Ageing with digital technologies: From theory to agency and practice

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The title of this special issue, "Ageing with digital technologies" points to two of the growing challenges facing the twenty-first century, namely the changing demographic structure of societies connected to ageing populations on the one hand and the technological development and digitalization of societies on the other hand. These challenges are continuously addressed by researchers and scholars across the globe in a variety of academic disciplines, including medicine, demography, biotechnology, neuroscience to name just a few. At the same time, questions of ageing and technology do not go unnoticed in other disciplines, including humanities and social sciences. The focus of this special issue is on the latter, namely exploring and better understanding the *social* and *material* factors, in terms of theory, agency, and practice, that play a role when older people are co-creators, users, and recipients of technological innovations.

The notion that older adults are one of the groups for whom digitalization of society is the most problematic has been widely discussed by ageing researchers (Russel, 2011, Quaan-Haase et al., 2018). Most research on older people and digital technology has previously been discussed in two ways: first, in the context of digital and social inequalities, digital divide, and social exclusion. This research has also informed the popular

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portrayal of Internet users in developed countries in rather stereotypical ways, namely young people as tech and internet savvy and older people as lagging behind and relying on help and support from others (Bennett, Maton & Kervin, 2008; Selwyn et al., 2003). Second, the focus has been on the role and impact of technology on older peoples' health and well-being (Schulz et al., 2015). One of the concerns has been that older people often remain excluded from key service infrastructures, which can negatively affect their mental health and well-being. Particularly in the latter case, the scholarly and public discourse has been heavily informed by the idea that different technologies, such as, for instance, social robots, online services, and assistive technologies, can possibly alleviate experiences of exclusion, loneliness, and marginalization. These studies are often informed by a celebratory, techno-deterministic approach to digital technologies and/or are characterized by an interventionist logic that positions the networked, digital technologies themselves as major solutions to the "problems" of aging (Peine & Neven, 2019). This research has previously informed various policies and policy interventions supporting the discourse of digitalization as an inevitably positive force and change in societies. For instance, in 2020, the European Council debated and produced a report entitled "Human Rights, Participation and Well-Being of Older Persons in the Era of Digitalisation" (EU, 2020). Also, the World Health Organisation's "Global Report on ageism" (2021) mentions the beneficial aspects of digital technologies in alleviating loneliness among older people during the COVID-19 lockdowns.

At the same time, in recent years, scholars have begun to critically address and assess the intertwining of ageing and technology and a new field of Socio-gerontology has been established (Peine et al., 2021a; Peine & Neven, 2021b). Here, the new theoretical perspectives and emerging methodological approaches provide both critiques of the dominant accounts of ageing and technology and inspiration for new policy solutions and technology design processes. The topics of research include questions of socio-materiality pertaining to care robots (Bischof, 2017; Ertner & Lassen, 2021), social media use (Beneito-Montagut & Begueria, 2021), and dementia care (Schwennesen, 2021) as well as empirical interventions, design research studies, and critical scholarship on the intersections between Ageing Studies and Science and Technology Studies (STS) (Bischof & Jarke, 2021; Manchester, 2021; Wanka & Gallistl, 2021).

In the spirit of Socio-gerontechnological studies, the task of this special issue is to continue the critical debate and expand the research on ageing and technology by shedding light on how the design and use of digital technologies are embedded in socio-material contexts and may be employed in many creative, sometimes unexpected ways. The approach of the research presented here emphasizes the agency of older people, both as users and co-designers of digital technologies and as participants in the complex processes and systems of technology development and use. This is to say that topics examined in the articles that are part of this special issue point to ageing and technology as a broad phenomenon embedded and located in specific material contexts, temporalities, and spaces. Instead of merely focusing on "testing hypotheses" and "applying theory," we as guest editors were interested in research that would shed light on the "messiness of practice" emerging from, sometimes unexpected, encounters that involve questions of subjectivity, agency, digital (dis)engagement, and technology nonuse. We were interested in moving beyond binaries often invoked between, for instance, older people who have or don't have skills or competencies to understand how this unfolds in real lives and situations.

Scholars in this special issue draw on a range of theoretical inspirations in their papers, including Science and Technology Studies (STS), Actor network theory, Feminist materialist approaches, and critical theories of ageing, and including those exploring datafication, power, and valuation studies. These theoretical understandings foreground particular epistemological and ontological thinking from social researchers, foregrounding relationality between human and nonhuman entities and therefore adopting methods that allow researchers to focus in on practices and how they unfold in complex relations. Many of the papers in this Special Issue adopt ethnographic and design methods and longitudinal design to describe and understand the relations between humans and nonhumans, between ageing and technologies, carers, wired connections, spaces and places, and older people.

Broadly, what connects our thinking across the special issue is the so-called sociomaterial turn that features in the work of the Socio-gerontechnology network (Höppner & Urban, 2019, Peine & Neven, 2019, Peine et al., 2021). The special issue sets out to shed light on the variety of ways in which technologies and ageing lives are not only mutually co-constituted

but also composed of human and nonhuman actors, public discourses, and power relations. By doing so, we hope to provide a closer look into more diverse, nuanced, and participatory techno-gerontological contexts and cultures.

In the following, we introduce the specific themes explored by the papers in this special issue.

Theme 1: Situating care and technologies: screens, robots, and infrastructures of ageing and technologies

Technologies and their effects have become increasingly implicated in our everyday lives and caring practices (Matthewmann, 2011) including in those of older people living in care facilities. Technologies are often seen as a solution to the problem of caring for people as we age. However, often mainstream technology designs for care settings have not lived up to the expectations of policy makers and designers when they are placed into real-life contexts (Vines et al., 2015; Peine & Neven, 2019). This is due, in part, to policy makers and designers not understanding the complex, unfolding relations between technologies, older people, carers, and the material places and spaces where they are situated.

In fact, scholars such as Mol, Moser, and Pols (2010) have suggested that care and technology have often been imagined as opposites. Care involving warmth and tenderness and often perceived as happening in the private sphere while technologies are cold and utilitarian, effective and efficient, and largely situated in the public sphere. They point out that this understanding creates false binaries that are not helpful in understanding how care practices increasingly unfold across assemblages of human and nonhuman relations (Callon and Law, 1995) in both public and private spheres. Technologies, such as health trackers, sensors, and assistive technologies, are increasingly entangled in everyday practices of care, situated in emergent relations, and therefore requiring constant repair, reconfiguration, and "practical tinkering" (Mol, Moser & Pols, 2010:13; Katz & Marshall, 2018).

Taking this approach to understanding the co-production of technologies and care practices means understanding the messy situatedness, the specificities, and the detail of relations (Code, 2015). This more nuanced understanding of caring practices suggests the importance of

acknowledging and making visible and tangible the affective, the ethical/ political, and the maintenance work required for care when designing technologies (Puig de la Bellacasa, 2017). As Winance (2010, p.111) points out, caring alongside, among, and with technologies might then involve adaptation of practices that require exploration, testing, touching, adjusting, and paying attention to details in order to adapt them to find "a suitable arrangement (material, emotional, relational)."

In their article, entitled "Window Work: Screen-based care and Professional Precarity at the Welfare Frontier," Kristina Grünenberg, Line Hillersdal, and Jonas Winther explore how policy imperatives and material situations led healthcare workers to switch to screenwork to deliver care during the COVID-19 pandemic. They draw on an ethnographic study in three Danish island locations to consider how care workers negotiated new roles, developed new competencies, and adapted their practices when caring through screens. Understanding screenwork as a material, embodied, and technological practice, they explore how screens frame vision in particular ways that delimit what care workers can see, do, and achieve. Drawing on the concept of a window as a metaphor, they discuss the "filtering" of the senses and the care workers' and older people's negotiations of proximity, feelings of closeness and connection and disconnection. They suggest that the introduction of screens, which is often seen as an "easy" solution to the "problem" of providing home care for older people, requires significant "invisible work" on the part of healthcare workers. In particular, the co-presence required for care workers to be able to attend to sensory experiences and bodies in space is not easily reproduced through "window work."

In her article, entitled "Infrastructuring ageing; theorising non human agency in ageing and technology studies," Sara-Marie Ertner proposes that the STS concept of infrastructuring can shed important light on the role of nonhuman agency and materiality in explorations of technology and ageing. She first describes the "reductionist" approaches and centering of the human in previous social studies of ageing and technologies and suggests a move toward a relational approach that focusses on how entities and realities unfold in practice. This view understands technologies, not as bounded objects, but rather as distributed in "complex chains of material relations [that] reconfigure bodies, societies and knowledge and discourse in ways often unnoticed" (Harvey et al., 2017, p. 5). Ertner

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provides examples from her own work and that of Lipp (2019) and Langstrup (2013) to explain how the STS concept of infrastructuring can help us to foreground the idea of nonhuman agency in relations between care and technologies. For instance, understanding care robots not as bounded objects but rather as highly distributed across networks of entities, some of which might be visible but others invisible. Her paper demonstrates that researchers might look beyond the human actors and their roles in designing technologies for older adults or beyond a particular bounded site of investigation and rather foreground the distributed and complex workings of infrastructure in order to make sense of the messiness of technologies in practices of ageing and care.

Theme 2: Critical approaches to ageing and digital technologies: power and meaningful technology use

When it comes to ideas about the role of technology in society, the optimistic claims about technologies as solutions to keep ageing populations healthy and independent are among the most dominant ones. These are often informed by the "solutionist" logics of innovation, intervention, and effectiveness. They also encourage more desirable and cost-efficient forms of residence and care. At the same time, scholars have recently begun to offer critical and alternative perspectives with a particular focus on discourses on datafication and embodiment on the one hand and Internet use and aging on the other hand. Two articles in this special issue particularly challenge some dominant imperatives about the beneficial aspects of digital technologies as central to imagining ageing futures. By doing so, they offer a more nuanced perspective while emphasizing the complexity and embeddedness of power relations entrenched on both macro level of discourse and micro level of practice and use.

Nicole Dalmer, Kirsten L. Ellison, Stephen Katz, and Barbara L. Marshall, in their article, entitled "Ageing, embodiment and datafication: Dynamics of power in digital health and care technologies," propose a framework for advancing critical research on ageing and digital technologies by shedding light on three dimensions of power, namely ageing bodies and numbers, ageing spaces and surveillance, and age care and gendered relations. By addressing these issues, they seek to emphasize the shift from more conventional gerontological ideas of healthy

and successful ageing to ageing futures and imaginaries informed by technologically enhanced and coordinated life courses. Methodologically, they draw on previously published studies within ageing and technology, policy documents, Age Tech advertisements, and corporate texts. They argue that to grasp the growing centrality of technology in current systems of care and risk management of older care recipients, we need to pay closer attention to the terrain of the neoliberal governance of health systems and austerity politics and how age-coded and gendered care labor relations reconfigure and endorse certain biases, including those of ageism.

A critical approach to aging and technologies, albeit explored from a different angle, is provided by Anna Wanka and Vera Gallistl who, in their article, entitled "The Internet Multiple: How Internet Practices are Valued in Later Life," ask an important question about how Internet-related practices are valued. Using *valuography*-oriented methodology, they go beyond the binary distinction between Internet use and nonuse and argue for a sociological understanding of value that is both situated and enacted. They analyze different types of empirical materials, such as the funding bodies' research mission statements, research proposals as well as interviews with older Internet users. They distinguish between two specific registers of values related to Internet use, namely autonomy and innovation. The results of their analysis point toward a performative, reflexive, and value-oriented understanding of Internet practices that open for further research and investigation of the "Internet multiple."

Similarly, digital technology use perceived as a form of spectrum rather than "use/non-use" binary is explored by Anoop C Choolayil and Laxmi Putran, in their article, entitled "Transcending Borders and Stereotypes: Older Parents' Intergenerational Contacts and Social Networking through Digital Platforms." They focus on the question of what constitutes a meaningful digital interaction for older adults and how they make sense of their digital life. This article offers also a valuable, and at time overlooked, perspective from the Global South. Empirically, through interviews with older Internet users in Kerala, India, they explore the role of intergenerational contacts as motivational factors for embracing digital life among older adults. The results of their analysis confirm to some extent what previous research has shown, namely that older users often do engage in digital activities that are meaningful for them. Maintaining

contacts with their grandchildren who emigrated is often connected to perceived emotional support stemming from those contacts.

Theme 3: Older people as co-creators and creative agentic users of technologies

Scholarship in Age Studies and Design studies has begun to engage with how older adults themselves might have creative agency in their relations with technologies—both in use in their everyday lives (Bergschold et al., 2019; Wilson, 2018) and in processes of design (Vines et al., 2015; Baker et al., 2019). This has developed alongside an increased call, from organizations advocating for older adults and in policy frameworks, for the participation of older adults in the design and implementation of geron-technologies (Lopez Gomez & Criado, 2021). These studies have begun to question dominant stereotypes of older people as lacking skills and interest in technology use and design or being frail and in need of care. While gerontechnologies have tended to be designed to support the health and care needs of older people, these studies have begun to explore creative and playful uses of technologies and resistance from older people themselves to those mainstream stereotypes suggested above.

Socio-gerontechnology scholarship takes up many of these questions while also adopting a critical understanding of how technologies are shaping and being shaped by socio-material constructs of age (Lassen, 2017; Peine & Neven, 2021; Wanka & Gallistl, 2018). Ethnographic methods have helped scholars to make visible older people's creative uses of technologies and their do-it-yourself arrangements to support depictions of older adults as "technogenarians" rather than "laggards" (Joyce & Loe, 2010; Lopez Gomez & Criado, 2021). In addition, Socio-gerontechnology scholars have developed and adopted participatory design approaches that involve older adults creatively in design and development processes rather than as "testers" of almost finished products and services.

Gabrielle Lavenir's article in this special issue, entitled "Beyond the Silver Gamer: The Compromises and Strategies of Older Video Game Players," draws on her ethnographic research with 15 women, aged 60–82 years who joined video game workshops in a French Cultural Centre. The article explores their situated experiences as they engaged playfully with the video games, exerting their agency as technogenarians (Loe, 2011). The argument

foregrounds the older adults' playfulness and creativity as they negotiate their identities as older game players. It contributes to our understanding not only of older adults' creative and skilful uses of technology but also of their agency and identities as they play out as people age. Lavenir develops a nuanced understanding of the complex way that participants' technobiographies contribute to their ambivalence toward video games and gaming and the development of alternative gender and age identities and collaborative approaches to gaming and play. Her article suggests how participants engaging in video gaming often need to resist and contest discourses that stigmatize the image of the "older woman," developing new discourses and identities to support their play in the process.

Helen Manchester and Juliane Jarke's article, entitled "Considering the role of material gerontology in reimagining technology design for ageing populations," takes up the theme of older people as creative and agentic as they engage as co-creators of technologies, alongside design teams. Their article draws on two co-design projects and utilizes feminist materialist approaches, including the work of Barad (2007) and Haraway (2016), to empirically explore, and critically analyse co-design as a sociomaterial process that produces specific subjectivities and materialities. They draw attention to the importance of critically understanding agency as co-produced dynamically between human and nonhuman actors during co-design processes.

They suggest the value of feminist materialist ideas in making visible taken-for-granted assumptions inscribed in contexts of gerontechnology design practices and offer advice for design teams co-creating technologies alongside older adults.

In summary, this special issue aims to continue the development of the interdisciplinary field of Socio-gerontology. It not only brings together social science and arts and humanities' approaches to researching the co-constitution of ageing and technology and their complex unfolding in everyday lives and spaces of care but also invites for future research and exploration in these rapidly developing fields.

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