator that made them feel comfortable enough to pivot the discussion. When material conditions engaged participants in the discussions, they could choose photos that were meaningful for them, reject the story title, or get the facilitator to understand and incorporate experiences that make younger generations uncomfortable. Through these kinds of actions in the pre-story space, the resulting stories confronted viewers' expectations and, in this way, positively redefined the agency granted to participants.

Conclusion

In this chapter, we examined how Digital Storytelling – a socio-technical intervention aimed at participant empowerment – can both reproduce and confront ageist ideas about the "fourth age" (Higgs & Gilleard, 2021). Within the residential care settings of this research, discriminatory stereotypes about care home residents, whether evident in funding policies or upheld by workshop facilitators and participants themselves, worked to limit and undermine participants' levels of agency within the Digital Storytelling workshops. The

empowering potentials of Digital Storytelling were contingent on participants negotiating and confronting the facilitators' expectations for story content, the systemic forms of social and digital exclusion that limited participant involvement, and their own negative perceptions about old age. Where socio-technical interventions are the focus of communication media research in care homes (Wagner, 2022) and are plagued by stereotyped views of older technology users (Fischer et al., 2019), this chapter draws attention to the power differentials at stake for older participants. Care home residents' levels of agency within the workshops were shaped by diverse and individuated interactions with the material components of the pre-story space. The task at hand for socio-technical interventions is to create combinations of devices, built environments, and facilitators that engage older participants, legitimise their contradictions and incorporate their inputs into the intervention's digital practices.

Funding acknowledgement

Note

1 Participant names have been changed to preserve confidentiality.

References

Alexandrakis, D., Chorianopoulos, K., & Tselios, N. (2020). Digital storytelling experiences and outcomes with different recording media: An exploratory case study with older adults. *Journal of Technology in Human Services*, 1–32. https://doi.org/10.1080/15228835.2020.1796893

Chen, Y.-R. R., & Schulz, P. J. (2016). The effect of information communication technology interventions on reducing social isolation in the elderly: A systematic review. *Journal of Medical Internet Research*, *18*(1), e18. https://doi.org/10.2196/jmir.4596

Comunello, F., Mulargia, S., & Iericitano, F. (2023). "Forever young?" Digital technology, ageism and the (non-) ideal user. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Cotterell, N., Buffel, T., & Phillipson, C. (2018). Preventing social isolation in older people. *Maturitas*, *113*, 80–84. https://doi.org/10.1016/j.maturitas.2018.04.014

Estabrooks, C. A., Straus, S. E., Flood, C. M., Keefe, J., Armstrong, P., Donner, G. J., & Wolfson, M. C. (2020). Restoring trust: COVID-19 and the future of long-term care in Canada. *Facets*, *5*(1), 651–691. https://doi.org/10.1139/FACETS-2020-0056

Fernández-Ardèvol, M., Sawchuk, K., & Grenier, L. (2017). Maintaining connections: Octo- and nonagenarians on digital "use and non-use". *Nordicom Review*, *38*(1), 39–51. https://doi.org/10.1515/nor-2017-0396

Fischer, B., Peine, A., & Östlund, B. (2019). The importance of user involvement: A systematic review of involving older users in technology design. *The Gerontologist*, *60*(7), 513–523. https://doi.org/10.1093/geront/gnz163

Gilleard, C., & Higgs, P. (2017). An enveloping shadow. The role of the nursing home in the social imaginary of the fourth age. In S. Chivers & U. Kriebernegg (Eds.), *Care home stories: Aging, disability and long-term residential care* (pp. 229–246). Transcript Verlag.

Givskov, C., & Deuze, M. (2018). Researching new media and social diversity in later life. *New Media and Society*, *20*(1), 399–412. https://doi.org/10.1177/1461444816663949

Government of B.C. (2021). *Social connections*. https://www2.gov.bc.ca/gov/content/family-social-supports/seniors/health-safety/active-aging/social-connections

Hausknecht, S. (2018). The role of new media in communicating and shaping older adult stories. In J. Zhou, & G. Salvendy (Eds.), *Lecture notes in computer science* (pp. 478–491). Springer.

Hausknecht, S., Vanchu-Orosco, M., & Kaufman, D. (2019). Digitising the wisdom of our elders: Connectedness through digital storytelling. *Ageing & Society*, *39*(12), 2714–2734. https://doi.org/10.1017/S0144686X18000739

Health Standards Organization. (2021). *Developing a new national long-term care services standard*. https://longtermcarestandards.ca/

Hewson, J., Danbrook, C., & Sieppert, J. C. (2015). Engaging post-secondary students and older adults in an intergenerational digital storytelling course. *Contemporary Issues in Education Research*, *8*(3), 135–142.

Higgs, P., & Gilleard, C. (2021). Fourth ageism: Real and imaginary old age. *Societies*, *11*(1), 1–7. https://doi.org/10.3390/soc11010012

Katz, S., & Calasanti, T. (2015). Critical perspectives on successful aging: Does it "appeal more than it illuminates?" *The Gerontologist*, *55*(1), 26–33. https://doi.org/10.1093/geront/gnu027

Katz, S., & Marshall, B. L. (2018). Tracked and fit: Fitbits, brain games, and the quantified aging body. *Journal of Aging Studies*, *45*, 63–68. https://doi.org/10.1016/j.jaging.2018.01.009

Lambert, J. (2013). *Digital storytelling: Capturing lives, creating community* (4th ed.). Routledge.

Latour, B. (1996). On actor-network theory: A few clarifications. *Source: Soziale Welt*, *47*, 369–381.

Latour, B. (2005). *Reassembling the social: An introduction to actor-network-theory*. Clarendon.

Law, J. (1992). Notes on the theory of the actor-network: Ordering, strategy, and heterogeneity. *Systems Practice*, *5*(4), 379–393. https://doi.org/10.1007/BF01059830

Lenchuk, I., & Swain, M. (2010). Alise's small stories: Indices of identity construction and of resistance to the discourse of cognitive impairment. *Language Policy*, *9*(1), 9–28. https://doi.org/10.1007/s10993-009-9149-4

Loe, M. (2013). The digital life history project: Intergenerational collaborative research. *Gerontology & Geriatrics Education*, *34*(1), 26–42. https://doi.org/10.1080/02701960.2012.718013

Marcus, G. E. (1995). Ethnography in/of the world system: The emergence of multisited ethnography. *Annual Review of Anthropology*, *24*, 95–117.

Ministry of Health, Labour and Welfare of Japan. (2016a). *Long-term care insurance system*. https://www.mhlw.go.jp/english/policy/care-welfare/care-welfare-elderly/dl/ltcisj_e.pdf

Ministry of Health, Labour and Welfare of Japan. (2016b). *Jigyō no mokuteki kaigo yobō [Project objectives; Nursing care prevention system]*. https://www.mhlw.go.jp/file/06-Seisakujouhou-12300000-Roukenkyoku/hukyuutenkai.pdf

Ministry of Health, Labour and Welfare of Japan. (2022). *Kōreisha no hō no genki o sasaeru [Supporting the energy of the elderly]*. https://kayoinoba.mhlw.go.jp/

Office of the Seniors Advocate in B.C. (2021). *British Columbia long-term care directory*. https://www.seniorsadvocatebc.ca/app/uploads/sites/4/2021/12/LTCD2021-Summary.pdf

Ogawa, A., & Ito, M. (2010). Monogatari wo tsumugidasu Digital Storytelling jissen: Media Conte workshop no kokoromi [Digital Storytelling to weave individual stories: An example of the Media Conte workshop]. *Shakai Johogaku Kenkyu*, *14*(2), 115–128.

Ogawa, A., & Tsuchiya, Y. (2017). From the pre-story space: A proposal of a story weaving method for digital storytelling. In M. Dunford, & T. Jenkins (Eds.), *Digital storytelling* (pp. 139–154). Palgrave MacMillan.

Peine, A., Faulkner, A., Jæger, B., & Moors, E. (2015). Science, technology and the "grand challenge" of ageing: Understanding the socio-material constitution of later life. *Technological Forecasting and Social Change*, *93*, 1–9. https://doi.org/10.1016/j.techfore.2014.11.010

Peine, A., & Neven, L. (2019). From intervention to co-constitution: New directions in theorizing about aging and technology. *The Gerontologist*, *59*(1), 15–21. https://doi.org/10.1093/GERONT/GNY050

Prieto-Flores, M.-E., João Forjaz, M., Fernandez-Mayoralas, G., Rojo-Perez, F., & Martinez-Martin, P. (2011). Factors associated with loneliness of noninstitutionalized and institutionalized older adults. *Journal of Aging and Health*, *23*(1), 177–194. https://doi.org/10.1177/0898264310382658

Souza, F., de Las Casas, D., Flores, V., Youn, S. B., Cha, M., Quercia, D., & Almeida, V. (2015). Dawn of the selfie era: The whos, wheres, and hows of selfies on Instagram. *Proceedings of the 2015 ACM Conference on Online Social Networks*, 221–231. https://doi.org/10.1145/2817946.2817948

VERBI Software. (2019). MAXQDA 2020 [computer software]. Berlin: VERBI Software. https://www.maxqda.com/

Wada, M., Canham, S. L., Sixsmith, J., Woolrych, R., Fang, M. L., & Sixsmith, A. (2020). Perceptions of home in long-term care settings: Before and after institutional relocation. *Aging & Society*, *40*, 1267–1290. https://doi.org/10.1017/S0144686X18001721

Wagner, S. (2022). Place-making through media: How media environments make a difference for long-term care residents' agency. *Societies*, *12*(1), 26. https://doi.org/10.3390/soc12010027

12 Digital and personal networks

Interactions in later life. Evidence from six Latin American countries

Roxana Barrantes, Silvana Manrique and Daniela Ugarte Villalobos

The ageing of the global population and the inversion of today's demographic pyramid represent a worldwide phenomenon. A United Nations report (2014) points out that this is due to decreased fertility and mortality levels. The percentage of people over 60 increased from 9% in 1994 to 12% in 2014 (Cotlear et al., 2011). Latin America – where 13% of the population is 60 years old or more – is witnessing a rapid increase in the population over 80 years old (Gonzales Ollino et al., 2021). However, when compared to the countries in the Global North, the region still has a lower number of older adults.

The inversion of the population pyramid poses new challenges for public policies. These revolve around higher levels of demand for health services, lower levels of employment and higher dependency ratios, as well as limited resources available in the pension system, new family structures and changes in the internal power structure in the family, among other factors (Blaschke et al., 2009).

To face these challenges, the literature concurs that the deployment and appropriation of digital technologies, especially the internet, by older adults is an opportunity to improve their quality of life, considering health, education, interpersonal relationships and entertainment (Cheek et al., 2005; Selwyn, 2004; Straka & Clark, 2000). However, evidence shows that the rate of internet adoption among older adults in Latin America is lower than in other age groups (Barrantes & Vargas, 2017; Castellón & Jaramillo, 2002; Colombo et al., 2015; Neves & Amaro, 2012; Robinson et al., 2015; Zickuhr & Madden, 2012).

Latin America exhibits a different internet adoption pattern in comparison to countries in the Global North that achieved internet penetration earlier and currently exhibit a higher rate of internet usage. Even though internet adoption has risen in Latin America reaching 75.5% penetration in 2020 (Pick et al., 2021), it still falls well short of 100% as a region. Different countries exhibit particular dynamics, reflecting the different factors that contribute to and explain digital technologies' adoption and use, with age being just one of them. Research indicates that use and appropriation patterns among older adults correspond to various characteristics such as gender, previous

experience using digital technologies, support networks, educational level and socio-economic level (Cotten et al., 2012; Neves et al., 2018; Quan-Haase et al., 2018). However, to understand older adults' internet usage in Latin America, it is vital to highlight the significant differences that different age groups exhibit (Pick et al., 2021; Sunkel & Ullmann, 2019).

Older adults in Latin America lag behind internet adoption and use levels in comparison to other age groups (Sunkel & Ullmann, 2019). It is reasonable to postulate that older adults still face barriers that the literature breaks down into two dimensions. The first one regards to access and use, while the second one focuses on the skills or digital literacy that older adults develop (Quan-Haase et al., 2018). But "older adults" is still a wide generalisation of a heterogeneous population, given that, likewise any other population group, older adults have diverse patterns of digital use and skills that meet various needs (Lagacé et al., 2015; Van Deursen & Helsper, 2015). Nonetheless, research has shown that communication is one of the main uses of the internet among older adults (Sunkel & Ullmann, 2019).

Little research has been done about the existing age discrimination in society as one of the barriers to internet adoption faced by older adults. As explained by Rosales et al. (2023) in Chapter 1 of this book, ageism is present in different levels and dimensions of society. Ageism is based on stereotypes that portray older adults as anti-technology, which results in them being characterized as less interested in learning how to use digital technologies, with limited experience, or insufficient digital literacy skills. Therefore, ageism reinforces the negative stereotypes that portray older adults as "technophobic" or uninterested in connecting to the internet due to the time and effort this may imply without acknowledging the heterogeneity within this population group (Cutler, 2005; McGregor & Gray, 2002; Ng & Feldman, 2012; Rosales & Fernández-Ardèvol, 2020; Van Deursen & Helsper, 2015).

Ageism also renders older adults' needs and usage of technologies invisible. This is reinforced by the fact that digital platforms tend to target younger populations and their algorithms, more often than not, base their configurations on their usage patterns (Braun, 2013; Lenhart, 2009). This makes it difficult for older adults to access platforms or leads to an understanding of their use as limited or inadequate. The same happens with social media platforms (SMPs) configured in a manner that is often unfriendly towards older populations (Braun, 2013; Cutler, 2005; Ivan & Cutler, 2021; Rosales & Fernández-Ardèvol, 2020).

As highlighted in Chapters 2 and 3, research on internet use by older adults tends to ignore and homogenize the diversity that older adults display when using digital technologies, obscuring any understanding of the diversity of usage patterns, as well as lower levels of adoption when compared to other age groups. Moreover, the homogenisation of older adults and the ageism that comes with it is also present in the scarcity of research about the patterns of older adults' internet usage in Latin America. Internet usage by older adults tends to be shoved to the margins, overlooking that these not only respond

to their needs but also their agency. All these are, in turn, shaped by socio-economic conditions, which are different from those in the Global North.

Our contribution provides a study on the uses of the internet by older adults and how they complement or substitute face-to-face (FTF) interactions in six Latin American countries: Argentina, Colombia, Ecuador, Guatemala, Paraguay and Peru. This is particularly relevant since the research that focuses on understanding the displacement effect or supplementary effect of the internet is mainly focused on the Global North or those countries with a higher rate of connectivity (Anderson & Tracey, 2001; Gaskins & Jerit, 2012; Kaiser & Kongsted, 2005; Liebowitz & Zentner; 2012; Wellman et al., 2001; Saboor et al., 2015).

We focus our research on SMPs because one main use of the internet for older adults in the region is communication (Sunkel & Ullmann, 2019). The objective of this chapter is to gain a broader understanding of older adults' internet usage in Latin America and how internet use has displaced or complemented FTF interactions. While communication and economic literature provide justifications for both complementarity and substitution between types of uses (SMPs and FTF), the empirical results of our study show complementarity.

By highlighting the complementary use of SMPs, we expect to provide a more accurate picture of the relationship older adults in Latin America have with technology, moving away from the negative ageist stereotypes that portray them as non-interested internet users. Our approach is quantitative, as will be explained after the literature review that follows this introduction. Then, we will present and discuss our results. The chapter closes with our conclusions.

Framework

Studies on the uses of the internet and traditional media have found mixed evidence regarding whether there is a displacement or supplementary effect. Some studies (Kaiser & Kongsted, 2005, Lee & Leung, 2008; Saboor et al., 2015) argue that there is a "displacement effect" between the internet and traditional media, while others argue that, on the contrary, there is a "supplementary effect" (Newell et al., 2008) Furthermore, a third group of studies states that there is no relationship between the two, arguing that internet use is independent of traditional media (Anderson & Tracey, 2001; Kaiser, 2003; among others).

Most of the research on the media displacement theory focuses on understanding how the internet or new media are replacing traditional media, such as radio or television (Newell et al., 2008; Nimrod, 2019). Nimrod (2019) highlights how older adults present selective displacement of traditional media in six countries (Austria, Denmark, Israel, Spain, Romania and the Netherlands). Her study shows that displacement rates among older adults are higher for newspapers and books than for other media such as TV or

radio (Nimrod, 2019). However, it also shows that this selective displacement depends on the user's media habits, the relative perceived advantages of each media outlet, their needs, and the socio-cultural context impacting older adults' displacement choices and their processes (Nimrod, 2019).

In the specific case of SMPs, studies in different countries have pointed out that relationships established online strengthen FTF interactions (Doyle & Goldingay, 2012 Lee et al., 2011Nef et al., 2013; Vroman et al., 2015; Wellman et al., 2001; Xie, 2008). This would indicate that there is supplementary – even in some cases an independency – between the two mediums for conducting social relations.

In communication sciences, two different approaches, one centred on the medium and the other on the user, explain the displacement effect between two mediums (Lee & Leung, 2008). The niche theory, which forms part of the first approach, states that a medium is displaced by a new one when the attributes of the latter are superior (Lee & Leung, 2008). The uses and gratifications approach, which forms part of the second approach centred on the user, argues that displacement occurs only if the user considers that the new medium gives them greater gratification.

Niche theory examines the attributes of a new medium, in this case, SMPs, and their effects on existing media (Lee & Leung, 2008). In other words, based on this theory, the displacement of FTF interactions responds to supply conditions (characteristics of SMPs). The uses and gratifications approach assumes that users actively and freely choose which communication medium to use depending on the benefits associated with the media based on their own needs (Dimmick & Albarran, 1994; Dimmick & Rothenbuhler 1984; Kaye & Johnson, 2003; Lee & Leung, 2008; Lin, 2001; Rubin, 2009). From this perspective, displacement occurs when the media fail to meet the user's needs (Lee & Leung, 2008). Under this approach, relationships between SMPs and FTF interactions will depend on the gratification perceived by individuals based on their communication needs. Therefore, within this framework, both elements could be substitutes, supplements or independent.

The model from the standpoint of older adults as consumers

Applying the uses and gratification approach – in which users guide the supplementary or displace FTF interactions for SMPs based on the perceived benefits of the media and their own needs – we use economic theory to examine the problem, postulating the older adult as a utility-maximising agent. This approach allows us to include the monetary and temporal restrictions faced by older adults in the model. For this purpose, we have taken Becker's (1965) time allocation model as a base, which includes the time endowment in the household maximisation problem, as well as in the extension of the model for the case of older adults, carried out by Gauthier and Smeeding (2003).

According to economic theory, the consumer maximizes their utility function subject to their budget constraint. Thus, the model postulates that the

objective of the average consumer is to achieve the maximum level of utility subject to their expenditures being equal to their income. Becker (1965) developed an extension of the model and incorporated time endowment as one of the constraints.

In the specific case of older adults, it is important to note that, although they also face a limited time endowment, they present different time use patterns compared to the other age groups. In fact, according to the results of previous studies, older adults tend to spend less time doing paid work or partaking in physically demanding leisure activities (Cutler & Hendricks, 1990; Jacobs, 2005); on the contrary, they spend more time in activities associated with home and family life (Kelly, 2006). Likewise, there is evidence that older adults spend more time on leisure activities (Jones, 1990).

Therefore, in line with Gauthier and Smeeding (2003), the model suggests that older adults maximize their utility subject to a time endowment broken down into (i) paid work, (ii) work at home and (iii) leisure activities. It should be noted that, in the case of retired older adults, the opportunity cost of leisure cannot be quantified precisely in terms of wages, given that, being retired, one hour more of leisure does not imply one hour less of work.

Drawing on this theoretical basis and the studies described above, we hypothesize that SMPs and FTF interactions are complementary, meaning that SMP use is associated with a greater likelihood of maintaining FTF interactions.

The empirical strategy

The proposed model was tested using two approaches. The first consisted of estimating a probability of maintaining FTF interactions conditioned by the use of SMPs, for which the Logit model was used because the available data compiled information on various uses of the internet, such as social media networking and FTF interactions.

The second approach was an extension of the first, assessing the intensity of FTF interactions, measured as the frequency within a specified time interval, conditional on the use of SMPs. In this case, an ordered Logit econometric model was adopted.

Next, the survey used is described, the sample is characterized through descriptive statistics, and the results of the econometric analysis are presented.

Data source

The After Access 2017 survey, conducted by the Regional Dialogue on the Information Society -DIRSI- (2017) (DIRSI, 2017) network, is the data source for the estimates. DIRSI was a network of professionals and institutions specialized in information and communication technology (ICT) policy and research in LATAM. This network conducts research within the framework of ICT policy, regulation and governance in the region.

Table 12.1 Individuals survey in each country

Country	GDP per capita 2017[1]	N
Argentina	23,597	1500
Colombia	14,171	1539
Paraguay	12,591	1570
Peru	12,507	1544
Ecuador	11,618	1500
Guatemala	8322	1517
Total	**n/a**	**9170**

[1] GDP is reported in US$ at constant 2011 international prices.

DIRSI carried out the survey in six Latin American countries: Argentina (higher income country and highest of the six), Colombia, Peru and Paraguay (middle-income countries) and Ecuador and Guatemala (lower-income countries). Information from 9170 individuals was collected. Table 12.1 summarises the GDP per capita and the number of respondents for each country.

Specifically, the survey collected general information about the household and also about the specific uses of digital devices, the internet and social media of a randomly selected member of the household.[1] The sampling method used allows for representative results at the national level in each country in terms of households and individuals. Likewise, the survey collects information from both urban and rural areas in each country.[2] Finally, to ensure an optimal collection of information, pilot tests and training sessions were carried out with the interviewers.

It is worth mentioning that when this study was underway, independent initiatives in the selected countries had been mapped out for collecting information on the uses of digital technologies, the internet and social media. However, there has been no evidence of another effort similar to After Access 2017 in which information has been collected from households across several Latin American countries.

Characteristics of the sample

In this section, we present the descriptive statistics of the whole sample broken down into two parts. The first one compares relevant variables by age group, which allows us to see the differences between older adults and the rest of the population. The second one focuses on descriptive statistics for the older adult group in six countries.

Working from the assumption that older adults might have more FTF interactions due to the existing digital divide documented in the literature, Figure 12.1 shows the average number of hours per week that an individual spends on FTF interactions.[3] However, the figure shows an inversely proportional relationship between age and FTF interactions.
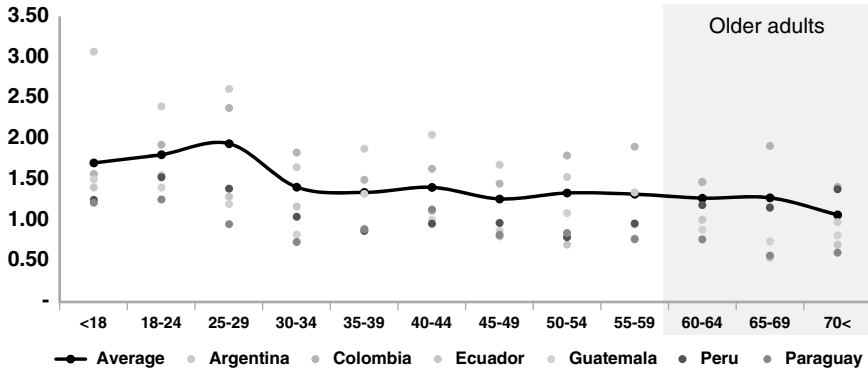
Figure 12.1 Average number of hours of face-to-face interactions (average number of hours per week).

Although this trend is observed in all the countries analysed, the level of hours dedicated to FTF relationships varies between countries. In Colombia and Argentina, individuals tend to invest more hours in FTF relationships compared to Paraguay, Guatemala, Ecuador and Peru.

In addition, according to the information provided by the survey, older adults are less inclined to socialize. As can be seen in Figure 12.2, the proportion of older adults who (i) have a greater preference for being alone, (ii) do not make friends easily and (iii) do not know many people is greater than the other age groups.

It is expected that older adults are the least likely to use the internet and social media, in general, from any device (mobile, computer, laptop, etc.). Figures 12.3 and 12.4 show this generational contrast in percentage terms. A decreasing trend in the use of the internet and social media is observed as
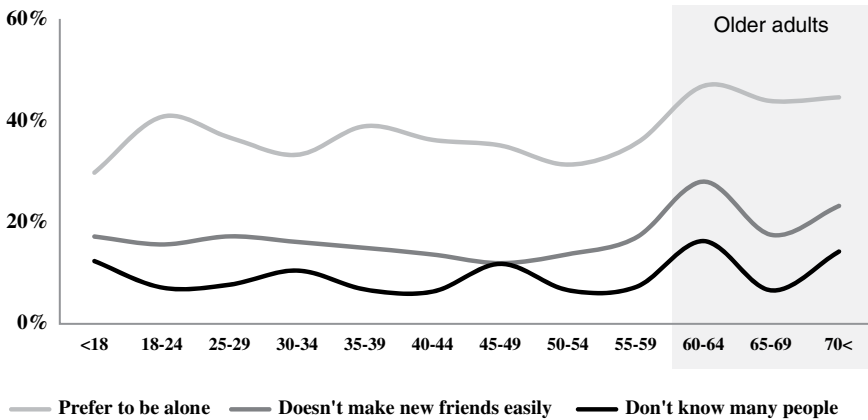
Figure 12.2 Antisocial flags: Antisocialisation propensity indicators (% by age group).
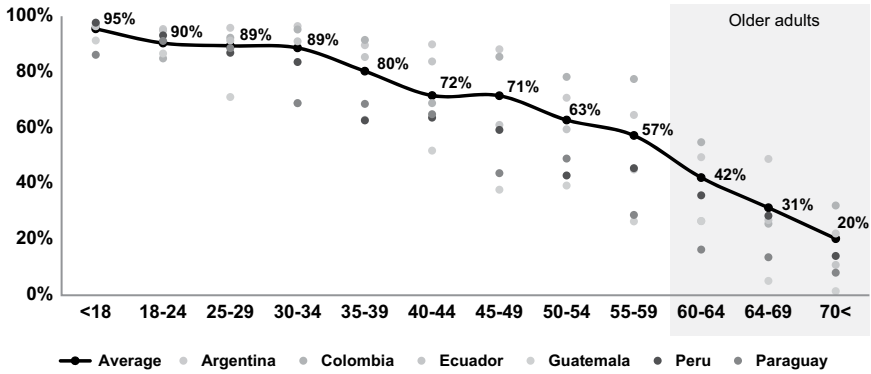
Figure 12.3 Internet use (%).

the age of the individual advances so that less than half of older adults use the internet and social media. Moreover, there is a difference of more than 75 percentage points between the youngest (under 18) and the oldest (70 and over) age ranges, which shows a clear difference in the use of technologies. This trend is consistent throughout the countries analysed, albeit a low level of internet and social media use was found in all age groups in Paraguay, Guatemala and Peru compared to Ecuador, Colombia and Argentina.

In the countries analysed, more than 40% of older adults said they access SMPs when they connect to the internet. This finding is aligned with the literature. Several papers analysing internet applications found that a significant proportion of older adults access social media when connected to the internet (Doyle & Goldingay, 2012; Vroman et al., 2015; Xie, 2008: Wellman et al., 2001). In that light, by focusing on the use of SMPs, the study addresses one of the most frequent uses of the internet among older adults.

Next, we characterize the sample of older adults for this study, defined by respondents 60 or older: 1408 respondents, who amount to 20% surveyed
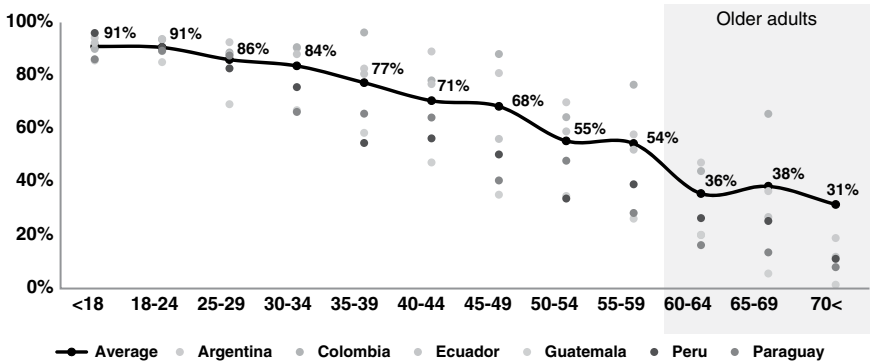
Figure 12.4 Social media use (%).

	Ecuador	Peru	Guatemala	Colombia	Argentina	Paraguay
OAs	8%	9%	11%	12%	19%	20%
Others	92%	91%	89%	88%	81%	80%

Figure 12.5 OAs in each country analysed (%).

from Paraguay, 19% from Argentina; 12% from Colombia; 11% from Guatemala; 9% from Peru; and 8% from Ecuador, as can be seen in Figure 12.5.

It is worth mentioning that the sample is not restricted to a certain age threshold upwards, meaning that older adults are between 60 and 96 years old, as shown in Figure 12.6. As expected, given the natural demographic distribution of the population, the older the respondents are, the fewer of them there are in the sample.

For the sample of older adults, we first analysed the relationship between the use of social media and the intensity of FTF relationships. As shown in Figure 12.7, we found that older adults who use social media interact more hours per week in person. This is consistent in all the countries analysed, although the greatest differences are observed in Guatemala and Ecuador, where older adults who use social media networks interact face to face, 127% and 78% more, respectively, than older adults who do not use them.

To deepen the analysis of this positive relationship, we use multivariate econometric analysis. They allow us to examine how conditioned this
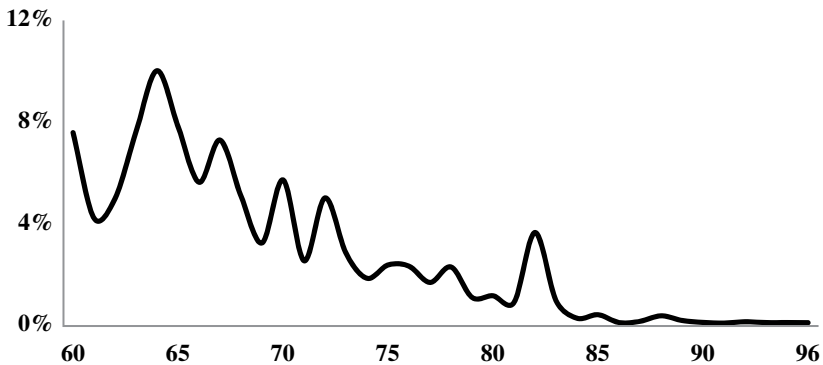
Figure 12.6 Sample age distribution (%).
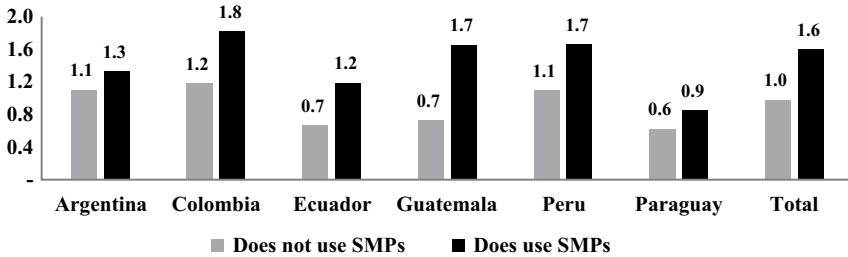
Figure 12.7 Average number of hours of face-to-face interactions of older adults (average number of hours per week).

relationship is to other possible variables such as, for example, an individual's personality and attitudes towards socialisation. It is reasonable to think that a more sociable individual would prefer FTF interactions and that, to schedule them, they could use a SMP, thus explaining the positive relationship found.

Results and discussion

An econometric multivariate analysis allows us to define a set of control variables or covariates that can influence the positive relationship found. From the literature review (Gaskins & Jerit, 2012; Jang & Park, 2016; Kaye & Johnson, 2003), the type of variables that influence an individual's FTF interactions – and are considered covariates – are the characteristics such as their age, gender, marital status, personality, social ability, education, socioeconomic level, geographical area and country of residence. These variables are detailed in Table 12.2.

Thus, when analysing the effect of using SMPs on the level of FTF interaction, the positive relationship found in the bivariate analysis is confirmed by isolating the effect of the variables using a bivariate Logit and Ordered Logit econometric model. Table 12.3 presents the summary of the results of the bivariate Logit model.

In the case of FTF interactions, the use of SMPs is positively associated with the probability of FTF interactions. Specifically, the use of SMPs explains an 8% increase in the probability of FTF interactions, which could be higher when considering FTF interactions with relatives at home. This result suggests that, for the older adults in our sample, SMPs do not replace FTF interactions; on the contrary, they lead to an increase in the probability of interacting FTF.

This is similar to what has been found in studies on usage patterns among older adults in developed countries that highlight the complementarity of SMPs and FTF interactions (Doyle & Goldingay, 2012; Vroman et al., 2015; Wellman et al., 2001; Xie, 2008). This result shows us how SMPs still increase the likelihood of FTF interactions in the six countries where the survey

Table 12.2 Co-variables that may influence face-to-face interactions of older adults

Indicator	Variable definition	Type	Categories
Age	Age	Continuous	-
Gender	Man or woman	Dichotomous	0 "man" 1 "woman"
Civil status	Married/no domestic partner	Categorical	1 "single" 2 "married" 3 "separated, widowed, divorced"
Personality	Prefers to be alone	Categorical	1 "prefers to be alone" 2 "not sure/doesn't know" 3 "doesn't prefer to be alone"
Skillset	Makes new friends quickly	Categorical	1 "doesn't make friends easily" 2 "unsure/doesn't know" 3 "makes friends easily"
Education	Level of education	Categorical	1 "unemployed" 2 "employed" 3 "domestic worker" 4 "other"
Socio-economic	Socio-economic level	Continuous	-
Urban	Lives in an urban area	Dichotomous	0 "rural" 1 "urban"
Country	Categorical variables for the six countries	Categorical	1 "Argentina" 2 "Colombia" 3 "Ecuador" 4 "Guatemala" 5 "Paraguay" 6 "Peru"

was conducted, despite differences from developed countries. Likewise, this finding undermines ageist stereotypes that promulgate older adults' disinterest in learning how to use SMPs, since the results imply that use increases their support networks, which are essential for older adults.

In addition, the results provide a consistent tool to combat the existing ageism in social network platform design (Braun, 2013) since there is a demand within the older population to use these platforms. Thus, the results show that although studies indicate that older adults face difficulties in using SMPs, they also obtain important benefits in their social life.

Regarding the rest of the explanatory variables, the main results show that women are 7% less likely to interact FTF than men. Likewise, an additional year of age in an older adult explains a drop of less than one percentage point in the probability of interacting FTF. Finally, the "ability to make friends easily" factor increases the probability of interacting FTF by 11%, compared to

Table 12.3 Bivariate Logit regression (marginal effects)

Explanatory variable	FTF interactions[1]	Explanatory variable	FTF interactions[1]
SMP use	0.0826**	*Argentina*	
	(0.029)	Colombia	0.06
Woman	−0.0665***		(0.0402)
	(0.0258)	Ecuador	0.0106
Age	−0.0035***		−0.0452
	(0.00133)	Guatemala	0.0757**
Socio-economic level	0.136**		(0.0380)
	(0.063)	Paraguay	−165
Single			−0.041
Has a domestic partner	−0.00392	Peru	
	(0.0308)	*Incomplete high school*	–
Separated/widowed/ divorced	0.0231	*High school complete*	−0.0285
	(0.03)		(0.0351)
Unemployed		*More than high school*	0.0065
Employed	−0.00555		(0.0391)
	(0.0269)	*Prefers to be alone*	
Domestic worker	−0.0547*	Unsure/doesn't know	−0.0383
	(0.0304)		(0.0305)
Rural	−0.03	Doesn't prefer to be alone	0.0145
	(0.0224)		(0.0270)
		Doesn't make friends easily	
Observations	1,408	Unsure/doesn't know	0.0719*
			(0.0367)
		Makes friends easily	0.108***
			(0.0294)

Standard errors in parentheses
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
[1] Variables: Hours per week that the individual socializes in person with friends and/or spends FTF time with social groups.

those who claim not to have it, which reaffirms the importance of psychological factors in the use of SMPs by older adults (Lagacé et al., 2015; Rosell & Vergés, 2021).

Likewise, the results of the regressions of the ordered Logit model, which constitutes the second econometric model in this study, are summarized in Table 12.4.[4]

The estimation of the ordered Logit model reveals that the different intensities of FTF interactions are conditional on the use of SMPs. Moreover, significant coefficients (at 99% confidence) are evident in all the frequencies of FTF interactions. Thus, while the use of SMPs reduces the probability of no interaction (−5%) and low-frequency interaction (−2%), it increases the probability of medium-high (3%) and high-frequency (7%) interactions. This reinforces the results obtained from the bivariate Logit regression, which

Table 12.4 Summary of the ordered Logit model results (marginal effects)

Intensity of FTF interactions	Effect of social media platforms on FTF interactions
Doesn't interact	−0.0474***
	(0.0143)
Low	−0.0237***
	(0.00712)
Medium-low	−0.0286***
	(0.00838)
Medium-high	0.0278***
	(0.00843)
High	0.0719***
	(0.0208)
Observations	**1408**

Standard errors in parentheses
*** p < 0.01, ** p < 0.05, * p < 0.1

shows that the use of social media is not replacing FTF interactions among older adults.

Results from this model coincide with those obtained using the previous model (Logit). Gender and age have a significant effect (at 99% and 90% confidence, respectively) on the probability of interacting FTF for each of the intensities analysed. Likewise, in line with the first model, ease of making friends has a directly proportional effect with respect to the frequency of interacting FTF.

However, unlike the first model, the level of education shows significant results (at different confidence/reliability levels depending on the frequency of FTF interactions analysed). For example, having completed more than high school decreases the probability of not interacting FTF to a low level or a medium-low level; in turn, it increases the probability of interacting FTF at a medium-high and high level.

The results of the other explanatory variables are consistent with the results of the first model. Thus, they show that gender, location (urban or rural), socio-economic conditions and educational levels are highly related to the probability of interacting FTF at the different intensities analysed.

Thus, being a woman increases the probability of never interacting FTF while decreasing the probability of interacting FTF rarely, weekly, and daily. Likewise, living in a rural area increases the probability of never interacting FTF and decreases the probability of interacting FTF as a function of the intensity of the interaction (the greater the intensity, the lower the probability). In addition, socio-economic and educational levels have a negative effect on the probability of never interacting FTF but have a positive effect on the probability of interacting on a weekly or daily basis.

In summary, for the sample of older adults in all six countries, there is no evidence that SMPs are displacing FTF interactions. On the contrary, SMP use is related to an increase in the probability of interacting FTF. This suggests a complementarity effect in this specific case. These results – consistent with the hypothesis of the present study contradict the literature review regarding SMP use by older adults (Doyle & Goldingay, 2012; Vroman et al., 2015; Wellman et al., 2001; Xie, 2008). Therefore, it can be argued that the use of social media allows older adults to be in contact with their friends and social groups to engage in FTF meetings, for example.

Regarding the rest of the variables analysed, it was possible to determine that gender, age, occupational activity, socio-economic level, educational level and ability to make friends are variables that have a significant effect on the probability of using FTF interactions analysed.

Conclusions

This study aimed to analyse the relationship between SMPs and FTF interactions in a sample of 1,408 older adults surveyed in 2017 from Argentina, Colombia, Ecuador, Guatemala, Paraguay and Peru. We sought to answer whether SMPs displace or supplement FTF interactions in the case of older adults: do they coexist or substitute each other?

The theoretical model based on economic theory guided the empirical testing that shows that older adults' SMP usage is not the same as the rest of the age groups. This is because older adults, as the literature points out, have different patterns of internet use that respond to different needs and rhythms of life (Cutler, 2005).

Likewise, these usage patterns reinforce the idea that when analysing the internet patterns of the entire population, older adults tend to be made invisible. This occurs because of ageist ideas that older adults are not social network platform users (Cutler, 2005; Durick et al., 2013; Rosales & Fernández-Ardèvol, 2020). However, as our data for older adults across six Latin American countries indicate, this is not the case; on the contrary, older adults derive benefits from the use of these platforms.

To this extent, the econometric results obtained are consistent with our hypothesis and show that there is complementarity between SMPs and FTF interactions. More FTF interactions are positively associated with SMP use. Older adults using these platforms are not doing it at the expense of FTF interactions. Thus, a supplementary effect between the two is suggested. As mentioned, SMPs probably allow older adults to keep in touch with friends and family and even establish new in-person social networks.

These findings combat existing ageist stereotypes that older adults are "technophobes" or uninterested in these platforms. On the contrary, they show that older adults are users of SMPs, gaining benefits from using them.

Similarly, these results contribute to combating the ageism that exists in the very design of SMPs (Cutler, 2005; Durick et al., 2013; Rosales & Fernández-Ardèvol, 2020) by indicating that older adults are indeed users of these platforms.

Likewise, the supplementary use between SMPs and FTF interactions is fundamental to understanding the use patterns among older adults in these six Latin American countries. Again, this use reinforces the need to understand older adults as users of SMPs with their own characteristics, not as a result of other age groups as is often the case due to existing ageism.

However, there are limitations to the study. First, while the arrangement of the data (cross-sectional for 2017) did allow us to approximate a complementarity effect on both modes of maintaining social relationships, it did not allow us to assess the pattern of use over time (as panel data would). Second, the data did not allow us to identify the difficulties encountered by older adults when using SMPs, which forms a fundamental part of the structural ageism they face. Third, the data do not show us a difference over time in the interactions via SMPs and FTF interactions and whether there is a difference in the way older adults connect with their support networks. Fourth, all older adults are categorized as over 60 years old based on available data. However, this could hamper the understanding of different SMPs' adoption patterns by age within our older adult category. These limitations are potential lines of research to further probe the digital use and skills of older adults involving SMPs.

Finally, it is important to keep in mind that while the data clearly shows us how SMPs and FTF relationships complement each other in this case, it is crucial to consider the possibility of future studies to delve deeper into existing uses of social network platforms/internet among older adults and the skills they need to use them. Furthermore, the relationship found between SMPs and FTF interactions also highlights the need for further study of the barriers that non-users face and how they relate to ageism in these countries.

Notes

1 The questionnaire had two main parts. Part A, which was answered by anyone with sufficient knowledge of the household (preferably the head of household), and Part B, which was answered by a randomly selected individual (individual in the household whose birthday is closest to the date on which the survey is being conducted).
2 Rural zones in Argentina represent a very low proportion of total population.
3 To construct the FTF interactions variable, the number of hours in a typical week in which the individual socializes and/or spends with their social groups is considered.
4 This chapter is based on extensive econometric work published as a working paper in Spanish, which could be found at: https://doi.org/10.18800/2079-8474.0505

References

Anderson, B., & Tracey, K. (2001). Digital living: The impact (or otherwise) of the internet on everyday life. *American Behavioral Scientist*, *45*(3), 456–475.

Barrantes, R., & Vargas, E. (2017). ¿ Caminos distintos y destinos iguales?: Análisis de la convergencia en patrones de uso de Internet entre diferentes grupos etarios. http://files.pucp.edu.pe/departamento/economia/DDD438.pdf

Becker, G. S. (1965). A theory of the allocation of time. *The Economic Journal*, *75*(299), 493–517.

Blaschke, C. M., Freddolino, P. P., & Mullen, E. E. (2009). Ageing and technology: A review of the research literature. *British Journal of Social Work*, *39*(4), 641–656. http://doi.org/10.1093/bjsw/bcp025

Braun, M. T. (2013). Obstacles to social networking website use among older adults. *Computers in Human Behavior*, *29*(3), 673–680. https://doi.org/10.1016/j.chb.2012.12.004

Castellón, L., & Jaramillo, O. (2002). Las múltiples dimensiones de la brecha digital. *Reflexiones Académicas*, *13*.

Cheek, P., Nikpour, L., & Nowlin, H. D. (2005). Aging well with smart technology. *Nursing Administration Quarterly*, *29*(4), 329–338.

Colombo, F., Aroldi, P., & Carlo, S. (2015). Nuevos mayores, viejas brechas: TIC, desigualdad y bienestar en la tercera edad en Italia [New Elders, Old Divides: ICTs, Inequalities and Well-Being amongst Young Elderly Italians], 47–64. http://dx.doi.org/10.3916/C45-2015-05

Cotlear, D., Graham, C., Holz, M., Mason, C., Medici, A., Miller, T., Saad, P., Tornarolli, L., & Turra, C. (2011). Population Aging: Is Latin America Ready? The International Bank for Reconstruction and Development/The World Bank.

Cotten, S., Ford, G., Ford, S. & Hale, T. (2012) Internet use and depression among older adults. *Computers in Human Behavior*. 28(2). pp. 469–499. https://doi.org/10.1016/j.chb.2011.10.021.

Cutler, S. (2005). Ageism and technology. *Generations*, *29*(3), 67–72.

Cutler, S. J., & Hendricks, J. (1990). Leisure and time use across the life course. *Handbook of Aging and the Social Sciences*, *3*, 169–185.

Dimmick, J., & Albarran, A. B. (1994). The role of gratification opportunities in determining media preference. *Mass Comm Review*, *21*, 223–235.

Dimmick, J., & Rothenbuhler, E. (1984). The theory of the niche: Quantifying competition among media industries. *Journal of Communication*, *34*(1), 103–119.

DIRSI (2017*). Encuesta After Access 2017* del Proyecto OlaTICs. https://olatics.net/

Doyle, C., & Goldingay, S. (2012). The rise of the "silver surfer": Online social networking and social inclusion for older adults. *Journal of Social Inclusion*, *3*(2), 40–54.

Durick, J., Robertson, T., Brereton, M., Vetere, F., & Nansen, B. (2013, November). Dispelling ageing myths in technology design. In *Proceedings of the 25th Australian Computer-Human Interaction Conference: Augmentation, Application, Innovation, Collaboration* (pp. 467–476). http://doi.org/10.1145/2541016.2541040

Gaskins, B., & Jerit, J. (2012). Internet news: Is it a replacement for traditional media outlets? *The International Journal of Press/Politics*, *17*(2), 190–213.

González Ollino, D., Sosa, Z., & Reboiras Finardi, L. D (2021). Las dimensiones del envejecimiento y los derechos de las personas mayores en América Latina y el Caribe. Textos seleccionados 2009-2020. CEPAL. https://www.cepal.org/es/publicaciones/46730-dimensiones-envejecimiento-derechos-personas-mayores-america-latina-caribe.

Gauthier, A. & Smeeding, T. (2003). Time use at older ages: cross-national differences. *Research on aging*, *25 (3)*, pp. 247–274.

Ivan, L., & Cutler, S. J. (2021). Ageism and technology: The role of internalized stereotypes. *University of Toronto Quarterly*, *90*(2), 127–139.

Jacobs, T. (2005). Being old, feeling old. *Between autonomy and dependence in the area of "active ageing"*. Department of Sociology, University of Antwerp, Antwerp, Belgium1–12.

Jang, S., & Park, M. (2016). Do new media substitute for old media?: A panel analysis of daily media use. *Journal of Media Economics*, *29*(2), 73–91. https://doi.org/10.1080/08997764.2016.1170021

Jones, M. (1990). Time use of the elderly. *Canadian Social Trends*, Summer, 28–30.

Kaiser, U. (2003). *The effects of website provision on the demand magazines. Centre for Economic and Business Research discussion paper*. https://pdfs.semantic-scholar.org/f39a/cfd402136afa26714300f395ef55c8395def.pdf

Kaye, B. K., & Johnson, T. J. (2003). From here to obscurity?: Media substitution theory and traditional media in an on-line world. *Journal of the American Society for Information Science and Technology*, *54*(3), 260–273.

Lagacé, M., Charmarkeh, H., Laplante, J., & Tanguay, A. (2015). How ageism contributes to the second-level digital divide: The case of Canadian seniors. *Journal of Technologies and Human Usability*, *11*(4), 1–13.

Lee, P. S., & Leung, L. (2008). Assessing the displacement effects of the internet. *Telematics and Informatics*, *25*(3), 145–155.

Lenhart, A. (2009). Adults and social network websites. Pew Research Center: Internet, Science & Tech. https://policycommons.net/artifacts/626620/adults-and-social-network-websites/1607927

Liebowitz, S. J., & Zentner, A. (2012). Clash of the titans: Does internet use reduce television viewing?. *Review of Economics and Statistics*, *94*(1), 234–245.

Lin, C. A. (2001). Audience attributes, media supplementation, and likely online service adoption. *Mass Communication & Society*, *4*(1), 19–38.

McGregor, J., & Gray, L. (2002). Stereotypes and older workers: The New Zealand experience. *Social Policy Journal of New Zealand*, 163–177.

Nef, T., Ganea, R. L., Müri, R. M., & Mosimann, U. P. (2013). Social networking sites and older users – a systematic review. *International Psychogeriatrics*, *25*(7), 1041–1053. https://doi.org/10.1017/S1041610213000355

Neves, B. B., & Amaro, F. (2012). Too old for technology? How the elderly of Lisbon use and perceive ICT. *The Journal of Community Informatics*, *8*(1), 1–12. https://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.956.624&rep=rep1&type=pdf

Neves, B. B., Waycott, J., & Malta, S. (2018). Old and afraid of new communication technologies? Reconceptualising and contesting the "age-based digital divide". *Journal of Sociology*, *54*(2), 236–248. https://doi.org/10.1177/1440783318766119

Newell, J., Pilotta, J. J., & Thomas, J. C. (2008). Mass media displacement and saturation. *The International Journal on Media Management*, *10*(4), 131–138. https://doi.org/10.1080/14241270802426600

Ng, T. W., & Feldman, D. C. (2012). Evaluating six common stereotypes about older workers with meta-analytical data. *Personnel Psychology*, *65*(4), 821–858.

Nimrod, G. (2019). Selective motion: media displacement among older internet users. *Information, Communication & Society*, *22*(9), 1269–1280. https://doi.org/10.1080/1369118X.2017.1414865

Pick, J., Sarkar, A., & Parrish, E. (2021). The Latin American and Caribbean digital divide: A geospatial and multivariate analysis. *Information Technology for Development*, *27*(2), 235–262. https://doi.org/10.1080/02681102.2020.1805398

Quan-Haase, A., Williams, C., Kicevski, M., Elueze, I., & Wellman, B. (2018). Dividing the grey divide: Deconstructing myths about older adults' online activities, skills, and attitudes. *American Behavioral Scientist*, *62*(9), 1207–1228.

Robinson, L., Cotten, S. R., Ono, H., Quan-Haase, A., Mesch, G., Chen, W., & Stern, M. J. (2015). Digital inequalities and why they matter. *Information, Communication & Society*, *18*(5), 569–582. https://doi.org/10.1080/1369118x.2015.1012532

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence*, *26*(5–6), 1074–1087. https://doi.org/10.1177/1354856520930905

Rosales, A., Svensson, J., & Fernández-Ardèvol, A. (2023). Digital ageism in data societies. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Rosell, J., & Vergés, A. (2021, July). The impact of ageism on the e-leisure of older people in Chile. In *International conference on human-computer interaction* (pp. 228–239). Springer. https://doi.org/10.1007/978-3-030-78108-8_17

Rubin, A. M. (2009). Uses and gratifications. In: The SAGE handbook of media processes and effects. Pp. 147–159. SAGE Publications

Saboor, M., Sum, S., Sahaf, R., & Pourghasem, M. (2015). The internet use in elderly people. *Medicinski Glasnik/Medical Gazette*, *20*(56), 43–52.

Selwyn, N. (2004). The information aged: A qualitative study of older adults' use of information and communications technology. *Journal of Aging Studies*, *18*(4), 369–384.

Straka, S. M., & Clark, F. (2000). *Connections: Internet access for frail older seniors to improve their psychosocial well-being*. The McGill University Research Centre for Studies in Aging (MCSA). https://academic.oup.com/bjsw/article/39/4/641/1625388

Sunkel, G., & Ullmann, H. (2019). Las personas mayores de América Latina en la era digital: superación de la brecha digital. *Revista Cepal*. https://www.cepal.org/es/publicaciones/44580-personas-mayores-america-latina-la-era-digital-superacion-la-brecha-digital

Van Deursen, A. J., & Helsper, E. J. (2015). A nuanced understanding of internet use and non-use among the elderly. *European Journal of Communication*, *30*(2), 171–187. https://doi.org/10.1177/0267323115578059

Varian, H. R. (2010). *Intermediate microeconomics: Modern approach* (4th ed.). New York: W.W. Norton & Company.

Vroman, K. G., Arthanat, S., & Lysack, C. (2015). "Who over 65 is online?" Older adults' dispositions toward information communication technology. *Computers in Human Behavior*, *43*, 156–166.

Wellman, B., Haase, A. Q., Witte, J., & Hampton, K. (2001). Does the internet increase, decrease, or supplement social capital? Social networks, participation, and community commitment. *American Behavioral Scientist*, *45*(3), 436–455. https://journals.sagepub.com/doi/abs/10.1177/00027640121957286

Xie, B. (2008). The mutual shaping of online and offline social relationships. https://informationr.net/ir/13-3/paper350.html

Zickuhr, K., & Madden, M. (2012). Older adults and internet use. *Pew Internet & American Life Project*. https://www.pewresearch.org/internet/wp-content/uploads/sites/9/media/Files/Reports/2012/PIP_Older_adults_and_internet_use.pdf

13 Contrasting ageism in research on older adults and digital technologies

A methodological reflection

Emma Garavaglia, Alessandro Caliandro, Giulia Melis, Emanuela Sala and Daniele Zaccaria

In this chapter, we propose a reflection on the challenges that doing social science research on ageing and digital technologies may pose in terms of age-related stereotypes that researchers risk to perpetuate and reinforce. To this aim, we draw on three pieces of research that the authors carried out in Italy, based on digital methods, social experiments and online methods. These methods are currently widely employed in the social sciences (Salganik, 2018) but less used in social science research on ageing (Peine & Neven, 2021).

As Iversen and Wilinska argue:

> The creation of academic knowledge, such as media institutions, texts and technologies, makes age and ageing socially visible as well as relevant and important to the ways in which we perceive ourselves, others and the social reality in which we live. By extension, old age is something that is done, and this doing involves the processes of categorising, organising and ranking according to socially and culturally defined imaginaries.
>
> (Iversen & Wilinska, 2020, p. 124)

The literature highlights that studies that claim to reject stereotypical representations of older digital technology users as intrinsically deficient (Rosales & Fernández-Ardèvol, 2020) often tend to: a) exclude some of them – usually, the oldest-old, who are assumed to be lacking the digital skills needed to take part in the study (Howlett, 2021; Swift et al., 2018) and b) represent them as "endowed with a partial agency" in using digital media (Caliandro et al., 2021, p. 54).

As a matter of fact, based on the available statistics, older adults can be classified as less active users. The fact that their use of digital media is limited – in terms of time and variety of tools – when compared to other age groups is often linked to a series of "negative" characteristics. Specifically, they tend to be defined as less interested in digital technologies, less prone to learn technology-related skills, and, as mentioned above, less able to exercise their agency (Millward, 2003). However, as highlighted by Loos

et al. (2012), the centrality of digital media does not depend on the intensity of the use but on the relevance and meaning that the users attribute to these tools. When older people become digital technologies users, they can be "active users" (Vincent, 2023, in this volume): they use digital technologies for fulfilling personal tasks and reaching personal goals (Marston et al., 2020), attribute certain meanings to the use of digital media (Taipale & Farinosi, 2018), and contribute to the construction of specific digital cultures (Comunello et al., 2020).

The fact that social research on ageing and digital technologies risks reproducing standard stereotypes on older technology users can be linked to the assumptions that inform the research process. First, how age is conceptualised, which is reflected in the methodological choices we make (e.g., age groups to be included in the study, language used in the interview outline, etc.) – and even more to the degree of researchers' reflexivity about age images and categorisations (Iversen & Wilinska, 2020). As Fernández-Ardèvol et al. (2019) stress, to confront the age "difference" in a positive way, it is important to make the assumptions at the base of our works explicit and critically discuss them throughout every stage of the study.

How scholars studying stereotypes risk reproducing and reinforcing these processes is a matter discussed in the literature (Cecchini, 2019; Chenail, 2011; Troyna & Carrington, 2005). Nonetheless, in our opinion, a specific debate around the reproduction of ageing stereotypes is very much needed. Moreover, considerations on how to handle, in practice, these risks are still lacking (Cecchini, 2019). Therefore, in this chapter, we wish to contribute to kick-starting a discussion about the risks of ageism against older adults in social science research practice on ageing and digital technologies and to provide researchers with some practical suggestions on how to cope with them.

Context, objectives and methods

As previously mentioned, our reflection draws upon three empirical studies carried out in Italy. Specifically, we present three pieces of research developed within the project Aging in a Networked Society: Older People, Social Networks and Well-being (https://ageingsocieties.unimib.it/) (2018–2020), funded by Fondazione Cariplo. Overall, the project was aimed at investigating the impact of offline (traditional and face-to-face social networks) and online social networks (social relationships developed using social networking sites (SNS)) on older adults' well-being, as well as at exploring the role of smartphone and SNS use on older adults' social inclusion and intergenerational relationships, in Italy. Italy represents an interesting and relevant context in which to observe the relationship between older adults and digital technologies – and thus reflect on the methodological challenges that may arise when studying these topics. In fact, not only is Italy one of the European countries with the highest percentage of people aged 55+ in the

total population (Eurostat, 2020), but also older adults living in Italy show lower percentages of Internet and social media use when compared to their European peers (Sala & Gaia, 2019).

The first study – the AUSER (Associazione per l'invecchiamento attivo) study (the study was named after AUSER, the major Italian association for the promotion of active ageing, whose volunteers were involved as participants; https://www.auser.it/) – employed smartphone-based digital methods with the aim of understanding the role of smartphones (and especially of social media used via smartphone) in older people's everyday life, as well as the way in which such devices shape their social relationships (Caliandro et al., 2021). Specifically, the AUSER study aimed at exploring the forms of sociality with peers and family members older adults put in place through smartphones in their everyday life, as well as the meanings they articulate around smartphone-mediated forms of sociality. To meet the study's aims, the researchers installed on the smartphones of 30 volunteers aged 62–76 an ad hoc app, RescueTime (https://www.rescuetime.com/), to "observe" and measure their daily patterns of use. The app remained installed on the participants' phones for one month (24/01/2019–24/02/2019). Then, to understand the motives behind the use of a given app/website, as well as to gain a broad understanding of the socio-cultural practices the participants developed around their smartphones in everyday life, 3 focus groups and 20 semi-structured interviews were conducted.

The second study – The Aging in a Networked Society-Social Experiment (ANS-SE) – was a randomised controlled trial conducted on older adults residing in Abbiategrasso, a town located in the Milan area, aimed at assessing the short and long-term impact of SNS use on older adults' loneliness and social isolation. The experiment was structured into one treatment group and two control groups; the intervention consisted of participation in a training course on SNS use (treatment group) or on lifestyle and brain functioning education (active control group). The inactive control group was constituted of a waiting list. The study was constituted by two stages, i.e., the baseline and the follow-up (see Zaccaria et al. (2020) for details on the study protocol).

The third study is the Italian Longitudinal Study on Older People's Quality of Life during the COVID-19 pandemic (ILQA-19): a qualitative case study, with a longitudinal design, conducted on older adults through online qualitative interviews. It involved a cluster of ten villages in Northern Italy that experienced the first lockdown in Europe. ILQA-19 investigated the social consequences of the pandemic on older adults' everyday life, focusing on the resources employed to face social distancing measures and the role played that ICT use plays within this process. This study, carried out fully remotely and ongoing at the moment of writing, was conducted on a panel of 40 older adults – a purposive sample heterogeneous in terms of age (65–80 years old),

gender, social background and ICT skills. Wave 1 started in spring 2020, while wave three is currently fielded.

(Methodological) lessons learned

We will now give more details about the characteristics of the methods employed in the three studies and discuss, for each of them, the challenges encountered in our work – in terms of reproduction of ageist biases against older people – and how we handled them.

The AUSER study

The AUSER study employed smartphone-based digital methods and, more specifically, tracking techniques. Tracking techniques are increasingly employed in social research insofar as they allow to study people's digital practices in (nearly) real-time, within the natural environment in which they occur, and with an exceptional degree of granularity (Bouwman et al., 2013). By installing an ad hoc app or software on participants' digital devices, it is possible to directly observe and keep track of a wide variety of (key) digital practices, such as patterns of smartphone use, browsing behaviours, clicking behaviours, and styles of navigation within websites, etc. (Aipperspach et al., 2006). In particular, apps/software for device tracking have demonstrated to be particularly helpful and popular in social research on smartphone use (Stier et al., 2020). As a matter of fact, studying patterns of smartphone use through tracking techniques brings along several methodological advantages. Specifically, it allows the researcher to (a) observe social actors' everyday digital practices which would be otherwise unobservable (e.g., the number of times a person accesses a smartphone in a day); (b) get very granular data that would not be possible to obtain through analogue methods (e.g., number of seconds a user spends on a given smartphone app each time they access it); (c) overcome the measurement errors occurring when measuring everyday digital practices with analogue methods, such as questionnaires or self-tracking sheets (Boase & Ling, 2013) (e.g., it is very unlikely that the interviewees would remember exactly the amount of time spent on their smartphone over a week and/or the number of apps daily accessed).

Tracking techniques fall in the broader epistemological framework of *digital methods* (Audy Martínek et al., 2022). Digital methods consist of the "deployment of online tools and data for the purposes of social and medium research. More specifically, they derive from online methods, or methods of the medium, which are reimagined and repurposed for research" (Rogers, 2017, p. 75). The digital methods paradigm is premised on the principle of *follow the medium*, that is, to take advantage of the natively digital methods that digital environments (e.g., search engines employ to gather, order,

organise, rank, and rate digital data – as with APIs, algorithms, links, likes or hashtags (Rogers, 2019).

The use of tracking devices is also gaining traction within digital research on older adults and digital media. For example, exploiting the functionalities of ad hoc tracking devices, Rosales and Fernández-Ardèvol (2019) systematically investigated everyday habits of 238 Spanish smartphone users aged 20–76, highlighting different patterns of use within different age cohorts.

With specific reference to this field of research, we believe that drawing exclusively on the principle of "following the medium" carries some risks of ageism against older adults. Let us imagine that after tracking the smartphone of an older participant for a week, we find out that for most of the time they used only WhatsApp. This mere quantitative datum compels us to make assumptions and speculations. Two kinds of assumptions can be made based on common sense or on literature. If we reason through the lens of common sense, it would be easy to jump to the conclusion that such excessive use of WhatsApp is linked to a lack of digital skills – preventing older users from taking advantage of all functions offered by the device. On the other hand, if we look exclusively at the literature, we could be tempted to think that the participant used WhatsApp (and so the smartphone) to stay in touch with some younger relatives from which they can get help and support (Doyle & Goldingay, 2012). Not to mention that focusing exclusively on quantitative data leads researchers to overlook exploring the cultural dimension of smartphone practices, which is crucial when studying the use of digital technology in everyday life (Madianou & Miller, 2013).

To prevent the risk of reproducing stereotypes on older technology users, in the AUSER study, we decided to combine digital methods (tracking techniques) with qualitative methods, i.e., focus groups and qualitative interviews (Caliandro & Gandini, 2017). More specifically, instead of *following the medium* only, we decided to *follow the users,* too (Caliandro, 2018, p. 55). Speaking in more practical terms, to "follow the users", methodologically, means: (a) making the users your co-researcher; (b) paying attention to users' practical usage of digital technologies in everyday life; (c) paying attention to the systems of meanings users attach to digital technologies; (d) define with the users the ethical boundaries of your digital research (Caliandro, 2021). Let us explain this in detail.

Rescue Time – which, as mentioned before, we installed on the smartphones of 30 volunteers –retrieved many rich and valuable data, such as the whole list of apps/websites participants accessed every day and the exact amount of time they spent on them. However, analysing these data would not allow us to know the exact motives behind the use of a given app/website, nor to obtain a broad understanding of the socio-cultural practices participants developed around their smartphones in everyday life. To fill this gap, we took advantage of qualitative research techniques: *focus group* and *face-to-face interview*. Through focus groups, we gained an understanding of our dataset, which would have been impossible to get otherwise. For example, through

Rescue Time, we noticed a dramatic drop in smartphone activities during the weekends. We brought up this odd result in one of the focus groups, as well as in some face-to-face interviews and the conundrum was immediately clarified by participants. They explained to us that during the weekends, they are usually more engaged in "real life activities" (e.g., relaxing in front of the TV or hanging out with friends/relatives) and so, physiologically, they have less time to spend on their smartphones. Qualitative methods were also useful to set the ethical boundaries of our research. Given the invasiveness of Rescue Time, we were worried about the (legitimate) privacy concerns participants harboured about the research. Surprisingly, during the focus groups, participants admitted not being so worried about privacy issues. Instead, they had many "technical" matters they wanted to discuss with us. For example, they wanted to be reassured that the app would have not consumed their data and/or battery – (something that Rescue Time does not do). This "incident" taught us a valuable lesson about our own (ageist) conceptions of older technology users. In fact, when we started the research, we did not consider sharing such technical details with participants because we presumed they would not be interested in them.

In conclusion, this research experience helped us reflect on the fact that, as social researchers, we must be the first ones to make an effort to overcome the image of older users as tech illiterates. In doing so, we could concretely contribute to contrasting the rhetoric of compassionate ageism (Binstock, 2010) that tends to be still prevalent when discussing older adults and ICTs.

The ANS-SE study

The ANS-SE study was a randomised controlled trial. Experimental research draws its origin from the scientific method and lies at the heart of the so-called positivistic approach. Experiments can be defined as "ways of assessing causal relationships, by randomly allocating 'subjects' to two groups and then comparing one (the 'control group') in which no changes are made, with the other (the 'test group') who is subjected to some manipulation or stimulus" (Payne & Payne, 2004, p. 85). Social experiments are characterised by three main elements (Lewis-Beck et al., 2004, p. 2): (a) manipulation of the amount (as in the case of quantitative independent variables) or the level of the independent variable (as in the case of qualitative independent variables); (b) control of nuisance (or confounding) variables using random selection and random assignment of subjects into treatment conditions; and (c) careful recording or observation of the change in the dependent variable. We can distinguish between different types of experiments and experimental designs (see, e.g., Coleman, 2018). The ANS-SE study is a field experiment.

Despite the limited role that experimental research attributes to study participants (often considered as passive research subjects), there are examples of innovative research methods that use experimental research in combination with other qualitative methods (e.g., Harrits & Møller, 2021; Levy Paluck,

2010; Prowse & Camfield, 2013; Steils, 2021). These new approaches to experimental research implicitly recognise the relevance of study participants as active actors of the research process. However, for a number of reasons, older adults are still often underrepresented/excluded from these studies, with many published articles reporting unjustified upper age limits when designing clinical trials (Bloch & Charasz, 2014; Van Spall et al., 2007). Indeed, some argue that older age is often associated with non-response (e.g., Golomb et al., 2012; Herzog & Rodgers, 1988). Even when researchers involve older adults in their studies, they continue to passively engage with them, often only requiring advice or feedback in the early or later phases of the study (Merkel & Kucharski, 2019). Grigorovich et al. (2021) have recently called for gerontechnology research to adopt study designs and guarantee a participatory engagement of older people.

In the ANS-SE study, when recruiting participants, implementing the experiment, and evaluating the findings, we drew on considerations and guidelines entailing older adults' involvement in research, with a specific focus on best practices concerning ageing research on technology use (e.g., Mannheim et al., 2019; Poli et al., 2021). At the recruitment stage, older adults are often excluded for two main reasons, i.e., age and lack of digital skills. On the one hand, the oldest-old (aged 80 and over) are often considered as a homogenous population with frail health, cognitive problems, and less motivation, being therefore very likely to refuse (or interrupt) taking part in experimental research (Cuddy et al., 2005; Swift et al., 2018). On the other hand, poor digital skills may represent a technology-driven barrier to participation because of study design requirements (e.g., technologically savvy participants (Poli et al., 2021). In adopting an age-inclusive approach, the ANS-SE population was constituted of the oldest-old (i.e., individuals aged between 80 and 84), who were recruited from an ongoing population-based longitudinal study – i.e., the Brain Ageing in Abbiategrasso Study (InveCE. Ab study) (Guaita et al., 2013). This strategy also allowed us to overcome the problems of external validity (e.g., selection bias) that arise when conducting research on convenience samples (Chen & Schulz, 2016). We also included in the study older adults with poor digital skills, who were provided with the training needed to effectively use the study devices (i.e., smartphones) before the start of the intervention. Thus, previous experience with technology use was not considered an inclusion criterion.

Also, the procedures developed for obtaining informed consent may discourage older adults' participation in research. Communicating the study objectives in a clear way or simplifying consent forms can facilitate consent procedures and increase understanding and participation (Dunn & Jeste, 2001). In our experiment, we drafted the consent documents in plain Italian in collaboration with geriatricians and neuropsychologists and organised individual (telephone and face-to-face) meetings to provide further details on the experiment. This strategy proved to be effective in obtaining participants'

signed consent forms. However, due to the lack of confidence in technology use, about 20% dropped out of the study, especially in the early stages of the intervention. Devoting more time to explaining to study participants the potential of smartphone use and the benefits derived from the study participation may have led to higher retention rates.

At the implementation stage, it is important to tailor the interventions according to older adults' needs. Indeed, ignoring sensory decline in older age (e.g., in vision or hearing loss) can influence active participation in experimental activities and, eventually, can have a detrimental impact on the research findings. Therefore, study materials should be written using fonts, colours and sizes suitable for all participants, and background noises should be minimised to facilitate better understanding (Mannheim et al., 2019). The appearance and aesthetics of the devices/tools used while carrying out experiments are important too. Indeed, they can be symbols of frailty and, therefore, can be considered stigmatising, reducing the willingness to be involved in a study (Zwijsen et al., 2011). In the ANS-SE, we conducted all research activities (e.g., meetings, training activities, etc.) in a friendly environment, already familiar to the participants (because of the previous participation in the already mentioned InveCE.Ab study), with a sound amplification system and protected from noise sources. We also used an overhead projector with a large screen to accommodate the needs of study participants with poor eyesight and difficulties in reading written materials. To avoid using stigmatising devices, we provided participants in the treatment group with a smartphone with a special design: despite having some simplified functions, its aesthetics was quite similar to that of the most common smartphones.

Another key aspect to consider when designing interventions in experimental research on older adults is the provision of adequate training and tutoring because some participants may not be familiar with the devices and the tools used in the study. In our case, we organised supplementary classes on smartphone use (e.g., some participants had difficulties with the "touch" function) and specific telephone and in-person tutoring on smartphone and SNS use. Older adults' high participation in tutoring classes may suggest that our introductory classes were not successful in meeting their training needs. Specifically, we should have dedicated more time to provide basic skills for using and maintaining smartphones (e.g., recharging or putting it on standby).

At the evaluation stage, including both study participants' assessment and (quantitative) data analysis, many tools and tests to evaluate older adults' well-being and performance are not "older adult friendly" (Ben-David et al., 2018). Specifically, some tests can be very strenuous or have instructions that are difficult to understand; in some cases, verbal explanations may include age-related cues driven by ageist stereotypes (e.g., emphasising that a given test is in a simplified version to meet older adults' specificities). At

the evaluation stage, we carefully designed our procedures to avoid age stereotypes activation. First, we measured participants' performance using only validated international scales specifically suitable for older adults. Second, we designed the procedures to explain and administer the tests in collaboration with a team of geriatricians and neuropsychologists. Third, before starting the study, we tested all procedures with a handful of voluntary oldest-old not involved in the ANS-SE project. This served to finalise the administration methods and evaluate the time needed to complete the tests, to avoid participant cognitive and physical burden. When researching older adults, qualitative methods are also suitable, especially to investigate attitudes towards technologies. This approach has the potential to reduce interviewees' stress if older participants have any memory impairment or difficulties in answering questions that involve particular skills (e.g., maths or logic). To overcome this problem, we designed pre-post evaluation procedures that also included some open questions to collect participants' attitudes and expectations on SNS use. However, to better grasp participants' attitudes towards technology and receive their feedback on the experiment, we could have designed a more balanced quantitative-qualitative assessment making the experiment more inclusive and participative. The choice of including open-ended questions in the assessment needs to be balanced against costs and evaluations on the interview length and participants' psychological discomfort.

Adopting a participatory approach also means involving older participants throughout the study duration, including its final stages, i.e., reporting and disseminating the results, to avoid a "hit and run" approach (Mannheim et al., 2019). This is especially the case when participation lasts over time, as in the case of our experiment, which covered two months. To involve study participants in the dissemination activities, we appointed a member of the research staff who informed the participants about important news and updates, interacting with them through Facebook or WhatsApp. In addition, we organised in-person meetings to present and discuss in plain Italian the main results; participants also had the opportunity to share their experiences in using technology with others. Furthermore, we disseminated the research findings through the local press, also available online, to reach participants unable to attend the meetings in person.

Finally, ethical issues play a key role in experimental research on older adults. First, researchers must guarantee study participants the possibility to leave the study at any time. In the case of media studies, an important issue concerns granting the possibility of being disconnected from the device (Van Hoof et al., 2018). In fact, if participants feel that their privacy is excessively violated, they may become too suspicious and decide to withdraw from the study. In the ANS-SE, all participants had the opportunity to choose when to keep their smartphone connected; in addition, we did not fix any minimum time threshold for SNS use (e.g., no minimum number of posts on Facebook or messages to be sent on WhatsApp).

Furthermore, to guarantee access to the technology even after the formal end of the study, we offered participants the opportunity to keep their smartphones for free. To avoid the rise of digital inequalities, older participants in the two control groups could attend an SNS course.

The ILQA-19 study

The ILQA-19 study was based on online qualitative interviews (Hine, 2005). In these years, most qualitative studies have gradually pivoted to online forms of data collection, as social distancing measures due to the COVID-19 pandemic have limited traditional face-to-face research designs (Roberts et al., 2021). Recent literature provided a series of best practices and innovative solutions to the limitations on qualitative methods of data collection caused by social distancing measures. Specifically, literature in the field of sociology of disasters and online synchronous interviewing addressed the ethical issues related to the choice of video-calling software, e.g., the challenges in terms of data security and informed consent (Dodds & Hess, 2020; Lobe et al., 2020; Roberts et al., 2021), the efforts needed to establish trust through remote interactions, and the call for more ethically driven research to mitigate the traumatic experiences arisen from social distancing (Lawrence, 2022; Moran & Caetano, 2021). Some amendments to research designs have been discussed, e.g., innovative attempts to remote recruitment procedures (Kobakhidze et al., 2021) or flexible study timelines (Roberts et al., 2021) to meet research targets. Also, some scholars illustrated the limitations of online recruitment, especially concerning the risk of under-representation for social categories with low or no access to online technologies (Newman et al., 2021; Saberi, 2020; Sy et al., 2020), but without any practical suggestion to overcome these difficulties.

Specifically, little is known about strategies to successfully engage older adults in online interviewing. Actually, research teams have often cut older adults out from their online interviews-based studies, with the explanation that they did not meet the digital skills required to participate (Dodds & Hess, 2020; Howlett, 2021). Despite the request for more empirical data on older adults' experiences of the pandemic (Richardson et al., 2020), this tendency was particularly evident in pandemic-related research, as some scholars pointed out (Ng & Indran, 2022; Pentaris et al., 2020; Silva et al., 2021).

In the ILQA-19 study, we tried to address these very methodological gaps. When wave 1 of the study started in spring 2020, a widespread study advertising campaign was enacted among main community stakeholders: we informed local authorities, newspapers, and community leaders of the study and invited them to collaborate with the recruitment. This was part of the preliminary trust-building activities: while socially distancing, local gatekeepers could represent a guarantee for potential participants instead of in-person preliminary interactions with the research team. During the first contact with study participants, this common ground of trust was key when

convincing them to participate through video interviews: we had, in fact, to overcome some reluctances due to various reasons, such as different media ideologies (Gershon, 2010), e.g., personal preference for a normal telephone call, shyness, and/or auto-assessed low digital competences, so trust enabled a successful interviewer-interviewees interaction.

In our original research design, we fell prey to ageist misconceptions, limiting the recruitment only to older people aged 65–75 in the belief that only the youngest old would be able and willing to participate in our online study. However, as the recruitment process started, some 75+ individuals called us expressing their will to participate in the study. To adapt to a heterogeneous population and make space for an extended age range, we implemented a non-invasive protocol to preliminary assess participants' abilities and enable them to contribute regardless of their ICT skills (more details in Melis et al., 2021a). In the interactions before the interviews, we investigated preferred devices and software and personal or external resources that they could activate to prepare for the video interview, if necessary. The protocol had the emancipatory aim to allow our panel to experiment without a patronising approach, e.g., by selecting the platform they felt more confident with, asking a family member for specific assistance, and ultimately seeking technical help from the interviewer. We adapted to their preferences and intervened only if needed, allowing them to autonomously consider alternative solutions. We sent preliminary instructions in different formats depending on the preference (e.g., via email, text message, etc.) and tailored interview reminders accordingly (e.g., through step-by-step instructions or a phone call right that guided through the video call). Right before the interview, the interviewer provided assistance in case of anxious participants or should any problem arise, assuming an emphatic role (Lo & Fan, 2021). During the interviews, only minor difficulties were experienced (mostly due to poor reception), and even the less ICT-savvy users were able to contribute to the study. By virtue of the trustworthy relationship, study participants felt more confident in experimenting with ICTs even when not directly necessary for the research, i.e., by autonomously playing around to attend online dissemination activities or asking the interviewer for assistance to satisfy ICT-related curiosities. During wave 2, in spring 2021, they experimented even more, to the extent of nearly reversing traditional interviewer-interviewees power dynamics: as study participants experimented with ICT use practices to adapt to their daily habits (see also Melis et al., 2021b), we observed them while actively suggesting their preferred video-calling platforms, proposing alternatives or autonomously working out a solution in the case of technical difficulties (Melis et al., 2022).

Finally, in our experience, two main elements are to be taken into consideration when planning qualitative online research with older adults: tailored procedures and positive interaction between the research team and study participants. First, a flexible research design helps adapting to older adults' different backgrounds in terms of ICT use practices, providing personalised

procedures before and during online video interviews. Second, dedicated efforts to build participants' trust are crucial in mitigating possible difficulties in online qualitative research. A positive interaction with study participants might also help negotiate and co-construct tailored procedures, enabling them to request eventual interventions that allow them to fully participate. All in all, these elements proved successful in our online research, helping us recruit a heterogeneous panel of older adults that felt at ease participating in a video interview and felt confident asking for technical assistance rather than withdrawing from participation.

Concluding remarks

To conclude, drawing on our research experience, we would like to propose some methodological suggestions that might be useful to the social researcher interested in studying ageing and digital technologies – but also digital technology use among different age groups – and avoiding reproducing standard age-related stereotypes. Despite the methods discussed in this chapter being very different, there are some commonalities that are worth highlighting. We identified three key aspects to be taken into account:

1 When starting a research project on ageing and digital technologies, the researchers shall discuss their own definition of the concept "older person" to be sure not to exclude people from specific age groups and to take into account the profound differences among individuals classified as older adults. A reflection on the diversity that characterises the older adults group is not only crucial for guaranteeing an inclusive approach to the recruitment of participants but also to the preparation of research materials and the very collection of data – e.g., the implementation of tailored procedures might enable the inclusion of different ICT users from a heterogeneity of age groups and take into account specific needs.
2 The research undertaken has also highlighted the importance of adopting a participatory approach: older participants need to be consulted at each stage of the research process to allow the discussion of the empirical procedures, the meanings that researchers attribute to the data collected, and the ethical boundaries of the research itself. Adopting a participatory approach often requires mixing quantitative and qualitative methods, to ensure taking into account participants' digital media cultures and their own images of themselves as technology users.
3 Last, a flexible research design helps adapting to older adults' different backgrounds in terms of ICT use practices, providing personalised procedures.

As previously mentioned, our experience is based on research undertaken in Italy. This is a context in which trends in the ageing population and digital technology use make research on ageing and digital technologies particularly

relevant – and thus also a reflection on the risks of reproducing ageism against older adults while researching these topics. Nonetheless, in our opinion, the reflection developed and the suggestions provided might inspire a broader debate on what we would call "methodological ageism", that is, the risk of reproducing and reinforcing, through our methodological choices, standard stereotypes on age and technology use. As far as ageism against older adults is concerned, acknowledging this risk is crucial to recognise older adults' full agency in the use of digital technologies while doing social research. In fact, like any other social actor, older adults might use digital technology to fulfil specific tasks they confront during the contingency of everyday life. Similarly, they might not necessarily use digital devices simply to join social groups but instead to actively participate in their construction.

References

Aipperspach, R., Rattenbury, T. L., Woodruff, A., Anderson, K., Canny, J. F., & Aoki, P. (2006). Ethno-mining: Integrating numbers and words from the ground up. *Electrical Engineering and Computer Sciences University of California at Berkeley*, Tech Report UCB/EECS-2006, 125. https://www2.eecs.berkeley.edu/Pubs/TechRpts/2006/EECS-2006-124.html

Audy Martínek, P., Caliandro, A., & Denegri-Knott, J. (2022). Digital practices tracing: Studying consumer lurking in digital environments. *Journal of Marketing Management*, 1–31. https://doi.org/10.1080/0267257X.2022.2105385

Ben-David, B. M., Malkin, G., & Erel, H. (2018). Ageism and neuropsychological tests. In L. Ayalon & C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism* (pp. 277–297). Springer Nature. https://doi.org/10.1007/978-3-319-73820-8

Binstock, R. H. (2010). From compassionate ageism to intergenerational conflict? *The Gerontologist*, *50*(5), 574–585. https://doi.org/10.1093/geront/gnq056

Bloch, F., & Charasz, N. (2014). Attitudes of older adults to their participation in clinical trials: A pilot study. *Drugs & Aging*, *31*(5), 373–377. https://doi.org/10.1007/s40266-014-0168-2

Boase, J., & Ling, R. (2013). Measuring mobile phone use: Self-report versus log data. *Journal of Computer-Mediated Communication*, *18*(4), 508–519. https://doi.org/10.1111/jcc4.12021

Bouwman, H., de Reuver, M., Heerschap, N., & Verkasalo, H. (2013). Opportunities and problems with automated data collection via smartphones. *Mobile Media & Communication*, *1*(1), 63–68. https://doi.org/10.1177/2050157912464492

Caliandro, A. (2018). Digital methods for ethnography: Analytical concepts for ethnographers exploring social media environments. *Journal of Contemporary Ethnography*, *47*(5), 551–578. https://doi.org/10.1177/0891241617702960

Caliandro, A. (2021). Repurposing digital methods in a post-API research environment: Methodological and ethical implications. *Italian Sociological Review*, *11*(4S), 225–242.

Caliandro, A., & Gandini, A. (2017). *Qualitative research in digital environments: A research toolkit*. Routledge.

Caliandro, A., Garavaglia, E., Sturiale, V., & Di Leva, A. (2021). Older people and smartphone practices in everyday life: An inquire on digital sociality of Italian older

users. *The Communication Review*, *24*(1), 47–78. https://doi.org/10.1080/107144 21.2021.1904771

Cecchini, M. (2019). Reinforcing and reproducing stereotypes? Ethical considerations when doing research on stereotypes and stereotyped reasoning. *Societies*, *9*(4), 79. https://doi.org/10.3390/soc9040079

Chen, Y.-R. R., & Schulz, P. J. (2016). The effect of information communication technology interventions on reducing social isolation in the elderly: A systematic review. *Journal of Medical Internet Research*, *18*(1), e18. https://doi.org/10.2196/ jmir.4596

Chenail, R. J. (2011). Interviewing the investigator: Strategies for addressing instrumentation and researcher bias concerns in qualitative research. *Qualitative Report*, *16*(1), 255–262. https://eric.ed.gov/?id=EJ914046

Coleman, R. (2018). *Designing experiments for the social sciences: How to plan, create, and execute research using experiments*. Sage Publications.

Comunello, F., Rosales, A., Mulargia, S., Ieracitano, F., Belotti, F., & Fernández-Ardèvol, M. (2020). "Youngsplaining" and moralistic judgements: Exploring ageism through the lens of digital "media ideologies". *Ageing & Society*, 1–24. https://doi. org/10.1017/S0144686X20001312

Cuddy, A. J., Norton, M. I., & Fiske, S. T. (2005). This old stereotype: The pervasiveness and persistence of the elderly stereotype. *Journal of Social Issues*, *61*(2), 267–285. https://doi.org/10.1111/j.1540-4560.2005.00405.x

Dodds, S., & Hess, A. C. (2020). Adapting research methodology during COVID-19: Lessons for transformative service research. *Journal of Service Management*, *32*(2), 203–217. https://doi.org/10.1108/JOSM-05-2020-0153

Doyle, C., & Goldingay, S. (2012). The rise of the "silver surfer": Online social networking and social inclusion for older adults. *Journal of Social Inclusion*, *3*(2), 40–54. https://doi.org/10.36251/josi.54

Dunn, L. B., & Jeste, D. V. (2001). Enhancing informed consent for research and treatment. *Neuropsychopharmacology*, *24*(6), 595–607. https://doi.org/10.1016/ S0893-133X(00)00218-9

Eurostat (2020). *Population and demography* [Data set]. https://ec.europa.eu/ eurostat/web/population-demography

Fernández-Ardèvol, M., Rosales, A., Loos, E., Peine, A., Beneito-Montagut, R., Blanche, D., & Östlund, B. (2019). Methodological strategies to understand smartphone practices for social connectedness in later life. In J. Zhou & G. Salvendy (Eds.), *International Conference on human-computer interaction* (pp. 46–64). Springer. https://doi.org/10.1007/978-3-030-22015-0_4

Gershon, I. (2010). Media ideologies: An introduction. *Journal of Linguistic Anthropology*, *20*(2), 283–293. https://www.jstor.org/stable/43104264

Golomb, B. A., Chan, V. T., Evans, M. A., Koperski, S., White, H. L., & Criqui, M. H. (2012). The older the better: Are elderly study participants more nonrepresentative? A cross-sectional analysis of clinical trial and observational study samples. *BMJ Open*, *2*(6), e000833. http://dx.doi.org/10.1136/bmjopen-2012-000833

Grigorovich, A., Kontos, P., Jenkins, A., & Kirkland, S. (2021). Moving toward the promise of participatory engagement of older adults in gerotechnology. *The Gerontologist*, *62*(3), 324–331. https://doi.org/10.1093/geront/gnab026

Guaita, A., Colombo, M., Vaccaro, R., Fossi, S., Vitali, S. F., Forloni, G., Polito, L., Davin, A., Ferretti, V. V., & Villani, S. (2013). Brain aging and dementia during the transition from late adulthood to old age: Design and methodology of the

"Invece. Ab" population-based study. *BMC Geriatrics*, *13*(1), 1–9. https://doi.org/10.1186/1471-2318-13-98

Harrits, G. S., & Møller, M. (2021). Qualitative vignette experiments: A mixed methods design. *Journal of Mixed Methods Research*, *15*(4), 526–545. https://doi.org/10.1177/1558689820977607

Herzog, A. R., & Rodgers, W. L. (1988). Age and response rates to interview sample surveys. *Journal of Gerontology*, *43*(6), S200–S205. https://doi.org/10.1093/geronj/43.6.S200

Hine, C. (2005). *Virtual methods: Issues in social research on the Internet*. Berg Pub Limited.

Howlett, M. (2021). Looking at the "field" through a Zoom lens: Methodological reflections on conducting online research during a global pandemic. *Qualitative Research*, *22*(3), 387–402. https://doi.org/10.1177/1468794120985691

Iversen, S. M., & Wilinska, M. (2020). Ageing, old age and media: Critical appraisal of knowledge practices in academic research. *International Journal of Ageing and Later Life*, *14*(1), 121–149. https://doi.org/10.3384/ijal.1652-8670.18441

Kobakhidze, M. N., Hui, J., Chui, J., & González, A. (2021). Research disruptions, new opportunities: Re-imagining qualitative interview study during the COVID-19 pandemic. *International Journal of Qualitative Methods*, *20*. https://doi.org/10.1177/16094069211051576.

Lawrence, L. (2022). Conducting cross-cultural qualitative interviews with mainland Chinese participants during COVID: Lessons from the field. *Qualitative Research*, *22*(1), 154–165. https://doi.org/10.1177/1468794120974157

Levy Paluck, E. (2010). The promising integration of qualitative methods and field experiments. *The ANNALS of the American Academy of Political and Social Science*, *628*(1), 59–71. https://doi.org/10.1177/0002716209351510

Lewis-Beck, M., Bryman, A. E., & Liao, T. F. (2004). *The Sage encyclopedia of social science research methods*. Sage Publications.

Lo, M. C. M., & Fan, Y. (2021). How narratives of disaster impact survivors' emotionality: The case of typhoon Morakot. *Poetics*, 101579. https://doi.org/10.1016/j.poetic.2021.101579

Lobe, B., Morgan, D., & Hoffman, K. A. (2020). Qualitative data collection in an era of social distancing. *International Journal of Qualitative Methods*, 19, 160940692093787. https://doi.org/10.1177/1609406920937875.

Loos, E., Haddon, H., & Mante-Meijer, E. (2012). *Generational use of new media*. Ashgate Publishing.

Madianou, M., & Miller, D. (2013). Polymedia: Towards a new theory of digital media in interpersonal communication. *International Journal of Cultural Studies*, *16*(2), 169–187. https://doi.org/10.1177/1367877912452486

Mannheim, I., Schwartz, E., Xi, W., Buttigieg, S. C., McDonnell-Naughton, M., Wouters, E. J. M., & van Zaalen, Y. (2019). Inclusion of older adults in the research and design of digital technology. *International Journal of Environmental Research and Public Health*, *16*(19), 3718. https://doi.org/10.3390/ijerph16193718

Marston, H. R., Musselwhite, C., & Hadley, R. (2020). COVID-19 vs social isolation: The impact technology can have on communities, social connections and citizens. *Aging Issues*. Retrieved from: https://ageingissues.wordpress.com/2020/03/18/covid-19-vs-social-isolation-the-impact-technology-can-have-on-communities-social-connections-and-citizens/?fbclid=IwAR30zMJujZfWFBImQR6V_wLJWlnHBrUYq21_SgTBS9qQ7Hgl9jkQ-_BU9kg

Melis, G., Sala, E., & Zaccaria, D. (2021a). Remote recruiting and video-interviewing older people: A research note on A qualitative case study carried out in the first COVID-19 red zone in Europe. *International Journal of Social Research Methodology*, *25*(4), 477–482. https://doi.org/10.1080/13645579.2021.1913921

Melis, G., Sala, E., & Zaccaria, D. (2021b). «I turned to Facebook to know when they would open the cemetery». Results from a qualitative case study on older people's social media use during COVID-19 lockdown in Italy. *Rassegna Italiana di Sociologia*, *62*(2), 431–457. https://doi.org/10.1423/101851

Melis, G., Sala, E., & Zaccaria, D. (2022). The role of information and communication technologies in researching older people during the COVID-19 pandemic. in Q. Gao & J. Zhou (Eds.), *International Conference on Human-Computer Interaction*, pp. 53–68, Springer.

Merkel, S., & Kucharski, A. (2019). Participatory design in gerontechnology: A systematic literature review. *The Gerontologist*, *59*(1), e16–e25. https://doi.org/10.1093/geront/gny034

Millward, P. (2003). The "grey digital divide": Perception, exclusion and barriers of access to the Internet for older people. *First Monday*, *8*(7). https://firstmonday.org/ojs/index.php/fm/article/view/1066

Moran, L., & Caetano, A. (2021). Biographical research through the looking glass of social distancing: Reflections on biographical interviewing and online technologies in pandemic times. *Irish Journal of Sociology*, *30*(2), 209–2013. https://doi.org/10.1177/07916035211022182

Newman, P. A., Guta, A., & Black, T. (2021). Ethical considerations for qualitative research methods during the COVID-19 pandemic and other emergency situations: Navigating the virtual field. *International Journal of Qualitative Methods*, *20*. https://doi.org/10.1177/16094069211047823

Ng, R., & Indran, N. (2022). Reframing aging during COVID-19: Familial role-based framing of older adults linked to decreased ageism. *Journal of the American Geriatrics Society*, *70*(1), 60–66. https://doi.org/10.1111/jgs.17532

Payne, G., & Payne, J. (2004). *Key concepts in social research*. Sage Publications.

Peine, A., & Neven, L. (2021). The co-constitution of ageing and technology – a model and agenda. *Ageing & Society*, *41*(12), 2845–2866. https://doi.org/10.1017/S0144686X20000641

Pentaris, P., Willis, P., Ray, M., Deusdad, B., Lonbay, S., Niemi, M., & Donnelly, S. (2020). Older people in the context of COVID-19: A European perspective. *Journal of Gerontological Social Work*, *63*(8), 736–742. https://doi.org/10.1080/01634372.2020.1821143

Poli, A., Kelfve, S., Berg, K., & Motel-Klingebiel, A. (2021). Old-age diversity is underrepresented in digital health research: Findings from the evaluation of a mobile phone system for post-operative progress monitoring in Sweden. *Ageing and Society*, 1–23. https://doi.org/10.1017/S0144686X21001641

Prowse, M., & Camfield, L. (2013). Improving the quality of development assistance: What role for qualitative methods in randomized experiments? *Progress in Development Studies*, *13*(1), 51–61. https://doi.org/10.1177/146499341201300104

Richardson, S. J., Carroll, C. B., Close, J., Gordon, A. L., O'Brien, J., Quinn, T. J., & Witham, M. D. (2020). Research with older people in a world with COVID-19: Identification of current and future priorities, challenges and opportunities. *Age and Ageing*, *49*(6), 901–906. https://doi.org/10.1093/ageing/afaa149

Roberts, J. K., Pavlakis, A. E., & Richards, M. P. (2021). It's more complicated than it seems: Virtual qualitative research in the COVID-19 era. *International Journal of Qualitative Methods*, *20*. https://doi.org/10.1177/16094069211002959

Rogers, R. (2017). Foundations of digital methods: Query design. In M. T. Schäfer, & K. van Es (Eds.), *The Datafied Society. Studying culture through data* (pp. 75–94). Amsterdam University Press.

Rogers, R. (2019). *Doing digital methods*. Sage.

Rosales, A., & Fernández-Ardèvol, M. (2019). Smartphone usage diversity among older people. Smartphone usage diversity among older people. In S. Sayago (Ed.), *Perspectives on human-computer interaction research with older people* (pp. 51–66). Springer.

Rosales, A., & Fernández-Ardèvol, M. (2020). Ageism in the era of digital platforms. *Convergence*, *26*(5–6), 1074–1087. https://doi.org/10.1177/1354856520930905

Saberi, P. (2020). Research in the time of coronavirus: Continuing ongoing studies in the midst of the COVID-19 pandemic. *AIDS and Behavior*, *24*(8), 2232–2235. https://doi.org/10.1007/s10461-020-02868-4

Sala, E., & Gaia, A. (2019). Older People's use of «Information and communication technology» in Europe. The Italian case. *Autonomie locali e servizi sociali*, *2*(2019), 163–183. https://doi.org/10.1447/95863

Salganik, M. J. (2018). *Bit by bit. Social research in a digital age*. Princeton University Press.

Silva, M. F., Silva, D. S. M. D., Bacurau, A. G. D. M., Francisco, P. M. S. B., Assumpção, D. D., Neri, A. L., & Borim, F. S. A. (2021). Ageism against older adults in the context of the COVID-19 pandemic: An integrative review. *Revista de saude publica*, *55*. https://doi.org/10.11606/s1518-8787.2021055003082

Steils, N. (2021). Qualitative experiments for social sciences. *New Trends in Qualitative Research*, *6*, 24–31. https://doi.org/10.36367/ntqr.6.2021.24-31

Stier, S., Breuer, J., Siegers, P., & Thorson, K. (2020). Integrating survey data and digital trace data: Key issues in developing an emerging field. *Social Science Computer Review*, *38*(5), 503–516. https://doi.org/10.1177/0894439319843669

Swift, H. J., Abrams, D., Marques, S., Vauclair, C. M., Bratt, C., & Lima, M.-L. (2018). Ageism in the European region: Finding from the European social survey. In L. Ayalon, & C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism* (pp. 441–459). Springer.

Sy, M., O'Leary, N., Nagraj, S., El-Awaisi, A., O'Carroll, V., & Xyrichis, A. (2020). Doing interprofessional research in the COVID-19 era: A discussion paper. *Journal of Interprofessional Care*, *34*(5), 600–606. https://doi.org/10.1080/13561820.2020.1791808

Taipale, S., & Farinosi, M. (2018). The big meaning of small messages: The use of WhatsApp in intergenerational family communication. In J. Zhou & G. Salvendy (Eds.), *Human aspects of IT for the aged population: Acceptance, communication and participation* (pp. 532–546). Springer. https://doi.org/10.1007/978-3-319-92034-4_40

Troyna, B., & Carrington, B. (2005). Whose side are we on? Ethical dilemmas in research on "race" and education. In R. G. Burgess (Ed.), *The ethics of educational research* (pp. 205–223). Falmer Press.

Van Hoof, J., Verboor, J., Oude Weernink, C. E., Sponselee, A. A. G., Sturm, J. A., Kazak, J. K., Govers, G. M. J., & Van Zaalen, Y. (2018). Real-time location systems for asset management in nursing homes: An explorative study of ethical aspects. *Information*, *9*(4), 80. https://doi.org/10.3390/info9040080

Van Spall, H. G., Toren, A., Kiss, A., & Fowler, R. A. (2007). Eligibility criteria of randomized controlled trials published in high-impact general medical journals: A systematic sampling review. *Jama*, *297*(11), 1233–1240. https://doi.org/10.1001/jama.297.11.1233

Vincent, J. (2023). Life stage or age? Reviewing perceptions of oldest ICT users. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Zaccaria, D., Guaita, A., Vaccaro, R., Casanova, G., Abbondanza, S., Pettinato, L., Cerati, G., Rolandi, E., & Sala, E. (2020). Assessing the impact of social networking site use on older people's loneliness and social isolation. A randomized controlled trial: The Aging in a Networked Society-Social Experiment Study (ANS-SE). *Contemporary Clinical Trials Communications*, *19*, 100615. https://doi.org/10.1016/j.conctc.2020.100615

Zwijsen, S. A., Niemeijer, A. R., & Hertogh, C. M. (2011). Ethics of using assistive technology in the care for community-dwelling elderly people: An overview of the literature. *Aging & Mental Health*, *15*(4), 419–427. https://doi.org/10.1080/13607863.2010.543662

Conclusion: Production, transmission and reproduction of ageist practices

Mireia Fernández-Ardèvol

In most contemporary societies, a stigma is associated with elderhood (e.g., Calasanti & King, 2017; Gullette, 2017). Generally speaking, no one is thrilled about being labelled an "old person", and even some ageist approaches are described from third-agers towards fourth-agers (Kydd et al., 2018) – meaning from younger older adults towards the oldest ones. Along those lines, Margaret M. Gullette suggests that "ageing is the process that serves as the trigger for ageism" (Gullette, 2017, p. xiv), while it might be the reason why ageism is all around (Gullette, 2017; World Health Organization, 2017).

This book aims to shed light on how ageism operates in the digital realm and how this influences society at large. It is a relevant issue given the hyper-digitisation processes of contemporary societies, which accelerated even more with the COVID-19 pandemic outbreak in 2020 (e.g., Aarts et al., 2021; Nguyen et al., 2020). In addition, it considers the intersection of ageing and (digital) technology a "privileged standpoint" for approaching the study of ageism (Comunello et al., 2023, p. 18). By analysing digital technologies – their materiality and performance, their associated values and symbols, and the cultures around them – in relation to old age, this volume contributes to producing emancipatory resources that, as cultural gerontologist Stephen Katz argues, are needed for a better understanding of increasingly ageing societies (Katz, 2014). While ageism mainly belongs to the ageing studies field (Levy & Macdonald, 2016), it would be a mistake to keep the analysis of its roots and consequences confined to this single area of knowledge. Ageism, in fact, shapes all of society, as this volume discusses through a range of different studies that focus on how elderhood is depicted, practised and understood.

Two research questions articulate this volume. First, how does ageism operate in hyper-digitised societies? And second, what would be the strategies to tackle ageism? To answer them, I propose two levels of analysis that articulate the discussion below: ageism at the design level and ageism at the symbolic level. Inspired by Francesca Comunello et al. (2023), the two levels of analysis can be connected to the space of multiple modes of ageist exclusion (Sassen, 2014) that Justyna Stypińska et al. (2023) find in the technology industry. The authors identify three dimensions in which the Silicon Valley

culture exerts its practices of exclusion towards those individuals "considered old" (Rosales & Svensson, 2021): products and services, ideology and narratives, and work relations and workspaces. These dimensions are embedded in the two levels of analysis, I propose. First, the design level includes the products and services dimension, as the former is necessary to define and materialise the latter. The design level, however, is broader. It also involves other areas, such as the design of workspaces and work relations, the design of public policies and scientific research design in any field, including social sciences and humanities, to name a few. Finally, the design level is directly attached to decision-making processes. Second, the symbolic level relates to the dimension of ideology and narratives. Again, work relations and even workspaces also have a symbolic dimension, as many other aspects of everyday life that, among others, concern communication.

A feedback loop operates as the design and symbolic levels shape each other. Relevant elements in such a loop are the stereotypical assumptions of old age, which reinforce both ageism in general (e.g., Billette et al., 2020; Gullette, 2017; Levy & Macdonald, 2016) and internalised ageism – or self-ageism – in particular (e.g., Köttl et al., 2021; Vickerstaff & van der Horst, 2022). Ultimately, the associated practices the loops produce and reproduce can contribute to old-age exclusion (Walsh et al., 2017). In this sense, empirical evidence should help debunk the myths or stereotypes that feed and support ageist practices.

Some evidence on how ageism operates

Ageism at the design level

Human-computer interaction (HCI) constitutes a key area of study for the design of services and products. As with other areas of knowledge, it shows an increasing interest towards including the perspective of the older population. Sergio Sayago (2023) identifies three stages. After an initial period when old age was not considered in the design of services and products, a second stage included old age but from a patronising perspective mostly based on stereotypical assumptions of what it means to be old. The current and third stage includes older people's voices to avoid ageism in products and services. Therefore, some sensitivity is already being incorporated that moves beyond the youth-oriented ideal user (Rosales & Svensson, 2021), although there is still significant room for improvement. The trends in the HCI field might resemble current dynamics in society, where older adults are starting to be less "invisible", meaning there is more interest in them, for instance, in mass media or advertisement (as discussed in Ylänne, 2022).

Of relevance is the role of empirical research that feeds evidence-based decision-making in the public and private sectors (e.g., Denzin, 2017; Parkhurst, 2016). As noted by different authors in this volume, there is a risk of perpetuating ageist practices in different stages of empirical research, and a reflection

on research design becomes crucial to tackle the issue. First, Sarah Wagner and Akiko Ogawa (2023) reflect on the practicalities of a case study in Japan and Canada that invited individuals over the age of 80 living in a retirement home to participate in a digital storytelling workshop around ageism. In this case, the authors observe how the facilitators' expectations, together with the surrounding technical architectures and the material objects, could affect the participants' experience within the workshops. They conclude that "socio-technical interventions "must engage older participants, legitimise their contradictions and incorporate their inputs into the intervention's digital practices" (Wagner & Ogawa, 2023, p. 226). Second, Maria Sourbati (Sourbati, 2023) identifies how age biases shape the public transportation system in London (UK), particularly when artificial intelligence-based systems rely on digital datasets that exclude less digitised groups, such as older adults. She recalls that determining the characteristics of the datasets is as relevant as identifying the data not collected (Sourbati & Behrendt, 2020) to identify the strands of exclusion. Finally, in their chapter, Emma Garavaglia et al. (2023) initiate a discussion about such risks in the social sciences field, particularly when the analysis involves digital technologies and old age. Based on their experience conducting research in Italy, they focus on research practice and discuss different techniques and approaches to critically face the (still) silent ways in which ageism is embedded in research design.

Two chapters provide interesting examples of how old age – and its diversity – can be incorporated into different types of research projects. First, Roser Beneito-Montagut et al. (2023) established a permanent dialogue with participants in their ethnographic research in Barcelona (Catalonia, Spain). With this strategy, the authors avoided imposing imported frameworks and ways of doing research that do not consider older people's experiences, particularly older women. Second, in their research in six Latin American countries (Argentina, Colombia, Ecuador, Guatemala, Paraguay and Peru), Barrantes et al. (2023) rely on a survey that did not impose any upper age threshold in the target population – similar approaches can be found in König et al. (2018) and Rosenberg and Taipale (2022). On the other hand, Barrantes et al. fieldwork relies on face-to-face data collection. It avoids the coverage bias associated with fully online methods (e.g., Dutwin & Buskirk, 2022; Mohorko et al., 2013), which comparatively exclude more those populations with a higher digital divide, such as older populations. To be noted is that the authors' analysis was only possible thanks to the design of the original survey, which in this case acts as secondary data, meaning that the data is reused from a previous project.

Even before defining the empirical design details, research projects usually rely on secondary data to contextualise and fine-tune the planned work. A significant number of quantitative analyses depend on secondary data – available on a free-access basis or under a paywall. Those data can be either big data sets or more traditional statistics data sets. A common issue

is the existing data gap when the object of research lies at the intersection of digitisation and old age, as claimed, for instance, by Fret et al. (2019) or Ivan (2017). They found no appropriate secondary data on the matter. Also, from retirement age onwards, older people tend to be homogenised, as discussed by Amaral et al. (2018), meaning that several age groups are treated as a single social category (e.g., the over 65s). In such contexts, it is possible to talk about data ageism (Fernández-Ardèvol & Grenier, 2022; Fret et al., 2019), which renders part of the population invisible to the eyes of data users (Rosales & Fernández-Ardèvol, 2019). Data ageism "results from decisions on how data are collected and delivered that, although well-intended, tend to produce and reproduce the disadvantaged status of old age (Calasanti, 2020; Calasanti & King, 2021)" (Fernández-Ardèvol & Grenier, 2022, p. 11). The data gap, or data divide (Milan & Treré, 2021), operates not only at the country level but might also prevent comparisons and analyses that involve more than one country.

Besides the data divide, Jane Vincent (2023) expressed concern regarding the use of chronological age as "the" indicator of old age diversity and analysed the case for the UK. Remarkably, she questions how individuals' life stages are accounted for – if they are – and the consequences of perceptions and representations of old age. The author discusses the obstacles preventing more accurate representation of old age, an issue that comparatively affects the oldest individuals more and those who might be identified as fourth age (Higgs & Gilleard, 2015). For instance, vulnerability tends to be associated with old age and even more with very old age. Henderson and Sawchuk point out that a simplistic use of the term might enforce those narratives that construct older people as necessarily vulnerable instead of considering the conditions that would render a person vulnerable (Henderson & Sawchuk, 2022). It is not age but life conditions that should count, and those should be known in advance to avoid inaccurate representations of old age and its diversity. For that reason, Vincent advocates a "life stage approach to studies about digital technologies that is inclusive of all ages, so [the] cultural imaginaries of the oldest old can be replaced with factually relevant evidence pertaining to life events rather than age" (Vincent, 2023, p. 38). Here, relevant life events might be related to the conditions that create vulnerability, which are not necessarily associated with chronological age.

Ageism at the symbolic level

At the symbolic level, textual and visual narratives play a role in the representation of old age and ageism (Loos & Ivan, 2018; Phelan, 2018) and constitute one of the many elements that shape the existing cultural imaginaries of the intersection of ageing and digital technologies.

Regarding narratives, two chapters connect to the *magic* and normative concepts of "ageing well" and "active ageing". Originally aimed at dissociating old age from dependency (Taghizadeh Larsson & Jönson, 2018),

they constitute critical elements of public policies (Chapman, 2005; Foster & Walker, 2015). These have been extensively criticised for their neoliberal connotations, which would make older individuals responsible for their own well-being (Dillaway & Byrnes, 2009; Ivan & Loos, 2023). In addition, both provide evidence of the intersection between ageism and sexism. First, Inês Amaral and Marta Flores (2023) focus on the collective appropriation of the concept of active ageing on a particular digital platform, Instagram, to determine how collective narratives on social media depict gender and ageing. Their analysis covers the Portuguese and Spanish linguistic spheres, two major languages with a presence in Europe, Latin America and Africa ("List of Countries and Territories Where Portuguese Is an Official Language", n.d.; "List of Countries Where Spanish Is an Official Language", n.d.). They observe that, in these linguistic communities, most narratives on active ageing reproduce traditional hegemonic gender roles and heteronormative logics. In contrast, there appears to be some evolution in the narratives of old age. The authors qualify as advancement the presence of narratives that move beyond infantilisation, considering older people as responsible and capable of taking care of themselves – which, to my understanding, aligns with some of the neoliberal connotations of the active ageing and ageing well paradigms.

Second, Loredana Ivan and Eugène Loos (2023) analyse the visual representation of older adults in advertisements and marketing strategies for technological products. They rely on a systematic literature review of empirical studies indexed in selected academic databases and published in English between 2011 and 2021. Their findings are less optimistic than the ones obtained by Amaral and Flores. For instance, older adults tend to be more associated with mechanical technologies, such as cars, than digital technologies. The expert role is associated with traditional technologies, whereas older individuals usually play a secondary role when they are sophisticated or digital. The authors consider that the visual portrayals of men are comparatively more positive, mainly due to the lower frequency with which women are included. When they are, they appear in heteronormative couples or the technology is not pictured, delivering the idea that they are not the ones who manipulate or drive the technology and therefore depend on others to use it.

Regarding the cultural imaginaries of old age, it is relevant to recall how these build upon stereotypes and other inaccurate representations (e.g., Sawchuk et al., 2020; Voss et al., 2018). They tend to homogenise old age, ignoring the existing diversity of this life stage – an issue that Bernice Neugarten (1996) already discussed in the 1990s. Magdalena Kania-Lundholm (2023) explores the issue in Sweden, where she confirms how older adults cope with (self-) expectations around their ability to live in a hyper-digitised society. She notes how the paradoxical discourses of connection and disconnection shape older adults' digital practices and the narratives around these. Such narratives are shaped by the negative perceptions of age in the digital technology sector (Rosales & Svensson, 2021). Along those lines, Justyna Stypińska et al. (2023) analyse Silicon Valley (California, US), the iconic location where

the digital technology industry was initiated. They suggest the term Silicon Valley Ageism and propose a framework to conceptualise it, which applies to other kinds of biases in any industry. An essential dimension of its ageism is the prevalent fascination for the youth of Silicon Valley and, more generally, the digital technology industry. On those lines, Jakob Svensson (2023) traces, from a historical perspective, the roots of the technology culture's youth orientation based on research conducted in Brazil, Denmark, Germany, India, Sweden and the US.

Old age as a periphery of digitised societies

To my understanding, part of the problem is that old age constitutes a social periphery. More often than not, entering old age and retirement implies being located in a particular "social location" (Calasanti & King, 2017, p. 38) that pushes the individual from a central position (active in the labour market) to the margins of society (retirement). I call these margins (e.g., Krekula et al., 2018) the periphery. Individuals lose their productive value (if any had ever been recognised) and are deemed to be a burden to societies (e.g., Ginn & Duncan-Jordan, 2019; Mander, 2014). As pensioners, they become dependent on active workers; as individuals, they are more likely to need health and care services. In this context, ageist metaphors such as the "grey tsunami" arose, delivering the idea that the demographic shift represents a challenge, a problem to be tackled because it threatens the existing welfare (Barusch, 2013). Also, the fourth age might be seen in more negative terms than the third age, as recently discussed by Higgs and Gilleard (2022).

I argue that older people's disadvantaged position is amplified and exacerbated when the digital dimension becomes essential, as in contemporary societies. One reason is the age-based digital divide, which is the most pervasive nowadays (e.g., Eurostat, 2022; Sala et al., 2020). The other is the youth orientation of digital culture, which tends to disregard old age and, in some instances, penalises it (see Stypińska et al., 2023; Svensson, 2023). As mentioned above, ageing means facing ageism. Tensions arise due to the contradictions in which older people get trapped as societies are profoundly ageist. Individuals live with and negotiate stereotypical and self-stereotypical assumptions of old age and digitisation (Beneito-Montagut et al., 2023; Kania-Lundholm, 2023).

On digital platforms such as Instagram, there appears to be a trend towards the perpetuation of discourses on hegemonic roles, where sexism and ageism go hand in hand (Amaral & Flores, 2023). Of interest is that older adults are constructed as "the others", and these discourses of alterity reinforce the idea that older adults constitute a peripherical population in terms of the dominant discourses on the platform. Such a peripheral position, which might well be the same in other online platforms, is also observed in visual representations of old age in advertisements (Ivan & Loos, 2023) and in smart mobility systems (Sourbati, 2023).

Recommendations

Strategies to tackle ageism include awareness campaigns and focused interventions with particular collectives (Officer & de la Fuente-Núñez, 2018). In this section, nevertheless, I focus on research design, a dimension that, to my knowledge, needs further discussion. As mentioned above, different chapters in the volume discuss the process and the tools available for analysing old age in the same terms as any other life stage. Thus, Jane Vincent argues, "We cannot leave the acquisition of new knowledge about the oldest only in the hands of those researching the oldest; this approach makes the research an exception rather than part of the norm" (Vincent, 2023, p. 46–47). The same is valid for the more general social category of "older adults". While there is more interest in and more empirical evidence on older adults compared to the oldest older ones, there is still significant room for improvement.

Research on old age, whether in HCI or social sciences, should avoid importing themes, codes or categories from mainstream research (Fernández-Ardèvol et al., 2017). Wagner and Ogawa (2023) demonstrate that even minor practicalities should be questioned, which Beneito-Montagut et al. (2023) implement in their research. To my understanding, the strategy should be incremental so that researchers can introduce improvements in each new iteration or project. Here, Garavaglia et al. (2023) highlight the need for suggestions and examples on how to properly involve older people in digital research design. The authors mention the use of tailored procedures. In contrast, there is also a need to take approaches that acknowledge and embrace heterogeneity (Meunier et al., 2013) together with flexibility and reflexivity (Billo & Hiemstra, 2013) during the research process. As a matter of recommendation, I would call for reflection on ideas and practices for non-ageist research in a digital world, highlighting seven aspects (ACT project Manifesto, summarised on Fernández-Ardèvol & Blanche-Blanche-Tarragó, 2019). First, acknowledge and embrace the existence of old age as a relevant stage in the life course that, as with earlier life stages, should be subject to scientific study. Second, give older people [whether younger-old or older-old] the same chance to participate in research projects as younger people. Third, include older participants in a way that accounts for their diversity. Fourth, expand diversity among older ages by including other distinguishing factors and acknowledging intersectionality. Fifth, avoid ageism in all stages of the research process. Sixth, avoid using emotions instead of argued reason or critical analysis. And seventh, avoid patronising relationships with older people throughout the research project.

Finally, Vincent (2023) suggests that a possible way of addressing ageism in research design, whatever the discipline, would include incorporating the issue, on the one hand, in research projects' codes of practice and, on the other, in project approvals and publications based on peer evaluation. From my point of view, such an ambitious goal would need a previous discussion, so the concern for avoiding ageism in research becomes part of the academic culture.

Ageism or *ageisms*?

The more we know about ageism, the more nuances arise to qualify and explain this complex phenomenon, as discussed in the introductory chapter. Contributions in this volume are not immune to such trends, so some chapters propose new concepts or relate to particular conceptualisations of ageism. To illustrate the trend, I focus on collocations that add an adjective to the noun "ageism" (see a summary in Table 1). To my understanding, the use of that particular structure exemplifies how authors reflect on the

Table 1 Particular concepts of ageism used in the volume

	Internal conceptualisation	*External conceptualisation*
Beneito et al.	Techno-ageism/ technological ageism	-
Barrantes et al.	-	Structural ageism (no source mentioned)
Comunello et al.	-	Digital ageism (Chu et al., 2022)
Garavaglia et al.	Methodological ageism	Compassionate ageism (Binstock, 2010)
Ivan and Loos	Visual ageism (Loos & Ivan, 2018)	-
Kania-Lundholm	-	Digital ageism (Manor & Herscovici, 2021)
Rosales et al.	Digital ageism	Digital ageism (Ahlawat, 2022; Berridge & Grigorovich, 2022; Chu et al., 2022; Gauthier & Sawchuk, 2017; Hebblethwaite, 2016; Lee & Hoh, 2021; *Mandate ACT Project*, 2014; Manor & Herscovici, 2021; Neves et al., 2022; Romero & Ouellet, 2016; Sawchuk, 2015)
Sourbati	-	Digital ageism (inspired by Cutler (2005) and Ivan and Cutler (2021), although these references develop the concept of ageism and technology in general)
Stypińska et al.	Silicon Valley ageism	Part of the framework relies on Manor and Herscovici (2021), although the authors do not explicitly use the term digital ageism
Vincent	-	Structural ageism (Rosales & Fernández-Ardèvol, 2019) Institutional ageism (Lloyd-Sherlock et al., 2016)

Alphabetical order by first author. Only chapters using the collocation "adjective + ageism" are included.

multi-dimensionality of the issue, while I do not claim this to be the only way of conceptualising ageism. Authors rely on internal and external conceptualisations. Here, internal refers to concepts proposed by the authors (in this book or elsewhere), and external refers to terms proposed by other authors and used in the chapter. I invite the reader to consult the corresponding article for further details and definitions. Here, the interest is in illustrating the diversity of *ageisms* (in plural), as already made evident in publications such as *Contemporary Perspectives on Ageism* edited by Liat Ayalon and Clemens Tesch-Römer (2018).

Concluding remarks

Older people, whatever their age, are citizens (among others, of smart cities). They are workers, leaders, and clients of the digital industry. They are also part of the hyper digitised network society – although not always recognised as such. Older individuals are consumers of digital technologies, digital platforms, and, more generally, constitute the human factor in HCI. As part of the digital culture, like any younger individual, older people make everyday life decisions regarding their relationship with digital technologies. However, those are shaped by age-based stereotypes and biases.

The book critically analyses the transmission chain(s) that (re)produce ageism in key spheres of (digital) technology. It sheds light on how ageism functions in the digital realm, from design to usage, and how it affects society. Hence, the different contributions in the book show how ageism operates in the design, development, and use of digital technologies and reflect on how this shapes power relationships at large, bringing ideas on how to counterbalance its impact. This volume might present more questions than answers. For instance, what would be the mechanisms to break with such dynamics? Is there an actual desire to fight ageism, or is there a more urgent need to increase general awareness about the issue? Would it be realistic to expect a reduction in some strands of ageism the moment the age-based digital divide is overcome?

This book is not aiming to be a critique of the critique, which is paralysing. Instead, it looks for a compromise between analysis of the situation – the critique – and possible reflections (and actions) regarding ageism and digital technology. Given the perspectives gathered throughout the chapters and the diverse typologies of ageism they consider, this volume can be said to open, or at least broaden, a discipline.

Acknowledgements

References

Aarts, E., Fleuren, H., Sitskoorn, M., & Wilthagen, T. (Eds.). (2021). *The new common. How the COVID-19 pandemic is transforming society*. Springer Nature. https://doi.org/10.1007/978-3-030-65355-2

Ahlawat, I. (2022). Ageing on the internet: Feminist perspectives on sexist practices. *Convergence*, *28*(5), 1392–1406. https://doi.org/10.1177/13548565221085817

Amaral, I., Daniel, F., & Guadalupe, S. (2018). Policies for gender equality in Portugal: Contributions to a framework for older women. *Prisma Social*, 22, 346–363. http://revistaprismasocial.es/article/view/2467

Amaral, I., & Flores, A. M. M. (2023). Challenging gendered and ageing normative stereotypes on Instagram. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Ayalon, L., & Tesch-Römer, C. (Eds.). (2018). *Contemporary perspectives on ageism*. Springer Open. https://doi.org/10.1007/978-3-319-73820-8

Barrantes, R., Manrique, S., & Ugarte, D. (2023). Digital and personal networks: Interactions in later life. Evidence from six Latin American countries. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Barusch, A. S. (2013). The aging tsunami: Time for a new metaphor. *Journal of Gerontological Social Work*, *56*(3), 181–184. https://doi.org/10.1080/01634372.2013.787348

Beneito-Montagut, R., López-Gómez, D., & García-Santesmases, A. (2023). Technological ageism in a sheltered housing for older people: An intersectional approach. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Berridge, C., & Grigorovich, A. (2022). Algorithmic harms and digital ageism in the use of surveillance technologies in nursing homes. *Frontiers in Sociology*, 7. https://doi.org/10.3389/fsoc.2022.957246

Billette, V., Marier, P., & Séguin, A.-M. (Eds.). (2020). *Getting wise about getting old. Debunking myths about aging*. UBC Press, Purich Books.

Billo, E., & Hiemstra, N. (2013). Mediating messiness: Expanding ideas of flexibility, reflexivity, and embodiment in fieldwork. *Gender, Place and Culture*, *20*(3), 313–328. https://doi.org/10.1080/0966369X.2012.674929

Binstock, R. H. (2010). From compassionate ageism to intergenerational conflict? *Gerontologist*, *50*(5), 574–585. https://doi.org/10.1093/geront/gnq056

Calasanti, T. (2020). Brown slime, the silver tsunami, and apocalyptic demography: The importance of ageism and age relations. *Social Currents*, *7*(3), 195–211. https://doi.org/10.1177/2329496520912736

Calasanti, T., & King, N. (2017). Successful aging, ageism, and the maintenance of age and gender relations. In S. Lamb (Ed.), *Successful aging as a contemporary obsession* (pp. 27–40). Rutgers University Press.

Calasanti, T., & King, N. (2021). Beyond successful aging 2.0: Inequalities, ageism, and the case for normalizing old ages. *The Journals of Gerontology. Series B, Psychological Sciences and Social Sciences*, *76*(9), 1817–1827. https://doi.org/10.1093/geronb/gbaa037

Chapman, S. A. (2005). Theorizing about aging well: Constructing a narrative. *Canadian Journal on Aging/La Revue Canadienne Du Vieillissement*, 24(1), 9–18. https://doi.org/10.1353/cja.2005.0004

Chu, C. H., Nyrup, R., Leslie, K., Shi, J., Bianchi, A., Lyn, A., McNicholl, M., Khan, S., Rahimi, S., Grenier, A., & Bloomberg, L. S. (2022). Digital ageism: Challenges and opportunities in artificial intelligence for older adults. *The Gerontologist*. https://doi.org/10.1093/GERONT/GNAB167

Comunello, F., Mulargia, S., & Ieracitano, F. (2023). "Forever young?" Digital technology, ageism and the (non-)ideal user. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Cutler, S. J. (2005). Ageism and technology. *Generations*, 29(3), 67–72.

Denzin, N. K. (2017). The elephant in the living room: Or extending the conversation about the politics of evidence. In N. K. Denzin & Y. S. Lincoln (Eds.), *The SAGE handbook of qualitative research* (5th ed., pp. 839–866). SAGE.

Dillaway, H. E., & Byrnes, M. (2009). Reconsidering successful aging. *Journal of Applied Gerontology*, 28(6), 702–722. https://doi.org/10.1177/0733464809333882

Dutwin, D., & Buskirk, T. D. (2022). A deeper dive into the digital divide: Reducing coverage bias in internet surveys. *Social Science Computer Review*, 1–19. https://doi.org/10.1177/08944393221093467

Eurostat. (2022). *Internet use in the last 3 months by Individuals [isoc_ci_ifp_iu] 2018, data explorer*. https://ec.europa.eu/eurostat/databrowser/view/ISOC_CI_IFP_IU/default/table?lang=en

Fernández-Ardèvol, M., & Blanche-Blanche-Tarragó, D. (2019). *Ideas and practices for non-ageist research in a digital world*. https://blogs.uoc.edu/in3/ideas-practices-non-ageist-research-digital-world/

Fernández-Ardèvol, M., & Grenier, L. (2022). Exploring data ageism: What good data can('t) tell us about the digital practices of older people? *New Media & Society*. https://doi.org/10.1177/14614448221127261

Fernández-Ardèvol, M., Sawchuk, K., & Grenier, L. (2017). Maintaining connections: Octo- and nonagenarians on digital "use and non-use". *Nordicom Review*, 38(s1), 39–51. https://doi.org/10.1515/nor-2017-0396

Foster, L., & Walker, A. (2015). Active and successful aging: A European policy perspective. *Gerontologist*, 55(1), 83–90. https://doi.org/10.1093/geront/gnu028

Fret, B., De Donder, L., Lambotte, D., Dury, S., Van der Elst, M., De Witte, N., Switsers, L., Hoens, S., Van Regenmortel, S., & Verté, D. (2019). Access to care of frail community-dwelling older adults in Belgium: A qualitative study. *Primary Health Care Research & Development*, 20, e43. https://doi.org/10.1017/S1463423619000100

Garavaglia, E., Caliandro, A., Sala, E., Melis, G., & Zaccaria, D. (2023). Contrasting ageism in research on older people and digital technologies: A methodological reflection. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Gauthier, M., & Sawchuk, K. (2017). Not notable enough: Feminism and expertise in Wikipedia. *Communication and Critical/Cultural Studies*, 14(4), 385–402. https://doi.org/10.1080/14791420.2017.1386321

Ginn, J., & Duncan-Jordan, N. (2019). The generation game: Ending the phony information war between young and old. In J. Evans, S. Ruane, & H. Southall (Eds.),

Data in society: Challenging statistics in an age of globalisation (pp. 291–302). Polity Press.

Gullette, M. M. (2017). *Ending ageism, or how not to shoot old people*. Rutgers University Press.

Hebblethwaite, S. (2016). The (in)visibility of older adults in digital leisure cultures. *Digital Leisure Cultures: Critical Perspectives*, 94–106. https://doi.org/10.4324/9781315666600

Henderson, J., & Sawchuck, K. (2022). Vulnerable and vulnerability : Complexities and conundrums in discourses about older people. *Age, Culture, Humanities: An Interdisciplinary Journal*, 6, 1–6. https://doi.org/10.7146/ageculturehumanities.v6i.133341

Higgs, P., & Gilleard, C. J. (2015). *Rethinking old age: Theorising the fourth age*. Palgrave Macmillan.

Higgs, P., & Gilleard, C. (2022). "Apocalyptic demography" versus the "reckless generation": Framing the third and fourth ages in the media. In V. Ylänne (Ed.), *Ageing and the media. International perspectives*. Polity Press.

Ivan, L. (2017). The adequacy of official national statistics for public policy on ageing (oral communication). Panel 5C: Where are the older people? *ECREA Conference "Digital Culture Meets Data"*, 7 November. University of Brighton, Brighton, United Kingdom.

Ivan, L., & Cutler, S. J. (2021). Ageism and technology: The role of internalized stereotypes. *University of Toronto Quarterly*, *90*(2), 127–139. https://doi.org/10.3138/utq.90.2.05

Ivan, L., & Loos, E. (2023). The marketing of technology products for older people: Evidence of visual ageism. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Kania-Lundholm, M. (2023). Coping in the culture of connectivity: How older people make sense of living with digital ageism. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Katz, S. (2014). What is age studies? *Age Culture Humanities: An Interdisciplinary Journal*, *1*, 17–23. http://ageculturehumanities.org/WP/what-is-age-studies/

König, R., Seifert, A., & Doh, M. (2018). Internet use among older Europeans: An analysis based on SHARE data. *Universal Access in the Information Society*, *17*(3), 621–633. https://doi.org/10.1007/s10209-018-0609-5

Köttl, H., Gallistl, V., Rohner, R., Ayalon, L. (2021). "But at the age of 85? Forget it!": Internalized ageism, a barrier to technology use. *Journal of Aging Studies*, *59*(December 2020). https://doi.org/10.1016/j.jaging.2021.100971

Krekula, C., Nikander, P., & Wilińska, M. (2018). Multiple marginalizations based on age: Gendered ageism and beyond. In L. Ayalon & C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism* (pp. 33–50). Springer Open. https://doi.org/10.1007/978-3-319-73820-8_3

Kydd, A., Fleming, A., Gardner, S., & Hafford-Letchfield, T. (2018). Ageism in the third age. In L. Ayalon & C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism* (pp. 115–130). Springer Open. https://doi.org/10.1007/978-3-319-73820-8_8

Lee, S. Y., & Hoh, J. W. T. (2021). A critical examination of ageism in memes and the role of meme factories. *New Media and Society*. https://doi.org/10.1177/14614448211047845

Levy, S. R., & Macdonald, J. L. (2016). Progress on understanding ageism. *Journal of Social Issues*, 72(1), 5–25. https://doi.org/10.1111/josi.12153

List of countries and territories where Portuguese is an official language. (n.d.). In *Wikipedia* (accessed 05/09/2022). https://en.wikipedia.org/wiki/List_of_countries_and_territories_where_Portuguese_is_an_official_language

List of countries where Spanish is an official language. (n.d.). In *Wikipedia* (accessed 05/09/2022). https://en.wikipedia.org/wiki/List_of_countries_where_Spanish_is_an_official_language

Lloyd-Sherlock, P. G., Ebrahim, S., McKee, M., & Prince, M. J. (2016). Institutional ageism in global health policy. *BMJ (Clinical Research Ed.)*, *354*, i4514. https://doi.org/10.1136/bmj.i4514

Loos, E., & Ivan, L. (2018). Visual ageism in the media. In Ayalon, L & Tesch-Römer, C (Eds.), *Contemporary perspectives on ageism. International perspectives on aging* (pp. 163–176). Springer. https://doi.org/10.1007/978-3-319-73820-8_11

Mandate ACT project. (2014). ACT: [Ageing – Communication – Technology]. Concordia University. http://actproject.ca/mandate

Mander, T. (2014). Longevity and healthy ageing – will healthcare be drowned by the grey tsunami or sunk by the demographic iceberg? *Post Reproductive Health*, *20*(1), 8–10. https://doi.org/10.1177/1754045313515208

Manor, S., & Herscovici, A. (2021). Digital ageism: A new kind of discrimination. *Human Behavior and Emerging Technologies*, *3*(5), 1084–1093. https://doi.org/10.1002/HBE2.299

Meunier, D., Lambotte, F., & Choukah, S. (2013). Du bricolage au rhizome : comment rendre compte de l'hétérogénéité de la pratique de recherche scientifique en sciences sociales ?/From bricolage to rhizome: How to account for heterogeneity of research practices in social sciences? *Questions de Communication*, *23*, 345–366. https://doi.org/10.4000/questionsdecommunication.8480

Milan, S., & Treré, E. (2021). Widening data divide: COVID-19 and the Global South. In S. Milan, E. Treré, & S. Masiero (Eds.), *COVID-19 from the margins. Pandemic invisibilities, policies and resistance in the datafied society* (pp. 24–28). Institute of Network Cultures.

Mohorko, A., de Leeuw, E., & Hox, J. (2013). Internet coverage and coverage bias in Europe: Developments across countries and over time. *Journal of Official Statistics*, *29*(4), 609–622. https://doi.org/10.2478/jos-2013-0042

Neugarten, B. L. (1996). *The meanings of age: Selected papers of Bernice l. Neugarten* (D.A. Neugarten (Ed.)). University Of Chicago Press.

Neves, B. B., Colón Cabrera, D., Sanders, A., & Warren, N. (2022). Pandemic diaries: Lived experiences of loneliness, loss, and hope among older adults during COVID-19. *The Gerontologist*, *63*(1), 120–130. https://doi.org/10.1093/geront/gnac104

Nguyen, M. H., Gruber, J., Fuchs, J., Marler, W., Hunsaker, A., & Hargittai, E. (2020). Changes in digital communication during the COVID-19 global pandemic: Implications for digital inequality and future research. *Social Media and Society*, *6*(3). https://doi.org/10.1177/2056305120948255

Officer, A., & de la Fuente-Núñez, V. (2018). A global campaign to combat ageism. *Bulletin of the World Health Organization*, *96*(4), 295–296. https://doi.org/10.2471/BLT.17.202424

Parkhurst, J. (2016). *The politics of evidence: From evidence-based policy to the good governance of evidence*. Routledge.

Phelan, A. (2018). Researching ageism through discourse. In L. Ayalon & C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism* (pp. 549–564). Springer Open. https://doi.org/10.1007/978-3-319-73820-8_31

Romero, M., & Ouellet, H. (2016). Scaffolding digital game design activities grouping older adults, younger adults and teens. *Lecture Notes in Computer Science (Including Subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)*, *9754*, 74–81. https://doi.org/10.1007/978-3-319-39943-0_8

Rosales, A., & Fernández-Ardèvol, M. (2019). Structural ageism in big data approaches. *Nordicom Review*, *40*(1), 51–64. https://doi.org/10.2478/nor-2019-0013

Rosales, A., & Svensson, J. (2021). Perceptions of age in contemporary tech. *Nordicom Review*, *41*, 79–91. https://doi.org/10.2478/nor-2021-0021

Rosenberg, D., & Taipale, S. (2022). Social and satisfied? Social uses of mobile phone and subjective wellbeing in later life. *Human Technology*, *18*(1), 45–65. https://doi.org/10.14254/1795-6889.2022.18-1.4

Sala, E., Gaia, A., & Cerati, G. (2020). The gray digital divide in social networking site use in Europe: Results from a quantitative study. *Social Science Computer Review*. https://doi.org/10.1177/0894439320909507

Sassen, S. (2014). *Expulsions: Brutality and complexity in the global economy*. Harvard University Press.

Sawchuk, K. (2015). Digital ageism: Age-related inclusions and exclusions in networked societies. *Silver gaming intergenerational summer school #SGISS15. 21–22 August, Université Laval, Québec, Canada*, 21. http://lel.crires.ulaval.ca/oeuvre/intergenerational-learning-life-narratives-and-games-sgiss-2015-proceedings

Sawchuk, K., Grenier, L., & Lafontaine, C. (2020). "That's surprising, at your age!" The myth of digital disinterest. In V. Billette, P. Marier, & A.-M. Séguin (Eds.), *Debunking myths about aging* (pp. 36–43). UBC Press, Purich Books.

Sayago, S. (2023). Human-computer interaction research on ageism: Essential, incipient, and challenging. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Sourbati, M. (2023). Age bias on The move: The case of smart mobility. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Sourbati, M., & Behrendt, F. (2020). Smart mobility, age and data justice. *New Media and Society*. https://doi.org/10.1177/1461444820902682

Stypińska, J., Rosales, A., & Svensson, J. (2023). Silicon Valley ageism – ideologies and practices of expulsion in tech industry. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Svensson, J. (2023). Technology culture as youth oriented. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Taghizadeh Larsson, A., & Jönson, H. (2018). Ageism and the rights of older people. In L. Alayon & C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism* (pp. 369–382). Springer Open. https://doi.org/10.1007/978-3-319-73820-8_22

Vickerstaff, S., & van der Horst, M. (2022). Embodied ageism: "I don't know if you do get to an age where you're too old to learn". *Journal of Aging Studies*, *62*(June), 101054. https://doi.org/10.1016/j.jaging.2022.101054

Vincent, J. (2023). Life stage or age? Reviewing perceptions of oldest ICT users. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Voss, P., Bodner, E., & Rothermund, K. (2018). Ageism: The relationship between age stereotypes and age discrimination. In L. Ayalon & C. Tesch-Römer (Eds.), *Contemporary perspectives on ageism* (pp. 11–31). Springer Open. https://doi.org/10.1007/978-3-319-73820-8_2

Wagner, S., & Ogawa, A. (2023). Tackling ageism in sociotechnical interventions: An actor-network analysis of the pre-story space in digital storytelling workshops with care home residents. In A. Rosales, M. Fernández-Ardèvol, & J. Svensson (Eds.), *Digital ageism: How it operates and approaches to tackling it*. Routledge.

Walsh, K., Scharf, T., & Keating, N. (2017). Social exclusion of older persons: A scoping review and conceptual framework. *European Journal of Ageing*, *14*(1), 81–98. https://doi.org/10.1007/s10433-016-0398-8

World Health Organization. (2017, May). *10 facts on ageing and health*. http://www.who.int/features/factfiles/ageing/en/

Ylänne, V. (Ed.). (2022). *Ageing and the media. International perspectives*. Polity Press.

Index