ORIGINAL ARTICLE

DOI: https://doi.org/10.34024/8ewcg739

Everyday Technologies in Older Adults' Homes
Tecnologias Cotidianas nas Casas de Pessoas Idosas
Tecnologías Cotidianas en los Hogares de Personas Mayores

Dr. Simona Palladino – *Liverpool Hope University – Liverpool, United Kingdom*
Orcid: https://orcid.org/0000-0002-1201-4966
Dr. Alessandra Fasulo – *University of Portsmouth - Hampshire, United Kingdom*
Orcid: https://orcid.org/0000-0003-4464-3895

Abstract

Older people have been identified as part of the digital divide. However, what contributes to a diverse engagement with technology amongst older adults is still poorly understood. Negative social construction of older age tends to position technology as a solution to the challenges of the aging process, thus contributing to alienating older people from technological devices and developments. This research focuses on the relation between technology and older people, by giving attention to subjective ways in which everyday technology asserts its presence in later life. Participants in England and Italy were video-interviewed about cherished objects in their home space. An ethnographic approach, and a detailed analysis of the verbal and visual data, allowed an understanding of the older adults' practices related to the use of technology. The analysis shows that technological competence is distributed in the social and material environment, and that interviewees engaged with devices that were respondent to their current needs, rather than resisting learning new technologies per se. Availability of support and training from older people's services made a difference in access and consumption of media and technology, whereas reliance on younger members of family could represent an obstacle. This work offers suggestions for design processes of digital technology with an aging population and tailored digital literacy intervention, expanding opportunities for life-long learning.

Keywords: older adults, technology, material culture, ageism

Resumo

As pessoas idosas têm sido identificadas como parte da exclusão digital. No entanto, o que contribui para um engajamento diversificado dos adultos mais velhos com a tecnologia ainda é

Este é um artigo publicado em acesso aberto (Open Access) sob a licença Creative Commons Attribution Non- Commercial, que permite uso, distribuição e reprodução em qualquer meio, sem restrições desde que sem fins comerciais e que o trabalho original seja corretamente citado.

pouco compreendido. A construção social negativa da velhice tende a posicionar a tecnologia como uma solução para os desafios do processo de envelhecimento, contribuindo assim para alienar as pessoas idosas dos dispositivos e desenvolvimentos tecnológicos. Esta pesquisa centra-se na relação entre a tecnologia e as pessoas idosas, prestando atenção às formas subjetivas pelas quais a tecnologia cotidiana afirma sua presença na fase mais avançada da vida. Participantes na Inglaterra e na Itália foram entrevistados por vídeo sobre objetos de estimação em seu espaço doméstico. Uma abordagem etnográfica e uma análise detalhada dos dados verbais e visuais permitiram compreender as práticas dos adultos mais velhos relacionadas ao uso da tecnologia. A análise mostra que a competência tecnológica está distribuída no ambiente social e material, e que os entrevistados se engajaram com dispositivos que respondiam às suas necessidades atuais, em vez de resistirem ao aprendizado de novas tecnologias por si só. A disponibilidade de apoio e capacitação por parte dos serviços para pessoas idosas fez a diferença no acesso e consumo de mídias e tecnologia, enquanto a dependência de membros mais jovens da família pôde representar um obstáculo. Este trabalho oferece sugestões para processos de design de tecnologia digital com uma população em envelhecimento e intervenções personalizadas de letramento digital, expandindo as oportunidades de aprendizagem ao longo da vida

Palavras-chave: pessoas idosas, tecnologia, cultura material, ageísmo.

Resumen

Las personas mayores han sido identificadas como parte de la brecha digital. Sin embargo, todavía se comprende de manera limitada qué factores contribuyen a las diversas formas de interacción con la tecnología entre los adultos mayores. La construcción social negativa de la vejez tiende a posicionar la tecnología como una solución a los desafíos del proceso de envejecimiento, contribuyendo así al distanciamiento de las personas mayores respecto de los dispositivos y avances tecnológicos. Esta investigación se centra en la relación entre la tecnología y las personas mayores, prestando atención a las formas subjetivas en que la tecnología cotidiana se hace presente en la vida tardía. Participantes de Inglaterra e Italia fueron entrevistados mediante video acerca de objetos significativos presentes en sus espacios domésticos. Un enfoque etnográfico, junto con un análisis detallado de los datos verbales y visuales, permitió comprender las prácticas de las personas mayores relacionadas con el uso de la tecnología. El análisis muestra que la competencia tecnológica se distribuye en el entorno

social y material, y que los entrevistados interactuaban con dispositivos que respondían a sus necesidades actuales, en lugar de resistirse, en sí mismos, al aprendizaje de nuevas tecnologías. La disponibilidad de apoyo y formación ofrecidos por servicios dirigidos a personas mayores marcó una diferencia en el acceso y consumo de medios y tecnologías, mientras que la dependencia de familiares más jóvenes podía representar un obstáculo. Este trabajo ofrece aportes para los procesos de diseño de tecnologías digitales orientadas a una población envejecida y para intervenciones de alfabetización digital adaptadas, ampliando las oportunidades de aprendizaje a lo largo de la vida.

Palabras clave: personas mayores, tecnología, cultura material, edadismo.

Introduction and Theoretical Framework

The Digital Divide amongst Older People

Older people have been identified as part of the 'grey digital divide', potentially lacking access, skills and/or knowledge to use advanced technology (Hargittai, 2008; Van Dijk, and Van Deursen, 2010; McCreadie, 2010; Broady et al., 2010; Van Dijk, 2013; Peine et al., 2024). Increasingly older adults use technology and find it beneficial (Czaja, 2017), however, some may lack access to digital devices or not know how to use them (Francis et al., 2019; Ball et al., 2019). Despite attempts to challenge the digital divide (Selwyn, 2004), and problematize the digital literary paradox (Schreurs et al., 2017), or to deconstruct the myths about older people's lack of skills in IT (Quan-Haase, et al., 2018), what factors contribute to a diverse engagement with technology amongst older people is still poorly understood.

Early research of technology in later life held the view that older people were low users of digital technology, and as such, were at risk of being disadvantaged or marginalized from full societal participation (Mitzner et al., 2019; Hargittai, 2019; Choudrie et al., 2020). However, the reasons for non-use of technology amongst older people might be very diverse. For example, it has been shown that some are concerned about their privacy (Weaver et al., 2010) or are not interested in learning how to use technology (Van Deursen and Van Dijk, 2011; Friemel, 2016). Barriers for older adults to engage with technology seem also to rely on price and perception of the usefulness of the devices (Peek et al., 2016). Yet, older people expressed frustrations due to usability concerns, as the design features are not suited to them (Goodall et al., 2010; Heinz et al., 2013; Peine and Neven, 2019). As such, there might be a variety of reasons for not engaging with technology that goes beyond merely the chronological age.

Studies aiming at exploring how and why older people engage with technology suggest that the perception of age informs the usage of technology in later life (Kania-Lundholm and Torres, 2015). These show how older people reproduce the digital divide within their own age group (Kania-Lundholm and Torres, 2015). Older competent users do not necessarily challenge such dominant socio-cultural narrative: sometimes they may maintain and reinforce the stereotype that considers older people as digitally excluded by positioning themselves as exceptions, creating what has been defined as a divide within groups of older people (Kania-Lundholm and Torres, 2015). However, these studies have been conducted with prior definition of engagement vs. non-engagement with technology. For example, with groups of older people who deine themselves as technology users (Kania-Lundholm and Torres, 2015), or older non-users (Köttl et al., 2021), or by criteria that the researchers established for them (Fernández-Ardèvol et al., 2019; Gallistl et al., 2021; Kania-Lundholm, 2019).

In recent years, the emerging field of Socio-gerotechnology engaged with various aspects of aging-technology relations (Fernández-Ardèvol et al., 2019; Peine and Neven, 2019). Peine and Neven (2021) have proposed the CAT model - Co-constitution of Aging and Technology - based on the assumption that aging and technology mutually shape each other. Yet, technology for older people is informed by ideas of aging, often with interventionist logic: aging as a target for intervention or a problem to be solved through technological design. Therefore, these scholars highlight a 'Latourian divide' (Peine and Neven, 2019) between, on the one hand, those who design technology (engineers, designers etc.) for positively intervening into certain aspects of the lives of older people; on the other hand, social scientists who explore the use of everyday technology, and highlight the complexity and diversity of the lives of older people. Within this latter domain, they argue, technology has not received much attention as an important factor in shaping the notion of aging from the perspective of older people themselves.

In line with this perspective, we argue that to get a better understanding of meanings, use and adoption of technology in later life, the relation between older people and technological artefacts has to be explored in different social contexts, sites, or venues where this relation is created. This paper aims at contributing to gerontological knowledge, by exploring the meanings and experiences of everyday technology[1] used by older people in their homes. It focuses on the perspective of two older women: the views of the technology revealed by their

[1] We refer to technology in a broad sense throughout this article and do not focus on technology specifically designed for older people (i.e. assistive technology).

collocation inside the home and discourses associated with these. By adopting a bottom-up approach, in which the women discuss freely the home displays, we examine practices and use of different technological artefacts. This paper shows how multiple practices of use and non-use of technological devices might coexist in older people's homes.

The Social Construction of Aging in the Technological Domain

Ageism in the technological domain is defined as digital ageism that can act at different levels (Manor and Herscovici, 2021). According to Köttl and Mannheim (2021), the level of ageism in the context of digital technology plays a role on older people's engagement with technology, having an impact at the micro-level, such as how age stereotypes are internalized by older people themselves; at meso-level, such as how family, friends, service providers and healthcare professionals influence the use of digital technology for older people; at macro-level related to the design of digital technology products and policy. The following outlines these three levels in more details.

Older people's level of competence with technology has been influenced by reductionist understandings of later life. Within public discourses, there is a common belief that older people are less capable to use digital technology (Vines et al., 2015), thus assuming that the chronological age is the main factor driving the lower technological skills (Hakkarainen, 2012; Kania-Lundholm and Torres, 2015). Without acknowledging the heterogeneity amongst older people, aging is commonly associated with a decline for learning, including multitasking, processing new information and acquiring new skills (Cutler, 2005; Czaja and Lee, 2007). Hence, there is a general agreement that cognitive and physical decline in capabilities that comes with age have a significant impact on older adults' abilities to learn how to use technologies (Broady et al., 2010; Vines et al., 2015; Neves et al., 2018). Older users are portrayed as: less able to engage with new forms of technology (Broady et al., 2010; Neves et al., 2018); hesitant or intimidated to try new devices (Kim et al., 2017); slower at learning how to use technologies in comparison with younger groups of people (Mclaughlin et al., 2009; Lee and Coughlin, 2014); and therefore, in need of younger people when it comes to technology (Mannheim et al., 2019).

The impact of ageism at individual or micro-level seems to be associated with psychological factors, such as lack of confidence in technology use (McDonough, 2016; Anderson et al., 2017). Negative stereotypes surrounding digital literacy might lower older

people's confidence and deplete their willingness to further develop digital skills (Schreurs et al., 2017; Ivan and Cutler, 2021). These stereotypes are reinforced by older people contributing to what has been called self-ageism (Cutler, 2005; McDonough, 2016; Swift et al., 2020; Varvaecke and Meisner, 2021; Köttl et al., 2023). Such assumptions can be shared within this age group, with ageist stereotypes on technology influencing the way in which older people see themselves as users (Köttl et al., 2021).

It has been established how self- and other-directed ageism interacts and reinforces each other (Voss et al., 2018). For example, ageist media messages, such as technology advertisements for the younger generation make older people feel less capable (Caspi et al., 2019). Negative attitudes towards the aging process or perceived ageism were associated with less usage of technology (Swift et al., 2017; Choi et al., 2020; Köttl et al., 2023). Conversely, positive attitudes towards aging were associated with engagement with technology (Seifert and Wahl, 2018).

Ageism at meso-level might derive from the generational gap, according to which older people might feel beholden to younger generations to show them how to use technology (Morris, 2007; Friemel, 2016). The perceived incompetence of older people to engage with technology can cause tensions among family members, especially regarding access to particular devices, and the need for older people to be supervised by younger family members when using these (Ono and Zavodny, 2007; Kirk and Sellen, 2010). Furthermore, some older people feel uncomfortable to ask family members for support with digital technology, out of fear of being dismissed or experiencing age discrimination (Massie and Meisner, 2019). In sum, older people may perceive themselves as unable to grasp digital technology, and therefore, they may feel excluded from engagement with technology or unmotivated to learn how to use it. Thus, the deficit-model of older age might compromise their willingness to be engaged with technological objects around them.

At a macro level, research on older people and technology draws attention to how technological services and products can improve quality of life for an older population (Russell, 2011; Golant, 2017). Consequently, older users are often portrayed with a set of specific characteristics that technology helps to overcome. For example, health concerns, physical and cognitive decline with associated risks, shrinking social opportunities and loss of independence (Vines et al., 2015; Kania-Lundholm and Torres, 2015). Many research bodies and funders' goals have centred on designing technologies that allow people to 'live better for longer' by improving health care practices, reducing medical costs, offering opportunities for social

interaction (Schulz et al., 2015), or support in their homes (Sidner et al., 2018). Thus, technology for older people has been used for health care and chronic disease management (Mannheim et al., 2019), rather than for leisure and for fun (Chu et al., 2022). This might reinforce the negative social construction of older age, therefore, the tendency to position technology as a solution to the inevitable decline in later life (Peine and Neven, 2019; 2021).

In this respect, it is worth introducing the concept of 'affordance', initially employed by Gibson ([1979]/2014) to identify built-in opportunities in objects or places, and revised by Costall (1995), to encompass social elements that make an object as space seeable and shared in their salient and usable features. In Age Studies and Science and Technology Studies (STS), these are defined as 'scripts' (Akrich, 1992) or scenario for use, designed to enable or constrain the older users' actions. These scripts are based on an image of an aging population, and on the idea of what is appropriate, safe, and interesting for an older person to do, as such they are designed with a certain image of older users (Peine and Neven, 2021). According to Neven (2010), whether the older user is imagined as active and competent or technologically illiterate will significantly change the design of such scripts, and therefore the technological artefact itself. As such, the idea of aging is not only created in design processes, but also inscribed into objects (Peine and Neven, 2021). For example, the prescriptive use of assistive technologies reinforces the idea of risks and vulnerability in older age (Endter, 2016; Astell et al., 2019); like an alarm pendant to be carried all the time (Aceros et al., 2015); as well as fitness trackers which are designed to incentivize health practices (Urban, 2017); or exercise games which adopt prescriptive sequence to identify what is a useful exercise and what is not (Wanka & Gallistl, 2018). Thus, technologies specifically designed for an older population come with scripts that convey certain notions of older people, leaving them with very little possibility to resist the negative or disabled image of aging (Astell et al., 2019).

Situated Approaches to Technological Competence in Older Age

The research reviewed in the section above starts to foreground the role of social context - from immediate family members to media messages - as well as the role of previous experiences and opportunities for engaging with technology, as factors possibly shaping how older people perceive technology and their willingness to engage with it. Yet, according to Neves and Mead (2021), exploring learning, use and adoption of new technologies amongst older people requires a combined framework of social contexts, actors and technological properties that

acknowledges the heterogeneity of the older population.

The importance of the social context to explore the relationship between older people and technology, often defined as life-words of older people, has been acknowledged (Peine et al., 2014; Giaccardi et al., 2016; Rosalez and Fernández-Ardèvol, 2020; Peine and Neven, 2021). This body of research pointed out, not only at the diversity of an older population - gender, race, social status, personal history etc. - but also at the importance of exploring the everyday life of older people as sites to generate insights into the relationship between technology and aging. As such, some older people might define themselves as re-constituted in interaction with technology (Gomez, 2015).

Attention to the socio-material negotiation between older people, technologic devices and wider contexts brings to light what has been defined as ‘moment of frictions’ (Gomez, 2015). For example, studies conducted with an ethnographic approach explore older adults’ use (and the non-use) of technology, practices to resist them, or engage with technological devices in creative ways (Joyce and Loe, 2010; Greubel et al., 2025). They seek to capture these different dimensions through the direct observation of technologies in-use. In this respect, Neves and colleagues (2018) demonstrated individualized strategies of appropriation, but also different understanding of ‘use’ as such. These scholars advocate for an approach that considers the interrelations between technology, social context, and human agency, and their recursive influence on each other (Neves et al., 2018). This approach aims to go beyond a priori definitions of users/non-users, by studying practices of ‘appropriation’ into the person's daily life.

Similarly, the enabling or constraining effect can also be embedded in the social context in which older people create the relationship with everyday technology. Hence, ethnographic studies identified a dynamic relationship between individuals, environment and affordances of the devices (Neves et. al., 2020), which can help identify areas for the development of competencies beyond age-related static borders. Neves and colleagues (2020) discuss that internalized assumptions of capability could impact use of the device itself, but report also on how the characteristics of the devices interacted with the learning strategies and the support context in shaping the older people's engagement with these. Even the very language used by the researchers/trainers in the intervention appeared to have an impact, with the perception in some of the older adults that the jargon terms researchers used (such as 'swiping' or 'scrolling') contributed to distancing them from the devices and their appropriation.

Looking at the digital care service for older adults in Barcelona, Greubel and colleagues

(2025) focused on moments of crisis that highlighted the tensions between the material design of technology and the practices of using, non using, or using technology differently. Data show that the older participants' engagement with the devices did not align with service providers' definition of good use, as such considered as non-use (Greubel et al., 2025). As such, the definition of technology non-use itself has been problematized and detached from the notion of bad aging (Gallistl et al., 2021; Greubel et al., 2025). The non-use of digital technology should not be seen as a source of concern, as this might render invisible the use of technology other than expected or creative adaptations of their use (Berridge, 2017; Greubel et al., 2025). Therefore, critical perspectives on technology engagement in later life suggest exploring the non-use of digital technology, as a relational and multifaceted phenomenon, as this might reveal what is important to older people themselves (Gallistl and Wanka, 2022; Greubel et al., 2025). Thus, research on the relationship between older people and technology might benefit from a processual and dialogical approach that does not pre-define neither the individuals, nor the technology use, but attempts to capture competencies that are actually in use.

Studies in this area, to summarize, suggest that to understand barriers to older people's use of technology and paths to inclusion, researchers could look at older people as more heterogeneous, discarding traditional dichotomies of engagement or disengagement with technology and widening some of the current definitions around 'use' so that the best combinations of design and support can be identified for different situations.

Our study adopts this perspective by focusing on the subjective use of technologies situated within contexts. By doing so, it explores accounts of domestic technologies through the discourse and practices emerging from a dialogue about older people's life at home. Emphasizing the role of the home as a site for cherished objects, it focuses on everyday technological devices to open up dialogues about the use of these. In our study, the relation with old and new technology emerges from a wider discussion on cherished objects and home displays, thus illuminating from a different angle how technology is embedded in a complex web of personal history and social relations.

Cherished Objects in the Home

Cherished objects, or objects of affection, can be defined as individual possessions holding high personal significance for the owners, regardless of their economic value (Sherman and Dacher, 2005). These are valuable mnemonic containers for personal histories (Hoskins, 1998),

evocative objects of autobiographical value (Turkle, 2007). Several scholars have stressed the value of understanding the ways people express the self through the medium of objects in the domestic sphere (Blunt, 2006; Petrelli and Whittaker, 2010; Cook et al., 2016; Miller, 2021). Studies in material culture have shown how objects, and their layout and organization in personal spaces play an important role in dynamics of family history and cultural belonging to homeowners (Tilley, 2006; Giorgi and Fasulo, 2013). Similarly, in social gerontology, it is widely accepted that home is a central aspect of personal biography in later life (Csikszentmihalyi and Halton, 1981; Rowles & Chaudhury, 2005; Peace et al., 2005). Within this discipline, a large body of research shows how personalization of private dwellings contributes to older adults' quality of life, and that the emotional link among older adults and their homes is represented through cherished objects (Phenice and Griffore, 2013). Due to the prominent deficit model that considers older people as unable to engage with technology, little attention has been paid to explore how technological devices, in older peoples' homes, are regarded as cherished objects. And this is where our study is situated, as outlined below.

Ethnographic Methodology

This study is part of a project carried out between 2010 and 2012, in two middle size cities in the UK and Italy. The double location responds to an interest in extending the diversity of participants, but did not have a comparative goal. The project was an 'ethnography of memories', aiming at understanding the interplay between autobiographical narratives, materiality and object displays in older people's homes. Ethical approval was granted by the University of Portsmouth, and it included permission to publish images and quotes.

Participants

Participants 65 years or older were recruited through acquaintances in Italy and through a Pensioners' association in the UK. A total of 11 participants took part in this study. Six homes were visited in the UK, including four couples and two women who lived alone (both widows). Three homes were visited in Italy and all three participants were widows and lived alone.

For this study we take a case study approach, focusing on one participant per country. Two cases have been selected because of the opportunities they offer to explore the phenomena of relevance, without compromising the integrity and complexity of their respective circumstances. Case studies are a key resource across the social sciences, as they have the potential to offer new perspectives and change the understanding of key factors at play in a phenomenon of interest (Flyvbjerg, 2004). The two participants are Martha, from the UK, and

Michelina from Italy. Both were widowed and they lived on their own.

Data

Data were video-recorded ethnographic interviews (Spradley, 2016) and photographs. Photos were taken during the interview or at the end, so they reflect both the perspective of the participant when they were pointing us at things or places, and our own ethnographic gaze.

The interviews began with discussing treasured objects the person had selected in preparation for the meeting, then moved on to discuss displays on shelves, mantelpieces and walls. This widening of focus and integration of other objects and spaces during the interview was achieved by allowing ourselves to wander around alongside the participant with a handheld camera, demonstrating curiosity and interest and occasionally asking questions arising from noticing parts of the environment or specific objects. In this way, we ensured that the interview was participant-led, while communicating that no objects were too small or secondary for us, and that we were keen to listen to the 'biography of the objects' (Gosden and Marshall, 2010; De Leon, 2016), in relation to the participants' life.

*Transcription and analysis***.**

The video recordings of the interviews were transcribed verbatim. The ethnographic analysis of the verbal and visual data was an inductive process in which themes were identified through a dialogic approach, in which the participants' own emphasis and valorisation and the ethnographer's interest would congeal around particular objects and the related practices.

Quotes from the Italian interview have been translated into English for this paper. Pseudonyms and reference to places or other people have been used to protect participants' confidentiality.

Analysis of Case 1. Martha: Updating New Skills on Technological Devices

Martha is a 74-year-old British widow, living in an apartment that she has shared with her husband. Martha contacted the second author after seeing the ad on the Pensioners' Association newsletter. She is interested in family history, and it emerged in the interview that she spent considerable time and energy reconstructing the genealogy of her family, going all the way to the vicarage in a different city to retrieve centuries old birth certificates.

Martha's cherished objects, exhibited mainly in the living room, include several wooden artefacts carved by her late husband, who had been a shipbuilder, as well as gold-initialled crockery that had belonged to her family. These pieces of valuable handicraft were interspersed,

on tables and in glass cabinets, with objects of much less value, sometimes even plastic toys of her grandchildren. On displays on the mantelpiece and on the television are travel souvenirs and framed photos, both with her husband and of her solo travelling.

Her general approach with mixing objects of different nature also included technological devices. We noticed two devices in the living room that had been associated with aesthetic objects, i.e. the modem (Figure 1), and the thermostat (Figure 2). This arrangement highlights those devices, rather than hiding them, and makes them share values of home decor with the neighbouring objects.

Prompted by the interviewer taking pictures of the thermostat, Martha explains that she had learned how to use it only recently. This enabled Martha to talk about her acquired competencies in the use of technology.

Figure 1

Modem for wireless Internet connection in Martha's home.



Figure 2

Thermostat in Martha's house.



In the following extract, Martha explains the way she injured her leg by dashing to get her camera, to take pictures of the TV screen during a favourite astronomy programme.

> 'I don't know what I have done with that leg, just there. They say I must sit down when it hurts. I dashed! You see, they had stargazing on television last evening. I am engrossed watching this, sitting and taking photographs of these galaxies, and the stars. So, I go back and I have got no light on and hit my leg.
>
> This is what I took you to see: this is the sun, and the eclipse, and the Aurora Borealis, and this is Neptune. All from the television, I mean they're brilliant, aren't they? This was on someone's camera, on his computer sent to the television and I photographed it. I've got a posh camera, and these are two galaxies, and this is the sky…and this is how I bashed my leg, taking them!
>
> I do like taking photos. Yes, I bored everybody with this. 'Cause, my daughter said (imitating voice) "Mother! It's not a very usual thing for a lady of your years to do!" I said "Well that's all right, don't need to be normal"! (laughing).

She explains that she takes pictures of what she sees on television via a digital camera.

Afterwards, she saves these pictures on the PC, using a USB memory stick, before finally printing them, to collect these in a photo-album that she shows to the researchers (Figure 3). In outlining the different stages of taking pictures from the television, she shows the competence acquired in the use of technology. She is very enthusiastic in describing her passion for photography and the satisfaction with the digital camera she owns. She emphasizes the whole technological infrastructure capabilities enabling the passing of images from orbit. She is enthralled by the possibility of accessing these images through highly complex advanced technologies. The control of the photographing and printing technology gives her a means to fulfil her passion for astronomy, and a tangible tool to share it with others.

Figure 3

Martha's photo album.



This extract enables reflection on processes of self-representation in later life and has the potential to shore up ageism. In describing her passion for photographs, Martha explicitly opposes the stereotype of older adults as unable to use technology. Yet, she states that she is attracted by technology. However, imitating her daughter's voice, Martha states that she looks upon her willingness to use her digital camera with scepticism, because 'it's not something related to a person of her age'. This is an example of what Köttl and Mannheim (2021) defined as ageism at meso-level, in this case referring to how family members influence the use of technology. Nevertheless, Martha constructs her identity as exceptional, by saying 'I don't need to be normal!', she describes herself as a sui-generis older lady. In this sense, these findings resonate with Kania-Lundholm and Torres' work (2015), as their participants deemed themselves to be different from older non-users of technology. By doing so, in some instances, older people reproduce the digital divide within their own age group (Kania-Lundholm & Torres, 2015). Similarly, Martha does not argue that her chronological age has nothing to do with her engagement with technology. Apparently, she wants to challenge stigmatizing representations of older age, however, she strengthens the digital divide within their age groups, as she wants to distance herself by the dominant social construction of old age. This is significant because it demonstrates how Martha is aware of negative stereotypes of older age and technological use, however, she does not challenge this, and instead she reinforces ageism.

Technological independence

Participants illustrated how technology can help acquiring new skills in later life. In the following extract, Martha explains the reason why she started to develop technological skills:

> 'I got that cupboard there, absolutely full of photographs. I've got albums with photographs of the children and I've got every holiday in an album. My oldest daughter just loves to look at them. 'Cause they have them on the computer and you can't… I like to see them! They take a picture and I say: "can I have a copy?" "Yes!" but I never get it so now I take my own camera and then if there's something to be photographed then I photograph it. And I am clever enough now I can actually print the picture on my printer. 'Cause I've been struggling with all this technology for about seven years. I can do some of this now! [laughing voice] Yes I don't like it, but I do think I need to.'

Due to her passion for photography, Martha emphasized her role of collecting family memories in a photo album that she can keep and show to guests. However, since the digital camera became popular, she risked losing these memories as she became dependent on others for copies of the pictures. So, she learned how to use a digital camera and a printer, to continue

her collection. She is satisfied with her progress, as evidenced by the verbs of action 'I photograph', 'I print', 'I can', emphasizing her active role and self-efficacy. This is further evidenced by the following extract, as Martha narrates about her IT classes:

> 'I'd like to learn a bit more about computing. I've been to Age Concern this afternoon. Because I can do the basics, but I can't do all sorts of other things. I do e-mail and I didn't know how to put an attachment on. I didn't know how to write a letter. I learned how to put Favourites on Wikipedia, and things like that.'

This excerpt shows how Martha acquired IT skills, attending a charity association dedicated to older people. This quote displays her newly formed competencies by using the appropriate terminology for software and web resources. These findings are significant in challenging the stereotypical assumptions about older people's competencies or inability to learn how to use digital technology. In line with previous studies (Woodward et al., 2011), Martha's example shows how older adults, with appropriate training, are willing and capable of learning new technological skills.

Moreover, these findings echo Köttl and colleagues (2021), in showing how older people feel the need to learn how to use technology, not to fall back and remain engaged with society. In fact, Martha states that she didn't like to learn how to use the digital camera, but she felt the need to acquire a whole new skill set in later life. In this example, counteracting age stereotypes was an incentive to learn how to use technology.

Additionally, by learning how to print her photographs, Martha was able to reiterate the 'old fashioned' practice of showing her photographs via a photo-album to guests, as we were able to witness, as researchers in her house. Thus, the newly acquired skill with technology, allowed her to continue her passion for photographs and perpetuate the social practices of sharing memories through the semiotics of photography (see also Palladino et al., 2024).

The attention is not only in the visual aspect of the photographs, but the individual practices of obtaining it. She says that she had to learn how to use a digital camera and the printer to fulfil her need and pleasure of analogic and material photo collection. We assume that in the past she liked to develop the camera roll film in photography shops, but these kinds of services are no longer available. In sum, Martha's narrative illustrates that mastery of technological devices can be acquired when they are in the service of activities and soial roles that are already part of someone's life. She is not ignoring stereotypes that are addressed to her, but recruiting these to a rhetorical effect of power, cleverness, and persistence

Analysis of Case 2. Michelina Embracing Ageism and Technological Dependence

Michelina is a 77-year-old Italian woman. She lost her husband when she was 46. She used to be a nurse, with a passion for dressmaking. She attends her local church and helps out as a volunteer, by organizing social gatherings. Michelina attends her pensioners association where she sings and dances at social events. She lives alone in an 11th floor apartment without an elevator, in the city centre. The first author of this paper contacted Michelina as she was a longstanding friend of her grandmother.

As the interview started, Michelina discursively positioned herself in relation to the dominant social construction of aging, defined as such: 'I'm too old to learn how to use technology now! I don't have the same energy as when I was younger'

Michelina defines herself as a non-user of digital technology and employs age as a category to explain her low level of technological skills, describing her life-stage as characterized by a decline of personal abilities. This illustrates the internalized self-ageism (Neves et al., 2020; Köttl et al., 2021), according to which older people consider themselves unable to learn and succeed with technology. Michelina accepts that it is too late for her to change and adjust to the digital domain. This attitude has an impact on her presumptions regarding her technological competencies.

Her apartment was purchased in the '90s and she says that the furniture and technological objects in her house were modern at the time. She didn't feel the need to replace these devices with more modern versions, for example, her television, radio, turntable (Figure. 4).

Figure 4

Michelina's television and gramophone.



Nevertheless, she feels that she is encouraged to do so by different actors, in the family sphere – her daughter and her grandson – and wider society. For example, whenever she asks for technical assistance with her broken television, she is encouraged to replace her old device

with new ones, with comments like:

> 'They told me ((Imitating voice)) "Oh Madam, this is old stuff, nobody is left who can fix these, just throw it away! New technology is affordable, even for elderly people"'.

Michelina does not want to replace her outdated technological devices with new ones as these are cherished objects, with an autobiographical value. For example, Michelina says that she loves to have music in her house, and she showed her collection of vinyl and audiocassettes (Figure 5).

Figure 5

Michelina's collection of Vinyl's.



Later, by showing an audiocassette by Renato Carosone (Figure. 6), an Italian singer of the '50s, she said:

> 'These old cassettes are rare to find in modern shops. Why should I throw them away? When I hear these songs, I remember all the conversations I had with my brother, who passed away'.

Michelina shows how some cherished objects foster reminiscence in older adults, and she demonstrates proficiency in how to use these technological devices. As she says, outdated technological devices do not prevent her from feeling excluded from 'modernization' but help to keep her company. As such, an ethnographic approach on the non-use of digital technologies in her house informs on the use of older technologies, as a form of resistance.

Figure 6

Michelina's Audio Cassette.



Michelina would like to acquire new technological devices, although her concern is about not knowing how to use them. In this respect, she said that she received a DVD player, but she didn't know how to activate the device. She shows the DVD of her theatre performance recorded by her pensioners association. She said that she would have loved to see herself in the video, but she had been unable to view it.

> 'Now, you have got the CD! I have got the CD player; they gave it to me…but. I cannot use it! I have performed twice in the pensioners association and they recorded the show, they gave me the DVD. I asked my grandson to help me with this. However, it has been a few years now and I have never watched it. ((Showing the DVD box)). Look, this is not even open. I have never watched it. On the other hand that vinyl, I open it and I can listen to it.'

Michelina describes her reliance on family members to assist her on how to use new devices, however, her requests seem to be dismissed. Thus, she justifies why she continues to use obsolete technology, as she can control them, she knows how to use the older ones. In line with Köttl and colleagues (2021), this extract shows the tensions amongst family members, as older people are reliant on younger generations to show how to use devices and that can negatively affect the intergenerational relationship.

Similarly, she was dependent on family members (her daughter or grandchildren) for setting the thermostat in her house, or to print documents. Remembering the interviews with Martha and her words around the thermostat, the researcher directed Michelina's attention to the thermostat in her house. However, in this case, the answer was completely different. Michelina said: 'My daughter sets it, and I'm not allowed to touch it, for all winter!'

Michelina's daughter, in supporting her mother to set the thermostat in her own house, offered a kind of help that might be considered disabling. Likewise, she complains about

modern times from which she feels excluded. Her sense of frustration is extended to television programs, as described in the following extract.

> 'I get nervous! When I listen to the TV saying: "Look at the tele-text or at the internet on www", I'm wondering can older adults [access the Internet]? They should do some programs for older people and some for the younger generation. Because all the programs on TV are for the younger generation and that's not fair!'

Technology, according to Michelina's point of view, increases the division between the older and the younger generations. She adopts an ageist perception of technological skills and accepts that the digital world belongs to younger people, thus giving up and avoiding use of on line services. As argued by Köttl et al. (2021), the fewer digital technologies are used, the more prone older individuals are to perceive their own aging negatively in related to beliefs of personal competence.

In this respect, it is worth mentioning that language proficiency, amongst other factors, plays a role in shaping digital inclusion for older people (Goodall et al., 2010; Chen et al., 2020). Thus, Michelina, being Italian, might not have had skills in English that might influence her level of confidence in approaching the Internet. Whether or not this is the reason for her sense of inadequacy with technology, a key aspect of these findings is that Michelina feels excluded by the digital domain. These findings are in line with Köttl and colleagues (2021) in showing how internalization of age stereotypes led to lower technology adoption, and the belief that other older people are excluded from engagement.

General Discussion

This paper highlighted older adult's experience with technology within their homes, via an in-depth analysis of two participants, as representing diverse attitudes towards technology. While almost opposite at first sight, the two participants reveal several commonalities, highlighting the multidimensional factors that shape accessibility, agency, competence and lived experiences around technological devices. Overall, findings show that technological competencies are distributed in the social and material environment of the house. Participants engaged with devices that were responding to their needs, rather than resisting learning new technologies per se. This work outlined the experiences of using technological devices, including the way in which these contributed to make internalized ageism visible.

This study addressed how older peoples' relationship with technology was manifested through cherished objects in their homes and this helped to widen the concept of technology to devices that are not generally explored, such as mundane technology. Adopting the theoretical framework of material culture studies, we discussed how older people think of themselves

through the medium of everyday technology in their homes. Due to the prominent deficit model that considers older people as unable to engage with technology, little attention has been paid to explore the extent to which technological devices in older peoples' homes, are regarded as cherished objects. Whilst in social gerontology there is recognition of the importance of the individual possessions in later life, research does not typically explore the place technological devices occupy in the landscape of objects of affection for older people.

Our immersive research methods, bringing us into the heart of the home, generated novel insights into relationships with technology, and subjective perspectives on the definition of aging. On a methodological level, a key aspect of this study was to raise awareness of the value of things that older people considered as part of the background of the home. Yet, rather than resisting engaging with technology, these findings have shown how multiple practices of use and non-use of technological devices might coexist in older people's homes. These findings contribute to the current research on 'non-use' of digital technology (Greubel et al., 2025), as we argue that the home is the most suited site to explore engagement with technology amongst older people.

Both participants had shown a positive relationship with technology, as evidenced by technological objects of affection with an autobiographical function. Both participants described the use of technology for leisure purposes -music and photography- thus contrasting the stereotypes of technology use amongst older people for health-related concerns. Therefore, this might suggest the need for consideration of technology for personal interest and entertainment in later life (Gatto & Tak, 2008; Chu et al., 2022). In fact, gerontologists (i.e., Bytheway, 2005) denounced how marking out classes of people and making assumptions about their abilities, risks denying opportunities that others enjoy, reinforcing denigration of the aging process.

Firstly, this paper showed that developing technological skills in later life is influenced by how older people perceive older age. This is in line with previous studies suggesting that older users refer to their age as one aspect informing the usage of technology and by doing so, they create a divide within the group of older people (Kania-Lundholm & Torres, 2015). This research has shown how internalized ageism has an impact on technology use and how older people discursively position themselves in line or in contrast with ageist stereotypes. Interviewees are influenced by the negative stereotypes attributed to older people and their skills with technology: 'it's too late to learn how to use technology', or 'technology is not something related to a lady of that age'. In both cases, ageist stereotypes are internalized; nevertheless, while one participant is adapting and perhaps justifying her lack of skills within the daily discourse of what it means to be older, the other one's performance is far from the

characteristics assigned to the older age category. Michelina reinforces the stereotype of older people being not tech-savvy, who are on the outskirts of society by saying 'how can older people access the Internet?' and maintains that older people cannot develop technological skills. She reiterates the stereotype that Martha would like to oppose. However, in Martha's case, ageism is opposed, but not challenged: by distancing herself from the social construction of older age 'I don't need to be normal' Martha reinforces ageism. On the individual level, ageism has influenced how older users consider themselves and had an impact on their perceived competencies. This echoes previous studies on the impact of internalized ageism on attitude towards acquiring new technological skills (Köttl et al., 2021; Köttl et al., 2023). On this note, Greubel and colleagues (2025) state that: 'various actors may ascribe older adults as users or non-users of digital technologies, but this might conflict with how older adults define their own engagement with technologies' (p. 2). In this sense, our research highlights that ageism is not only pervasive at different levels (Manor and Herscovici, 2021; Köttl and Mannheim, 2021), but it has to be explored within relational and social contexts.

Secondly, this research has shown how oldness is attributed to the participants by themselves and by members of the family and beyond, as refracted by the use of technology. Participants' reliance on younger family members could represent an obstacle for engaging with technology and can reinforce prejudices and opposition among generations. Findings outlined how ageism can act at a meso-level (Vervaecke & Meisner, 2021), with family and service providers influencing the adoption of new technologies by older people. Yet, this research demonstrated how age stereotypes in the family environment affected both participants. Marta's daughter looked upon her willingness to use her digital camera with scepticism. Michelina's daughter did not allow her to touch the thermostat as she thinks she is not able to use it. The example of Martha demonstrates, however, that the mastery of new technological skills became a matter of pride of satisfaction to her in later life; and contributed to her continued growth. This echoes previous works that shows how older people can be enthusiastic about learning to use technology and training programs have been successful in facilitating use with older people as well as enhancing their general wellbeing (Cody et al., 1999; Mitzner et al., 2019). In the case of Michelina, where the technology was not updated, neither was her own sense of comfort with technology. Her frustration for not being able to use the technology places obstacles in the intergenerational relations with family members and it is extended to wider society - referring to the lack of amenities for repairing broken devices, or the television industry that no longer targets older people as users. Michelina is an example of friction with the relational and wider context, to the extent of arguing in favour of TV programs in which references to websites or use of new technologies were abolished. She shows ways to resist technological changes in her

domestic sphere by cherishing outdated devices. Thus, this work contributes to the discussion in gerontological literature about technology non-use as a relational and multifaceted phenomenon (Gallistl et al., 2021; Greubel et al., 2025). Looking at older people's interaction with the material elements that they cherish, we may start to understand why, in the case of Michelina, the friction could not be accommodated in the same way as for Martha. Learning how to use technology seems to be challenged by ageism within the social context she lives in, consequently, there is a clear need to move away from the technology deficit model of older age and the binary definition of users vs. non-users of technology, as it risks reducing the wide variety of practices, knowledge and experiences of all older people to an overly simplistic binary.

Moreover, oversimplification of competency increases the divide between the older and the younger generations, placing more obstacles in the intergenerational relationship. In our study, Michelina relied on her family members to learn how to use some technological devices. However, her requests of support were dismissed. Thus, this research has shown that dependence on family members for technological support might create intergenerational tensions. These findings are in line with previous studies that showed how support systems, like family and peers in social settings can act as mentors and help mediate the reluctance to be engaged with technology amongst older people, developing digital literacy (Schreurs et al., 2017). However, some older people may not have easy access to someone who can assist them in learning (Choudrie, et al., 2020), or family members might not always be equipped with the skills themselves (Manor and Herscovici, 2021). In this respect, Manor and Herscovici argue that ‘instead of assuming that every older adult has a young family member who can help, designers should make the digital product or service older users friendly’ (Manor and Herscovici, 2021, p.1091).

This research has shown that availability of support and training from older people's services made a difference in access and consumption of technology. Drawing on these findings, it is worth asking if it is possible to promote personal development and the acquisition of new skills in later life without tackling ageism. In line with other scholars (i.e. Peine and Neven, 2019), this research argues the urgent need of eliminating prejudice and discrimination based on age, both in research and policy discourses to develop effective learning programs. Promoting personal development must be seen as a core dimension in later life, by increasing technology literacy amongst older people and expanding their opportunities for life-long learning, including the tailored digital literacy intervention (Gallistl, 2021). In this sense, these findings support Köttl and Mannheim’s (2021) policy brief, according to which interventions need to focus on tackling technology related ageism through awareness-raising and empowering

older people in accessing and using technology; fostering the inclusion of older people in digital technology related policy. Ageism in the context of technology can be tackled via fostering intergenerational contact in learning (Lytle et al., 2020).

Despite older people being often identified as targets of digital inclusion policy initiatives, older people are misrepresented in the technology domain. Hence, ageist stereotypes might be an explanation for older people being excluded from research, design and development of digital technologies, (Abbey and Hyde, 2009; Mannheim et al., 2019; Rosales and Fernandez-Ardevol, 2020; Neves and Mead, 2021; Mannheim et al., 2023). Having older people's input in designing technology would benefit the ways in which these would meet older adults' needs (Peine and Neven, 2021) and avoid stereotypical assumptions of older people (Köttl et al., 2021). Despite recent research aiming at developing technologies, conducted with older people (Mannheim et al., 2019), there is the need to address structural issues in research and development of technology and related policy (Chu et al., 2022; Köttl and Mannheim, 2021).

Finally, taking for granted age as a factor that leads to digital literacy - or lack of it - research on older people and technology failed to address other differences in technological skills, as such disadvantaging factors accumulated over the life course, for example levels of education, income or socio-economic status or language barriers (Hargittai et al., 2019; Fang et al., 2019). Thus, further research is needed to explore these themes.

A few limitations of this research need to be outlined. Data collection took place more than a decade ago, however, insights from the research are still part of contemporary issues for older people. An in-depth analysis of the participants' narratives around technological objects does not exhaust the variety of relations and interpretations that older adults can establish with technologies. Nevertheless, it can provide valuable insights into the wider processes of constructing meanings to the use of technological objects within private dwellings. However, the methodology might not be applicable with institutionalized older adults.

Conclusions

This study focused on some of the experiences of technology among older adults, challenging stereotyped perspectives on older people. This research stresses the pressing need to address ageism that excludes older people from the use of technology. This work suggests that older people are a highly diverse group of technology users and this diversity has to be taken into account. The two case studies are not meant to represent older adults as a whole, but to use ethnographic sensibility to underpin the complexity of the factors at stake. Nevertheless, a larger group and a more focused study would consolidate these understanding and provide more

insights toward technological design and support franeworks. We have argued that acquiring technological skills in later life can be affected by ways in which people define later life, and whether or not they feel they are exceptions or representative examples in relation to technology/ This insight could usefully assist in promoting life-long learning programs for older people and could be helpful implications for the methods by which cherished objects can be displayed and organized in the home layout.

Acknowledgments

We thank all the participants for having shared their stories with us.

References

Abbey, R., & Hyde, S. (2009). No country for older people? Age and the digital divide. *Journal of Information, Communication and Ethics in Society*, *7*(4), 225–242. https://doi.org/10.1108/14779960911004480

Aceros, J. C., Pols, J., & Domènech, M. (2015). Where is grandma? Home telecare, good aging and the domestication of later life. *Technological Forecasting and Social Change*, *93*, 102–111. https://doi.org/10.1016/j.techfore.2014.01.016

Akrich, M. (1992). The de-scription of technical objects. In W. Bijker & J. Law (Eds.), *Shaping technology/building society: Studies in sociotechnical change* (pp. 205–224). MIT Press.

Astell, A. J., McGrath, C., & Dove, E. (2020). 'That's for old so and so's!': Does identity influence older adults' technology adoption decisions? *Ageing & Society*, *40*(7), 1550–1576. https://doi.org/10.1017/S0144686X19000230

Berridge, C. (2017). Active subjects of passive monitoring: Responses to a passive monitoring system in low-income independent living. *Ageing & Society*, *37*(3), 537–560. https://doi.org/10.1017/S0144686X15001269

Blunt, A. (2005). Cultural geography: Cultural geographies of home. *Progress in Human Geography*, *29*(4), 505–515. https://doi.org/10.1191/0309132505ph564pr

Broady, T., Chan, A., & Caputi, P. (2010). Comparison of older and younger adults' attitudes

towards and abilities with computers: Implications for training and learning. *British Journal of Educational Technology*, *41*(3), 473–485. https://doi.org/10.1111/j.1467-8535.2008.00914.x

Bytheway, B. (2005). Ageism and age categorization. *Journal of Social Issues*, *61*(2), 361–374. https://doi.org/10.1111/j.1540-4560.2005.00410.x

Caspi, A., Daniel, M., & Kavé, G. (2019). Technology makes older adults feel older. *Aging & Mental Health*, *23*(8), 1025–1030. https://doi.org/10.1080/13607863.2018.1479834

Chen, K. (2020). Why do older people love and hate assistive technology? An emotional experience perspective. *Ergonomics*, *63*(12), 1463–1474. https://doi.org/10.1080/00140139.2020.1808714

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

Choudrie, J., Pheeraphuttranghkoon, S., & Davari, S. (2020). The digital divide and older adult population adoption, use and diffusion of mobile phones: A quantitative study. *Information Systems Frontiers*, *22*, 673–695. https://doi.org/10.1007/s10796-018-9875-2

Chu, C. H., Nyrup, R., Leslie, K., Shi, J., Bianchi, A., Lyn, A., & Grenier, A. (2022). Digital ageism: Challenges and opportunities in artificial intelligence for older adults. *The Gerontologist*, *62*(7), 947–955. https://doi.org/10.1093/geront/gnab167

Cody, M. J., Dunn, D., Hoppin, S., & Wendt, P. (1999). Silver surfers: Training and evaluating internet use among older adult learners. *Communication Education*, *48*(4), 269–286. https://doi.org/10.1080/03634529909379178

Cook, N., Davison, A., & Crabtree, L. (2016). The politics of housing/home. In *Housing and home unbound* (pp. 1–16). Routledge.

Costall, A. (1995). Socializing affordances. *Theory & Psychology*, *5*(4), 467–481.

https://doi.org/10.1177/0959354395054001

Csikszentmihalyi, M., & Halton, E. (1981). *The meaning of things: Domestic symbols and the self*. Cambridge University Press.

Cutler, S. (2005). Ageism and technology. *Generations*, *29*(3), 67–72.

Czaja, S. J. (2017). The potential role of technology in supporting older adults. *Public Policy & Aging Report*, *27*(2), 44–48. https://doi.org/10.1093/ppar/prx006

Czaja, S. J., & Lee, C. (2007). The impact of aging on access to technology. *Universal Access in the Information Society*, *5*, 341–349. https://doi.org/10.1145/1102187.1102189

De Leon, J. P. (2016). *Moving digital ethnography into the home: Methodological challenges and innovations*. Routledge.

Endter, C. (2016). Skripting age–The negotiation of age and aging in ambient assisted living. In E. Domínguez Rué & L. Nierling (Eds.), *Aging and technology* (pp. 121–140). Transcript.

Fang, M. L., Canham, S. L., Battersby, L., Sixsmith, J., Wada, M., & Sixsmith, A. (2019). Exploring privilege in the digital divide: Implications for theory, policy, and practice. *The Gerontologist*, *59*(1), e1–e15. https://doi.org/10.1093/geront/gny037

Fernández-Ardèvol, M., Rosales, A., Loos, E., Peine, A., Beneito-Montagut, R., Blanche, D., Fisher, B., Katz, S., & Östlund, B. (2019). Methodological strategies to understand smartphone practices for social connectedness in later life. In *Human aspects of IT for the aged population: Social media, games and assistive environments* (pp. 46–64). Springer.

Flyvbjerg, B. (2004). Five misunderstandings about case-study research. *Sosiologisk Tidsskrift*, *12*(2), 117–142. https://doi.org/10.18261/ISSN1504-2928-2004-02-02

Francis, J., Ball, C., Kadylak, T., & Cotten, S. R. (2019). Aging in the digital age: Conceptualizing technology adoption and digital inequalities. In B. Neves & F. Vetere (Eds.), *Aging and digital technology: Designing and evaluating emerging technologies for older adults*

(pp. 35–49). Springer Singapore. https://doi.org/10.1007/978-981-13-3693-5

Friemel, T. N. (2016). The digital divide has grown old: Determinants of a digital divide among seniors. *New Media & Society*, *18*(2), 313–331. https://doi.org/10.1177/1461444814538648

Gallistl, V., Rohner, R., Hengl, L., & Kolland, F. (2021). Doing digital exclusion–Technology practices of older internet non-users. *Journal of Aging Studies*, *59*, Article 100973. https://doi.org/10.1016/j.jaging.2021.100973

Gallistl, V., & Wanka, A. (2022). The internet multiple: How internet practices are valued in later life. *International Journal of Ageing and Later Life*, *15*(2), 103–126. https://doi.org/10.3384/ijal.1652-8670.3563

Gatto, S. L., & Tak, S. H. (2008). Computer, internet, and e-mail use among older adults: Benefits and barriers. *Educational Gerontology*, *34*(9), 800–811. https://doi.org/10.1080/03601270802243700

Giaccardi, E., Cila, N., Speed, C., & Caldwell, M. (2016). Thing ethnography: Doing design research with non-humans. In *Proceedings of the 2016 ACM Conference on Designing Interactive Systems* (pp. 377–387). https://doi.org/10.1145/2901790.2901905

Gibson, J. J. (2014). *The ecological approach to visual perception*. Psychology Press. (Original work published 1979)

Golant, S. M. (2017). A theoretical model to explain the smart technology adoption behaviors of elder consumers (Elderadopt). *Journal of Aging Studies*, *42*, 56–73. https://doi.org/10.1016/j.jaging.2017.07.003

Gómez, D. L. (2015). Little arrangements that matter: Rethinking autonomy-enabling innovations for later life. *Technological Forecasting and Social Change*, *93*, 91–101. https://doi.org/10.1016/j.techfore.2014.02.015

Gosden, C., & Marshall, Y. (1999). The cultural biography of objects. *World Archaeology*, *31*(2),

169–178. https://doi.org/10.1080/00438243.1999.9980439

Greubel, C., Gómez, D. L., van Hees, S., Moors, E. H., & Peine, A. (2025). When technology non-use troubles good aging. *Journal of Aging Studies*, *75*, Article 101324. https://doi.org/10.1016/j.jaging.2025.101324

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

Hargittai, E., & Hinnant, A. (2008). Digital inequality: Differences in young adults' use of the internet. *Communication Research*, *35*(5), 602–621. https://doi.org/10.1177/0093650208321782

Hargittai, E., Piper, A. M., & Morris, M. R. (2019). From internet access to internet skills: Digital inequality among older adults. *Universal Access in the Information Society*, *18*, 881–890. https://doi.org/10.1007/s10209-018-0617-5

Heinz, M., Martin, P., Margrett, J. A., Yearns, M., Franke, W., Yang, H. I., Wong, J., & Chang, C. K. (2013). Perceptions of technology among older adults. *Journal of Gerontological Nursing*, *39*(1), 42–51. https://doi.org/10.3928/00989134-20121204-04

Hoskins, J. (1998). *Biographical objects: How things tell the story of people's lives*. Routledge.

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

Joyce, K., & Loe, M. (2010). A sociological approach to aging, technology and health. *Sociology of Health & Illness*, *32*(2), 171–180. https://doi.org/10.1111/j.1467-9566.2009.01219.x

Kania-Lundholm, M. (2019). Slow side of the divide? Older ICT non- and seldom-users discussing social acceleration and social change. *Digital Culture & Society*, *5*(1), 85–104. https://doi.org/10.14361/dcs-2019-0106

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

Kim, J., Lee, H. Y., Christensen, M. C., & Merighi, J. R. (2017). Technology access and use, and their associations with social engagement among older adults: Do women and men differ? *Journals of Gerontology: Series B*, *72*(5), 836–845. https://doi.org/10.1093/geronb/gbw123

Kirk, D., & Sellen, A. (2010). On human remains: Values and practice in the home archiving of cherished objects. *ACM Transactions on Computer-Human Interaction*, *17*(3), 1–43. https://doi.org/10.1145/1806923.1806924

Köttl, H., Allen, L. D., Mannheim, I., & Ayalon, L. (2023). Associations between everyday ICT usage and (self-)ageism: A systematic literature review. *The Gerontologist*, *63*(7), 1172–1187. https://doi.org/10.1093/geront/gnac075

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*, Article 100971. https://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.

Lee, C., & Coughlin, J. F. (2014). Perspective: Older adults' adoption of technology: An integrated approach to identifying determinants and barriers. *Journal of Product Innovation Management*, *32*(5), 747–759. https://doi.org/10.1111/jpim.12176

Lytle, A., Nowacek, N., & Levy, S. R. (2020). Instapals: Reducing ageism by facilitating intergenerational contact and providing aging education. *Gerontology & Geriatrics Education*, *41*(3), 308–319. https://doi.org/10.1080/02701960.2020.1737047

Mannheim, I., Schwartz, E., Xi, W., Buttigieg, S. C., McDonnell-Naughton, M., Wouters, E. J., & 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), Article 3718. https://doi.org/10.3390/ijerph16193718

Mannheim, I., Wouters, E. J., Köttl, H., van Boekel, L. C., Brankaert, R., & van Zaalen, Y. (2023). Ageism in the discourse and practice of designing digital technology for older persons: A scoping review. *The Gerontologist*, *63*(7), 1188–1200. https://doi.org/10.1093/geront/gnac144

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

Massie, A. S., & Meisner, B. A. (2019). Perceptions of aging and experiences of ageism as constraining factors of moderate to vigorous leisure-time physical activity in later life. *Loisir et Société/Society and Leisure* , *42*(1), 24–42. https://doi.org/10.1080/07053436.2019.1582903

McCreadie, C. (2010). Technology and older people. In *The SAGE handbook of social gerontology* (pp. 607–617). SAGE.

McDonough, C. C. (2016). The effect of ageism on the digital divide among older adults. *Journal of Gerontology and Geriatric Medicine*, *2*(1), 1–7. https://doi.org/10.24966/GGM-8662/100008

McLaughlin, A., Rogers, W. A., & Fisk, A. D. (2009). Using direct and indirect input devices: Attention demands and age-related differences. *ACM Transactions on Computer-Human Interaction*, *16*(1), 1–15. https://doi.org/10.1145/1502800.1502802

Miller, D. (Ed.). (2021). *Home possessions: Material culture behind closed doors*. Routledge.

Mitzner, T. L., Savla, J., Boot, W. R., Sharit, J., Charness, N., Czaja, S. J., & Rogers, W. A. (2019). Technology adoption by older adults: Findings from the PRISM trial. *The Gerontologist*, *59*(1), 34–44. https://doi.org/10.1093/geront/gny113

Morris, A., Goodman, J., & Brading, H. (2007). Internet use and non-use: Views of older users. *Universal Access in the Information Society*, *6*, 43–57. https://doi.org/10.1007/s10209-006-0057-5

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. https://doi.org/10.1111/j.1467-9566.2009.01218.x

Neves, B. B., & Mead, G. (2021). Digital technology and older people: Towards a sociological approach to technology adoption in later life. *Sociology*, *55*(5), 888–905. https://doi.org/10.1177/0038038520975587

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

Ono, H., & Zavodny, M. (2007). Digital inequality: A five country comparison using microdata. *Social Science Research*, *36*(3), 1135–1155. https://doi.org/10.1016/j.ssresearch.2006.09.001

Palladino, S., D'Ambrosio, M., & Mitra, P. (2024). Addressing uncomfortable emotions through the photo-exhibition Leaving and Waving by Deanna Dikeman. *Photography and Culture*, *17*(1), 57–77. https://doi.org/10.1080/17514517.2024.2324507

Peace, S., Holland, C., & Kellaher, L. (2005). Making space for identity. In G. J. Andrews & D. R. Phillips (Eds.), *Aging and place: Perspectives, policy, practice* (pp. 188–204). Routledge.

Peek, S. T., Luijkx, K. G., Rijnaard, M. D., Nieboer, M. E., Van Der Voort, C. S., Aarts, S., ... & Wouters, E. J. (2016). Older adults' reasons for using technology while aging in place. *Gerontology*, *62*(2), 226–237. https://doi.org/10.1159/000430949

Peine, A., Meissner, A., & Wanka, A. (2024). Digitalisation and population aging: Social policy dimensions of the digital divide and innovation. In *A research agenda for aging and social policy* (pp. 131–149). Edward Elgar Publishing. https://doi.org/10.4337/9781802208139.00017

Peine, A., & Neven, L. (2019). From intervention to co-constitution: New directions in theorizing about aging and technology. *The Gerontologist*, *59*, 15–21.

https://doi.org/10.1093/geront/gny050

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

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

Petrelli, D., & Whittaker, S. (2010). Family memories in the home: Contrasting physical and digital mementos. *Personal and Ubiquitous Computing*, *14*, 153–169. https://doi.org/10.1007/s00779-009-0279-7

Phenice, L., & Griffore, R. (2013). The importance of object memories for older adults. *Educational Gerontology*, *39*(10), 741–749. https://doi.org/10.1080/03601277.2013.766536

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

Rowles, G., & Chaudhury, H. (2005). Home and identity in late life: International perspectives. In G. Rowles & H. Chaudhury (Eds.), *Home and identity in late life* (pp. 3–20). Springer Publishing Company.

Russell, H. (2011). Later life ICT learners aging well. *International Journal of Ageing and Later Life*, *6*(2), 103–127. https://doi.org/10.3384/ijal.1652-8670.1162103

Schreurs, K., Quan-Haase, A., & Martin, K. (2017). Problematizing the digital literacy paradox in the context of older adults' ICT use: Aging, media discourse, and self-determination. *Canadian Journal of Communication*, *42*(2). https://doi.org/10.22230/cjc.2017v42n2a3130

Schulz, R., Wahl, H. W., Matthews, J. T., De Vito Dabbs, A., Beach, S. R., & Czaja, S. J. (2015). Advancing the aging and technology agenda in gerontology. *The Gerontologist*, *55*(5), 724–734. https://doi.org/10.1093/geront/gnu071

Seifert, A., & Wahl, H. W. (2018). Young at heart and online? Subjective age and internet use in two Swiss survey studies. *Educational Gerontology*, *44*(2–3), 139–147. https://doi.org/10.1080/03601277.2018.1427495

Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media & Society*, *6*(3), 341–362. https://doi.org/10.1177/1461444804042519

Sherman, E., & Dacher, J. (2005). Cherished objects and the home: Their meaning and roles in late life. In G. D. Rowles & H. Chaudhury (Eds.), *Home and identity in late life* (pp. 63–79). Springer Publishing Company.

Sidner, C. L., Bickmore, T., Nooraie, B., Rich, C., Ring, L., Shayganfar, M., & Vardoulakis, L. (2018). Creating new technologies for companionable agents to support isolated older adults. *ACM Transactions on Interactive Intelligent Systems*, *8*(3), 1–27. https://doi.org/10.1145/3213050

Spradley, J. P. (2016). *The ethnographic interview*. Waveland Press.

Swift, H. J., Abrams, D., Lamont, R. A., & Drury, L. (2017). The risks of ageism model: How ageism and negative attitudes toward age can be a barrier to active aging. *Social Issues and Policy Review*, *11*(1), 195–231. https://doi.org/10.1111/sipr.12031

Tilley, C. (2006). Landscape, heritage and identity. *Journal of Material Culture*, *11*(1–2), 1–261. https://doi.org/10.1177/1359183506062990

Turkle, S. (2007). The secret power of things we hold dear. *New Scientist*, *194*(2607), 50–52. https://doi.org/10.1016/S0262-4079(07)61446-8

Urban, M. (2017). Embodying digital aging: Aging with digital health technologies and the

significance of inequalities. In *Precarity within the digital age: Media change and social insecurity* (pp. 163–178). Springer. https://doi.org/10.1007/978-3-658-17678-5_11

Van Deursen, A., & Van Dijk, J. A. (2011). Internet skills and the digital divide. *New Media & Society*, *13*(6), 893–911. https://doi.org/10.1177/1461444810386774

Van Dijk, J. A. (2013). A theory of the digital divide. In *The digital divide* (pp. 29–51). Routledge.

Van Dijk, J. A., & Van Deursen, A. (2010). Inequalities of digital skills and how to overcome them. In *Handbook of research on overcoming digital divides: Constructing an equitable and competitive information society* (pp. 278–291). IGI Global.

Vervaecke, D., & Meisner, B. A. (2021). Caremongering and assumptions of need: The spread of compassionate ageism during COVID-19. *The Gerontologist*, *61*(2), 159–165. https://doi.org/10.1093/geront/gnaa131

Vines, J., Pritchard, G., Wright, P., Olivier, P., & Brittain, K. (2015). An age-old problem: Examining the discourses of aging in HCI and strategies for future research. *ACM Transactions on Computer-Human Interaction*, *22*(1), Article 2. https://doi.org/10.1145/2696867

Voss, P., Bodner, E., & Rothermund, K. (2018). Ageism: The relationship between age stereotypes and age discrimination. In *Contemporary perspectives on ageism* (pp. 11–31). Springer. https://doi.org/10.1007/978-3-319-73820-8_2

Wanka, A., & Gallistl, V. (2018). Doing age in a digitized world—A material praxeology of aging with technology. *Frontiers in Sociology*, *3*, Article 6. https://doi.org/10.3389/fsoc.2018.00006

Weaver, C. K., Zorn, T., & Richardson, M. (2010). Goods not wanted: Older people's narratives of computer use rejection. *Information, Communication & Society*, *13*(5), 696–721. https://doi.org/10.1080/13691180903410535

Woodward, A. T., Freddolino, P. P., Blaschke-Thompson, C. M., Wishart, D. J., Bakk, L., Kobayashi, R., & Tupper, C. (2011). Technology and aging project: Training outcomes and efficacy from a randomized field trial. *Aging International*, *36*, 46–65. https://doi.org/10.1007/s12126-010-9074-z