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SPECIAL ISSUE

**More Years, More Technologies:
Aging in the Digital Era**

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Riitta Hänninen**
Guest Editors

Jukka Jouhki
Editor in Chief

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Guest Editors' Introduction**MORE YEARS, MORE TECHNOLOGIES: AGING IN THE
DIGITAL ERA****Sakari Taipale**

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Today, people are enjoying longer lives, often without major disabilities (World Health Organization, 2015). For the disciplines of human and social sciences, the increased longevity opens a completely new horizon for investigating the role of new technologies in human lives; people living longer have many more years to experience increasingly frequent waves of innovation in technologies. Even though not all old people are active and independent users of digital technology, the amplitude of new devices, applications, and services targeted at a growing segment of older people is staggering. This special issue of *Human Technology* brings together six research articles that explore the role of digital health and communication technologies in later life.

Amid the ongoing trends in aging, this area of research has been defined by the abundance of off-the-shelf products and emerging technologies, on the one hand, and a wide diversity in digital technology use among the older people on the other. Contemporary markets are targeting older consumers more than ever before (Gilleard, 2018). All sorts of traditional and new digital solutions—ranging from simple walking sticks and ergonomic chairs to senior phones, alarm pendants, and smart home and telecare systems—are available in the marketplace to facilitate successful aging and autonomous living, whether in institutional care, home-like environments, or at home. At the individual level, people's longer lives are influenced by and integrated with digital technologies to varying extents. Hence, it can be argued that the principle of aged heterogeneity (Nelson & Dannefer, 1992), proposing that old people constitute a more diverse group in terms of their physiological, psychological, social, and functional traits than young people, also manifests itself with respect to the adoption and use of digital technologies. Through research, the considerable variation in older people's personal



attitudes towards and history of technology use has been identified, as well as their information and communication technology (ICT) ownership and usage rates, digital skills, and the availability of support networks (e.g., Friemel, 2016; Sourbati, 2015).

The articles of this special issue tackle the various aspects of this “abundant supply–heterogeneous demands” phenomenon from two perspectives. First, the issue includes studies that analyze groups of relatively experienced older technology users in different European countries who have engaged with various digital technologies from early on, especially mobile phones, computers, and the Internet. Second, the possible downsides to using digital technologies in later life are examined and discussed in the articles. Concerns such as a possible loss of self-determination and privacy violations are typically associated with the passive and/or involuntary use of telehealth, telecare, and telemonitoring technologies. Yet, in practice, these very same problems relate to the use of ordinary personal communication technologies as well. For example, smartphones or online service may be used for tracking online behavior and physical movements irrespective of users’ age. Although these two perspectives do not explicitly address issues concerning older nonusers or digitally less-engaged seniors, the articles of this special issue do not leave the challenges faced by older people in the digital era unaddressed. Moreover, although the challenges pinpointed in the articles are mainly characteristics of older technology users, some of these concerns can be ascribed to younger user groups as well.

OVERVIEW OF THE SPECIAL ISSUE

The special issue includes six articles from the authors researching in different countries: Canada, Italy, the Netherlands, Spain, Sweden, and the United Kingdom. The first two articles present systematic overviews of the prior research on older people’s use of mHealth and eHealth solutions. The paper by **Alice Spann and Ellen Stewart** presents their research into the barriers to and facilitators of older people’s usage of mHealth. Conducting a qualitative thematic synthesis, they are able to indentify three factors—drawn from 17 eligible studies published between 2007 and 2017—that directly connect to older people’s intentions or actual use of mHealth solutions. Based on the results of their synthesis, the authors maintain that older people’s perceptions of usefulness often deviate from those of their relatives or home care providers and that, at times, old people feel pressured to adopt technologies they deem inappropriate. The other two factors were self-efficacy and the costs of equipment and associated services. Spann and Stewart call for concrete measures to ensure older people’s self-determination over the adoption and use of mHealth solutions.

Mei Lan Fang, Ellie Siden, Anastasia Korol, Marie-Anne Demestihis, Judith Sixsmith, and Andrew Sixsmith investigated the intended and unintended consequences of eHealth applications on older people. This article presents a scoping review of literature published between 2010 and 2017 that was informed by a Health Equity Impact Assessment framework. The authors identify several potential benefits of eHealth initiatives for older adults, which indicate that cost-effective eHealth systems offer great potential to alleviate the growing health-care demands on societies. Even so, the study also reveals that eHealth care systems may not solve—and may even exacerbate—the problems of old people at the margins

of society. Too often, these systems fail to recognize cultural and linguistic factors and individual needs—that is to say, aged heterogeneity—that influence technology appropriation.

In the next two articles, older people and their practices of using new technologies are at the center of analysis. **Tobias Olsson and Dino Viscovi** breathe new life into the concept of warm experts, originally coined by Maria Bakardjieva (2005). When the first personal computers and Internet technology were domesticated, the role of these proximate and familiar persons, who had a relatively deep knowledge of new technology but provided help without expectations for return, was crucial for facilitating ICT uptake and usage. While acknowledging that in Sweden, the country of their study, a majority of older people have been using the Internet already for some years, Olsson and Viscovi asked who are the warm experts for older people today, and what do they actually do? Based on both qualitative and quantitative evidence, the article indicates that the need for help in technological matters has not disappeared, and that even the most skilled seniors need assistance in technology use at times. Besides its other merits, the study reminds that a large number of older people living alone in Sweden have fewer, in any, possibilities to get help, support, and encouragement in ICT use from people nearby.

The article written by **Fausto Colombo, Piermarco Aroldi, and Simone Carlo** turned attention to Italian grandmothers, especially to their generational experiences and perceptions of ICT use. The authors interviewed a group of grandmothers living in Milan and its surroundings, all of whom are ICT users, in order to understand the dynamics of intergenerational exchanges and ICT-related family communication. What surfaced from their analysis is that the grandmothers had developed a distinctive understanding of what they believe is the correct use of technology. According to the authors, this understanding was based on their inter- and intragenerational experiences, produced through reflections on the grandmothers' own practices of ICT use and contrasted with those considered typical for younger generations.

The last two articles approaches explore the outcomes of aging and digitalization from the perspectives of organizations. The study by **Loos** investigated the use of online stock photographs portraying old people. When used on the Web sites for organizations offering services to older people, Loos maintains such photos typically depict old people as active and healthy individuals, thus consequently overlooking the aged heterogeneity. In his exploratory study, Loos exposed a group of older Dutch people—differing in terms of their age, gender, living arrangement, and self-reported vitality—to five sets of online stock photos to find out which photos they would identify with and like most. The results of the study indicate that, although all participants liked certain photos quite unanimously, they typically liked most the photos portraying old people in the same life stage as themselves. This said, Loos advises organizations using stock photos to make their Web sites more attractive for older online users consider ways to acknowledge the diversity of older people better.

Lastly, **Deusdad and Riccò** examined digitalization and digital technology available to professionals in organizations providing long-term care services to the older people. While researchers and politicians are often worried about older people's attitudes and ability to use public digital services, the resistance towards a wider utilization of new technology also has appeared to be strong and persistent among professional care workers, according to the authors. In contrast to previous Spanish studies, Deusdad and Riccò now present that care professionals' attitudes toward the digitalization of administrative processes have changed.

Drawing from their recently collected focus group responses and semistructured individual interviews, the authors indicate that earlier digitalization projects in the Spanish care sector were partial and insufficient, thereby increasing care workers' workloads and anxiety. However, a new, more comprehensive, and wisely-designed digitalization process of long-care services was seen as a way to relieve workers' burdens and to facilitate clients' claiming of services.

DISCUSSION AND CONCLUSIONS

As social circles typically shrink when people get old, gerontologists argue that older people would prefer using their time on socially meaningful activities and less on learning new things and skills (Carstensen, Isaacowitz, & Charles, 1999). In contrast, in the field of human–technology studies, the general, but strongly held, perspective is that older people in particular would benefit from using ICTs, social media, and other digital technologies—for a variety of reasons. This supposed great potential is validated by referring to, for instance, the evidence of positive effects of ICT use on older people's physical and mental well-being, as well as lower levels of social isolation (e.g., Delello & McWhorter, 2017; Sims, Reed & Carr, 2017). Another presumption behind this argument is that more intuitive technologies require less learning and skills updating, and hence seem particularly suitable for older people.

This special issue makes a couple of important contributions to this ongoing debate: analyzing a wealth of new technologies used by or targeted at older people while simultaneously recognizing the potential impacts of aged heterogeneity. First of all, it seems that allegedly increasingly intuitive user interfaces have not, at least to date, significantly decreased the need for external help in ICT usage. Even the most skilled and experienced older technology users need help with the rapidly regenerating and novel devices and applications. The studies also have clarified that generational experiences (see also, Haddon, 2018) and earlier personal encounters with then-new technology shape the ways in and the extents to which new technologies are appropriated and used in old age. Besides a relatively high diversity in their digital skills and actual use of digital technology, older people's perception of what is intuitive, acceptable, and appropriate with respect to technology and its use differs from younger people. Bearing in mind that some older people's unwillingness to accept new technologies is associated with the potential loss of agency and autonomy, it is obvious that the aged heterogeneity and the particularities of old age as a stage of life are still insufficiently incorporated into the design of digital technologies and applications.

Intuitive interfaces have accommodated much of the digital development over the past decades by providing easy access to various ICTs, thus democratizing the ways people generally incorporate the digital world into their everyday lives, and vice versa, meaning how the needs and demands emerging from everyday life situations are reflected in the development of technology. Although heterogeneity characterizes older people's stance on and needs for digital technologies, the fact remains that almost everybody, regardless of their age, struggles with ICTs at some point in their lives. In this light, it is also intriguing to see what happens to Bakardjieva's (2005) original notion of the warm experts in the future: How long are the warm experts needed in the context of digital technologies and applications and in what capacity. As the articles in this special issue indicate, the development of digital

technologies remains a work in progress, at its best, yet continually must be made intelligible and meaningful to many of the elderly people. Thus, more insight is needed into how older people experience ICTs as a part of their everyday lives and well-being, not just as a distinctively heterogeneous group but particularly in terms of how elderly people themselves choose to participate in the digital era.

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Authors' Note

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BARRIERS AND FACILITATORS OF OLDER PEOPLE'S mHEALTH USAGE: A QUALITATIVE REVIEW OF OLDER PEOPLE'S VIEWS

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Abstract: The aim of this qualitative evidence synthesis is to identify and assess existing evidence on barriers to and facilitators of older people's usage of mHealth. Existing literature identified many factors that affect people's experiences and perceptions of mHealth, which are in turn influenced by their personal circumstances and biography. The following themes were identified using the thematic synthesis approach: (a) perception of usefulness, (b) user requirements, (c) self-efficacy, (d) sense of self and control, (e) privacy and confidentiality, and (f) cost. MHealth devices and services are complex interventions that have to be integrated into an older person's life in order to facilitate effective use. Developers, providers, and policymakers should make sure that older people are included in decisions about technology use and, further, should question whether the current promotion of technology as a panacea for societal and budgetary problems is rooted in a realistic assessment of their use in practice.

Keywords: older people, mHealth, user perspectives, technology acceptance, barriers and facilitators, qualitative evidence synthesis.



INTRODUCTION

The world's population is aging. By 2020, more people will be aged 60 or older than 5 or younger (World Health Organization [WHO], 2015). The likelihood of needing lengthy and complex health and social care rises with increasing age. This brings serious implications to the funding, quality, and organization of health- and social care systems, many of which are already under pressure due to lack of personnel and financial resources (Nilsen, 2015; WHO, 2011). Technology is seen as a way of increasing access to services, decentralizing care, and empowering patients to manage their own conditions, thereby reducing health-care expenditure and improving patients' quality of life (Free et al., 2013; Varshney, 2014). Thanks to the advancements in mobile technologies, many of the functions that have traditionally been dependent on home-based control units or other nonportable devices can now be integrated into mobile devices and freed from spatial or temporal restrictions (Free et al., 2013). The increasing popularity, capabilities, and affordability of modern mobile devices, such as smartphones, smartwatches, or tablet PCs, make them very attractive tools for health-care delivery (Free et al., 2013; Shahrokni, Mahmoudzadeh, Saeedi, & Ghasemzadeh, 2015).

WHO (2011, p. 6) defined mHealth as "medical and public health practice supported by mobile devices, such as mobile phones, patient monitoring devices, personal digital assistants (PDAs), and other wireless device." Free et al. (2013, p. 2) described it as "the use of mobile computing and communication technologies in health care and public health," and Varshney (2014, p. 20) stated that the purpose of mHealth is to provide "healthcare to anyone, anytime, and anywhere by removing locational and temporal constraints while increasing both the coverage and the quality of healthcare." These definitions are vague by necessity due to the rapid development of hardware and software capabilities and the seemingly infinite possibilities for their application. In this study, we define mHealth as the delivery of health and care services via mobile devices. A device is considered mobile if it is portable (i.e., can easily be carried in a small bag) or wearable.

Gokalp and Clarke (2013) indicated several tasks mHealth can fulfill in the care of older people:

- Devices can be used to monitor vital functions and disease patterns and communicate with health- or social care professionals (HCPs). These functions are traditionally referred to as telehealth, telemonitoring, or telemedicine (see also Cook et al., 2016; Pecina et al., 2011).
- Wireless sensors can detect falls or changes in motion patterns or routines, as well as the use of objects like medication dispensers, also referred to as telemonitoring (see also Horton, 2008).
- Alarms can be used to help older people live safely in their homes and to actively call for help in case of falls or other emergencies, a system also known as telecare (see also Barlow, Singh, Bayer, & Curry, 2007; Turner & McGee-Lennon, 2013).

Additionally, a growing range of software applications ("apps") for smartphones or tablet PCs are being developed to help people modify unhealthy behavior (e.g., smoking cessation apps) or actively manage their health (e.g., apps for diabetes or chronic obstructive pulmonary disease management; Varshney, 2014). The intention behind such apps is to provide these functions in the comfort of the home and to save older people the effort of having to travel,

sometimes far distances, to see HCPs (Call et al., 2015). Currently, the boundaries of what technology can achieve are being pushed ever further with new areas of application discovered continuously (Istepanian & Lacal, 2003; Kumar, Singh, & Mohan, 2010; Silva, Rodrigues, de la Torre Díez, López-Coronado, & Saleem, 2015). As most of these technologies and applications are still in their infancy, further expansion of mHealth can be expected in the years to come.

However, despite the hopes that mHealth can improve access and quality of health care while simultaneously reducing cost, little is yet known whether it can actually achieve these goals in practice (Barlow et al., 2007; Free et al., 2013; Shahrokni et al., 2015; Vesel, Hipgrave, Dowden, & Kariuki, 2015). Reasons for that concern include a tendency of technology designers to focus on usability of interventions rather than actual health outcomes; a lack of standardized, replicable study designs; and an absence of frameworks for evaluation (Labrique, Vasudevan, Kochi, Fabricant, & Mehl, 2013; Vesel et al., 2015). Furthermore, Vesel et al. (2015) stated that it is essential to address issues of technology acceptance to ensure successful implementation of mHealth programs.

Technology acceptance is an important matter in regard to older people's adoption of mHealth, not least because it appears that the overall uptake of technology for health-related purposes is low in this age cohort (Turner & McGee-Lennon, 2013). According to Smith (2014), people over the age of 65 generally use fewer new technologies—including the Internet, smartphones, and other digital devices—and use them less frequently than younger people. Older, less educated, and less affluent people, as well as people with disabilities, appear to use them even less often (Smith, 2014). This phenomenon is commonly referred to as the digital divide (Brodie et al., 2000). However, as Parker, Jessel, Richardson, and Reid (2013) pointed out, older people are the fastest growing group in terms of new users. To develop technologies that address older people's health needs and support their autonomy—and which also are widely accepted, adopted, and utilized—it is essential to understand older people's experiences, expectations, and concerns.

As of yet, very little research directly addresses issues that influence older people's decisions to adopt mHealth. A majority of studies referring to mHealth in their title or abstract are effectiveness or feasibility studies; another sizable group addresses HCPs, especially in low- or middle-income countries. As highlighted earlier, aspects of mHealth also are known under different names, including telehealth, telecare, or telemonitoring. By using these terms, it is possible to identify a slightly larger number of studies that concerned, firstly, older people's perceptions and experiences of technology for health- and social care purposes and, secondly, what influences their decisions on whether and how to use them. Even though these studies do not explicitly talk about mHealth, the technology used is often wearable or portable and can thus be referred to as mobile. The aim of the present research is to identify and assess evidence on barriers to or facilitators in older people's usage and their expectations and requirements concerning mHealth.

METHODOLOGY

Qualitative methods are uniquely suited to exploring people's experiences and expectations on phenomena and products and for providing explanations as to why, how, and for whom certain interventions are effective (Atkins et al., 2008; Thomas & Harden, 2008). Thematic synthesis,

developed and described by Thomas and Harden (2008), is one of a number of emerging methods to synthesize findings from qualitative studies (Barnett-Page & Thomas, 2009). It combines components of traditional systematic reviews and methods for analyzing primary qualitative research with the aim of providing insight into people's acceptance, need, and experiences of health promotion and public health interventions. It thus can be used to generate hypotheses against which findings of quantitative studies concerned with intervention effectiveness can be tested (Thomas & Harden, 2008). The main steps of the thematic synthesis are illustrated in Figure 1.

Systematic Search

Constructing the Search Strategy

In this study, the initial search strategy was devised by the first author and discussed and advanced by both authors. We used the SPIDER (Sample, Phenomenon of Interest, Design, Evaluation and Research type) tool, developed by Cooke, Smith, and Booth (2012), to construct the search. We generated key terms to capture mHealth from studies identified in an initial scoping search. Where appropriate, we used thesaurus terms or subject headings and supplemented them with free-text keywords, which we combined using the Boolean operator "OR." We employed a similar strategy for each of the individual SPIDER elements, which we then combined via "AND." After a test run using MEDLINE, we decided to omit the Evaluation element as it yielded no further eligible studies but increased the number of articles to be screened almost threefold. The SPIDER search elements can be found in Table 1. Appendix A displays the finalized search strategy with the keywords that were used for the search.

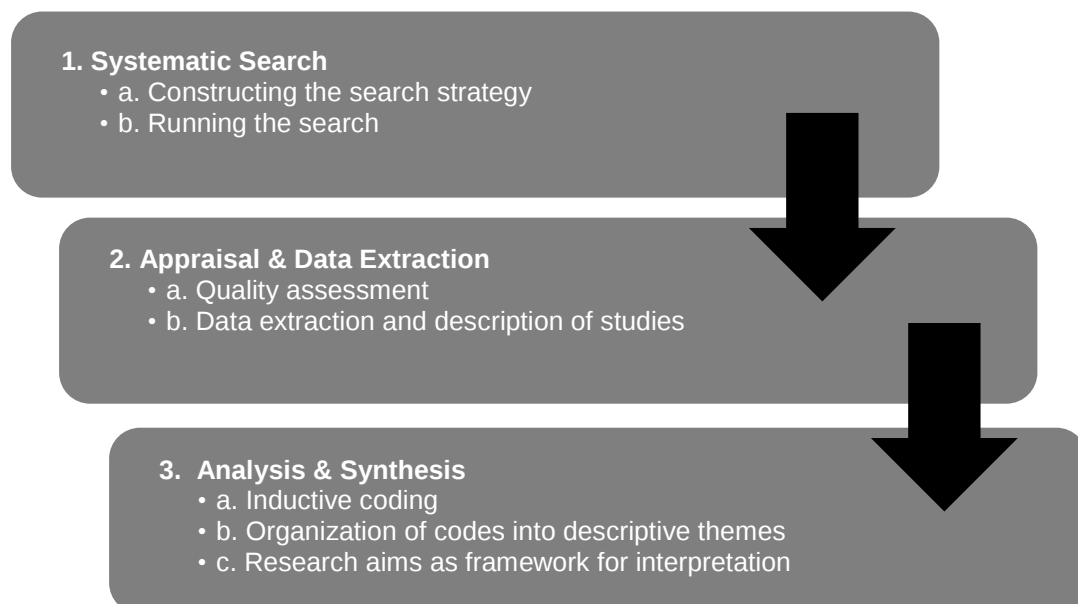


Figure 1. The main steps of thematic synthesis according to Thomas and Harden (2008).

Table 1. SPIDER Elements and Eligibility Criteria.

SPIDER elements	Eligibility criteria
Sample: <i>"Older people"</i>	Included: - No restrictions in terms of age of participants as long as the mean is above 60 - No limitations in terms of living arrangements, health status, or cognitive abilities Excluded: - Studies focusing on management of mental health and palliative care - Studies that include other stakeholders (e.g., health- and social care professionals = HCPs, caregivers, mHealth providers) if their individual contributions cannot be discerned
Phenomenon of Interest: <i>"mHealth"</i>	Included: - Digital/electronic technologies that are mobile, i.e., portable or wearable, even if not specifically referred to as mHealth Excluded: - Nonportable or wearable technology used for health or care delivery, i.e., landline telephones, TVs, PCs/Laptops, or robots - Technology for other purposes than (self-) care and health/disease management for older people - Technology for acute conditions or short-term care (e.g., postoperative care after discharge from hospital)
Design	Included: - Qualitative data generation methods Excluded: - Effectiveness and feasibility studies - Pilot studies if they do not contain qualitative elements
Evaluation	Included: All older people's experiences and views concerning mHealth, irrespective of their current or previous use or decision not to use
Research type	Included: - Qualitative or mixed-methods studies Excluded: - Quantitative studies such as randomized controlled trials or surveys

Running the Search

The databases MEDLINE, CINAHL, ASSIA and PsycINFO were searched by the first author for studies published in English between January 1, 2007 and June 15, 2017, the day on which the search was carried out. This date restriction was chosen because the introduction of the first iPhone in 2007¹ led to dramatic developments in what mobile technology can do and in the way people use and integrate it into their lives (Hern, 2017; Lupton, 2013; Silva et al., 2015). MEDLINE was chosen for its focus on biomedical literature. CINAHL is a database for literature on nursing and allied disciplines. ASSIA indexes sociological literature, and PsycINFO lists content from psychology. The 570 thus identified studies were inputted into EndNote X7 referencing software. The first author then screened the titles and abstracts of the 489 studies remaining after elimination of duplicates for their relevance according to the predefined eligibility criteria, presented in Table 1. After this review, only 32 papers remained with titles/abstracts that met the criteria.

The first author then retrieved and carefully read the full texts of the 32 articles, after which just 13 eligible studies remained. The author checked the reference lists of these 13 papers to identify any potentially valuable studies that may have been missed in the systematic search. This yielded 5 additional articles meeting the criteria. A total of 18 articles were found to be appropriate to continue into the next stage, quality assessment, although subsequently one was eliminated because of problematic reporting. This left 17 studies for the analysis and synthesis phase. The search process is illustrated in Figure 2. An overview of the included studies can be found in Table 2.

Data Extraction and Description of Studies

We created a data extraction tool to capture the key characteristics of the individual studies—an essential step to ensure that their context is preserved (Thomas & Harden, 2008). This tool included information on authors, year of publication, study location, recruitment strategy and sample, context (e.g., living conditions and health status of participants; prior experience with mHealth, etc., insofar as this information was available), the sort of technology used, research aims, and major findings. The results are displayed in Appendix B. The description of the selected studies is presented in the Findings section of this paper.

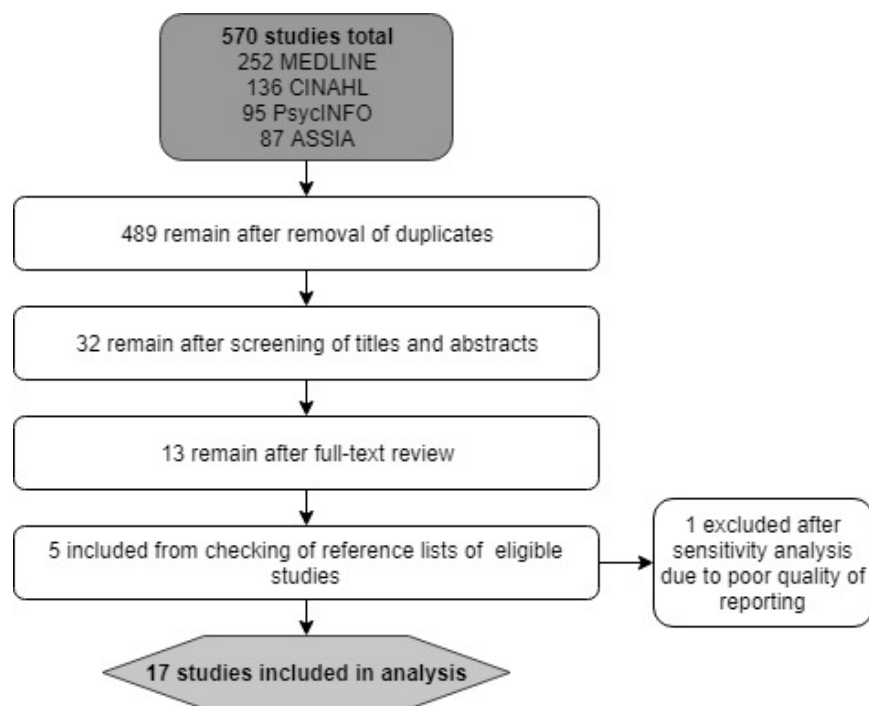


Figure 2. Flowchart of the search process to identify studies for analysis and synthesis.

Table 2. Quality Assessment and Overview of Eligible Studies.

Number of study	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	X
1. Was there a clear statement of the aims of the research?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N
2. Is a qualitative methodology appropriate?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	CT
3. Was the research design appropriate to address the aims of the research?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
4. Was the recruitment strategy appropriate to the aims of the research?	Y	Y	CT	Y	Y	Y	Y	Y	Y	CT	Y	Y	Y	N	CT	Y	N	CT
5. Were the data collected in a way that addressed the research issue?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	CT
6. Has the relationship between researcher and participants been adequately considered?	N	N	N	N	Y	N	Y	Y	N	N	Y	N	N	N	N	N	N	CT
7. Have ethical issues been taken into consideration?	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	CT	CT	CT	Y	Y	Y
8. Was the data analysis sufficiently rigorous?	Y	Y	Y	Y	Y	Y	Y	Y	Y	CT	Y	Y	Y	CT	Y	Y	Y	CT
9. Is there a clear statement of findings?	Y	N	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	Y	Y	N
10. How valuable is the research?	++	~	+	++	++	++	++	++	+	+	++	++	~	~	++	++	++	~

Note. Y = Yes; N = No; CT = cannot tell; ++ = very valuable; + = valuable; ~ = moderately valuable

Papers meeting eligibility criteria for analysis:

- | | | |
|--|---|---|
| 1. Bentley, Powell, Orrell, & Mountain, 2014 | 6. Cook et al., 2016 | 13. Parker, Jessel, Richardson, & Reid, 2013 |
| 2. Bond & Worswick, 2015 | 7. Essén, 2008 | 14. Pecina et al., 2011 |
| 3. Boström, Kjellström, & Björklund, 2011 | 8. Fairbrother et al., 2013 | 15. Pritchard & Brittain, 2015 |
| 4. Boström, Kjellström, Malmberg, & Björklund 2013 | 9. Grindrod, Li, & Gates, 2014 | 16. Shulver, Killington, Morris, & Crotty, 2017 |
| 5. Chung, Thompson, Joe, Hall, & Demiris, 2017 | 10. Hamblin, 2017 | 17. Steele, Lo, Secombe, & Wong, 2009 |
| | 11. Horton, 2008 | X Mort, Roberts, & Callen, 2013 |
| | 12. Melander-Wikman, Fältholm, & Gard, 2008 | |

Analysis and Synthesis

The first author performed the data analysis. The 17 selected studies were read multiple times to become familiar with their context, content, and key concepts, and then the information was entered into NVivo11-Pro software for qualitative data analysis. Data from the Findings and Discussion sections of each study were coded inductively, varying from small parts of sentences to larger sections in order not to lose sight of the context of what was being presented in each

paper. Contributions made by participants other than older people, such as caregivers or HCPs, were omitted. The codes were applied across the studies and new codes added where necessary. After each study was coded completely, the individual codes were examined for their internal consistency of interpretation and then combined to form descriptive themes. Codes that essentially addressed the same issue were merged; codes that were related to one another were joined together to form a tree-shaped hierarchy. Through this process, overarching themes started to emerge. An example of this process is presented in Table 3. The final stage of the synthesis uses the research aims as a framework for interpretation of the themes. This means that the inductively developed themes are collated and presented in a way that addresses the research aims. Due to its interpretive nature, this process is difficult to describe (Thomas & Harden, 2008). The identified themes relating to barriers and facilitators of mHealth usage of older people were discussed with the second author and are presented in the Findings section of this paper.

Table 3. Example of the Process of Developing the Themes from Coded Texts from the Articles.

Example of Coded Text	→ Code
"In particular, many found it helpful to know their oxygen saturation and to learn their 'normal' range by identifying telemonitoring data trends over time."	Increases knowledge and awareness
"She could've looked at it and said, "Yeah, hey, I need to take this pill" or there's a reminder."	Helps to remember medication
"I might be able to try to become active for my health."	Helps to change behavior
"One proposed benefit of home telemonitoring is earlier detection of a decline in health status that would allow intervention at an earlier stage of illness."	Can prevent deterioration
"Participants noted several potential ways mHealth could help to improve pain care, including assisting patients to reach healthcare providers more expeditiously."	Enables communication with professionals
"The time-saving and convenience of not having to travel to appointments or exercise classes afforded by video consults was a consistent theme."	Can save time
→ Descriptive Theme: <i>Helps to manage health condition</i>	
→ Subtheme: <i>Functional Requirements</i>	
→ Theme: <i>User Requirements</i>	

FINDINGS

The 17 eligible papers for this study involved a total of 541 participants. Some of the reviewed studies included participants under the age of 60 but were still included in our analysis because the mean age of all participants was well above 60. Four studies included caregivers or HCPs, whose contributions were omitted from analysis. In terms of people's living and health conditions, their care arrangements, ethnic, educational, and socioeconomic circumstances, the studies were generally very diverse, insofar as this type of information was available. Table 4 provides a description of the included studies.

We identified nine themes or subthemes influencing older people's acceptance of mHealth from participants' views and experiences: (a) Perception of Usefulness, (b) User Requirements,

Table 4. Description of the Information Provided by the Included Studies.

Included studies		
1. Bentley et al., 2014	7. Essén, 2008	13. Parker et al., 2013
2. Bond & Worswick, 2015	8. Fairbrother et al., 2013	14. Pecina et al., 2011
3. Boström et al., 2011	9. Grindrod et al., 2014	15. Pritchard & Brittain, 2015
4. Boström et al., 2013	10. Hamblin, 2017	16. Shulver et al., 2017
5. Chung et al., 2017	11. Horton, 2008	17. Steele et al., 2009
6. Cook et al., 2016	12. Melander-Wikman et al., 2008	
Feature	Description	No. of study
Participants	Participants under the age of 60 included	1, 2, 6, 8, 9, 15
	Caregivers or HCPs included	2, 8, 10, 15, 16
	Participants with no prior mHealth experience included	5, 9, 17
	Participants who declined mHealth included	1, 2, 6
Terminology used	mHealth	13
	Mobile medication management applications	9
	Telehealth	2, 6
	Telecare	1, 6, 10
	Telemonitoring, home-based monitoring, monitoring technologies	4, 5, 8, 11, 14
	Telerehabilitation	16
	Electronic care surveillance	9
	Mobile safety alarm, alarm pendant, personal emergency response system ("PERS")	3, 12, 15
Technology used	Pendant/wrist alarm	1, 3, 6, 10, 11, 12, 15
	Extended wrist alarm (includes GPS, accelerometer, vital signs monitoring, or fall detector)	4, 7, 12
	Smartphones or Tablet PCs	1, 9, 13, 16
	Intel Health Guide	8, 14
	Vital parameter monitor/sensor	2, 4, 5, 6, 8, 14, 17
	Technology for health/disease management	2, 4, 5, 6, 8, 10, 13, 14, 16, 17
	Wearable falls sensors	11, 12, 17
	Bed/chair occupancy sensors	10, 11
	Motion sensors or accelerometers	4, 5, 16
	Medication reminder systems	9, 10
	Studies using existing technology	1, 2, 3, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16
	Studies using hypothetical technology	4, 5, 13, 17
Study location	Australia	16, 17
	Canada	9
	Sweden	3, 4, 7, 12
	UK	1, 2, 6, 8, 10, 11, 15
	USA	13, 14
	USA & South Korea	5

comprising Functional Requirements, Technical Requirements, and Personalization, (c) Self-efficacy, (d) Sense of Self and Control, (e) Privacy and Confidentiality, and (f) Cost. These themes are explicated in the subsections below.

Perception of Usefulness

Perceived or experienced need, usefulness, and benefit of a device or service significantly influenced uptake and engagement with technology [Studies 1, 5, 6, 9, 16, 17]. Participants who did not feel the need for mHealth—that is, did not see any advantages over strategies they already employed to help them cope or felt that the services offered did not fit their requirements—were less likely to perceive devices as useful and thus did not use them [Studies 5, 8, 9, 10, 11, 13, 14, 16, 17]. There generally did not appear to be a big difference between older people who had and those who did not have prior experience with mHealth in terms of perceived usefulness. Rather, whether a service or device was seen as useful depended on whether people perceived a need for assistance and whether they thought technology would suitably address that need.

Many older people acknowledged the potential usefulness of services and devices but did not feel they needed them personally because they were happy with the services the health or care systems already performed for them, thought they had sufficient support from their social network, or felt they were not old, sick, or frail enough yet [Studies 1, 4, 5, 6, 9, 11, 17]. This is illustrated in the following statement:

Wendy had experienced frustration at her father's refusal of the pendant alarm. At the same time she was horrified by the thought of a family member suggesting the pendant alarm to her: "I would be horrified if someone said that to me because it would be their way of saying to me you are losing it you are not managing or coping and nobody wants to have that said to them." (Bentley, Powell, Orrell, & Mountain, 2014, p. 227)²

As is apparent from this account, technology had the potential to influence older people's sense of self, which is discussed in more detail later. User requirements, both functional (what a device can be used for) and technical (how a device operates), as well as the possibility to personalize the functions and design of a device to individual need and preferences, were found to influence perceived usefulness and are discussed below.

User Requirements

User requirements were found to be an important theme. This theme is divided into the subthemes Functional Requirements (what devices can be used for), Technical Requirements (how devices operate), and Personalization (whether device is adaptable to fit functional and aesthetic preferences).

Functional Requirements

Participants generally seemed to appreciate devices that allowed them to manage their disease. In this case, people felt the devices could help them increase their knowledge and become more aware of their disease [Studies 2, 5, 6, 8, 9, 14, 16]. They valued technology that could help

them to remember their medication [Studies 6, 9], identify and alter behavior perceived as unhealthy, and motivate them to become more active [Studies 14, 16]. Monitoring their health could help them make better decisions or prompt interventions from HCPs involved in the service, thereby potentially delaying or preventing a deterioration of their conditions [Studies 2, 5, 6, 8, 14].

Feeling that HCPs were watching over them and would offer advice or intervene, if necessary, was viewed as very useful by participants [Studies 6, 7, 13, 14, 16]. Additionally, many older people appreciated that mHealth could save them time and unnecessary trips to the doctor, which were arduous for some of them [Studies 6, 7, 14, 16], either by allowing them to contact HCPs remotely or by managing their health themselves.

It keeps me from running back and forth to the ER [emergency room] and whenever I start to feel a little queasy, it's about my heart, I take my blood pressure which is so convenient instead of running to the hospital. (Participant identified as Male, age 75, in Pecina et al., 2011, p. 464)

Participants appreciated the convenience of not having to travel to appointments for rehabilitation services and recognized the value of telerehabilitation for people living in rural and remote areas, when travel is a significant barrier. (Shulver, Killington, Morris, & Crotty 2017, p. 125)

For some people, regular contact with call-center operators or HCPs via mHealth could reduce their feelings of loneliness and social isolation [Study 16]. However, many stressed that, no matter how useful a system is, mHealth cannot and must not completely replace face-to-face contact with HCPs [Studies 1, 9, 16, 17].

Many participants expressed the desire to stay in their own homes and to avoid having to go to a care facility [Studies 1, 7, 10, 11, 17]. For this purpose, mHealth was viewed as useful in that it could give them and their relatives the peace of mind of knowing that they are looked after while living alone and would receive help in case of emergencies. These sentiments were expressed in all of the reviewed studies, apart from Studies 2, 8, 9, and 16. Mostly, people were afraid of falling and not being able to get up again or call for help [Studies 5, 11, 12], whereas a few others were concerned about violence in their neighborhoods and appreciated the feeling of security a mobile safety alarm could provide [Study 12]. Using fall detectors or pendant alarms made some older people feel safe enough to take more risks and be more active and mobile, which they experienced as liberating [Studies 3, 10, 11, 12]. One participant referred to the service as insurance: “*You have got to see it in the same light as insurance, because that is what it is really, it's insurance*” (Participant identified as Georgina in Bentley et al., 2014, p. 231).

However, having to rely on the devices and the associated service also could feel like a loss of independence to older people, resulting in them having to weigh the costs and benefits [Studies 4, 6, 10, 15]. This potential impact on a person's sense of self is further explained later in this paper, but characterized here with this quote:

As you get older and you have to depend on maybe other people or different things, you feel it's part of your independence being taken away, but then when we got it and we realised it freed us up from worry, so that bit of independence had actually been given back to me. (Participant identified as Mrs Swallow, aged in the 60s, in Hamblin, 2017, p. 136)

Technical Requirements

Participants wanted an easy-to-use and understandable system [Studies 1, 2, 6, 9, 12, 13, 14, 17] and did not want to have to spend a lot of time using it and learning how to use the technology [Studies 6, 9, 10]. Many older people voiced the desire to know more about how their systems worked, what its functions were, and whether any alternative, possibly more advanced, technology was available; they also felt they did not receive enough information from providers and referring HCPs [Studies 1, 3, 6, 7, 10, 11, 17]. Some participants stated that they did not know how their systems worked or how to use them correctly, which in some cases led to frustration [Studies 7, 9, 10, 11]:

Many who had never activated their telecare device(s) were unclear about what would happen if they did; they were unsure as to who would answer the call, whether an ambulance would attend and how the responder would access their property. (Hamblin, 2017, p. 137)

Others did not want to know how the technology operated [Study 7]. Some older people preferred to receive information concerning mHealth face-to-face from their referring HCP rather than being overwhelmed by a deluge of leaflets and information material, as often happened after a stay in hospital [Study 6]. Others wanted an easily understandable manual that needed to take possible language barriers into account [Studies 5, 6, 9, 17]. Being able to get the information needed to operate the technology confidently appeared to impact people's self-efficacy, which is discussed in more detail later. Devices had to be as nondisruptive as possible and easily integrable into people's daily routines or risk being abandoned or forgotten [Studies 4, 6, 9, 10, 11].

I was good for the first few months, then I went away for a few days, and I couldn't have it with me because it wouldn't work in my daughter's house. Then I came home and I suppose it's like most things, you try it for a while and then you forget it. (Participant identified as Female, age 77, in Horton, 2008, p. 1189)

Having dependable technology and reliable operators was seen as an essential requirement of any mHealth system, a conclusion drawn from a UK-based study. *"However, as stated by our participants, the most important consideration in a person's decision to use a piece of technology is that the equipment, and the team behind the equipment, are reliable and operate as they should"* (Bentley et al., 2014, p. 232).

Some participants expressed concerns of having to rely on technology for accurately diagnosing illness or an accident [Studies 3, 5, 9, 17], whereas others stated that they trusted that it worked correctly [Study 6]. Faulty technology could lead to the abandonment of the service [Study 6], especially in case of multiple false alarms, which older people experienced as embarrassing or annoying [Studies 1, 10, 11, 15]. Many older people stated that they did not know what to do if the system required maintenance (e.g., a battery-change) or malfunctioned [Studies 6, 16] and expressed the wish for ongoing support [Studies 2, 5, 6, 10, 16, 17]. In Study 17, participants were concerned about potential health impacts resulting from technology use, especially when discussing the possibility of implanting sensors under the skin:

Some participants were aware of the fact that the sensors communicate with each other wirelessly and had concerns on whether those waves may cause cancer. Questions about

whether embedded sensors may cause allergic reactions were also raised. A few participants showed concerns regarding to the pain they may experience if a sensor is required to be planted underneath their skin. (Steele, Lo, Secombe, & Wong, 2009, p. 793)

The usability of mHealth was limited if it was uncomfortable to wear or constraining (e.g., neck-worn pendant alarms or belt-worn fall detectors; Studies 1, 10, 11). A further restriction was the limited reach of some services that were wirelessly connected to a home base (e.g., pendant alarms). Many participants expressed uncertainty as to how far their system could reach, often resulting in avoiding places in the home that they felt were out of range [Studies 3, 10, 11, 12].

Personalization

Participants differed on what functionalities could be useful and relevant for them [Study 17]. Many older people expressed the need for technologies and services to take physical, cognitive, and sensory impairment into account [Studies 1, 6, 9, 10, 11, 13, 14, 15, 16, 17], highlighting that there are no one-fits-all solutions. When asked, many participants had ideas how services could be improved in regard to usefulness and usability and often voiced the desire to be included in the design and development processes [Studies 3, 6, 12, 16].

The design of the devices was of great importance. Many participants expressed the view that technology designed for older people was unattractive and often uncomfortable to wear [Studies 1, 10, 15]. Although technology was less problematic in the privacy of their own home [Study 1], older people wanted technology to be inconspicuous and not easily identifiable as a health-care device when they went out in public. The design of devices could impact significantly people's sense of self, which is discussed in more detail later. People had many suggestions and preferences regarding technology design, which ranged from embedding devices in clothing and wearing them on the wrist instead of the neck to making them smaller and resembling jewelry or watches, or even having technology implanted under their skin [Studies 1, 6, 10, 17].

I want a gold chain. I don't like the rope! Could they not make like a little bracelet? Yes, it's for an emergency. You can't expect it to be beautiful, but when the gold ones come out I want to be first on the list. (Participant identified as Mrs. Tyne, aged in her 90s, in Hamblin, 2017, p. 134)

Technology associated with youth, such as smartphones and tablet PCs, were generally appreciated, if not necessarily used, and some participants suggested incorporating functions of traditional telecare services into those devices [Studies 1, 16]. In some cases, people tinkered with and adapted the devices they were given; in other situations, they refused the offered services and looked for alternatives that were cheaper and better suited their requirements [Studies 1, 3, 9, 16].

Self-Efficacy

Older people's faith in their own ability to operate devices successfully had a great impact on their adoption of mHealth. Some participants felt competent [Studies 2, 3, 9, 16], whereas others questioned their ability to use the technology correctly, and some even expressed dislike or a fear of it [Studies 4, 6, 10, 17]. *"There were discussions of apprehension and dislike*

towards technology across the 'non-users' who felt they lacked the confidence and experience to use technology" (Cook et al., 2016, p. 13).

Participants were often afraid of damaging the devices, making mistakes, or triggering accidental alarms [Studies 1, 9, 10, 15]. Previous experience with technology, for instance, computers, video recorders, or various information and communication technologies (ICTs), greatly influenced the participants' self-efficacy. Avid users of technology usually expressed faith in their abilities, whereas participants who previously experienced difficulties with other devices tended to be more apprehensive [Studies 1, 2, 3, 9, 12, 16, 17]. Friends' or relatives' experiences with mHealth also could affect older people's expectations of their own abilities to use technology effectively. In examining Korean and Korean-American participants' views, researchers in Study 5 found that culture too can influence. Older Korean people appeared to be more open to the idea of using mHealth as compared to their Korean-American counterparts, which was explained by the fact that Korea is considered a very tech-savvy nation.

Participants often voiced the desire to receive training and some were eager to learn, especially when mHealth was used for managing disease and because the technology used was associated with youth [Studies 13, 16, 17]. Researchers in Studies 9 and 16 found that participants became more comfortable and confident the longer they actively used their devices. People had varying views regarding the amount of information they required or desired about how their device worked or the connected service operated. It appeared that older people who had faith in their abilities and were more proactive in using technology wanted to know more about it whereas those who were more apprehensive did not.

Sense of Self and Control

Being able to maintain their identity and their sense of self was very important to participants. MHealth, especially if used for care purposes, posed a threat to people's self-concept in that it made them feel older, frailer, more vulnerable, and more dependent on others than they liked to see themselves [Studies 1, 6, 12, 15]. More importantly, it could change the way they were perceived and treated by others [Studies 1, 6, 10, 15]. Using mHealth was particularly problematic if the technology's design was felt to be stigmatizing, signposting a person's frailty and inability to manage on his/her own. This evoked a sense of shame [Studies 1, 6, 10, 15, 17]. Some people were afraid of social prejudice and discrimination: *"Well, I think she feels that it, sort of, draws attention to her frailty which she doesn't really want to do because she's always been very strong and now she isn't as strong"* (Pritchard & Brittain, 2015, p. 129).

Some people who used mHealth to manage their state of health felt that the technology led to an unwanted constant awareness of their ill health [Studies 6, 9, 14]. For others, however, perceiving themselves as vulnerable, frail, and in need of help had the effect that they found mHealth and the remote monitoring of their well-being more useful and acceptable [Studies 1, 6, 17]. Some older people managed to reframe their technology (e.g., pendant alarm) as a "lucky charm," which helped them to overcome feelings of stigmatization [Study 10]. A very few highlighted that these technologies also were used by younger people living with disabilities. This removed the age-related, but not the vulnerability-related, stigma [Study 1].

Participants worried that using mHealth could lead to them being viewed as a "something" rather than as a someone by service providers [Studies 4, 15]. As demonstrated by this quote from a participants in Study 4, *"You become a stranger ... you become nothing ... and, I mean,*

how can they care about you when they do not know who you are.” (Boström, Kjellström, & Björklund, 2013, p. 122).

However, technology connected to call-center operators or directly to HCPs who participants knew and trusted was viewed very positively [Studies 7, 16]. As indicated by Essén (2008, p. 134), *“Being surveilled by the care personnel who they trust makes the seniors feel safe.”*

Many older people stressed that they did not want to be perceived as a burden. This often resulted in them avoiding “risky” activities, such as not trying to get up on their own if they had fallen previously or not activating their devices even if they really did need help [Studies 1, 6, 10, 11, 12].

Participants frequently used the language of not wanting to “bother people” as the rationale for not using their devices in an emergency. (Hamblin, 2017, p. 135)

One informant with functional limitations thought that a mobile alarm could be used to “test the limits,” but that in his case a mobile alarm would not make him move around more because he did not want to place the responsibility on those answering the alarm. (Melander-Wikman, Fältholm, & Gard, 2008, p. 342)

Many participants stated that they only agreed to use mHealth to appease relatives or HCPs, and some even felt they had been pressured to use the services. For some in this latter group, such perceptions had the effect that they wore their devices only when they expected a visit from their relatives or HCP [Studies 6, 7, 10, 15]. Having control over how, when, and whether at all they used their devices was very important to older people and served as a way of asserting their independence—or to rebel against those who had decided on use for them [Studies 1, 15]. Thus, many participants wanted devices that could be switched off, or they simply decided not to always wear or use them [Studies 9, 17]. Devices that automatically and constantly monitored aspects of their lives were thus seen as particularly problematic [Studies 6, 10, 15]. Participants stated that they were competent of deciding for themselves if they needed and wanted mHealth and wanted their choice to be respected [Studies 1, 13, 17]. Furthermore, people wanted to decide for themselves if they needed help in a given situation and to be in control of when devices sent an alarm [Study 10]. These were essential technical requirements for many older adults.

Privacy and Confidentiality

Most participants did not express concerns in regard to data confidentiality [Studies 4, 10, 16, 17]. They did not perceive their personal or medical data as interesting enough for third parties and thought that the modern surveillance society had already collected everything there was to know about them [Studies 5, 12, 17].

I do not care in the least! There are so many security-police things [sic] today and they are for my benefit. I mean “Big Brother” is already watching you all over. (Participant identified as P1, in Melander-Wikman et al., 2008, p. 342)

Participants do not perceive their medical data, such as heartbeat, pulse or blood pressure to hold any significant value to an outsider, with one participant dismissing the “Privacy” issue with the following comment: “What’s in it that’s private?” (Steele et al., 2009, p. 796)

Mostly they trusted providers and HCPs involved in the service to protect their data and were generally not aware of the potential risks and consequences of a confidentiality breach [Studies 10, 12, 16, 17]. However, heightened awareness of insufficient data protection could negatively impact users' acceptance of mHealth [Study 17]. Participants' statements in the study conducted by Grindrod, Li, and Gates (2014; Study 9) suggest that their trust depends on who operates the system. As an example, Grindrod et al. noted that older people were suspicious of technology operated by an insurance company, fearing that the collected information could be used against their insurance claims.

In terms of digital surveillance and personal privacy, the views of participants were more ambiguous. Although some stated that they had nothing to hide and preferred digital over face-to-face observation [Studies 7, 12, 13, 16, 17], others expressed their discomfort with continuous monitoring of their behavior and movements and the possibility of being judged [Studies 4, 5, 7, 11, 13, 17].

It hits me, when I lay down late in the mornings that this is monitored. Also, at times when I can't sleep and get up in the middle of the night I sometimes think that this might be seen." (Participant identified as Siv, in Essén, 2008, p. 133)

The possibility that someone may look at the data collected about her, and the possibility that her data may not look "normal" bothered this woman. (Essén, 2008, p. 134)

For some participants in Study 4, by Boström et al. (2013), the idea of being surveilled or monitored reawakened negative memories of being spied on in East Germany during the Cold War. It should be noted that restrictions of privacy were generally accepted by the study participants if they were perceived as necessary for the service provided (e.g., position tracking for mobile safety alarms) for which older people saw a personal need or benefit [Study 4, 12, 16]. This connects this theme to the theme Perception of Usefulness. On the other hand, functions considered unnecessary or overly intrusive, such as cameras or voice recordings, were seen as potential violations of privacy and often rejected by the older persons [Studies 4, 5, 12, 17].

Cost

The cost for equipment and associated services was a concern to many participants and was described as a major barrier to mHealth adoption [Studies 5, 13, 17]. Many participants pointed out that older people usually have to make do with a very limited income and thus have to prioritize their spending. MHealth, even if perceived as useful, was generally considered nonessential and for which money could be spent only if enough funds were left after taking care of the bare necessities [Studies 1, 13, 17]. As Bentley et al. (2014, p. 223) stated, *"Some people who could benefit from Telecare may simply not be able to afford it without foregoing essentials such as food and heating"*.

Some older people were not aware of the precise cost of the service they were using or intended to use due to misinformation by advising HCPs or complicated pricing structures [Studies 1, 10]. High prices for equipment and service sometimes resulted in participants looking for cheaper alternatives, such as buying an alarm button connected to family members or neighbors [Studies 1, 3, 9]. Some participants stated that they would only use the service if their families or the government paid for it [Studies 17]. In the study by Chung, Thompson, Joe, Hall, and Demiris, (2017; Study 5), their Korean participants expressed the

view that the government should improve accessibility and affordability of systems and services and provide subsidies for socioeconomically disadvantaged people. Furthermore, they stated that a competitive market could contribute to price reductions.

DISCUSSION

The purpose of this study was to understand factors that either facilitate or hinder older people's usage of mHealth. Figure 3 displays the findings and their interrelation, which will now be discussed in more detail.

Perception of Usefulness has been highlighted consistently as a major factor influencing technology acceptance and usage and has been validated several times in a range of quantitative studies in the health-care context (see Holden & Karsh, 2010). In the technology acceptance model (TAM; Davis, 1989; Davis, Bagozzi, & Warshaw, 1989), perception of usefulness is one of the two factors directly influencing both the intention to use and actual use of technology. Essentially, perception of usefulness means that the user must see a personal gain or benefit from using technology. The UTAUT, the unified theory of acceptance and use of technology, refers to this concept as performance expectancy (Venkatesh, Morris, Davis, & Davis, 2003). The TPB, the theory of planned behavior, uses the concept "attitude toward the behavior" to describe a person's belief that a certain act or behavior, such as using mHealth, will have a positive impact on his/her life (Ajzen, 1991).

This qualitative study confirms these findings. Even though there was a general acknowledgement that technology could be useful or serve a purpose, respondents needed to see a personal benefit or the need that a certain device would address in order to perceive it as useful for themselves. Accordingly, the functions offered by a specific device influenced how useful it was to a person through addressing his/her perceived needs. Figure 3 illustrates this interrelation by linking Perceived Usefulness to User Requirements and its subtheme Functional Requirements.

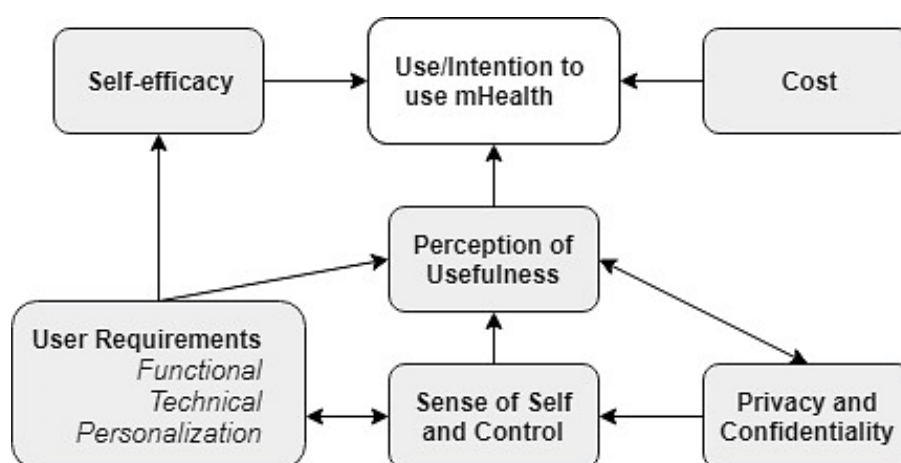


Figure 3. Interrelation of the identified themes: (a single-headed arrow represents a one-way relation; a double-headed arrow represents a bidirectional relation between the themes).

Many older adults found technology a useful addition to existing services, although they stated that it could not and should never completely replace personal interactions with HCPs. As the capabilities of mobile devices progress and they become ever more popular, the possibility exists that they could slowly replace traditional face-to-face services, as is increasingly the case with banking, for example. These changes to individual experiences of health care could have incremental societal consequences for patterns of service provision. The rapid development of smartphone apps for all kinds of health- and wellness-related purposes can be seen as a shift from HCPs actively managing health care for people to people managing it on their own (Lupton, 2013; Varshney, 2014).

For technology to be truly useful, it has to be reliable, unobtrusive, and easily integrable into people's lives, which is summed up under the subtheme Technical Requirements. The limited technological capabilities that devices offer to older people (in most cases a pendant or wrist-worn alarm) could lead to unwanted consequences. For example, having to rely on mHealth for safety when living alone could create a "prison of safety" inside the older person's home if the device was connected to a home-base with limited range. While being kept from harm, seniors were consequently restricted in their movements and prevented from active participation in society. Considering that technological capabilities are already available to provide these services free of spatial restrictions in the form of a mobile safety alarm, for instance, the question arises why these still are not offered to older people on a routine basis. Furthermore, older people wanted devices that were easy to handle and understand. This finding is mirrored in TAM's perceived ease of use, UTAUT's effort expectancy, and TPB's perceived behavioral control variables, which state that the perception of the physical and mental effort required to use technology influences the perception of usefulness and consequently the use of technology (Ajzen, 1991; Davis, 1989; Davis et al., 1989; Venkatesh et al., 2003).

Older people are a diverse group with different needs, capabilities, and preferences; the people included in this study wanted the option to personalize the needed functions and the design of the device to their personal requirements and tastes. People can generally be very inventive and creative in devising ways to counterbalance any experienced limitations or deficits (Loe, 2010; López Gómez, 2015). In fact, some participants in this study tinkered with the mHealth devices provided to them to make them more suitable for their individual requirements.

The design of mHealth is very important to people as it has the potential to impact on their sense of self. Public discourse promotes the ideal of active, autonomous, and independent seniors (López Gómez, 2015; Mort et al., 2013). The design of gadgets, however, often is perceived as stigmatizing, especially for devices specifically developed for older people. Thus the opposite—namely a frailer, more vulnerable, and less capable identity—is superimposed on seniors. López Gómez (2015) pointed out that people give objects and actions significance that is not necessarily visible or comprehensible to others. Technology too can be attached to a certain meaning (Lupton, 2013). This should be acknowledged by developers and providers and anticipated as much as possible. Many older people whose views were included in this study experienced friction between their sense of self and how they were viewed by others or made to view themselves because of mHealth. This frequently led to feelings of embarrassment and/or rebellion against the technology, leading to nonuse.

Although the general intention of geriatric technology development is to make older people more independent through mHealth, some of the participants of the reviewed studies felt

themselves become more limited and dependent on the devices and services provided. Some people, it seemed, internally struggled to come to terms with their loss of independence and increased need for assistance. This impacted on their perception of usefulness of mHealth and was often in stark contrast to the views of their relatives or HCPs. It was frequently the case that older people felt that they had been persuaded or even coerced by relatives or HCPs to accept technology. Forcing older people to adopt technologies for which they see no use, which they find difficult to integrate into their daily lives, and which can have a negative impact on their sense of self is both ethically highly questionable and a barrier to the realization of technologists', HCPs', and relatives' aspirations for implementation. Having control of how, when, and whether at all the devices were used was thus an important way for older people to assert themselves and maintain their sense of self. The relationship among the two concepts Sense of Self and Control and User Requirements is bidirectional, symbolized by a two-headed arrow in Figure 3. Being able to assert control over the device was a fundamental requirement. Poorly designed mHealth could negatively impact older people's sense of self. On the other hand, devices that fitted well with people's needs and preferences in both function and design, and allowed them a maximum of control, could help the users maintain their image of themselves.

Privacy and Confidentiality were found to play an ambivalent role. Privacy appeared to be a concern, whereas confidentiality seemed to be an issue most older adults did not consider unless it was brought up by researchers. Many older people seemed to be unconcerned or unaware of issues surrounding confidentiality, stating that they trusted their HCPs to keep their data safe or that they did not think it held any particular value. French and Smith (2013), however, highlighted how the respondents' information potentially could be used to their disadvantage, for example, by ratifying discriminating policies based on conclusions drawn from decontextualized personal data. In regard to privacy, a thin line appears between technologies collecting enough information about older people to serve their purpose, that is, to keep them safe and healthy, and becoming intrusive. Feeling watched had, for some, the effect that they became self-conscious and felt judged, which impacted their sense of self. Certain functions, such as video recording, were widely rejected as too invasive, whereas for other functions it seemed that people had to weigh the pros of being able to address their needs against the cons of having to sacrifice their privacy. This ambivalent relationship between Perceived Usefulness and Privacy is symbolized by a double-headed arrow in Figure 3.

Self-efficacy was another factor that directly influenced the usage or intention to use mHealth. Many older adults lacked faith in their abilities to successfully operate the devices and some even expressed a fear of them. It was shown that a device that is easily understandable and operable could increase people's faith in their own abilities to use it effectively, which links this concept to the User Requirements subtheme Technical Requirements. Furthermore, many older adults voiced the wish to receive training and ongoing support and it appeared that people's trust in their capabilities increased the longer they used mHealth. The TPB presented a person's expectation of succeeding at a task as an important factor that influences decisions and behavior (Ajzen, 1991). Sufficient knowledge and support are seen as facilitating conditions under the UTAUT (Venkatesh et al., 2003). People's experiences with technology throughout their lives, but also other people's accounts of using mHealth, could influence the older users' self-efficacy in both a positive and a negative way. Both the UTAUT and TPB characterize social and cultural influence as important factors impacting the intention to use and actual usage (Ajzen, 1991; Venkatesh et al., 2003). This suggests that, as technology increasingly becomes a natural part of

people's lives, it might be expected that using technology for health and care purposes will gradually become more normal for future generations.

The final factor that had a direct impact on whether older people used or intended to use mHealth was the cost of the device and service. Despite perceiving a personal need and benefit from mHealth, people decided not to use it if they felt that they could not afford it. Confusing or nontransparent pricing schemes for services and technology posed an additional barrier.

This discussion makes clear that any form of mHealth is a complex intervention, set in the bio-psycho-social context of an individual older person's life and involving a multitude of stakeholders who might have different motivations and interests (Barlow, Bayer, & Curry, 2006). Although the capabilities of individual devices are steadily advancing, conclusive evidence cannot be drawn concerning their effectiveness and cost-efficiency (Barlow et al., 2007; Turner & McGee-Lennon, 2013). Therefore, it is unhelpful to position and push technology, mobile or otherwise, as a quick fix or a panacea for societies' and the health-care systems' problems perceived as related to population aging. Furthermore, as Mort, Roberts, Pols, Comenech, & Moser. (2015) stated, technology can never be a solution in itself but rather implies a shift in responsibility, a reorganization of existing support structures, and the creation of additional tasks that, in the case of most older people, generally fall on the shoulders of relatives, neighbors, and friends. Hence, an important consideration should be who profits most from equipping older people with mHealth.

Additionally, it should be noted that using the term older people without considering the diversity of this demographic group is just as problematic as assuming that technology is the easy solution for limited health care resources. Often, the very heterogeneous population group referred to as older people is reduced to a single common characteristic: age. Thus, the risk of oversimplifying and generalizing older people's circumstances and experiences is high. One such generalized assumption is that older people need care and looking after. This begs the question of what these care needs are, who defines them, and who evaluates whether a person's needs have been met.

CONCLUSIONS

In this paper, we used thematic synthesis to gain a thorough understanding of the barriers to and facilitators of older people's usage of mHealth. If mHealth is to fulfill some of its stated potential of reducing health- and social care expenditures while simultaneously increasing older people's autonomy and quality of life, mHealth researchers and designers must acknowledge and learn from older users' experiences, views, and concerns. Due to the complex nature of mHealth interventions and the heterogeneity of the demographic group of older people, a one-fits-all mHealth solution cannot possibly exist. Many factors influence older people's perceptions of the usefulness and usability of mobile technologies and thus the likelihood of their uptake. However, it should be questioned why technologies are being presented as a panacea to problems of society and health-care systems associated with an aging population if their effectiveness and cost-efficiency are still not established. As mHealth devices cannot provide care by themselves, they can only be viewed as a tool to reorganize and redefine existing health and social care structures (Mort et al., 2015). Technological progress may create

opportunities for development and change for the better. However, questions should be asked regarding who profits most from mHealth provided to older people and how to ensure that the older users feel supported rather than coerced by it.

A key strength of this study is that it includes the views of older people who currently use mHealth, had previously used and decided to abandon it, had declined the invitation to use it, and had never used nor heard of mHealth before. Additionally, it includes one study directly investigating cultural influences on older people's views. Insofar as this information was available, participants had diverse sociocultural and economic backgrounds, living arrangements, and health conditions.

This study has several limitations. MHealth as of yet lacks a clear definition, with some researchers only referring to smartphone apps and others including all kinds of mobile ICTs and sensors used for health-care delivery. This study thus has used its own definition of mHealth, which may not concur with other researchers' or developers' understandings. Despite smartphones and tablet PCs increasingly taking over functions from more traditional telecare and telehealth services and many apps being created for health and care purposes, very few studies directly address older people's views of these devices. Although most studies included in this paper explicitly used mobile technologies, some also included devices that were not meant to be carried around (e.g., motion sensors, bed-occupancy sensors) or not strictly used for health or care purposes (e.g., smoke detectors). Additionally, six studies included participants under the age of 60 and it was not always possible to identify and omit younger participants' contributions. A further limitation is that the literature search was limited to a systematic search of the defined databases and a manual checking of the reference lists of selected articles. It would have been desirable to include a technological database alongside the ones ultimately used, although the number of qualitative articles published in journals cataloged by such a database might be limited. Therefore it cannot be guaranteed that all relevant articles were identified, although this is not necessarily required, as discussed by Thomas and Harden (2008).

As mHealth gathers pace internationally, technology providers, policy makers, and HCPs urgently need to better understand older people's views and experiences with a range of technologies used for health and care. Without that, evidence on the efficiency and cost-effectiveness of mHealth will remain incomplete.

IMPLICATIONS FOR APPLICATION AND POLICY

Even though this research makes clear that there can be no one-fits-all mHealth device or service, the findings presented in this paper contribute to the knowledge regarding health and care technology as well as some guidance for technology developers and providers of mHealth initiatives for older people. To begin with, it is essential to meaningfully include the target population in the technology development process. Apart from knowing their own circumstances and needs best, older people have many ideas regarding what technology should do for them. In terms of design and functionality, seniors want dependable devices and services on which they can fully rely, and which do not brand them as vulnerable and incompetent. They want to be able to personalize devices to their individual requirements and, ideally, aesthetic preference. It is crucial that devices do not limit older people in their mobility and their activities. Furthermore,

devices must be affordable, as unobtrusive as possible, and easy to understand and operate. There should be clear information concerning pricing schemes and data protection policies. Disruptions in people's privacy must be kept to a bare minimum and be allowed only if it is required for the service provided. People must be informed about the precise nature of these intrusions and given the opportunity to decline. Ongoing technical and emotional support from mHealth providers, as well as initial training, also are valued. Furthermore, it is important that services remain personal and respectful, ensuring that older people are viewed as individuals and not impersonalized as simply an alarm or health condition to be monitored. Providers should acknowledge that nonuse of mHealth or older people using it differently than intended by providers is a result of people not wanting or needing it or having been provided with technologies that do not suit their specific requirements or lifestyles. As a consequence, the devices are therefore adapted to fit better into older people's lives or "abandoned."

ENDNOTES

1. Information on the history of the iPhone is detailed on http://en.wikipedia.org/wiki/History_of:iPhone
2. The data quotes provided in this paper are drawn from previously published papers. Therefore, any errors in regard to grammar, spelling, or punctuation are exactly as they appeared in the original publications.

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Appendix A: Search Strategy

Presented below are a series of tables that displays the search strategies used for the individual databases. The tables are a print-out from the databases, which is why they differ slightly in their presentation (i.e., CINAHL is listed in reverse chronological order and displays an S in front of every search step and ASSIA presents the search string in one ongoing line). MEDLINE was chosen for its focus on biomedical literature. CINAHL is a database for literature on nursing and allied disciplines. ASSIA indexes sociological literature and PsycINFO lists content from psychology.

CINAHL → Results: 136 studies

- S25. S20 AND S23 Limiters- Publication Year: 2007-; Peer Reviewed; English Language; Age Groups: Aged, 65+ years [Find all my search terms]
 - S24. S20 AND S23 [Find all my search terms]
 - S23. S21 OR S22 [Find all my search terms]
 - S22. (MM "Semi-Structured Interview") OR (MM "Unstructured Interview") OR (MM "Narratives") OR (MH "Observational Methods+") OR (MM "Focus Groups") [Find all my search terms]
 - S21. (MH "Qualitative Studies+") [Find all my search terms]
 - S20. S15 AND S19 [Find all my search terms]
 - S19. S16 OR S18 [Find all my search terms]
 - S18. "senior* OR senior citizen* OR elderly OR old OR older people OR pensioner*" [SmartText Searching]
 - S17. "senior* OR senior citizen* OR elderly OR old OR older people OR pensioner*" [Find all my search terms]
 - S16. (MH "Aged+") [Find all my search terms]
 - S15. S1 OR S2 OR S3 OR S4 OR S5 OR S6 OR S7 OR S8 OR S9 OR S10 OR S11 OR S12 OR S13 OR S14 [Find all my search terms]
 - S14. (MH "Wearable Sensors+") [Find all my search terms]
 - S13. "technogenerian" [Find all my search terms]
 - S12. "gerontechnolog*" [Find all my search terms]
 - S11. "telemonitor*" [Find all my search terms]
 - S10. "remote care technolog*" [SmartText Searching]
 - S9. "remote care technolog*" [Find all my search terms]
 - S8. "digital health" [Find all my search terms]
 - S7. (MM "Home Health Care Information Systems") OR "HIT OR health information technology" [Find all my search terms]
 - S6. "ICT OR information communication technology" [SmartText Searching]
 - S5. "ICT OR information communication technology" [Find all my search terms]
 - S4. (MH "Smartphone+") OR (MH "Cellular Phone+") OR (MM "Mobile Applications") OR (MH "Computers, Hand-Held+") [Find all my search terms]
 - S3. "mHealth OR mobile health" [Find all my search terms]
 - S2. "telecare" [Find all my search terms]
 - S1. (MH "Telehealth+") OR (MH "Telemedicine+")
-

MEDLINE → Results: 252 studies

1. *telemedicine/ or *telerehabilitation/
 2. (mHealth or mobile health).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word,
 3. telecare.mp.
 4. exp cell phones/ or smartphone/ or *wireless technology/
 5. exp Computers, Handheld/
 6. exp Mobile Applications/
 7. (ICT or information communication technology).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease
 8. (hit or health information technology).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary
 9. digital health.mp.
 10. remote care technology.mp.
 11. telemonitoring.mp.
 12. gerontechnology.mp.
 13. wearables.mp.
 14. wearable sensor.mp.
 15. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14
 16. exp Aged/
 17. (senior* or senior citizen* or elderly or old or older people or pensioner*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept
 18. 16 or 17
 19. 15 and 18
 20. exp grounded theory/ or exp qualitative research/
 21. exp focus groups/ or exp interviews as topic/ or exp narration/
 22. Nursing Methodology Research/
 23. Observation/
 24. ethnography.mp.
 25. 20 or 21 or 22 or 23
 26. 19 and 25
 27. limit 26 to (English language and yr="2007 -Current" and "all aged (65 and over)")
-

PsycINFO → Results: 95 studies

1. telehealth.mp. or exp Telemedicine/
 2. telecare.mp.
 3. (mHealth or mobile health).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
 4. exp mobile devices/ or exp cellular phones/
 5. (mobile applications or apps or smartphone).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
 6. (ICT or information communication technology).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
 7. (hit or health information technology).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
 8. digital health.mp.
 9. remote care technology.mp.
 10. telemonitoring.mp.
 11. gerontechnology.mp.
 12. (wearable sensor or wearables).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
 13. 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12
 14. ageing/ or exp ageing in place/
 15. (senior* or senior citizen* or elderly or old or older people or pensioner* or aged).mp. [mp=title, abstract, heading word, table of contents, key concepts, original title, tests & measures]
 16. 14 or 15
 17. 13 and 16
 18. limit 17 to (peer reviewed journal and English language and "qualitative (best balance of sensitivity and specificity)" and "380 aged " and yr="2007 -Current")
-

ASSIA → Results: 87 studies

((((mhealth OR "mobile health" OR telehealth OR telecare OR SU.EXACT("Telemedicine") OR telemonitoring OR (smartphone app*) OR (wearable technology) OR gerontechnology OR "information communication technology" OR "health information technology" OR "digital health") AND (SU.EXACT("Elderly people") OR SU.EXACT("Older people")))) AND (qualitative OR (focus group) OR interview OR observation OR ethnography OR (grounded theory))) NOT (subt.exact("carers" OR "hospitals" OR "questionnaires" OR "internet" OR "computers" OR "mortality" OR "relatives" OR "middle aged women" OR "robotics" OR "caregivers" OR "health professionals" OR "mental health" OR "databases" OR "nurses" OR "confidence intervals" OR "councils" OR "electronic mail systems" OR "literature reviews") AND la.exact("ENG") AND pd(20070101-20171231)))

Appendix B: Data Extraction Form and Description of the Included Studies.

This table displays the main characteristics of the included studies. Presented are the study location, aims/research questions, methods of data collection, sampling strategy, number and (mean) age of participants, technology used, and main findings. Additionally, some information is provided, where available, on the context of the study. This includes whether participants are/have been active users of mHealth or refused it when offered, whether studies focused on the management of specific health conditions or care needs, and whether people lived alone in their own home or had made other arrangements. This ensures that the context of the included studies is preserved. Abbreviations: TC stands for telecare, TH for telehealth and TM for telemonitoring. COPD stands for chronic obstructive pulmonary disease; WNS stands for Wireless Network Systems.

Study	Site	Study Aims / RQs	Data Collection	Sampling	Participants	Technology	Context	Findings (themes/concepts)
1. Bentley et al., 2014	UK	1) Why people choose not to adopt TC when it may be an appropriate intervention in their circumstances? 2) Peoples' perceptions of how best to communicate the benefits of TC to (potential) users.	Semistructured interviews	Convenience sample; self-enrolled via media & community meetings	22 (1<50 yrs., 2 unknown; mean age: 68.4 yrs., range: 40-84 yrs.)	[No precise statement; mostly mention of pendant alarms, environmental sensors, tablets, & smartphones also mentioned]	People refusing TC; wide variation in personal circumstances & health status	1) Stigma 2) Design 3) Awareness 4) Alternative Options 5) Cost
2. Bond & Worswick, 2015	UK	Qualitative findings of an evaluation of a local TH program for patients with COPD or chronic heart failure.	Questionnaire & semistructured phone interviews. (at the start of intervention & after 3 mos.) & 1 focus group with professionals	Purposive sample of interested participants of TH program	29 for initial interview (4≤ 60 yrs.), 24 of those completed follow-up; & professionals	Monitoring equipment for blood pressure, weight, temperature, & oxygen saturation levels, a tablet-style computer that recorded readings from the monitoring equipment	Patients with COPD or chronic heart failure who use TH service; users & nonusers (refused or no longer used service) included	[Merely descriptive findings; no themes or concepts available.]
3. Boström et al., 2011	SWE	Analyze opinions & feelings about mobile alarms (called PERS) from people living in senior housing; highlight their wishes regarding its further development & innovation	5 focus groups	[n/a]	45 (67-97 yrs.)	Wrist or pendant alarm (PERS)	Living alone in senior housing; in good health; use or had previously used PERS; rural/ urban	1) safe & free 2) anxious, afraid & insecure 3) satisfied 4) uninformed 5) active innovators

4. Boström et al., 2013	SWE	How older persons, living at home independently & stating good health, perceive monitoring technology in terms of personal privacy	5 focus groups using open, semistructured questions	Snowball sampling	45 (67-97 yrs.)	Hypothetical wrist-worn device to detect position, vital functions (e.g., temperature, heart rate), & movement	Living alone in senior housing; in good health; experience with mHealth; rural/urban	1) maintaining a sense of self 2) independence vs. security 3) privacy vs. intrusion 4) in the best interest of me vs. in the best interest of others
S5. Chung et al., 2017	USA/ KOR	What factors could increase technology acceptance & diffusion in Korean & Korean-American older adults?	Focus groups & individual interviews	Convenience & snowball sampling; use of gatekeepers to identify & access participants	11 Korean-American, 10 Korean; >65 yrs.	Home-based sensor technologies (participants were given the example of activity & vital sign monitoring, fitness, etc.)	Older Korean immigrants in the US & older adults living in Korea; community dwelling	1) general perceptions 2) cultural factors impacting tech acceptance 3) factors influencing perceived need of tech
6. Cook et al., 2016	UK	Explore underlying factors that impact on patients' decisions to initially adopt & continually engage in TH & TC applications.	In-depth semistructured interviews	Purposive sample from all patients referred to TH/TC service in the area	28 users (35-92 yrs., median: 67 yrs.) & 9 nonusers (24-92 yrs., median 63.3 yrs.)	TH & TC either connected or stand-alone; a variety of technologies, most of which were mobile	Users & nonusers (declined or withdrawn) referred to TH & TC service; all types of conditions for which TC & TH can be used	1) decision to use service at point of referral a) acceptance of old age/health condition b) previous knowledge & awareness of the service & equipment available c) perceived usefulness d) attitudes & perceptions towards technology 2) engagement & use of service a) usability b) usefulness of equipment c) functionality of equipment d) threat to identity & independence
7. Essén, 2008	SWE	Understand not only if but also why seniors feel that electronic care surveillance (TM) does or does not violate their privacy.	In-depth interviews;	Purposive sample	17 (68-96 yrs.)	TM, wrist-worn (collects activity data continuously)	Seniors living alone in their own home; vulnerable & exposed to health risks; used the device for 6-7 mos.	1) Care surveillance as enabling the feeling of being cared for 2) Care surveillance as constraining – feeling as if under suspicion

8. Fairbrother et al., 2013	UK	Explore the views of patients & HCPs who were using TM as part of the TELESCOT COPD trial of the impact of telemonitoring on self-management in COPD	Semistructured interviews embedded in TELESCOT trail	Purposive sample from TELESCOT trail	38 patients (44-84 yrs., 1 participant <50 yrs.); mean: 67.5 yrs.) & 32 professionals	[N/a from study report; Web site reveals use of intel health guide, which is a small portable device with a touchscreen to which various health monitoring devices can be connected as needed]	Patients with COPD use the system for 6 mos.; maximum variation in age, SES, disease severity & adherence to the system	Central themes from patients' perspective: 1) knowledge & empowerment 2) accessibility & reassurance
9. Grindrod et al., 2014	CAN	Explore the usability & usefulness of existing medication management applications for adults over the age of 50.	Mixed-method; user testing followed by questionnaire & focus groups	Purposive sample followed by iterative, theoretical sampling	35 (52-78 yrs., mean: 67 yrs.)	Medication management app on tablet or smartphone	Participants take regular medication; no prior experience with touchscreen devices needed; very diverse sample	1) targeted design 2) functionality 3) simplicity 4) accessibility
10. Hamblin, 2017	UK	1) Whether obtrusiveness framework is applicable empirically to the English context? 2) What is the impact of the dimensions of obtrusiveness on the acceptance & use of TC?	Ethnographic observations & interviews supplemented by creative methods (e.g., photos & diaries); longitudinal (4-6 visits in 6-9 mos.)	[TC users of 2 providers approached; no information concerning how they were selected]	60 >65 yrs., caregivers present during interviews (no information on number)	Pendant alarm or TC package (includes GPS devices; bed, door, chair exit & environmental sensors; medication reminder & dispenser systems)	Cognitive impairment and/or proneness to falls; new or established TC users; community dwelling;	1) physical dimension 2) usability 3) privacy 4) functionality 5) human interaction 6) self-concept 7) routine 8) sustainability 9) control 10) information & ongoing support
11. Horton, 2008	UK	Older people's experiences with & expectations of the use of telemonitoring devices such as fall detectors & bed occupancy sensors	In-depth semistructured interviews; part of a larger, observational study	Convenience sample from TC call center database	35 (17 control/ 18 intervention group); >65 yrs., mean: 78.2 yrs.	Body-worn devices for fall detection & bed-occupancy sensor; control group used only pendant alarm	Experienced falls; without cognitive impairment; living alone or with a part-time caregiver in the community or sheltered housing; registered TC	1) expectations 2) feelings of security 3) call center support 4) barriers to using assistive devices 5) adherence 6) likelihood of using telemonitoring devices

12. Melander-Wikman et al., 2008	SWE	Describe elderly persons' experiences of testing a mobile safety alarm & their reasoning about safety, privacy, & mobility.	Narrative/reflective individual interviews	Purposive sample from a reference group	9 (60-84 yrs.)	Mobile safety alarm [includes GPS & drop sensor & button; allows communication with call center]	With & without functional limits (pain, dizziness, chronic illness, stroke, balance problems); some had used TC before; device tested for 3-6 wks.	1) feeling safe 2) being positioned & supervised 3) being mobile 4) reflecting on new technology
13. Parker et al., 2013	USA	Examine the willingness of older adults with chronic pain to adopt mHealth technologies, & to identify participants' perceived barriers & facilitators to adopting mHealth.	Mixed method; questionnaire & 6 focus groups	Convenience sample	42 (>60 yrs., mean: 76.2 yrs.)	Hypothetical intervention via smartphone	Chronic pain patients; living independently or in assisted living facilities; urban; varied experience with ICTs	1) willingness to use mHealth 2) barriers to using mHealth 3) facilitators to using mHealth
14. Pecina et al., 2011	USA	Understanding elderly patients' feelings & perspectives toward telemonitoring.	Mixed-method; user testing followed by questionnaire & semistructured phone interviews	Random sample from larger telemonitoring study	20 (70-81yrs.)	Intel Health Guide [touchscreen, portable, attachable devices for monitoring of vital signs (e.g., blood pressure)]	Have used device between 8 & 17 weeks; had complex illnesses	1) Telemonitoring increases patient awareness of health 2) Telemonitoring prompts action 3) Telemonitoring provides peace of mind
15. Pritchard & Brittain, 2015	UK	Investigating older people & caregivers' experiences using an alarm pendant; analysis focuses on some of the unanticipated social consequences of this device & the ways the social environment affects its use & function.	Focus groups, semistructured interviews, observations in a care home	Convenience sample; self-enrolment from age-related databases	47 (55-90 yrs.) & 9 informal caregivers (mostly family members)	Pendant alarm	Living at home; observations conducted in a care home with self-contained apartments equipped with pendant alarm; people without pendant-alarm experience included	1) Interrogating the utility of alarm pendants 2) Technological dehumanization 3) Rage against the (assistive) machine: alarm pendants & acts of resistance

16. Shulver et al., 2017	AUS	1) How do community-dwelling older people experience rehabilitation programs using TH? 2) How acceptable is TH to older people in the context of rehabilitation?	Semistructured interviews	Convenience sample; self-enrolment from "TH in the home" study	13 (60-92 yrs.) 3 spouses, & 1 caregiver present during interviews;	iPad with video conferencing tech & FitBit Activity monitor	Peri-urban; mobility issues; had undergone 8-wk. telerehabilitation program prior to study	1) convenience 2) promotion of motivation & self-awareness 3) fostering of positive therapeutic relationships 4) benefit of mastering technology of the young 5) no replacement for face-to-face therapy
17. Steele et al., 2009	AUS	Perceptions towards WSN designs; facilitate communication between users & researchers.	Exploratory study; 2 focus groups	Convenience sample from various elderly community groups	13 (>65 yrs.)	WSN [can be used for a variety of tasks (e.g., fall sensor, vital signs)]	Urban; living independently; no prior knowledge of WSN;	1) independence 2) perceived impact on the quality of life 3) concerns associated with WSNs 4) user's personal preferences; 5) design preferences 6) external factors

A SCOPING REVIEW EXPLORATION OF THE INTENDED AND UNINTENDED CONSEQUENCES OF EHEALTH ON OLDER PEOPLE: A HEALTH EQUITY IMPACT ASSESSMENT

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Abstract: *eHealth is one perceived mechanism to extend the range and reach of limited health-care resources for older adults. A decade-scoping review (2007–2017) was conducted to systematically search and synthesize evidence to understand the intended and unintended consequences of eHealth initiatives, informed by a health equity impact assessment framework. Scoping review sources included international academic and grey literature on eHealth initiatives (e.g., eHealth records, telemedicine/telecare, and mobile eHealth application) focused on the varying needs of older adults (aged 60+), particularly individuals experiencing sociocultural and economic difficulties. Findings suggest that eHealth has several potential benefits for older adults, but also the possibility of further*

excluding already marginalized groups, thereby exacerbating existing health disparities. Ongoing evaluation of eHealth initiatives for older adults is necessary and requires attention to unique individual-level, socioeconomic, and cultural characteristics to heighten benefits and better capture both the intended and unintended outcomes of advanced eHealth systems.

Keywords: *eHealth, health equity impact assessment, scoping review, older adults, aging and technology.*

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INTRODUCTION

Globally, high income as well as lower and middle income countries are experiencing a progressive demographic shift toward aging populations. In 2017, individuals over the age of 60 were approximated to be more than 962 million, a figure that has more than doubled since 1980, when the older adult population count was 382 million worldwide (United Nations, 2017). The number of older adults is projected to increase again two-fold by 2050 to nearly 2.1 billion individuals (United Nations, 2017). As expected, population aging is most advanced in the Western countries of Europe and North America, where approximately one in five individuals is over the age of 60 in 2017 (United Nations, 2017). However, other developing regions are also experiencing a similar trend. For instance, by 2050, the proportion of older adults are expected to increase to 25% in Latin America and the Caribbean, 24% in Asia, 23% in Oceania, and 9 % of the overall population in Africa (United Nations, 2017).

Across the globe, this rapid demographic progression of older people presents an array of challenges and opportunities for the organization of society (World Health Organization, 2018a). As health-care systems across nations shift their focus toward promoting healthy aging, including the prevention and treatment of communicable and noncommunicable diseases and improving expanded access to highly quality long-term and end-of-life care (United Nations, 2017), it is crucial that governments develop innovative technology solutions that serve to enhance their current systems and public services situated within appropriate policies that cater to the unique needs (i.e., housing, employment, health and social care, among others) of older people.

Undoubtedly, progressive population aging will impact the demand on current health and social care services. This requires adequate management and the development of service solutions that not only lessen the additional burden on the health-care system, but also simultaneously are more cost-effective, accessible, and user-friendly. Health ICTs (information and communication technologies), commonly known as eHealth, are defined, according to the World Health Organization (2018b, para. 1), as “the cost-effective and secure use of information and communications technologies in support of health and health-related fields, including health-care services, health surveillance, health literature, and health education, knowledge and research.” These include various functionalities that enable improvements in information, quality, efficiency, and outcomes of health-care delivery. The development of eHealth was shown to address some of the identified needs indirectly by empowering older adults to control and monitor their health issues, to delay and prevent disablement, to facilitate daily life with functional and chronic health conditions, and to increase personal safety (Siegel & Dornier, 2017).

Advancement in online service delivery (including eHealth) is continuously expanding in countries across the world. According to the United Nations’ eGovernment survey (2012), many nations have instituted eGovernment initiatives, facilitated by ICT devices and applications, to improve public sector efficiencies and streamline governance systems to create and enhance sustainable development for current future generations. Canada, for example, is one of the top 20 leading countries worldwide to adopt, maintain, and continuously expand an eGovernance system (United Nations, 2012). Other countries have followed suit by implementing essential components

of eGovernance, such as the implementation of online citizen orientation in public services (United Nations, 2012).

For example, in accord with eGovernance, eHealth is an online service delivery system for populations. The system is viewed as a means for helping older people to age-in-place and to admission into expensive acute and long-term care, while simultaneously extending the range and reach of limited health-care resources (Dimitrova, 2013). Although eHealth systems and interventions have the potential to provide cost-effective solutions to alleviate growing demands on health-care systems, this positive narrative may overlook some of the negative consequences of health-system innovation. As experienced in Canada, strong tensions have surfaced between the necessary technological adjustments required to improve health system efficiency and the abilities of health-care consumers to adapt to advanced system-level modifications (Fang et al., 2018). And akin to other Western societies in Europe and North America, the provision of essential health and well-being services for the wide range of older people is growing, alongside the increased diversity of older adults. It is predicted that by 2060, the proportion of older people in Canada belonging to a visible minority (non-white) group could reach 50%, compared to 17% predicted in 2020 (Statistics Canada, 2016). While existing international and Canadian reviews focusing on older adults examine a variety of topics—including the breadth of eHealth options available (Kampmeijer, Pavlova, Tambor, Golinowska, & Groot, 2016; Robbins, Keung, & Arvanitis, 2018), the facilitators and barriers for eHealth types (Kampmeijer et al., 2016), and eHealth literacy interventions (Jacobs, Lou, Ownby, & Caballero, 2016; Watkins & Xie, 2014)—none have yet to examine eHealth access and use from a health equity perspective.

Consequently, eHealth located within eGovernments has the possibility of further excluding already marginalized groups, thereby exacerbating existing health disparities. In this study, we examine the social factors that shape eHealth access and use and explore the intended impact and unintended consequences of eHealth within an eGovernance system. We approached this aim by conducting a scoping review informed by a Health Equity Impact Assessment (HEIA) framework. Accordingly, our identification of this important knowledge gap prompted this decade-scoping review. Similar to other types of review methods, scoping reviews progress via systematically searching for (i.e., using search terms and relevant databases) and synthesizing information from a body of literature to establish the breadth of knowledge currently available in a specific topic area, while identifying inconsistencies and limitations in an existing body of research (Arksey & O'Malley, 2005; Brien, Lorenzetti, Lewis, Kennedy & Ghali, 2010).

As the purpose of this study is exploratory in nature and not focused on determining the efficacy of a clinical intervention, the scoping review method was deemed more suitable compared to a more structured systematic review that aims to determine, for instance, treatment effectiveness alongside a critical appraisal of primary research (Armstrong, 2007). A traditional systematic review also lacks the flexibility necessary for a qualitative, thematic analysis of findings required for this review study to enable a better understanding of the intended and unintended consequences of technology solutions for the denoted challenge area. As well, unlike a realist synthesis, a review method that emphasizes the need for the integration and development of theory, the incorporation or application of theory is not a requirement of scoping reviews (Arksey & O'Malley, 2005; Rycroft-Malone et al., 2012).

The flexible, exploratory methodological features of the scoping review method enabled the use of a key analytical framework, HEIA, to thematically identify and sequester important information associated with equitable access to essential health and social services by older individuals that hold various social categories (Ontario Ministry of Health and Long-Term Care & Toronto Central LHIN, 2009). The HEIA framework was incorporated in our scoping review to investigate how well eHealth initiatives have responded to varying socioeconomic needs. Guided by HEIA, the current decade scoping review (2007–2017) aimed to synthesize systematically various sources of evidence to understand the effects of eHealth initiatives on a diversity of older adults. Because we are particularly interested in the impact of eHealth on the equitable access of essential services, as well as any associated health and well-being consequences, the HEIA framework provided the analytical questions and categories required to enable identifying and extracting key information. The HEIA originated from the Health Impact Assessment methodology and has been heavily used worldwide over the past decade as a decision-making tool to facilitate the development of healthy public policy (Ontario Ministry of Health and Long-Term Care & Toronto Central LHIN, 2009). We integrated the HEIA into the analytical process during the data extraction phase of our scoping review to better understand: (a) how existing eHealth initiatives can be tailored to better serve older adults with varying socioeconomic and cultural backgrounds, and (b) what are the intended impact and unintended consequences and opportunities for mitigation.

Accordingly, as highlighted in the 2002 Madrid International Plan of Action on Ageing (MIPAA), a great need exists for considering older people in global health and social care development and planning. Moreover, an emphasis remains on prioritizing the participation of older groups and ensuring that they also benefit from service innovations that serve to advance and improve the health and well-being of populations (United Nations, 2002). To do this effectively, the MIPAA emphasized that societies across the globe must adjust their existing environments and structures in order to successfully produce positive health and social outcomes for all peoples (United Nations, 2002). Lessons derived from international contexts as a product of this HEI- informed scoping review may present interesting opportunities to better understand eHealth implications for countries that have adopted it, such as in the case of Canada.

METHOD

Scoping reviews create broad overviews of topics in order to identify key gaps in knowledge and areas where future research is needed. The process consists of five key stages (a) defining the research question, (b) identifying relevant studies, (c) establishing the study selection, (d) charting the data, and (e) collating, summarizing, and reporting the results (Arksey & O'Malley, 2005). This review emerged from the identification of a perceived lack of research pertaining to the impact of eHealth technologies on existing health disparities in older adults. To further elucidate this gap, we used the scoping review method to collect, sort, and synthesize large volumes of peer-reviewed and grey literature (i.e., research sources and materials produced outside the traditional academic publishing channels) centering on this topic. The HEIA framework (Ontario Ministry of Health and

Long-Term Care & Toronto Central LHIN, 2009) was used to inform a thematic analysis of the study findings in Stage 4 (data charting) of the scoping review method. HEIA has five key steps (see Appendix A), however only Steps 1 through 3 were implemented for the purposes of our study, which focuses primarily on an examination of the intended impact and unintended consequences of eHealth and opportunities for mitigation. Steps 4 and 5 were not considered, as they were beyond the scope of most of the sources that we considered. Further, because the HEIA was designed for the Canadian context and our research explores an international perspective, only select categories from Step 1 were integrated into our data charting form and considered for analysis.

A systematic search and review of four databases, four specialized journals, and five Web sites was conducted between August 2007 and October 2017. Due to the interdisciplinary nature of health ICTs, databases were selected that represented social science, medical, informatics, and business perspectives on ICTs. Traditionally, the HEIA considers broader evidence, including grey literature, community consultations, program evaluation results, client surveys, and field evidence, among others. However, as HEIA was only used to guide the analysis of findings, our systematic search did not go beyond the review of the grey literature, selected to capture specific policy perspectives on health ICTs (Table 1), in addition to published academic works. The systematic search was conducted by entering predefined search terms into the search fields of databases and grey literature sources (Table 2). The search terms were determined in accord with our inclusion/exclusion criteria (Table 3).

Table 1. The List of Electronic Sources Searched for the Scoping Review.

Databases, Search Engines, and Content-Relevant Websites	Number of Sources
<i>Academic Databases</i>	4
PubMed	
CINAHL	
Web of Science	
ScienceDirect	
<i>Specialized Journals</i>	4
Technology Assessment in Healthcare	
Journal of the American Medical Association	
Journal of Telemedicine and Telecare	
Journal of Medical Research	
<i>Grey Sources (including government and nongovernmental organizations)</i>	5
Canada Health Infoway	
Government of Canada	
Canadian Association for Long Term Care	
Canadian Women's Health Network	
Google Scholar	
Total	13

Table 2. Search Terms Used in the Electronic Databases and Search Engines.

Search Terms	
eHealth	eHealth, electronic health, digital health, technology health, mHealth, telecare, telemedicine, electronic health records
Impact	impact*, change*, benefi*, Intervent*, outcome*, improv*,
Older Adult	age*, elder*, senior*, older adult

Table 3. Inclusion and Exclusion Criteria to Determine the Relevance of Articles for Inclusion in the Final Subset of Sources for Analysis.

Inclusion	Exclusion
Published after 2007	Published/created before 2007
Focuses on the impact of eHealth technologies on the ageing population (rather than on hospitals, government, caregivers, etc.)	Not focused on the impact of eHealth technology on the ageing
Mean population age is 60+	Require a fee OR not available through university library services
Available free-of-charge or are available through university library services	Mean population age is younger than 60 years
Impact of health ICT or eHealth on existing health disparities is demonstrated i.e. how eHealth affects or is affected by ethnicity, gender, education/ literacy, income, urban/rural habitation or language	No discussion of impact of health ICT or eHealth on existing health disparities
Written/created in English	Resources in languages other than English

Note. No restrictions were made on methodological design or geographical location.

Guided by our inclusion/exclusion criteria, a title scan of our initial results resulted in 337 articles, 12 of which were discarded as duplicates. We then inspected the references of the remaining papers to identify relevant articles that did not surface in our initial search process, resulting in seven new papers that were added to the pool of resources. The abstracts of the resulting 332 sources were assessed for suitability according to our inclusion/exclusion criteria, resulting in 46 articles that were subsequently read in full to determine suitability. Article content was coded into a spreadsheet, and any discrepancies were discussed between authors Siden, Korol, and Fang until consensus was reached, resulting in a final subset of 31 articles for data extraction and analysis. Figure 1 summarizes the article selection process. Details of our selected studies, including country of origin and intervention type is available in Appendix B.

Information from the final subset of articles was extracted and descriptively coded into a spreadsheet. Spreadsheet categories were formulated according to the HEIA framework to later inform our thematic analysis of findings. Then the search strategy, emerging themes, and findings were reviewed and validated by other members of the research team. The results of the scoping

review were also discussed with several researchers with expertise in the field to elicit important feedback and verify our findings.

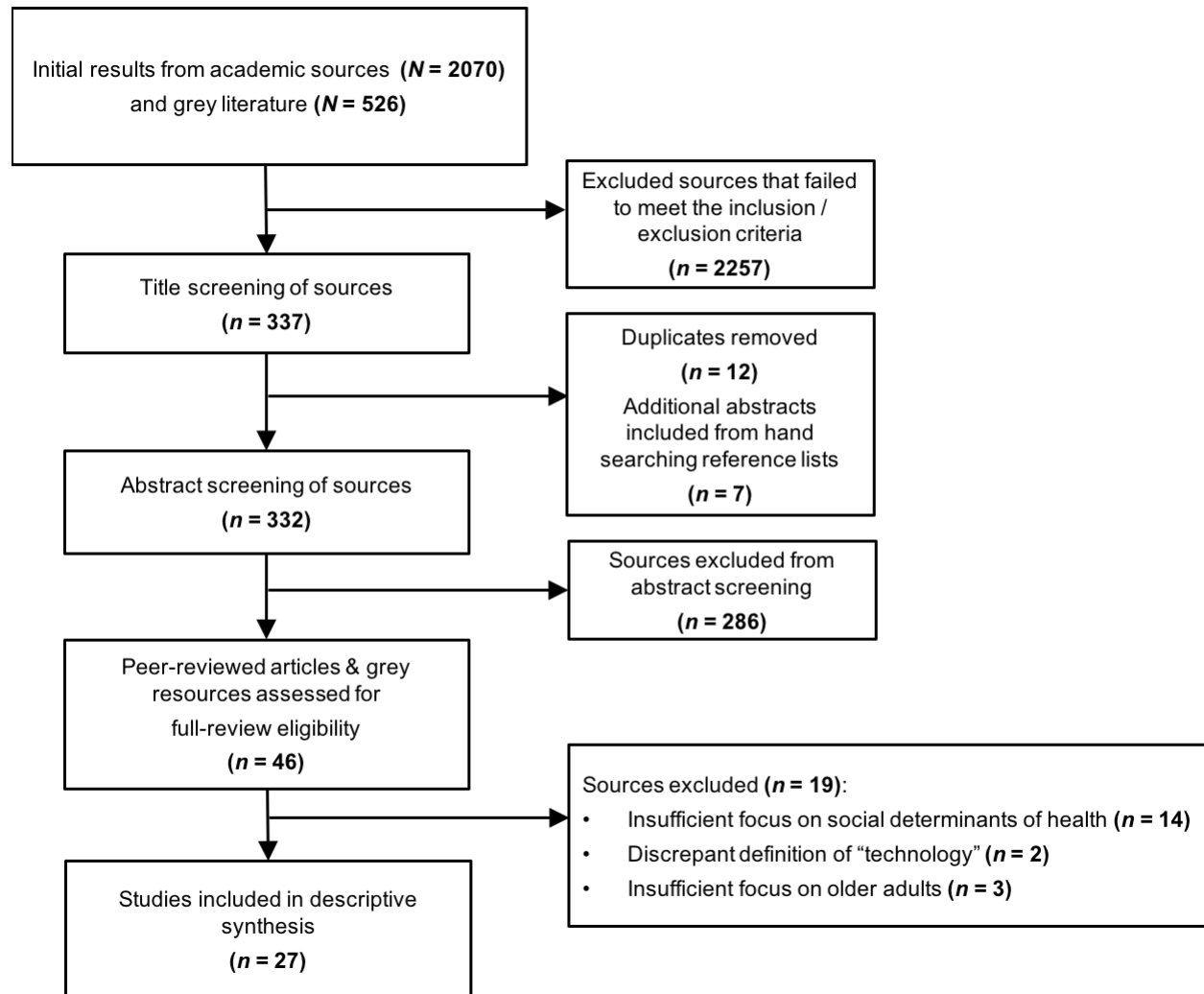


Figure 1. Scoping review search strategy and results.

FINDINGS

Based on the HEIA framework, our analysis was presented in cross-tabular form and categorized according to six social factors: age, gender, living status, socioeconomic status, ethnicity, and comorbidities (see Table 4). Each social factor was assessed according to the HEIA domains to better

Table 4. A Summary of Key Study Findings According to the Health Equity Impact Assessment (HEIA) Framework.

References	Social Factors	Determinants for Access	Intended Impact	Unintended Consequences	Recommendations for Mitigation
Andreassen et al., 2007; Bertera et al., 2007; Blaschke et al., 2009; Bujnowska-Fedak & Piogowicz, 2014; Choi, 2011; Choi & Dinitto, 2013; Chu et al., 2009; Cresci et al., 2010; de Veer et al., 2015; Fisher et al., 2012; Gordon et al., 2016; Goodall et al., 2010; Jimison et al., 2008; Kontos et al., 2014; Nguyen et al., 2017; van Uden-Kraan et al., 2009; Walters et al., 2017; Wong et al., 2014	Age	Interest in and use of eHealth decreases with age. Lack of previous experience with technology or services similar to eHealth.	Ease of use for persons with previous experience with general technology or technology similar to the eHealth services.	Older adults also have more privacy concerns regarding eHealth.	Incorporate eHealth technologies into familiar technologies and expose older adults more often and earlier to technologies. Provide information regarding the use of personal data. Have information in low- and nontechnological mediums.
Andreassen et al., 2007; Bujnowska-Fedak & Piogowicz, 2014; Choi, 2011; de Veer et al., 2015; Fisher et al., 2012; van Uden-Kraan et al., 2009; Wong et al., 2014	Gender	Contradictory findings in the literature.	Information not reported.	Information not reported.	Information not reported.
Atkinson, 2008; Bertera et al., 2007; Bujnowska-Fedak & Piogowicz, 2014; Choi & Dinitto, 2013; Chu et al., 2009; Echt et al., 2011; Friemal, 2016; Gan et al., 2016; Ham et al., 2014; Jung & Lee, 2017; Niehaves & Plattfaut, 2014; Marcelino et al., 2016; Nguyen et al., 2017; Omotayo, 2015; Peeters et al., 2012; Quan-Haase, 2016; Ruxwana, 2010; Torp et al., 2008; Tsai, 2015; Wu, 2015	Living Status	Individuals are interested in e-Health but lack the technical and social support and infrastructure at home and in the area. People living in urban areas were more interested in e-Health than those living in rural areas.	eHealth services provided higher quality and social interaction, increased support, and decreased the need for information outside the home. Individuals who lived alone showed interest in technologies that may help them age-in-place. Those living in isolated regions may not have medical resources in their proximity, and eHealth can bridge this gap.	Unfamiliarity with the language used in eHealth amplified any difficulties with technology use. An assumption persists that there is presence of and willingness from family/ community members to translate and provide support. Older adults in rural areas may lack access to eHealth equipment or support.	Provide eHealth services in a variety of languages, keeping the target population in mind. Technology assistance and training should also be available in these languages. Target isolated regions to develop technology infrastructure and increase educational outreach.
Andreassen et al., 2007; Bertera et al., 2007; Bujnowska-Fedak & Piogowicz, 2014; Choi & Dinitto, 2013; Chang et al., 2013; Chu et al., 2009; Cresci et al., 2010; de Veer et al., 2015; Khvorostianov et al. 2011; Kontos et al., 2014; Levy et al. 2015; Nguyen et al., 2017; van Uden-Kraan et al., 2009; Walters et al., 2017; Wong et al., 2014	Socioeconomic Status (SES)	eHealth use was lower in low SES older adults despite interest in technology. Low-income countries used eHealth services less than middle income countries. Those with less education had lower intent to use eHealth. Health and technology literacy determined eHealth use.	Low-income older adults demonstrated interest in eHealth, indicating that financial support might eradicate this disparity. Previous experience with technology increased interest in and use of eHealth.	Cost was a major barrier to eHealth use and continuation of use. Older adults with minimal technology experience were less likely to use eHealth and more likely to have difficulties with it.	Appropriate cost needs should be assessed for each service. Provide financial assistance to low SES communities via subsidies and allowances and by making technologies available in easily accessible places. Expose older adults to technology through educational programs on step-wise technology use. Explain purpose and benefits of eHealth by trained professionals and make them accessible to facilitate consistent access to technology assistance.

Bujnowska-Fedak & Piogowicz, 2014; Choi & Dinitto, 2013; Chou et al., 2013; Cresci et al., 2010; Chu et al., 2009; Goodall et al., 2010; Iliffe et al., 2010; Khvorostianov et al., 2011; Kontos et al., 2014; Nguyen et al., 2017; Peeters et al., 2012; Walters et al., 2017	Ethnicity	Ethnic minority persons are less likely to have access to and use eHealth services, despite demonstrated interest. Lack of proficiency in the language of the eHealth system decreases participation.	eHealth can help newcomers, low-income, and those less familiar with English navigate health and social service systems, especially when provided in an accessible language. eHealth services provided in language of choice increases participation.	Language, cultural differences, weaker support systems, lower income and/or isolation increase difficulties accessing and using eHealth. Unfamiliarity with the language used in eHealth amplifies any difficulties with the technology and assumes presence and willingness of family/ community members to translate.	Programs should target areas that have a higher percentage of minorities and personalize the programs to specific groups. Provide eHealth services in a variety of languages, keeping the target population in mind. Technology assistance and training should also be available in these languages.
Andreassen et al., 2007; Bujnowska-Fedak & Piogowicz, 2014; Choi & Dinitto, 2013; Chou et al., 2013; de Veer et al., 2015; Gordon & Hornbrook, 2016; Kontos et al., 2014; Levy et al., 2015; van Uden-Kraan et al., 2009; Wong et al., 2014)	Comorbidities	Disabled and homebound older adults used eHealth services less. Cognitive functioning increased acceptance and use of the services.	Older adults had more interest in eHealth if it was compatible with their personal everyday needs.	If the service did not accommodate the various health concerns of older adults, and was difficult to use, they were less inclined to use it.	eHealth services should provide personalized technology and user-friendly devices to facilitate use by tailoring the interventions to individual needs. For example, touchscreens and voice recognition (for the visually and hearing impaired), larger and clear fonts, as well as low-tech modalities, will enhance accessibility.

understand how these factors determined eHealth access and use, the intended impact, and unintended consequences, as well as recommendations for mitigation. Key findings were thematized and discussed according to the (a) social determinants of eHealth access, (b) intended eHealth impact, and (c) unintended eHealth consequences. The following sections are structured by these key thematic findings such that each theme presents findings according to the six social factors. Recommendations for mitigation are presented in the Discussion section.

Social Determinants of eHealth Access

Age

In general, older adults (65+) demonstrated less desire and intent to use eHealth than younger groups (Fischer & Clayton, 2012; Goodall, Ward, & Newman, 2010; Kontos, Blake, Chou, & Prestin, 2014; McLean, 2011; Walters et al., 2017). Reportedly, younger age groups comprised the most enthusiastic Internet users, as use of social media is more popular among younger populations. However, in terms of using ICTs to access health information, young and middle-aged adults demonstrated the most interest upon first usage compared to older groups (Andreassen et al., 2007). For example, Gordon and Hornbrook (2016) found that older adults of the age categories 70–74 and 75–79 years were much less likely than the 65–69 year olds to be registered in a patient portal. Among those registered individuals of later age categories were less likely to utilize the portal to exchange messages, review lab test results, and/or perform prescription refills. It is important to note that, although older groups are reported to use eHealth less than younger groups, studies have found weak evidence for age being a barrier or deterrence for future use of technology interventions (Jimison et al., 2008; Wong, Yeung, Ho, Tse, & Lam, 2014). Older age and comorbidity, together, were found to be associated with lower eHealth usage, predominantly where vision and functional disabilities prevented access and use of eHealth systems (Jimison et al., 2008). Largely, older adults do recognize the benefits of eHealth and are more open to learning more about eHealth (Blaschke, Freddolino, & Mullen, 2009; Bujnowska-Fedak & Pirogowicz, 2014; Chou, Chang, Lee, Chou, & Mills, 2013) as the system becomes more tailored to the specific challenges and needs of old age.

Gender

The evidence base from our scoping review reveals inconsistent eHealth use patterns and behaviors between men and women. These differences are further complexed when stratified by income and ethnicity. Some studies report that women, in general, used technology less often than men and had less intent to use eHealth (de Veer et al., 2015). For instance, according to Wong et al. (2014), older Chinese men demonstrated higher intent and greater frequency of Internet use than women. However, Andreassen et al. (2007) found that although men were more active Internet users, women had a higher tendency to use the Internet for health purposes. In particular, younger, more educated and employed women were more likely to use the Internet for health-related reasons (van Uden-Kraan et al., 2009). Conversely, a US study found that older, low-income men were less likely to engage in eHealth activities than their female counterparts (Kontos et al., 2014).

Living Status

Older adults who are single or are living alone are less likely to access and use eHealth (Ham, Bunn, Meyer, Khan, & Hickson, 2014). This is consistent with previous findings that indicate an association between social/peer support from family members and technology use (Friemel, 2016; Niehaves & Plattfaut, 2014; Omotayo, 2015; Quan-Haase, Martin, & Schreurs, 2016; Tsai, Shillair, Cotten, Winstead, & Yost, 2015; Wu, Damn  e, Kerherv  , Ware, & Rigaud, 2015). Similarly, technology use patterns and behaviors become further complicated when older adults are simultaneously low-income and struggling with some form of a comorbidity and/or disablement rendering them homebound (Atkinson, Black, & Curtis, 2008; Choi & Dinitto, 2013; Echt & Burrige, 2011; Gan et al., 2016). For instance, contrary to consensus findings, Choi and Dinitto (2013) found that older adults who lived alone and/or are struggling with depression are more likely to engage in Internet usage. In terms of urban versus rural locale, older adults living in more dense urban areas were reportedly more interested in accessing and using eHealth services compared to residents living in more rural areas (Bujnowska-Fedak & Pirogowicz, 2014). This finding contradicts with the presumption that individuals living in rural areas would benefit more from remotely accessible health services (Ruxwana, Herselman, & Pieter Conradie, 2010).

Socioeconomic Status

eHealth participation rates are minimal among low-income individuals, particularly among the oldest old and ethnic minority groups (Walters et al., 2017). For instance, research indicates that older male adults of low socioeconomic status (SES), as well as, older, low-income adults living with a disability, had significantly low rates of Internet use (Choi & Dinitto, 2013; Kontos et al., 2014). Conversely, individuals who have acquired more education, are employed, and hold more affluent positions in society are shown to use the Internet more actively for health-related reasons (Andreassen et al., 2007; Choi & Dinitto, 2013). Research indicates that individuals with lower education levels have less desire and intent to both access and use eHealth services (Bujnowska-Fedak & Pirogowicz, 2014; de Veer et al., 2015; Kontos et al., 2014; Nguyen, Mosadeghi, & Almario, 2017). According to Wong et al. (2014), education alone was shown to be significantly correlated with perceived ease of use, intent to use, and frequency of use in association with past experiences of computer and Internet usage. This finding suggests that certain groups, such as older adults with less education, are likely to experience difficulty when accessing health information online. As demonstrated, combined SES factors are indicative of how eHealth interventions may unintendedly increase the inequities in health services in terms of both access and intent to use. However, it is important to note that despite being low-income, older adults with more disadvantaged social positions, reportedly, still have interest in using health technologies and believe that digital interventions can help them age well (Bertera, Tran, Wuertz, & Bonner, 2007).

Ethnicity

eHealth access and use rates are generally lower among ethnic minority groups and even more so among the oldest old populations (Walters et al., 2017). However, one study found that once

eHealth access was achieved, discrepancies in use rates between different ethnicity groups disappeared (Kontos et al., 2014). However, when additional social factors, such as age and income, were introduced alongside ethnic minority status, older individuals, particularly those who lived in lower income neighborhoods and rural areas, were even less likely to access eHealth services (Goodall et al., 2010). A key obstacle to eHealth uptake in rural areas in general was having limited or no access to the Internet (Goodall et al., 2010). Within the US American context, studies found that African Americans, Hispanics, and Filipino seniors were significantly less likely to own a digital device, such as a computer, tablet, or smart phone, and thus were more likely to have reported not ever using the Internet, compared to nonHispanic and Chinese American seniors (Bujnowska-Fedak & Pirogowicz, 2014; Chu, Huber, Mastel-Smith, & Cesario, 2009). Accordingly, African Americans, Hispanics, and Filipino seniors are far less likely to be able and willing to use digital technology to obtain health information online and to perform health related tasks using digital technology devices and applications (Bujnowska-Fedak & Pirogowicz, 2014; Chu et al., 2009).

Comorbidities

Individuals living with comorbidities (e.g., diabetes, hypertension, cardiovascular disease, cognitive impairment, and balance issues) demonstrated very low eHealth access and use rates (Andreassen et al., 2007; Choi & Dinitto, 2013). Typically, those struggling with physical or cognitive challenges are often low-income, homebound older adults (Choi & Dinitto, 2013). Having adequate cognitive functioning was shown to be essential for technology-seeking behavior and technology acceptance for accessing and using eHealth services (Bujnowska-Fedak & Pirogowicz, 2014). Meanwhile, persons reporting good health had higher frequency of Internet use, but not necessarily for the purposes of seeking health-related information (Wong et al., 2014). There is some evidence to indicate that individuals who have been recently diagnosed with chronic conditions understood as being “an unexplained illness,” such as fibromyalgia, were more likely to use the Internet for health-related reasons (van Uden-Kraan et al., 2009).

Intended eHealth Impact

Health and Well-being

In the biomedical field, eHealth was shown to improve health outcomes. Specific examples include

- reduction of blood pressure in older adults through improvements in psycho-behavioral outcomes via a community-based eHealth self-management program (Jung & Lee, 2017),
- reduction in hospital admissions and being bed-ridden following enrollment in a care coordination home telehealth program (Darkins et al., 2008),
- increased confidence, perceived social support, and social connectedness in older adults through the use of ICTs (Blaschke et al., 2009),
- and decreased feelings of loneliness and social isolation (Peeters, de Veer, van der Hoek, & Francke, 2012).

These examples demonstrate that eHealth can be beneficial and help generate positive health outcomes. Older adults who are more actively engaging with ICTs are more likely to possess better physical and mental health. However, individuals who self-report their health status as being poor tended to have less engagement with ICTs, particularly, for health purposes (Andreassen et al., 2007; Atkinson et al., 2008; Denizard-Thompson, Feiereisel, Stevens, Miller & Wofford, 2011; Gan et al., 2016).

Perceived Benefits

People who perceived eHealth as beneficial for their overall well-being were more inclined to use ICT-based health interventions consistently (Bertera et al., 2007; de Veer et al., 2015). According to Andreassen et al. (2007), individuals are more likely to feel reassured, as opposed to feeling anxious, after using the Internet for health purposes. In general, individuals with more positive perceptions of eHealth's usefulness and optimistic feelings towards ICTs had a greater intent to use the Internet to search for health information (Andreassen et al., 2007); however, perceived usefulness was demonstrated to be an insignificant predictor of behavioral intent (Wong et al., 2014). Although a positive association was found between perceived usefulness and behavioral intent, the effect of perceived usefulness on behavioral intent was reduced when perceived ease-of-use was accounted for (Wong et al., 2014).

Usability

In terms of usability, people who inherently perceive eHealth as being easy-to-use are more inclined to use such applications in future (de Veer et al., 2015). For instance, older people displayed a greater willingness to seek health information from the Internet when perceived difficulties associated with ICT use were removed. Perceived usefulness of acquiring health information online, on the other hand, was less important (Wong et al., 2014). The attractiveness of using eHealth services is also related to the compatibility of these services in association with personal self-care needs (e.g., supporting activities of daily living; Bujnowska-Fedak & Pirogowicz, 2014; Chou et al., 2013). As such, in cases where a person suffers from physical and cognitive impairments, the convenience of eHealth initiatives may help them remain at home for longer periods by allowing them to navigate health resources from the comfort of their own home (Blaschke et al., 2009; McLean, 2011).

Unintended eHealth Consequences

Digital Divide

Older adults with minimal exposure to technology are less likely to access and use eHealth (de Veer et al., 2015; Kontos et al., 2014). According to McLean (2011), older adults who were exposed to ICTs in early- to mid-adulthood were more likely to endure shifts in technology development, which is often paired with substantial systemic change for accessing resources and supports (Fang et al., 2018; Marcelino, Laza, & Pereira, 2016). As such, individuals with no experience using a computer are much less likely to access eHealth interventions. Also, individuals who do have experience, but do not have easy access to a computer at home, tend to

have more difficulties using eHealth in public spaces (Chou et al., 2013). Despite having little or no experience with technologies, older adults with family members or friends who provide encouragement and technological support are more likely to access eHealth (Larsson, Larsson-Lund, & Nilsson, 2013; Peral-Peral, Arenas-Gaitán, & Villarejo-Ramos, 2015). Conversely, those without the appropriate social support generally feel insecure, anxious, and fearful when confronted with new technological devices and online applications, resulting in reduced uptake of eHealth interventions (Cresci, Yarandi, & Morrell, 2010).

Perceived Barriers

Several perceived barriers to eHealth have been identified and these include lack of perceived benefit, perceived difficulties for use, issues surrounding privacy and trust, convenience, and cost associated with a digitized system. Cost was the most frequently cited barrier to technology access and use (Choi & Dinitto, 2013; Chou et al., 2013; Fang et al., 2018; Jimison et al., 2008). Consequently, older adults with limited financial means often lack access to eHealth services and online health information (Peeters et al., 2012). The perceived lack of benefit was the second most frequently cited barrier to technology access and use, including the use of social media for health information (Chou et al., 2013; Fisher & Clayton, 2012; Goodall et al., 2010; Jimison et al., 2008). As such, older adults who do not view eHealth as having any significant benefit to their everyday lives are less likely to access eHealth and partake in a digitized system (Chou et al., 2013; Jimison et al., 2008). For instance, some believed that they already had access to all of the relevant information they needed in order to function in society with a desired quality of life without using eHealth (Goodall et al., 2010).

Perceived belief that eHealth would be a difficult system to use and integrate into their everyday routines is also a deterrent for eHealth uptake (de Veer et al., 2015). Individuals are less likely to use digitized systems that require accessing unfamiliar equipment or technology applications and programs if there is no social support available to provide assistance (Ham et al., 2014; Jimison et al., 2008). This was demonstrated in a study where more advanced forms of health interactions (such as teleconsultations with doctors and telemonitoring of important health parameters) resulted in the lowest level of acceptance from individuals considering the idea of virtual health services (Bujnowska-Fedak & Pirogowicz, 2014).

Lastly, privacy and confidentiality were reported as a significant challenge for the adoption of technology, including using ICTs to access health information (Fang et al., 2018). For example, McLean et al. (2011) found that out of all the age groups, people over the age of 55 years displayed the least amount of interest in smart homes due to distrust of the operation, which heightened feelings of insecurity. In general, if patients did not trust the necessary technology required to access health management systems, they were less likely to adhere to recommendations made by health professionals (Cresci et al., 2010). This finding was highlighted in a study where respondents reported that they were least likely to adopt health technologies that allowed health professionals, such as nurses, to perform follow-ups with patients using a built-in digital camera (Bertera et al., 2007).

Cultural Appropriateness

Differences in beliefs, values, and expectations associated with the culture of health-care access are indeed a challenge. Generally, older adults preferred face-to-face contact with health-care providers (Andreassen et al., 2007) and some feared that the mainstreaming of eHealth would reduce the amount of valuable social contact (McLean, 2011). For some health ailments, such as depression (Blaschke et al., 2009), human contact has shown to be more beneficial than virtual engagement with health-care providers (Billipp, 2001; Jimison et al., 2008). Certainly, in terms of the culture of technology use, misconceptions and contradictions regarding “who can use what” abound. For instance, it is perceived that the main reason older people do not engage with eHealth services is the lack of cultural interest in technology use. However, challenges associated with the culture of technology use are more complex. Older people, like many of people of any age, can become overwhelmed by the wealth of information available on the Internet, but this does not mean that there is a lack of interest or willingness to learn (van Uden-Kraan et al., 2009). With the appropriate technology supports available, older people can overcome challenges associated with using ICTs to access eHealth services.

For example, with respect to mobile health interventions, older individuals with limited technology- and health-literacy have difficulties, firstly, understanding how to receive and respond to instant messaging and, secondly, comprehending the meaning of the message once they are received (Chief Public Health Officer of Canada, 2014). An additional layer of complexity may be introduced if the primary language for communication does not match the language of the individual (Goodall et al., 2010). As such, without appropriate considerations for different aspects of the culture of technology use (Iliffe et al., 2010), eHealth interventions can result in the further marginalization of some groups as it pertains to health-care access (Fang et al., 2018).

DISCUSSION

As societies witness the demographic shift toward larger numbers of older adults, reducing disability from communicable and noncommunicable diseases is paramount for holding down costs of health and social care. As more efficient health-care solutions are being introduced to offset costs of care, it is important to note that “the health and economic burden of disability also can be reinforced or alleviated by environmental characteristics that can determine whether an older person can remain independent despite physical limitations” (World Health Organization, 2011, p. 3). The longer individuals can remain independent, mobile, and well enough to care for themselves, the lower the direct and indirect costs for families and societies at large (World Health Organization, 2011).

The overall cost-saving potential and the potential to help older people remain independent for as long as possible suggests eHealth services and supports are likely to become increasingly common within health-care systems worldwide. However, while there is the opportunity to ensure that the design of eHealth systems can be introduced in ways that can improve health outcomes and cost efficiency, limited research is available to assess the intended impact and unintended consequences of a digitized approach to health-care delivery. This is particularly important for countries that have transitioned fully toward eGovernance, such as in the case of

Canada. Since the media headlined “Zombie” report, a document published in 2015 (see Naylor et al., 2015) that assessed the current eHealth framework and its effectiveness, the Canadian eHealth system has advanced on multiple fronts (Canada Health Infoway, 2018). For instance, government funding has increased, electronic health record mechanisms have improved, and telehomecare and other interventions have been implemented (Canada Health Infoway, 2018). However, to date, limited information provides insight into how recent eHealth solutions and policies have impacted and responded to the needs of older adults in Canada and in other societal contexts, particularly, in respect to the needs of marginalized groups. Our scoping review incorporating the HEIA framework (Ontario Ministry of Health and Long-Term Care & Toronto Central LHIN, 2009) systematically synthesized various international evidence sources to understand the effects of eHealth initiatives on a diversity of older adults,

Globally, several countries have adopted an eGovernment model to strengthen institutional linkages and communication across departments and divisions, to improve government efficiency and, as it pertains to this study, to enhance public service delivery (United Nations, 2012). Yet, many of these countries are still lacking the appropriate infrastructure, human resource capacity, and the necessary balance between e-services supply and demand. Specifically, in many low-income countries, members of society continue to struggle with the traditional barriers to ICT investment, including lack of technical skills, high costs of technology, and ineffective policies to ensure that individuals have appropriate access (United Nations, 2012). Importantly, findings in this study suggest that even within high-income countries, persons who are situated at the margins of society experience similar challenges, particularly as it relates to health-system-level changes (i.e., as in the case of eHealth). Aligned with findings from a recent realist synthesis, which explored the inequities associated with the digital divide (Fang et al., 2018), our analysis revealed a similar trend with the onset of eHealth interventions. A key finding was that, although there are notable benefits and efficiencies of an eHealth system (e.g., enhanced health monitoring, improved social connectedness, and reduced loneliness and social isolation), its inaccessible nature for some citizens can further marginalize a society’s most disadvantaged groups, who, incidentally, are in most need of health-care services and supports. To mitigate some shortcomings, it is important to address the challenges of eHealth systems that relate to access, cultural appropriateness, technology-related self-efficacy, user-friendliness, and social support.

A first step to enhance access is to assess and address the cost-related challenges associated with eHealth access for individuals with limited financial means (Chief Public Health Officer of Canada, 2014). As eHealth requires the use of a digital device, such as a computer, tablet and/or smart phone, as well as sufficient Internet connectivity, cost becomes the primary barrier. A high-level approach to addressing this challenge is at the domain of social policy (Choi & Dinitto, 2013). Offering low-income persons (such as older adults with a limited income) subsidies/allowances to purchase a device and offset costs of wireless services can help them join the digital age and participate in health technology systems (Choi & Dinitto, 2013; Chou et al., 2013).

Once the barrier of cost is removed, the second challenge relates to technology-related self-efficacy and social support. Older adults with little or no exposure to ICTs are insecure and uncomfortable with their ability to access eHealth. Hence, social support is necessary and a key requirement to facilitate training, practice, and encouragement so older adults can become comfortable with using technologies to access eHealth services (Blaschke et al.,

2009). Importantly, ICTs in combination with human interaction creates the ideal condition, not only for improved eHealth access, but also for the overall health and well-being of the elderly user (Blaschke et al., 2009; Chou et al., 2013; Chu et al., 2009). To minimize hindrances that stem from limited computer knowledge and online applications, accessible training programs specifically designed for older people should be available and promoted in the community (via schools, libraries, health clinics, and community centers) to help them improve their computer skills and attitudes toward Internet usage (Keogh, 2009; Wong et al., 2014). This type of community intervention may result in multiple positive outcomes including increased social participation, reduced loneliness and social isolation, improved self-care and disease management, enhanced self-confidence, and greater independence.

Thirdly, in terms of cultural appropriateness, it is important that health technology designers consider the appropriateness of the intervention, especially as it pertains to the culture of older generations; the culture of gender norms, behaviors, values, and expectations; and the culture of various ethnic groups. Customized eHealth interventions, particularly those that combine multiple accessibility components, such as Web interface combined with face-to-face interaction and tailored health information in accessible languages, resulted in more positive uptake outcomes and better reviews from older people in terms of satisfaction, perceived benefit, and system use (Chief Public Health Officer of Canada, 2014; Jimison et al., 2008). Simultaneously addressing eHealth content challenges together with health literacy and language barriers is also important for the adoption of an eHealth platform for accessing health information (Goodall et al., 2010; Iliffe et al., 2010; Kontos et al., 2014).

Lastly, creating user-friendly devices and interfaces are necessary if older adults are to feel comfortable and confident accessing eHealth platforms for health information (de Veer et al., 2015; Jung & Lee, 2017). A particular driver for the uptake of eHealth technologies by older adults is the idea of introducing a gradual, stepwise introduction to technology devices and subsequently to the eHealth platform (Jimison et al., 2008). Furthermore, technology designers also should consider universal and accessible design features as it pertains to older individuals living with comorbidities and various levels of physical and/or cognitive abilities (Choi & Dinitto, 2013). Although having more accessible design features can minimize the amount of additional support and training necessary to access and use eHealth interventions, older adults should not be viewed as a homogenous group with the same technology access and use challenges. Hence, we would caution against interpreting and applying findings from the scoping review in this way.

It is important to note that this scoping review is not without limitations. eHealth constitutes many types of interventions, including telecare, telehealth, and telemedicine. As such, to encapsulate the wide range of eHealth technologies, we opted to keep our definition of eHealth very broad. However, the expanded parameter of the definition was reflected in the presentation of the findings, which were subsequently broad and lacked clarity for interpreting and linking recommendations to the specific type of eHealth technology. Conversely, to maintain the manageability of the scoping review, the parameters of our search strategy and inclusion/exclusion criteria were kept quite narrow. For example, we opted to search only four key specialized journals, and as a result, other plausible evidence could be available in other sources, such as in the *Journal of the American Medical Informatics Association*, the *Medical Informatics and Decision Making*, and the *International Journal of Medical Informatics*. Furthermore, our scoping review focused on studies written

in English and published between 2007 and 2017. Consequently, potentially relevant articles that were in a language other than English and/or published before 2007 or after 2017 were not considered for inclusion in our analysis.

CONCLUDING REMARKS

eHealth systems and interventions have the potential to provide cost-effective solutions to help alleviate growing demands on health-care systems. This new form of health innovation is perceived as a way of helping older people to age-in-place and to avoid admission into expensive acute and long-term care facilities, while simultaneously extending the range and reach of limited health-care resources. However, this positive narrative may overlook some of the negative consequences of health-system innovation, such as the tension between the necessary technological adjustments required to improve health system efficiency and the abilities of health-care consumers to adapt to advanced system-level modifications. As such, ongoing evaluation of eHealth initiatives for older adults' health status requires attention to unique individual-level socioeconomic and cultural characteristics to capture both the intended and unintended outcomes of new and advanced eHealth systems, and to mitigate not only access and use inequities, but also broader health disparities.

IMPLICATIONS FOR APPLICATION AND POLICY

Several implications can be drawn from this decade scoping review. Firstly, more research is required in examining specific systems and how older people themselves can co-create solutions to ensure its relevance to the intended populations and to co-design eHealth systems. This will help in providing intuitive, easy-to-use technologies that fit older peoples' frameworks of understanding (in terms of both health and technology). Secondly, our study points to the need for ongoing evaluation of the intended and unintended social, health, and well-being outcomes of eHealth initiatives to unpack what works and what fails to work under what personal and environmental conditions and contexts. Service efficiencies should then be possible alongside forestalling the personal health and well-being declines associated with unmet health needs. Thirdly, attention needs to be paid to the potential for eHealth systems to target older lonely and socially isolated people and alleviate their mental distress through provision of socially valued opportunities for connectedness and social participation that take into account their health conditions. Fourthly, our findings underscore the need for societies ensure that issues of cost, accessibility, and usability are fully understood with respect to the varying experiences, languages, and cultures, especially for marginalized groups, so that eHealth initiatives can make a positive difference to all. Finally, use of eHealth systems can be problematic for people with little technological experience and confidence. Thus our research points to the ongoing need for community- and service-based support needs to be readily available in local community locations and accessible to those who most need it.

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APPENDIX A

HEIA Template

Step 1: Scoping

- **Populations**
Using evidence, identify which populations may experience significant unintended health impacts (positive or negative) as a result of the planned policy, program or initiative.
- **Determinants of Health**
Identify determinants and health inequities to be considered alongside the populations you identify.

Step 2: Potential Impacts

- Unintended Positive Impacts
- Unintended Negative Impacts
- More Information Needed

Step 3: Mitigation

- Identify ways to reduce potential negative impacts and amplify the positive impacts.

Step 4: Monitoring

- Identify ways to measure success for each mitigation strategy identified.

Step 5: Dissemination

- Identify ways to share results and recommendations to address equity.

APPENDIX B

Table B1. Characteristics of Articles Included in the Scoping Review and Analysis.

Author	Year	Country	Intervention
Andreassen. et al.	2007	Norway	Computer and Internet use for health information
Bertera et al.	2007	USA	Telecare
Bujnowska-Fedak et al.	2014	Poland	Modern information and communications technology (ICT)
Choi.	2011	USA	Computer and Internet for health information
Choi & Dinitto	2013	USA	Health information technology
Chou et al.	2013	Taiwan	Telecare: The telecare services included (a) remote physiological monitors (e.g., blood pressure, blood sugar, and oxygen saturation) for data measurements and records tracking; (b) video health education and daily activity guidance; (c) medication/ treatment counselling and reminders of medication taken or next home visit; (d) health management planning, home diet provision, exercise analysis, and environment assessment; (e) social worker consultant; and (f) 24-hour health counsel and emergency services.
Chu et al.	2009	USA	Online health information retrieval
Cresci et al.	2010	USA	eHealth, Internet
de Veer et al.	2015	Netherlands	eHealth
Fisher et al.	2012	USA	Social media (SoMe): E-mail, texting, microblogging (e.g., Twitter), and smartphone mobile applications
Goodall et al.	2010	Australia	Information and communication technology (ICT)
Gordon et al.	2016	USA	Patient portal use and digital health communication
Iliffe et al.	2010	UK	Health Risk Appraisal in Older People (HRAO) technology
Jung & Lee	2017	South Korea	eHealth self-management (eHSM)
Khvorostianov et al.	2011	Israel	Internet
Kontos et al.	2014	USA	eHealth
Levy. et al.	2015	USA	Internet use to obtain health or medical information
Lexis et al.	2013	Netherlands	“QuietCare” activity monitoring system for people who are living at home alone
Marcelino et al.	2016	Portugal	Information communication technology (ICT)
Nguyen et al.	2017	USA	Computer and internet for health information
Papa et al.	2017	EU	EasyReach system: Based on a special social TV channel accessed

Author	Year	Country	Intervention
			by older adults through their own TV set, a set-top box and a specialized remote control unit endowed with gesture recognition, and video and audio capture capabilities.
Peeters et al.	2012	Netherlands	Home telecare
Torp et al.	2007	Norway	Participant families received a personal computer (PC), and an ICT course consisting of three 3-hour classes dispersed over a 3-week period. Included information programs, discussion forum, video conferencing, training and call center access.
Tseng et al.	2013	Taiwan	An intelligent health-monitoring system for the elderly living in nursing homes.
Van Uden-Kraan et al.	2009	Netherlands	Health-related internet use
Walters et al.	2017	UK	The Multi-dimensional Risk Appraisal for Older people (MRA-O) system includes: 1) Postal questionnaire including health, lifestyle, social and environmental domains; 2) Software system generating a personalized feedback report with advice on health and wellbeing; 3) Follow-up of people with new concerning or complex needs by GPs or practice nurses.
Wong. et al.	2014	People's Republic of China	Computer and internet use for health information

WARM EXPERTS FOR ELDERLY USERS: WHO ARE THEY AND WHAT DO THEY DO?

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Abstract: *This paper examines “warm experts”—that is, nonprofessional persons who help inexperienced users come to terms with digital devices—and their significance for the use of digital media in everyday life by elderly Swedes. We analyze data from a national survey (N = 1264) and from qualitative, semistructured interviews with 18 elderly Swedes (aged 65+). Our data reveal that the warm expert usually is a closely-related person, often a child or grandchild, who is strongly involved in nearly every stage of technology domestication, from appropriation (i.e., identifying the need, buying the item, and installing and adjusting it) to incorporation (i.e., choosing and downloading suitable apps, teaching how to use them, and solving technical problems). Although the clear majority of elderly Swedes have been online for more than a decade, the need for continuous assistance from warm experts seems to persist also among experienced users.*

Keywords: *warm experts, elderly, digital media, domestication, survey, interviews.*

INTRODUCTION

In 2005, media researcher Maria Bakardjieva (2005) published her book *Internet Society: The Internet in Everyday Life*. Her results and analyses were derived from longstanding, ethnographically inspired research on the use of and perceptions about computers and Internet connections in Canadian households. Her insights were based largely on in-depth interviews with a great variety of users of the then-new information and communication technologies (ICTs), conducted in the years before and after the turn of the millennium. Theoretically, the book was inspired by a number of interrelated research traditions. It was, for instance, inspired by Andrew Feenberg's (1991) critical theory of technology, especially regarding the role of human agency vis-à-vis technological systems. The book also drew on semiotic approaches to technology (Woolgar, 1996), which treat technology as at least partially open texts, possible for users to interpret and reinterpret. In order to theoretically grasp users' everyday life in general and technology's place within it in particular, Bakardjieva also drew on Henri Lefebvre in order to attend to "the productive work...performed by users through and around the Internet" (Bakardjieva, 2005, p. 55). Among the many rich insights her book offered about how everyday users both make sense of and use ICTs in their everyday lives, her notion of "warm experts" (Bakardjieva, 2005, p. 98) stood out as a particularly useful contribution.

Bakardjieva's (2005) notion of warm experts highlighted the important role that informal, nonprofessional "experts" play in helping inexperienced users come to terms with their home computers and Internet connections. These experts were important for getting people started using new ICTs and helping them feel comfortable in the new, emerging online environment. In Bakardjieva's theoretically inspired description, the warm expert "mediates between the technological universal and the concrete situation, needs and background of the novice user with whom he is in a close personal relationship" (Bakardjieva, 2005, p. 99). In the late 1990s and early 2000s, at the time when Bakardjieva conducted her empirical studies, the warm expert was typically a family member, relative, friend, or someone else within the new user's social network who happened to know a bit more about ICTs than the computer and Internet beginners did. As this was at an early stage in the development of everyday Internet usage, the warm experts identified in Bakardjieva's studies were often involved in tasks related to installing computer equipment (i.e., setting up an Internet connection) and getting people familiar with the Internet by identifying online areas of interest to them. In a way, the warm experts mainly served as resources to get novice users going, offering them an entrance to everyday use of online media.

Everyday ICTs are, however, in a state of constant change. During the time of Maria Bakardjieva's empirical studies, everyday Internet use at home was something being played out mainly on stationary home computers. These computers were most often connected to the Internet through a fixed telecommunications network. Since the early 2000s, however, users have experienced the continual introduction of new devices, for instance, laptops, smartphones, and tablets. Together with the fact that users nowadays get online access mainly via wireless connections, these devices have made Internet usage a more personal, portable, and mobile experience. Apart from offering convenience, this reality also complicates Internet usage for some everyday users and potentially adds a number of new items to the list of tasks for warm experts to help with. This is especially true as the technological development has been accompanied by the digitization of all kinds of societal services—commercial as well as public

ones. In short, both ICTs themselves and Internet-based services of all kinds have become far more ubiquitous today compared to the early 2000s. To us, this points to the need for research to examine what kinds of tasks contemporary warm experts are performing. Further, as the character of users' digital environments is changing, it also is interesting to investigate the identity of these warm experts: Who are they and what relationships do they typically have with the users that they help?

Sweden is a good case for such a study. As we have shown elsewhere (Olsson, Samuelsson, & Viscovi, 2019), the level of access to ICTs in Sweden is high compared to the rest of the Western world (World Internet Project, 2016), and this includes elderly users. The proportion of older people in Sweden with access to ICTs is significantly higher than in, for example, Switzerland (Friemel, 2016, p. 324) and Spain (Tirado-Morueta, Hernando-Gómez, & Ignacio Aguaded-Gomez, 2016), to compare Sweden with some other European countries. Eighty percent of Swedes in the age span of 65 to 85 years have an online connection. They also use their digital devices frequently. The average individual aged 65 to 85 must be considered a regular user of the Internet (Olsson, Samuelsson, & Viscovi, 2018). Hence, emerging patterns of digital inclusion and exclusion among senior citizens in Sweden today—as well as elderly Swedes' need for warm experts—can, to some extent, serve as a harbinger of possible future developments in other digitizing societies.

From Domestication to Warm Experts: A Theoretical Reflection

In this context, we tentatively define warm experts as nonprofessional persons who help more inexperienced users to come to terms with digital devices and services. The concept of warm experts can be situated within a wider theoretical context: domestication research. The theoretical notion of domestication was first established in the 1990s (Silverstone, 1994; Silverstone & Haddon, 1996; Silverstone & Hirsch, 1992). Domestication was inspired by and is intimately related to various strands of research within the humanities and social sciences, notably the general paradigm of social shaping of technologies (SST; cf. Lie & Sørensen, 1996; Mackenzie & Wajcman, 1999; Woolgar, 1996) and some instances of media research (cf. Bausinger, 1984; Brosveet & Sørensen, 2000; Olsson, 2006; Williams, 1974), as well as studies of consumption (cf. Du Gay, 1997). The notion of domestication shares with these traditions the conviction that technologies are not drivers of social change. Rather, technologies are always understood to be social and cultural artifacts: The invention as well as the diffusion and use of technologies must be unpacked as social and cultural phenomena. Hence, domestication research stands in opposition to technologically deterministic views of the relationship between technology and society/culture.

An important focus in research about the domestication of ICTs is the users themselves and how they socially and culturally shape (i.e., understand, make use of) ICTs in their everyday lives (cf. Haddon, 2016). Or, to put it in slightly more theoretical terms, how do everyday users negotiate with the technological affordances (Hutchby, 2001). Domestication research began in the 1990s with a specific ambition to understand and analyze in-home use of media, and research usually was analytically centered on television (Silverstone, 1994). Since then, research has expanded to include emerging media technologies, such as computers (cf. Berker, Hartmann, Punie, & Ward, 2005) and mobile phones (cf. Green & Haddon, 2009).

Early studies of domestication inspired further conceptual development (Haddon, 2016). Four concepts appeared to be particularly useful for increasing the understanding of how new ICTs became part of everyday life: appropriation, objectification, incorporation and conversion. In his recent overview of domestication research, one of the field's most prominent figures, Leslie Haddon, offered an insightful and handy explanation of these more fine-grained concepts. He referred to appropriation as the household's negotiations leading to the acquisition of a new ICT. The notion of objectification deals with space: that is, how new ICTs are spatially organized within the household as they arrive. The notion of incorporation draws attention to "how people [use] them and more specifically how that use [fits] into people's routines and hence their time structures" (Haddon, 2016, p. 20). Lastly, conversation relates to how households present themselves and their ICT practices to others: how they talk about technologies and display them.

These concepts help call attention to important aspects of domestication. Researchers are alerted to discussions within and around the household concerning whether the new ICT should be acquired (appropriation). They also point to the importance of everyday spatial organization of the home (objectification), as well as everyday routines (incorporation). Additionally, researchers become aware of symbolic aspect of ICTs and how ICTs become part of the household's negotiation of identity (conversion).

Social networks play an important role in all these phases. This was made clear very early in the history of domestication research (Murdock, Hartmann, & Grey, 1992), for instance, with the concept of social resources (cf. Olsson et al., 2018, 2019). The social dynamics within households (wife–husband, children–adults, among siblings, etc.), as well as the dynamics between households and their wider social network (friends, relatives, colleagues, etc.), are important components in shaping both perceptions about and use of ICTs. This thread—the impact of social networks on a household's domestication of ICTs—is what Maria Bakardjieva (2005) picked up and developed further with her concept of warm experts. It very clearly highlights the social and cultural character of domestication in general and the part played by people's social networks in particular.

One indication of the usefulness of the concept of warm experts is the simple and obvious fact that other researchers have made good use of it. Drawing on in-depth interviews with elderly Norwegians, Lüders and Gjevjon (2017) argued that social life is important for elderly ICT-users in several different ways. They noted that users "with a richer social life...tend to experience a double benefit: both having people to communicate with online and having close people acting as warm experts" (Lüders & Gjevjon, 2017, p. 72). In recent studies informed by the concept, researchers have also explored the identity of warm experts, that is, who performs this role. For example, Comunello, Fernández Ardevol, and Mulargia (2017) referred to "young relatives and young people in [the] relational network" (p. 806) as elderly users' warm experts (see also Barrantes Cáceres & Cozzubo Chaparo, 2017), which points to an intergenerational exchange between elderly users and younger warm experts. Examining the kinds of tasks that warm experts become involved in executing, Leong (2017) noted similarities between warm experts and "warm gatekeepers" in China. Similar to how gatekeepers (Katz & Lazarsfeld, 1955) are identified in the literature—as friends and acquaintances who introduce news and new innovations within their social networks—warm experts are described as being involved in introducing programs or applications. According to Leong (2017), warm experts are sometimes very concretely involved in the actual downloading and installation of applications. However,

Oreglia and Ling (2018) noted that they also are important assets when it comes to “digital-imagination.” Oreglia and Ling defined this as “the process by which individuals within a society develop an understanding of the potentials, the limitations, and eventually the threats of digital technology” (p. 2). In this regard, warm experts play a role in framing what technologies are and how they can be used.

In recent years, contemporary warm experts have been the subject of research that has produced some important insights; however, this does not mitigate the need for further work. Rather, we agree with the view expressed by Courtois and Verdegem (2016) in the conclusion to their article on social support and digital inequality: “More specifically, we urge further research to explore these social networks and identify warm experts, their skills’ levels and ways of offering support, which allows understanding its social dynamics” (Courtois & Verdegem, 2016, p. 1524).

Aim and Research Questions

Our goal in this article is to contribute to research on the role and identity of contemporary warm experts. To do so, we draw on two sets of data covering Swedish senior citizens (aged 65+ years). The results and analyses make use of (a) data from a large Swedish survey ($N = 1,264$, response rate 63%) and (b) data from interviews with elderly Swedish users. We pose two overarching research questions for this article:

1. For what purposes do elderly Swedish ICT users need warm experts?
2. Who are elderly Swedes’ warm experts?

The first question directs attention to the kinds of ICT problems that elderly Swedes experience in their everyday lives, that is, the problems for which they need help. Hence, it also points toward some of the actual practices that are part of the role of warm expert. The second question focuses on the warm experts themselves, in particular their identity and relationship to the elderly user.

For each research question, we use both kinds of data, that is, survey data as well interview data. The data and analyses are discussed in detail below.

METHODS

The research presented in this paper is based on two different types of empirical material: (a) a postal survey and, more importantly, (b) semistructured interviews. Apart from being a complement to a field dominated by qualitative studies, the survey data helped us to understand to some extent the needs for warm experts and certainly helped us to reveal the prevalence of warm experts, elucidating and ranking their social relations to the elderly. The interviews, inspired by Selwyn’s (2004) thinking about technological histories, make it possible to analyze warm experts’ involvement within and throughout the domestication process, thereby contributing to the research on domestication as well as warm experts.

Prior to the collection of the data, interviews were conducted with experienced instructors and mentors at SeniorNet Sweden, a nonprofit organization that supports ICT-usage among elderly Swedes. These interviews provided information about common problems seniors have with computers, tablets, smartphones, and so forth, and the questions they ask about them. This

information was used as inspiration in the construction of survey items and interview guides for the semistructured interviews.

Survey data were collected in the autumn of 2015. A simple random sample consisting of 2,000 individuals between the ages of 65 and 85¹ was drawn from the SPAR register (*Statens personadressregister*), which is administered by the Swedish Tax Authority and includes every resident living in Sweden. A postal questionnaire was distributed to these 2,000 individuals, who were given the option of responding either by mail or digitally (an option only 64 individuals took advantage of). A total of 1,264 questionnaires were returned, giving a gross response rate of 63%. Eighty percent of respondents (i.e., 1,011 individuals) reported access to digital devices. (The nonusers, the remaining 20%, representing 253 individuals, are not included in the analysis below.)

Overall, the representativeness of the sample in relation to the age group in question—65 to 85—is satisfactory and meets the standards usually accepted in Swedish surveys (cf. Bové, 2017). However, we identified a slight overrepresentation of women among respondents in the lower end of the age range and underrepresentation of both men and women with a medium level of education (see the Appendix).

Between March 2015 and June 2017, semistructured interviews were conducted. The interviews mainly took place in the participants' homes, most often at their kitchen tables, but occasionally in other, more public venues. In our selection of interviewees (snowball selection), the ambition was to obtain variation in age, income, education, civil status, and residence. Thus, couples as well as singles were interviewed, elderly in both rural and urban areas, elderly with shorter formal education and elderly academics, and newly retired persons and “experienced” pensioners. We note that all interviewees were in good health: They lived in their own homes and managed everyday life without the assistance of home care and similar services.

Altogether, 18 individuals (9 men and 9 women) were interviewed for 60 to 90 minutes. In six cases, couples were interviewed together. The interviews were recorded on smartphones—which sometimes served to enrich the interviews with discussions about the device's many capabilities—and then transcribed verbatim. All interviews were conducted in Swedish by Swedish interviewers. The quotes in English in this paper have been translated from Swedish by the researchers. Only comments that were obviously digressions have been left out. The shortest transcriptions were 9,000 words, the longest about 15,000.

The interview guide was informed by Selwyn's (2004) thinking about technological histories. Thus, the interviewees were asked to talk about when they first handled computers and digital technology. Most of them mentioned experiences from their working life, although they also clearly remembered their first cell phone, home computer, and so forth.

The interviews also covered respondents' broader media repertoires, as well as their online repertoires. Discussions focused on devices that the interviewees have access to and use in their everyday lives. These topics more or less naturally raised the issue of the presence and/or absence of warm experts and their roles.

The analysis, which was conducted manually, started with careful readings of the transcriptions. The next round of readings served to identify the presence and absence of warm experts. The extracts on warm experts were then coded in light of the theoretical notion of domestication, more specifically by help of the subconcepts appropriation, objectification, incorporation, and conversion. This phase of analysis revealed that the interview data was not

very thick regarding objectification and conversion, but very rich regarding both appropriation and incorporation. Hence, the article focuses on these first two processes. Overall, the analytical procedures are in line with Willis and Trondman's (2000) ideas about theoretically informed analysis, as well as John B. Thompson's (1990) methodology of interpretation.

RESULTS

Who are the Warm Experts and Why are They Needed?

The tasks for which warm experts are enlisted can, of course, vary greatly. Table 1 lists some of the technical problems that the users experienced more or less often and that might generate a need for assistance and help.

The critical reader could question whether the data in Table 1 says anything substantial about the frequency and types of technical problems that elderly users actually face. First, the scales are relative: "Often" for one person could mean "rarely" for another, and vice versa. In hindsight the wording in the survey items was rather vague, clearly not in accord with professional terminology. For instance, the phrase "the computer feels sluggish" could mean just about anything. Nevertheless, 39% of respondents agreed that their computer often or quite often feels sluggish, while 82% (39% + 43%) said that this happens sometimes (albeit rarely, according to 43%). Similarly, 71% said they have experienced network malfunctions, 70% browser malfunctions, and so on.

Even if these figures only approximately inform about the exact nature of technical problems experienced by elderly users, the data taken together reveal that, for many of them, dealing with digital media is associated with obvious practical difficulties. By comparison, if elderly people were asked about other kinds of home technology—for instance, their washing machines or radios—would the results be similar? Most likely no, they would not: The "never" responses would be much higher. Notably, the number of people who answered "I don't know"

Table 1. Percentage of Perceived Frequency of Technical Problems from the Mailed Survey Respondents Who Used Technology ($n = 1,011$).

	Often, quite often	Rarely	Never	I don't Know	$n =$
Computer feels sluggish	39	43	11	7	966
Network malfunctions	13	59	14	14	942
Browser malfunctions	10	60	17	13	954
Computer turns itself off	5	40	47	8	953
Updates do not work	6	59	21	14	963
Cannot download app/program	6	46	21	27	949
Virus problems	3	46	41	10	965

Note. Question asked: "Sometimes technology does not work as it should. How often does the following occur? Very often, quite often, rarely, never or I don't know."

is rather high. In one case—downloading apps and programs—fully 27% responded so. This general uncertainty suggests that digital media are perceived as difficult and/or elusive.

Thus, the overall picture shows that the survey respondents are generally untutored and possess a rather limited technological literacy² and that they feel unsure and insecure about handling digital media. This, in turn, can at least partly explain the need for and role of warm experts—which 67% of respondents said they engage very or quite often.³

As in Table 1, the possible answers in Table 2 are expressed as a relative scale, which means that we know little about actual frequencies. However, we do get information about the perceived need for warm experts and are able to rank them in terms of importance. Looking at the first column, which includes all respondents, we see that respondents first and foremost rely on their social networks, particularly persons they are closely related to, for help and support. Children are the most frequently engaged as warm experts, followed by one's partner. In third and fourth place are a grandchild and friend, respectively. Professional supporters—that is, people who provide services that can be bought on the market—are at the bottom of the list. However, these are conventional experts rather than warm experts. Thus, Table 2 shows that elderly people are like most technology users in that they prefer warm experts—related persons—over professionals for assistance. Another important note is that 11% report they have no one to consult if problems occur.

The second column includes only couples with children and grandchildren, which essentially captures the subset of respondents that, at least theoretically, has options regarding who to ask for help. However, as the table shows, this does not change the preference ordering, although the status of friend is slightly weaker and the status of partner, children and grandchildren is slightly higher.

The third column, which is limited to singles without family, shows that singles must rely on friends—and 49% report that they do so. Nonetheless, they are no more willing to buy service on the market than couples are (cf. 11% and 9%). Among singles, 29% have nobody to ask for help. This finding is in line with both Lüders and Gjevjon (2017), who argued that a richer social life increases the likelihood that one is in favor of warm experts, and Olsson et al.

Table 2. Percentage of Reported Technological Support from Warm Experts and Professionals by the Respondents of the Mail Survey ($n = 1,011$).

	All		Couple with Children and Grandchildren		Single Without Children	
	%	<i>n</i>	%	<i>n</i>	%	<i>n</i>
Child	52	899	55	617	—	—
Partner	30	802	36	562	—	—
Grandchild	23	813	26	561	—	—
Friend	21	789	17	526	49	37
Professional support	10	821	9	561	11	28
No one to ask	11	747	9	516	29	18

Note. Question asked: “When you have problems with your digital devices, who do you ask? Very often, quite often, rarely, never.” The figures in Table 2 present the responses of “very often” and “quite often.”

(2018, 2019), who argued that social networks are crucial for the elderly's access to digital media and the range of their online repertoires.

In summary, the respondents generally associated digital media with practical difficulties and insecurity, and thus felt in need of assistance. For this, they turned to warm experts rather than professional ones. In the overall picture regarding choice of warm experts, the respondents preferred to involve their children, followed by their partner. Their third-place preference is their grandchildren, and in fourth place are friends.

At least some readers might regard the findings reported thus far to be more or less self-evident. The elderly are almost routinely regarded as late adopters and novice users, and for that simple reason they need assistance. In fact, however, this is not true. Our survey results indicate that 74% of the respondents in the sample have been online since 2005—a decade or longer.⁴ In that sense, the vast majority of respondents represents experienced users, not inexperienced ones (cf. Bakardjieva, 2005). Nonetheless, they still need warm experts, which raises the overarching question for the next section: What do they need them for?

Warm Experts for Appropriation

The conventional understanding of the appropriation of digital media more or less presupposes an individual household that, for its own sake, recognizes an object of desire (Silverstone & Hirsch, 1992) and eventually acquires the artifact in question. However, this is not the only way it can occur. As will be shown, grown children might identify for their parent(s) a need for the object and its potential benefits.

Britt, 74, is a widow and lives alone. When her laptop—which her son once helped her buy second-hand—started to become outdated and unmanageable, her daughter acted and bought her a tablet: *“I actually got, from my daughter, this tablet for Christmas, 2 or 3 years ago.”* At the time, Britt had limited knowledge of the different options offered by the devices on the market. In practice, her daughter made the decision for her. As it turned out, the choice was to Britt's satisfaction: *“I think it works great.”*

As this example illustrates, warm experts are more than support technicians who solve problems of a technical nature, which Table 1 might suggest. Rather, they also function as initiators and advocates for new ICTs. Bengt, 75, and Inga's, 70, explanation of how they got a tablet and their cell phones is a good illustration:

Interviewer: *How did you get the idea of the tablet?*

Inga: *Well, it was probably Mia [daughter] who thought I might be needing one. I was retired, I think, something like that, and she thought that it could be useful for me.*

Bengt [husband]: *And you said, “No, why should I have one?” ...*

Inga: *It was the same thing with our cell phones, in the beginning. It was also our children who pushed us and said that, ‘Of course you should have a cell phone when you're out driving and things like that.’”*

Eva, 77, who is a widow, gets new smartphones regularly. She reported, *“I have a phone, like that one [smartphone]; I haven't bought any for myself ... Sara [daughter] buys new ones quite often. Then I get her [old one].”*

The younger generation, represented by the children, has already passed all the phases of the domestication process. From there, they go on to identify needs—sometimes latent or

potential needs—for their parents (cf. Östlund, 2011). In that sense, the parents are passive. The younger generation provides the devices yet understands that they cannot just hand them over without installing and adjusting them so they are usable. Thus, in a sensitive way, they make the devices meaningful in the context of their parents' everyday lives (Oreglia & Ling, 2018).

Downloading and installing different kinds of software can be understood in a similar way. The warm expert identifies a need and then acts on his or her "client's" behalf. For instance, Bo, 71, has a huge interest in sports and therefore uses an app for football and ice hockey results. He stated, *"Yes, I have it on the phone.... It was Simon who added it—my grandson."*

Britt's daughter not only bought her a tablet for Christmas, as mentioned above, she also set it up so it was ready to use. She prepared it technically by connecting it to a Wi-Fi network, and she set it up "repertoire-wise" by installing apps for bank ID, Blocket (a Swedish site similar to eBay), e-mail, SvtPlay (a streaming public service TV), online magazines that Britt regularly reads as well as an app for weather forecasts. These pleased Britt, who said, *"It is Christina who has installed all this. She did it almost immediately when we got it."*

Britt's daughter was familiar with her mother's main interests and off-line media repertoire, so she downloaded and set up relevant apps and taught her mother how they worked. In that sense, her daughter successfully helped bringing the tablet into Britt's everyday life and routines. In other words, she helped make them meaningful.

Warm Experts in Incorporation

Our interviews indicate that one of the everyday challenges with digital media experienced by the elderly is that media tend to need continuous support and adjustment. Only in marketing communication are everyday technologies like computers, tablets, smartphones, and so on, really "plug-and-play" (i.e., devices that a consumer can just plug in and start using, and that continue functioning properly until they simply wear out). In real life, digital media do not work like this. As our survey data have already revealed, ICTs actually create a fair number of everyday problems that need to be solved.

The previous subsection presented how the very acquisition of technology was supported by warm experts, who also play an important role in helping elderly users to start making use of their new digital devices. Beyond this, the incorporation of ICTs into everyday life tends to demand continuous efforts, both from users themselves and from warm experts. The list of things that users (or their warm experts) need to attend to in order to ensure that digital media continue to function properly includes installation of new hardware (e.g., installing a new printer), software updates (e.g., renewing an antivirus program), and updating applications (e.g., reinstalling a digital ID).

In addition to these more technologically-oriented tasks, the elderly need to continually learn new things as new services and applications develop. For instance, Ove, 71, and Siv, 67, wanted to sell their old gadgets on Blocket, an online consumer-to-consumer sales site. According to Ove, *"We got some help in the beginning, but then I did it myself."* He managed to photograph the objects, write the copy, and upload the ad. *"I sold everything, goddammit!"*

The extent to which the need to continually update digital devices creates problems for our interviewees varies greatly. Some users have a low level of technological literacy and limited online repertoires, while others are more literate and broader in their usage. Regardless of the magnitude of their repertoire and literacy, however, users emphasized the

importance of having warm experts in their social networks. Sooner or later, and more or less often, everyone seemed to require a helping hand.

Some of the interviewees found that they were capable of taking care of the continuous updates on their own, at least as a couple. For instance, overall, Inger and Karl, both 68 years old, seemed satisfied with and confident about the devices they own: smartphones, tablets, and laptops. Problems rarely occur for them, and they can solve most of those that do, either individually or by working together. Inger and her husband offered a quite telling example.

Interviewer: If you get problems, what do you do?

Inger: We solve them ourselves, most of the time. But then, sometimes things happen that are a bit trickier, and you have to ask the children.... But if it's something more specific, that we find really hard, we can always ask them. But it isn't very often, not really, no.

Inger and her husband live in a prosperous area of Sweden and have retired rather recently. They now spend a lot of time with friends and on various leisure activities. Both had occupations that brought them into contact with computers and mobile phones during their working lives. Hence, they developed a great deal of knowledge about how to use them and possible ways of solving a variety of typical problems—so they do not encounter too many problems in digitalized everyday life. Nevertheless, they occasionally need a helping hand; in such situations, they are fortunate to have their grown children living nearby who can help them.

While Inger and her husband are rather independent as a couple, other interviewees needed support from their warm experts more often. Among several of our respondents, the children—who often acted as initiators of the acquisition of a smartphone, tablet, or computer—also became the preferred helping hand for all kinds of ICT problems. They remain important as warm experts in helping maintain their parents' ICT-skills.

In Bo, 71, and Maj's, 68, case, the children in general, and their son John in particular, remain very important in their roles as warm experts, even after the appropriation of new ICTs. Their son lives nearby and can help them rather easily, and Bo and Maj do not hesitate to ask him for advice and concrete support. They see his role as their warm expert as part of a reciprocal exchange of services—they help him (and have helped him) with other things. John's role as warm expert has become part of a social exchange of services between the grown children and their elderly parents. The exchange makes it possible for Bo and Maj to maintain their level of online connectivity.

Interviewer: If things don't work, who do you ask?

Bo: John [son], he lives in the neighborhood.

Interviewer: He is your unpaid IT-support?

Maj: One could say that, yes.

Bo: Well, we have done a lot of unpaid work for them [their three children].... I think it was last week: I couldn't send any emails or whatever it was.

Interviewer: And he [John] could take a look at it?

Bo: He fixed it.

Maj: Yes.

Bo: But what he actually did, only the devil knows. But it worked, anyway.

Maj: It's easier if they [the children] can come and have a look at it.

Bo: If you have a good relationship with your children, you know, and all the carpentry I have done for them

However, our quantitative data reveal that not all elderly users have grown children who act as warm experts. Some elderly have no children, or their children do not live nearby. Some interviewees in this situation looked for warm experts elsewhere within their social network, for instance among their neighbors. Lars, 70, and his wife, Sara, 68, live in a village in southern Sweden. Lars has a degree from the prestigious KTH Royal Institute of Technology in Stockholm and is a well-educated and experienced user who helps others—that is, takes on the role of warm expert—more often than others help him. Among his group of close friends, he is often the one that people contact to get help with their digital devices. Lars is generally very interested and knows a lot about ICTs. Nevertheless, even Lars might occasionally need somebody to help him:

Lars: I have one, just across the street, who's a real expert, you know.

Interviewer: In what way?

Lars: Regarding computers and how computers work. He's an old IBM person who has run a computer consulting business half his life. So, if you want real help, you go to him. It's a totally different level.

In summary, warm experts are important, regardless of an individual's skill level and technical literacy. Lasting relationships with warm experts provide stability in daily use—technical difficulties can be solved and new things learned. In addition, they contribute to a feeling of safety. This becomes even more obvious when we analyzed what an absence of warm experts can mean.

Lack of Warm Experts

Saga, 84, a widow and retired nurse who runs a small chiropody firm, is an illuminating example of what a lack of warm experts can entail. Saga has a great interest in digital media. As far back as the early 1960s, she worked with computers in a Swedish department store chain, and in the 1980s, as a nurse, she handled digital medical records.

When her husband was still alive, they had a rather broad online repertoire. For instance, they used Skype, in particular, to communicate with their many friends abroad.

Saga: You see, my husband connected it. We have old friends in Frankfurt.... And I said, "You must have Skype, you see." And it was really fun. But later, when my husband passed away, well, I hadn't learned it.... I don't know when you call.... How should I know that you Skyped me? Or how it can reach my computer. I don't know it.

The difficulties do not stop there. Saga described a situation characterized by aging hardware and software and a decreasing online repertoire, a consequence of the absence of competent warm experts who can introduce new products, perform installations, and provide support. Her children live far away, and in the village where Saga lives—which has only 600 inhabitants—she has not, despite her efforts, been able to develop a relationship with a reliable person who can be her warm expert.

An acquaintance that Saga sought help from accidentally erased music and genealogical data from her hard drive, something that greatly disappointed her: “A *bright idiot*,” she called him. Another person, Mikael, provided some assistance, but Saga called him an “*amateur*.”

Interviewer: *What do you do when you need help? Do you have your children nearby?*

Saga: *One is in Stockholm, one is at sea and lives in Viken, close to Helsingborg. And then I have one in Öland and one down here, what's the name, Norje, yes. It is in the neighborhood of Sölvesborg....*

But I have a guy, though he's an amateur. But I, I'm probably [not] “world champion” in computers—I have realized that. I sat at the computer and tinkered and was [trying] to turn it on. And all icons disappeared! I just sat there and stared at a black screen.

Now, I have torn off three icons, and I don't know how to get them back. I don't know, no, no. It's hopeless. Yes, Mikael, maybe he can help me: He put them there. No, I get mad at this. I'm afraid of pushing the buttons. And the new keyboard that I bought, the keys stick. It has become a mess. I'm very annoyed at that.

Saga's children live far away. The closest is more than 100 km away; visits are rare and irregular. Despite her attempts, Saga has trouble finding a warm expert, a person with sufficient technical literacy and sensitivity in relation to her needs and preferences. Mikael has helped her by installing icons, but Saga obviously needs more training and assistance to be able to handle them. Finally, the newly-purchased keyboard does not work as she had hoped. Without knowledge about the devices she already has—brand, model, and so on—it is not easy to purchase compatible components. Also, even if components are appropriate, they must be installed and adjusted correctly, as well as explained and contextualized (Oreglia & Ling, 2018).

In short, Saga had been a quite satisfied and regular user of ICTs, but since her husband's death, she has been unable engage a warm expert. Her online repertoire is therefore in decline. Unfortunately, there is a risk that, over time, Saga might become one of Sweden's over 400,000 elderly nonusers of technology (cf. Olsson et al., 2019).

Occasionally, interviewees expressed their thoughts about aging and what it might lead to—even those who have a completely satisfactory social and economic situation, including people who act as warm experts. During a long career working in the field of social insurance, Siv (age 72) came into contact with many vulnerable people. These experiences lead her to reflect about older and lonely people, as well as her own situation, in relation to digital media:

Siv: *What's the help for them to get? That's what you think about then. It is with some mixed emotions that you look to the future. If technology is going to rush on, as it does today, and it does seem to continue to do so, it is important to keep up with it.*

Warm experts are crucial for many of the interviewees and important for all of them. For users with limited skills, the absence of warm experts can be almost devastating, as in Saga's case. But even for those in more favorable situations—people who might manage fairly well without them—warm experts play vital roles in their everyday life with digital media.

DISCUSSION

As we noted in the beginning of this article, research generally views domestication as a process with four phases (Haddon, 2016): appropriation, objectification, incorporation, and

conversion. In order to understand the role and identity of contemporary warm experts, and based on the findings from our data, two of these appear to be of particular relevance, namely, appropriation and incorporation.

Appropriation directs attention towards the early stages of domestication, stages at which a new ICT is about to enter the household, but also the initial phase after its entrance. Our data generally, and the interview data specifically, reveal the importance of warm experts in elderly users' appropriation. The warm experts, typically a son or daughter (sometimes a grandchild) help identify potential ICT needs that the parents might have. While doing so, they also help identify potential areas of usage. They initiate discussions about ICT with their elderly parents, arguing for its usability and explaining opportunities for acquiring it. Subsequently, they often are involved in the acquisition of the ICT, for instance, buying it as a gift for their parents or offering to give them their own, previously-used equipment. Once they have helped with the acquisition of an ICT, they become involved in setting it up. For example, they connect it to the Internet and install necessary software and useful applications.

These tasks are not, in themselves, technologically advanced: Most average users would be able to perform them. However, as regards the importance of knowledge about the elderly users themselves, the tasks performed by the warm expert are indeed complex. These tasks demand concrete insight into the elderly users' personal interests and demands. They require knowledge about the elderly users' established repertoires of media usage (Hasebrink & Domeyer, 2012; Hasebrink & Popp, 2006; Olsson et al., 2018) and their everyday lives more generally. In addition to these rather concrete insights about elderly users' lives, allowing another person to become involved in these processes presupposes the existence of a high degree of trust. In other words, to be able to function as champions for new ICTs vis-à-vis elderly users, it seems necessary that the experts are close and highly trusted partners in a joint effort to domesticate new ICTs.

The warm experts are also needed at the incorporation stage, when the new ICT is becoming part of the elderly user's everyday routines. They are needed for continuous support—updates, installations, reinstallations (e.g., Bank ID, antivirus programs, etc.). They also play an important role in suggesting and concretely pointing toward possible new areas of usage. Even these types of support require a level of trust between users and warm experts. As a result, this is not the kind of help that just anyone can provide. Furthermore, these efforts also seem to demand geographical proximity and accessibility. Our interviews reveal that these tasks are mostly undertaken by a relative who lives nearby—a son, daughter, or grandchild who can come on a short notice. The preferred way to provide such support appears to be face-to-face, one-on-one instruction. In essence, these services have the character of a family affair.

CONCLUSIONS

The need for and existence of warm experts highlights the fact that digital media are considerably different from older, previously domesticated media technology such as the telephone, radio, and television. None of these required continuous assistance and support of the kind and level that is characteristic of new ICT devices. For this reason, their users were not equally dependent on access to social networks.

In the 1980s, during the early days of home computing, Murdock et al. (1992, p. 150) underlined “the centrality of networks” and pointed out that “contacts can play an important role in providing back-up support at key moments.” A little more than a decade later, Bakardjieva (2005) reaffirmed the importance of social networks and even created a new concept: the warm expert, who “mediates between the technological universal and the concrete situation, needs and background of the novice user with whom he is in a close personal relationship” (Bakardjieva, 2005, p. 99).

Maybe the underlying assumptions in Murdock et al. (1992) and Bakardjieva (2005) supposed that the conditions they analyzed were likely to be temporary and transient insofar as the technology they analyzed was rather new. However, a decade or two later, our survey and interview data support the conclusion that digital media remain difficult to handle, even if the users had been engaging the technology for many years. In fact, contemporary technologies might be perceived to be even more difficult to handle, in that the digital media environment persists in a state of constant change. This change includes new devices, new software and, not the least, the expectation to become involved in a large variety of digital services, commercial as well as public ones. As a consequence, the warm expert remains needed and plays a pivotal role, at least in the everyday digital media lives of elderly people. Moreover, based on the data presented in this paper, we dare to claim that, a decade from now, the warm expert will still be playing an important role.

IMPLICATIONS FOR RESEARCH, APPLICATION, OR POLICY

Our research confirms that elderly users, even some with prior experience in technology, are forced to rely on others—here named warm experts—in order to take on, manage, and use various ICTs. Therefore, the plans made by governments to widely implement technologies as a way to work easier and to enhance health and public services may be overly optimistic and also hasty. Despite the good intention to make various services and information more available, digitalizing them might actually make them less available for elderly people. This is particularly true because some elderly do not have access to warm experts to help them out in their everyday encounters with ICTs. Decisions by policy makers to emphasize online services could negatively impact elderly users from accessing needed services as well as their participation in society more generally.

ENDNOTES

1. The upper limit of the interval, 85 years, has practical reasons and is motivated by the fact that response rate decreases with increasing age. Until 2000, 80 years was the standard upper limit in Swedish postal surveys. However, with a higher average life expectancy, it has been adjusted to 85 Bové (2017, p. 622).
2. This is supported also by the fact that 38% ($n = 358$) of the responding users reported they do not know what it means “to clear the cache memory” and 25% ($n = 238$) do not know what “clearing browse history” is. See also Tables 6, 7, & 8 in Olsson et al. (2019).

3. The figure 67% ($n = 695$) is calculated by filtering out—that is, subtracting—users who report they rarely or never consult a warm expert (i.e., child, partner, etc.). If professional experts are included, the figure rises to 70% ($n = 716$).
4. Survey question: “When did you start using the Internet?” ($n = 947$).

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Appendix

Table A1. Age and Gender Distribution and Educational Level in Sample and Swedish Population (percentage).

		Men		Women	
		Survey Respondents	Swedish Cohort	Survey Respondents	Swedish Cohort
Age	65-60	42	45	39	43
	71-75	28	27	27	30
	76-80	18	17	19	16
	81-85	12	11	15	11
Education	Low (Compulsory)	38	48	35	35
	Medium (Vocational, folk high school, etc.)	23	12	34	12
	High (Upper secondary & higher)	39	39	39	39

Note. Age and gender distribution and educational level in the sample are compared with data describing the whole population of Swedes between 65 and 85 years. Downloaded from Statistics Sweden 2016. The sample includes one woman aged 64, who is included in the age group 65-70.

“I USE IT CORRECTLY!”: THE USE OF ICTs AMONG ITALIAN GRANDMOTHERS IN A GENERATIONAL PERSPECTIVE

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Abstract: *In this project, we investigated the role played by digital media and information and communication technologies (ICTs) in building intergenerational and intragenerational relations for grandparents. Specifically, we investigated the possible relationships between grandmothers, children, and grandchildren, with the aim of understanding the dynamics of intergenerational exchanges and how grandmothers experience the use of the Internet as a tool to facilitate communication with family members. The research shows that the reflections regarding the role of the Internet among elderly people are often linked to a generational identity and generational belonging and involve constant comparison with younger generations. Several grandmothers affirm their correct use of technology (in a wise and moderate way) in contrast with what they see as the antisocial and immoderate modes of its use by the younger generations.*

Keywords: *the elderly, ICTs, generations, grandmothers, family.*



INTRODUCTION

Family relations and intergenerational communication within the family have a great impact on the appropriation of information and communication technologies (ICTs) among the elderly, especially grandmothers (Ivan & Hebblethwaite, 2016). On one hand, the possibility of keeping in touch with family members, especially the younger ones, is perceived by the elderly as a major benefit of going online (Selwyn, Gorard, Furlong, & Madden, 2003). On the other, ICTs often enter grandmothers' lives due to family pressure for safety reasons, that is, as a way of checking up on grandmothers' activities (Quan-Haase, Martin, & Schreurs, 2016; Sawchuk & Crow, 2012). In both cases, learning to use ICTs is perceived by the elderly as convenient, or even as a social duty, for communicating efficiently within their family setting (Carlo & Rebelo, 2018). Intergenerational relations thus seem to be a main reason for the elderly to start and continue going online, resulting in strengthened intergenerational relations (Colombo, Aroldi, & Carlo, 2015; Fernández-Ardèvol, Sawchuk, & Grenier, 2017). At the same time, the elderly also use ICTs for entertainment, information, and to communicate with their friends in an intragenerational perspective (Nimrod, 2014).

Using ICTs for both intergenerational and intragenerational relations also allows the elderly the opportunity to reflect on the differences between their own use of the Internet and that of the younger generations (Carlo & Rebelo, 2018). Therefore, as regards the elderly, mindfulness about digital media use is accompanied by a typical concern in old age today. They tend to question both the social role of their age (especially for the old-elderly, those more than 75 years old; Augé, 2014; Salzberger-Wittenberg, 2013; Zagrebelsky, 2016) and the aging of themselves and of their generation (especially for the young elderly, 65-74 years old).

In the Italian case, speaking about the digital elderly means taking into account a distinctive slice of the population. People over 65 using ICTs are a minority characterized by a stable economic and employment situation, a higher level of education, a satisfying relational context, and good levels of physical activity (Colombo et al., 2015). The progressive digital access of older Italians reveals a classic dynamic of the digital divide, influenced by socioeconomic dimensions (Loges & Jung, 2001; Van Dijk, 2005). In segments with limited digital access, such as the elderly Italian population, wealthier elders with greater cultural and social capital, who started to use computers during their qualified working career, are characterized by increased possession and use of ICTs (Colombo et al., 2015).¹

The relevance of inter- and intragenerational relational use of ICTs by the elderly and the distinctive characteristics of the senior ICT users are key elements leading beyond the notions of the age group as an independent variable shaping the uses of ICTs to a more complex notion of "generation." The word generation has been defined as "an age cohort that comes to have social significance by virtue of constituting itself as a cultural identity" (Edmunds & Turner, 2002, p. 7). In a generation, the biographical traits coexist alongside historical and cultural ones, with membership of an age group being associated with specific historical experiences, the development of distinctive consumption patterns, or the occupation of certain positions in the family chain (Colombo, Carlo, & Aroldi, 2014). Such a multidimensional category appears particularly useful for studying users who cannot be reduced to either individual sociodemographic traits (such as age, gender, education, job position) or to corresponding life styles (such as those codified by marketing). Rather, they have to be closely and simultaneously related to a number of factors. These factors are stage

of life, “technobiography,”² family and friendship networks, common values shared with other members of the same generation (Corsten, 1999; Edmunds & Turner, 2002), historical development of media systems, steps in technological innovation, as well as the wider structural changes affecting the social and cultural system (Bolin, 2017).

From a historical point of view, people over 65 years old today belong (at least in Italy, but more generally in Europe) to two different generations. The first was born immediately before or during the Second World War, and then participated in the prolonged reconstruction that took place throughout the 1950s; the second was born in the postwar period, experienced the birth of youth as a sociological category, and was the protagonist of the youth movements of the 1960s.

This second now-elderly generation, in particular, has been studied extensively and has served as a matrix for the most recent studies of generations. It has been called the “Postwar Generation” (Colombo, Carlo, & Aroldi, 2014), has been depicted as an active generation (Edmunds & Turner, 2002) and characterized by some unique features. It was the first generation to embody youth as a cultural and social group, with its own habits, tastes, and values (the first of all values being forever young) that differed from those of the adults (Savage, 2007). It was a global generation, largely spread worldwide. It showed a global consciousness, “demonstrated by the domino effect of the social protests and the extent of cross-national activism” (Edmunds & Turner, 2002, p. 565), sustained by a global media system that broadcast the same music, images, fictions, and values. It was also a strong generation that earned agency and proved willing to take history upon its shoulders (Colombo, 2011).

However, it must be recognized that the two older generations today have more points of contact than they had in the past. Both generations are characterized by having experienced the advent of great technological innovations during their childhood and youth. Regarding the people from the wartime generation, these innovations were the first home appliances, the first mass-produced motorcycles and cars, and then television. Turning to people from the postwar generation, the innovations included television, mobile equipment (radios and record players), CDs, and the first electronic games and computers.

Furthermore, both these generations have aged in a very different way from previous generations, thanks to longer life expectancies generated by better health conditions and care, diffused prosperity, and a more active social representation in the third (and fourth) age.³ Participation in the network society through an intense and appropriate use of ICTs is a relevant part of this new way of aging.

These generational attitudes are reflected in the use of ICTs, which often are seen as tools that need to be continually updated with the technological and social changes and with new digital skills. These attitudes drive people in this age group—together with other behaviors—to show they are still active and involved in social life, open to even the latest digital innovations as they were to the first technological revolutions. This means that the generational history of technological use had a real relevance in the processes of literacy in the older generations’ youth, and this remains true of their contemporary encounters with computers and digital devices. Members of the postwar generation in particular used these during their professional lives. They are people who became familiar with digital technologies during their careers, onwards from the late 1990s, at the height of the great wave of digitalization of Italian society.⁴

However the use of ICTs by the older generations also reveals other particular characteristics. The first one, which forms the background to our contribution, is the marked difference in use in terms of gender. This characteristic may be surprising because these generations were pioneers in supporting women's emancipation. In particular, postwar women gradually left their roles as solely wives and mothers to experience also a life of work and public engagement. The question of ICTs and their use thus makes it possible to understand the difference of gender within a common generational belonging.

In fact, despite the generational emancipation of postwar women and their entering in the life of work in the last decades of 1900s, elderly women who today use ICTs regularly constitute a rather small homogeneous group, an elite in terms of economic, cultural, and social capital (Colombo et al., 2015). It comprises women who had professional experience during the first phase of computerization of Italian society. This enabled them to overcome the gender gap and make their generational attitudes prevail, while maintaining their gender specificity, especially in relationships with family members and their own friendship circles. In particular, the few grandmothers with digital skills see ICTs as an instrument for relationships with the younger generations (represented by their grandchildren).

As highlighted in our previous research, this aspect has been one of the objectives of the researchers involved in the project "Grannies on the Net" presented here. Its aim was to understand how grandmothers use Facebook and digital devices within family and friendship networks and their subjective—personal and generational—perception of ICTs and their use.

In relation to the use of ICTs by older people, many researchers focused on the "grey divide" (Duggan & Brenner, 2013; Morris & Brading, 2007), that is the digital divide affecting over-65s. Focusing often on the first-level divide (access and use), the grey divide has been conceptualized as a clear distinction between users and nonusers (Millward, 2003). It often has been investigated in terms of the sociodemographic variables capable of determining it (Friemel, 2016).

More recently, researchers have deconstructed this dichotomous vision that distinguished between users and nonusers, suggesting a more nuanced view of the specificity of the adoption of ICTs by the elderly and their digital skills. For example, Fernández-Ardèvol et al. (2017) recorded the daily communication practices of elderly supported by technologies. They distinguished different usage configurations that change over time depending on one's position in the course of life, according to the notion of technobiographies (Kennedy, 2003). Moreover, Quan-Haase, Williams, Kicevski, Elueze, and Wellman (2018) proposed a detailed clustering of the over-65 ICT users on the basis of the various digital practices. In this perspective, the scholars highlighted the subjective dimension of the elderly, with a focus on their self-perception as ICTs users.

An important part of this self-perception concerns not so much the use or not of ICTs but their "correct" use. In fact, despite the openness to technological innovation over the years, today's older generations sometime appear to be victims of normative attitudes about how they should use ICTs correctly. The elderly seem to be subjected to pressures toward digitization and connectivity by the younger generations (but also by institutions and the market), which often fail to take into account elderly subjectivity, their everyday use of text messages, and their relational contexts (Aroldi & Colombo, 2016; Sourbati, 2016). On one hand, the elderly learn the use of ICTs in the most mainstream way, often transmitted by the younger generations (represented by children and grandchildren). On the other hand, the

elderly often criticize such dominant uses and shape their use to suit their own needs and their standards of correctness or appropriateness (Carlo & Rebelo, 2018).

The proper use of a communicative technology can mean many different things. Some authors have discussed the implicitly normative dimension of platform affordances. When researchers use the term affordance, they refer to the actionable properties between an object and an actor (Gibson, 1977). As recalled by Costa (2018) recently, the concept “has been embraced by social scientists and media and communication scholars to describe the relationship between the properties of technologies and the structure of social relations, and to point out the technological qualities that are subsumed by users’ practices” (p.10). Thus, the use of the notion of affordance is justified by the intention to avoid technological determinism. However, an interpretation of the affordances of ICTs and, in particular, of the social network sites as intrinsic “properties and features of a technology that are separated from the social context and the work of human users” (Costa, 2018, p. 10) suggests that some online communication practices are actually more correct than others because they are more coherent with platform affordances. For example, Comunello, Mulargia, and Parisi (2016, p. 529) showed that users “attribute intrinsic characteristics to different platforms, and refer to act accordingly.” Moreover, the users described a “platform-sensitive approach as ‘proper,’ acting in response to nuanced representations of the peculiarities of different social media platforms” (p. 529).

Comunello, Fernández-Ardèvol, Mulargia, and Belotti (2017) also emphasized the power and prejudices of the social discourse concerning ICTs, capable of accrediting some social uses with greater force than others and facilitating the dissemination of some particular social practices and the related netiquette. Therefore the stereotypes contained in the social discourses on ICTs are seen as capable of reinforcing digital inequalities because they are

inaccurate and biased beliefs about alleged uses of the devices that tend to homogenize and stigmatize specific social groups about their ICTs usages.... This is particularly evident when digital inequality varies according to age and gender, as these factors are two pivotal axes articulating ICT-related power relationships in life nowadays and influencing even the devices’ design and other technical features. (Comunello et al., 2017, p. 800)

A particular meaning of correct use is related to digital literacy, the physical ability of the elderly, and the usability of the interfaces (Bol et al., 2014). The focus shifts to confidence in the elderly’s digital skills compared to the complexity of technologies and the fear of making mistakes in their use. Recently, researchers have taken into consideration this subjective dimension. For example, Quan-Haase et al. (2018) built their typology of elderly users on the basis of two parameters: the self-perception of their digital skills and the number of online activities. The types proposed include, among others, reluctant users, apprehensive users, and savvy users, with each group being characterized by a specific self-assessment of the adequacy of its use of ICTs, especially when compared to that of younger generations. Older users are afraid of incurring different forms of wrong use (e.g., lack of digital skills, anxiety of wasting their time, fear of breaking the computer).

Fernandez-Ardevol et al. (2017) made explicit the normative dimension present in many social discourses about the digital access of the elderly, including scientific research. Fernandez-Ardevol et al. stated that “research on older users often contains normative

injunctions on ‘appropriate use’ that tend to equate non-use with a series of problems that digital technology could solve” (2017, p. 41). Overcoming the concept of the right or wrong way to use media technology, Fernandez-Ardevol et al. (2017) gave voice to the subjectivity of elderly users about how they use “a medley of devices to maintain, filter or cut their connection to the world” (p. 39). It emerged that what the elderly think is an appropriate use of a particular media contributes to shaping specific communication practices. In these approaches, the correct use is configured as a use that responds to the personal and contextual characteristics and needs of the users, respecting the preeminent and relevant values (Ivan & Hebblethwaite, 2016), also in their generational identity. For example, Ivan and Hebblethwaite (2016) showed that the use of Facebook by grandmothers is influenced by social standards regarding privacy and decency. Their concerns regard “what information they perceived to be ‘decent’ or ‘appropriate’ to share in a public forum” (p.8), “how others would judge what grandmothers shared on Facebook,” and “about teaching their grandchildren about these norms of decency and privacy” (p.19).

Starting from this scenario—one that considers users in the context of their generation and asks them to reflect on their online experience, in both intra- and intergenerational relationships—our research questions are

RQ1: What is the subjective experience of grandmothers with ICTs, where those inter-and intra-generational relationships are facilitated by ICTs?

RQ2: How do elderly people understand the “correct” use of ICTs and their own use of ICTs compared with ICTs use of other generations?

METHOD

We grounded the article in data collected in Italy as a part of an international research project titled *Grannies on the Net: Understanding the Role of Internet Communication Technologies (ICTs) in Family Relationships with Grandparents*.⁵ The main goal of this international project was to understand how grandmothers experience the use of the Internet as a tool to facilitate communication with family members and, at the same time, as a tool of communication, entertainment, and leisure activities with friends. We investigated how grandmothers learned to use ICTs, as well as their resistance to and difficulties in using them.

We collected data through four focus groups, each lasting approximately 2 hours and conducted in February and March 2017 in Milan, Italy. We recruited 28 Italian women, first via a snowball approach through acquaintances and then in collaboration with a local association of the elderly. In particular, in the process of finding and selecting possible participants, we culled participants from Milan’s University of the Third Age and a leisure association (attended not exclusively by the elderly) in a suburban neighborhood of Milan. We organized two focus groups in the University office and two others in the association’s office. We prepared the way for the focus group by a brief phone call between each elderly participant and one of the researchers. The aim of the call was to have prior knowledge of the grandmother and to check—through a closed questionnaire—her possession of the characteristics (age, family situation, computer skills) needed to participate in the focus group. The selection criteria were being 65 years old or older, a grandmother, and a frequent

user (at least twice a week) of at least one digital device from among the following: computer, laptop, tablet, and smartphone. The participants were born between 1936 and 1952 (average age was 72, minimum 65, maximum 81) and residents of Milan; the majority of participants declared they used either a desktop or laptop computer daily, as well as a smartphone. On the whole, the sample turned out to be very homogeneous, made up of well-educated middle- and middle-upper class women. Most of them were involved community activities in Milan.⁶ This peculiarity of the sample is not the result of a particular selection in the recruitment phase, during which no restriction was placed on socioeconomic or sociocultural status. Rather, the researchers considered the consequence of the spread of ICTs among older women in Italy that, as we have seen previously (Colombo et al., 2015), still tends to favor people with high economic, cultural, and social capital. Therefore the members of the focus group present characteristics that are consistent with the relatively small and privileged segment of older women ICTs users in Italy, and thus very relevant in order to understand their appropriation dynamics.

The use of the focus group method in this research allowed the researchers “to observe a large amount of interaction on a topic in a limited period of time” (Morgan, 1996, p. 8) and to experience the participants’ natural vocabulary on the topic. Interaction, one of the most distinctive features of this method, is important as it leads to “a relatively spontaneous response” and produces a “fairly high level of participant involvement” (Morgan, 1996, p. 10). The “friendliness” of this methodology for its participants “who typically enjoy their interactions together” (Morgan, 1996, p. 18) also makes it particularly suitable for the participants’ age group. Moreover, the focus group method activates social interactions that accentuate the shared experiences and allows the mutual recognition among members of the same generation.

Each focus group was led by a pair of researchers, one in charge of moderating the discussion while the other made a videotape and took notes on the most significant discursive interactions. After the warm-up phase, the researcher investigated the participants’ phase of learning to use ICTs, that is, understanding when and how the grandmothers learned to use ICTs and for which reasons. Then the researcher asked the participants to describe ICTs and their risks and benefits in the users’ everyday lives. A second section focused on how they communicate with their families, compared with how they communicate with their friends and acquaintances, and the difficulties faced when using ICTs with these two different types of people. The final section encouraged the participants to declare what they would change about these technologies and what, as they understand it, is the “correct and appropriate use” of ICTs.

During the focus groups, information was collected about family relationships and individual memories, including very personal and familial situations for some interviewees (such as relationships with children and grandchildren). In addition, sociodemographic information was collected that revealed their opinions regarding the use of ICTs with the characteristics of the participants.⁷ All the material recorded in Italian was transcribed and translated into English by researchers in order to support a cross-cultural comparison of data in the framework of the international project. Finally, all the transcripts were analyzed using video writing programs to facilitate a qualitative thematic text analysis and the coding and comparison of data within the framework of the constant comparative method (Glaser & Strauss, 1967).

RESULTS

We present the main results of our research focusing on two main points. The first point is the analysis on how technologies are inserted into the personal stories/biographies of the elderly. The second point is the elderly grandmothers' reflections on the dimension of correctness and appropriateness in the use of ICTs

The Technobiographies of Elderly Women

A first set of accounts refers to the respondents' technobiographies, which highlight their learning processes and family role. Both motivations for and resistance to using digital media were involved in the gradual appropriation of ICTs by the grandmothers. In particular, the narrative produced by the grandmothers allowed us to understand their motivations to use ICTs in relation to their personal inclinations and the system of relationships to which they belong. During the interviews, the grandmothers recalled when and why they began to use ICTs, with a focus on the memorial and retrospective dimensions of their first steps in digital use.

Each grandmother interviewed had and used at least one device for digital communication (e.g., computer, laptop, tablet, smartphone). The interviews clearly revealed that often the digitalization process and ICTs usage was not a recent event in our respondents' lives. According to many of them, they learned how to use digital technologies some years before. In fact, the majority of our grandmothers were retired teachers or office workers. They first experienced the digitalization processes during the second half of the 1990s.

A significant number of these grandmothers learned to use computers (often self-taught) in their office work, giving the world of computing a value of primarily utility and not leisure. As a 71-year-old woman told us: *"I learned in the office. I worked for almost 35 years for an American company, then for a Japanese company. There was a computer in the office. I learned from there and then everything else followed from that."*⁸ Another informant said, *"I learned a little by myself and a bit because of courses for teachers available at school"* (66 y/o).

The education of children and the need to give them tools for school and homework were an additional incentive to understand information technology and the digital world. The computer often entered the grandmothers' homes when their children attended university or school. For some grandmothers, it was an opportunity to get closer to ICTs and the digital world: *"I started with the PC years ago out of curiosity, to help the children for school, and then later the smartphone came. I've always used the PC a lot"* (72 y/o).

In many cases, the interviewed grandmothers learned to use the computer alongside their school-age children. In some cases, the grandmothers taught the basics of computer usage to their little children: *"In fact, my daughter learned to use the PC with me. I introduced her to the PC. Now things are different. Maybe for a lot of functions, I have to ask her to help me"* (65 y/o).

Grandmothers who had owned a computer for many years still use it nowadays to do research or send emails. However, they acknowledged that they use it less than before, particularly since the arrival of smartphones and tablets and the beginning of a new era of digital media. In the last few years, the grandmothers had perceived that the real change has been the arrival of the Internet and the smartphone but especially computer usage in social relations and entertainment, not just for work and to help children with homework.

The first digitalization processes⁹ were restricted to work and children's education. During the second digital wave, characterized by the Internet and smartphone, the role of technology in the family became fundamental. The younger members of the family both supported and pressed the elderly to adopt new technologies, often providing the devices to their elderly members to help them keep in touch within the family. In some cases, the second wave triggered a reaction on the part of the elderly people, who wanted to demonstrate to their relatives they are still just as capable of learning and as competent as the younger members of their family.

For our participants, the motivations for starting to use ICTs in this second wave were both personal and relational. In the first case, the impulse was related to the notion of adequacy and the need for keeping up with the times. In the second one, motivations were linked to family pressures in order to be connected with and to be reached by other family members. This was particularly true when their children and grandchildren lived some distance away”.

As for the theme of the family's role in stimulating technologies, the possibilities and necessity to keep in touch with their children and grandchildren remained the initial incentive for adopting technologies. In the cases of later entry to the new digital world, this adoption was due to some precise and particular event in the grandmothers' family lives, typically when children or grandchildren moved away from home. This event made the adoption of the smartphone or the Internet connection urgent. One informant said,

I started 16 years ago when one of my children moved to the US. He gave us the PC so as to learn to stay in touch, and then we were committed to it. I did two little courses, though unfortunately they closed after a while, but that helped me. (76 y/o)

Familial relationships supported and stimulated the initial usage of the ICTs, but in some cases, it was not a serene relationship. The grandmothers perceived a sort of family pressure concerning the updating and learning of new digital services and devices: a commitment to keep up with the times but especially to be connected with the family network. One of our informants told us,

I always refused to use the iPhone. Then my children and husband almost forced me to, and since then, when I use the smartphone, I also use WhatsApp. It's quite handy. I don't really like telecommunications. But I use them because otherwise I would feel cut off from my family. (71 y/o)

The interviewed grandmothers considered the digital tools essential to maintaining intimate relationships with distant family members. This situation particularly applied to the grandmothers whose children and grandchildren live far away and who see the digital channels as tools capable of simulating the proximity and feel, albeit virtually, the pleasure of physical contact, and an intimate relationship with distant relatives. In particular, grandmothers found the digital tools enabled them to observe their grandchildren's growth from a distance, through pictures shared online.

I can see my granddaughter growing up. I actually see her two or three times a year when I go there, but I still feel really close. For me, it's thrilling every time, every Sunday. She can't talk yet but she is starting to play. It's just a joy. (66 y/o)

This dimension of subjective and relational motivation appears even stronger when the grandmothers reflected on the nature of the personal challenge that often framed the adoption of the technologies. According to some grandmothers, in particular the oldest ones, the adoption of digital technologies was recounted as a personal challenge in relation to their family and society in general; it was also a personal challenge to still feel active. As one informant said,

I always wanted to keep up with the times and, at some point, I decided to buy a smartphone. My son asked me what I wanted a smartphone for, but I'd decided to buy one. One reason was because, in everyday life, I saw everybody using the new technology, and I didn't want to be outdone, apart from the fundamental importance of always keeping in touch. (79 y/o)

For some grandmothers, learning to use the computer and other digital devices (especially through organized courses for the elderly) was an occasion to show their independence, modernity, and activity. Joining these courses offered an opportunity for the grandmothers to feel active and independent, a value also pointed toward husbands and children. One informant said, *"I've been a widow for 15 years. After a while, my children were grown up, and they didn't need me anymore. I subscribed to a course without having a computer, so I didn't learn anything until I inherited one"* (67 y/o).

This sense of a personal challenge produced positive results both in terms of self-satisfaction and inclusion within the family network. Many of the interviewed grandmothers described how often the basic stimulus impulse to use the new digital technologies came from children but rarely from grandchildren. This is true of the older grandmothers with adult grandchildren. In particular, the children saw the digital access of their elderly parents as an opportunity for their inclusion in the lives of their children and grandchildren: *"My daughter taught me to use all these things because I used to reject them. It was a way to bring me closer"* (71 y/o).

After the learning phase, it seemed the younger generation did not devote as much attention to answering grandmothers' additional doubts and questions. According to our participants, it seemed that the introduction to the new digital world happened mainly at restricted and unexpected moments, perhaps involving the present of a smartphone or the casual download of a new service, but it was not followed by day-by-day assistance. Numerous grandmothers expressed a certain difficulty in getting help from children and grandchildren. They described their grandchildren as very intelligent and clever but unwilling to help their grandmothers except when asked specific and often insistent questions. Their answers are often hasty and incomplete:

When children do take the time to teach, they're so fast. They don't understand that we may need to take note, and they should answer without hurrying. They're so quick on the uptake themselves, and they don't think that it's different for us. (76 y/o)

In particular, the grandmothers considered their grandchildren to be rushed and not able to explain the complex steps in ICTs usage attentively. The grandmothers stated they require a certain patience in teaching with respect for their learning processes and comprehension of the different literacy levels. These requests often fall on deaf ears. Several of the interviewed grandmothers realized, often with some frustration, that they could not always count on their children or grandchildren to assuage doubts about how to use computers and smartphones.

“My grandchildren didn’t help us understand how to use these devices better. So I stopped asking” (79 y/o).

It is interesting that the difficulties in technology use were not blamed on the technologies themselves, but rather on the generational limits of the family members in the specific familial learning environment. *“My grandchildren know how to do everything on a computer, and they wanted to teach me. They do everything and they expect me to understand, but they don’t help me” (72 y/o).*

This difficulty in receiving assistance is compensated for by seeking help from their husbands, from young people outside the family (often paying them for their services), who are considered more helpful and patient, or other more expert elderly people. One commented *“I don’t ask my children because they never explain anything. I prefer to go to the shop or to a friend who knows more than me” (73 y/o).*

The elderly informants considered the younger generation less able to understand the time it takes for elderly people to learn new digital technologies. To this generational problem, we can add another issue related to the familial dynamics. Children and grandchildren are often perceived as impatient when it comes to teaching.

Rather than the informal, disorganized, and often rushed instructions provided by children and grandchildren, several of the interviewed grandmothers seemed to prefer a more formal learning process, based on the teacher–learner relationship, in a classroom setting, with homework, a final examination, and the awarding of a certificate. Information technology courses organized by public or private bodies were appreciated by our participants for the instructors’ patience in teaching the use of computers and smartphones.

However, according to several grandmothers, learning by doing is still fundamental, supplemented by advice requested of people of their own age or their children. In particular, the grandmothers with a high degree of self-reliance attributed importance to learning by doing. They were aware of being able to learn by themselves, by going about it calmly without being bothered by the availability of others:

I’m self-taught. I’m stubborn and I try to work things out for myself. I’m also familiar with computers because I learned to use them long ago. I’m not afraid. Even if I make mistakes, I try to correct them by myself. (71 y/o)

It must be a generational problem because we have learned the use of certain tools in the last 10 years, limited to small things. I took two small courses and I use the technology, but I don’t know how to use it properly. (76 y/o)

The Correct Use of ICTs

Within the above framework, the issue of the proper use of ICTs stands out. According to the interviewed grandmothers, using ICTs rightly means never making mistakes due to lack of technical or digital skills. From this point of view, some of the respondents were more confident than others, but generally speaking, all of them seemed to know very well what they can and cannot do. Their accounts expressed a cautious attitude, concerned to avoid taking risks or causing damage, but this attitude did not lead to marked limitations on their use of ICTs. For example, most of them indicated they are more likely to use a prepaid card rather than a credit card when making purchases or bookings online, but not exclusively. They also used online

home banking. When they did not know how to do something, they were likely to ask someone for a help. Some of them were restrained from using the riskier online services—such as home banking—on the recommendations of their children, but most of them seemed to be able to do online exactly what they needed to do. In their words, the right use of technology sounds to them, first of all, like a fairly confident use, proportional to their (often limited) skills.

I find that computer writing is simpler. For me, it is more convenient to use a big keyboard and not risk making mistakes due to automatic correction as happens with the smartphone. And email allows you to think longer. It's a letter. (79 y/o)

In contrast with awareness of their limited technical skills, the interviewees often claimed they use ICTs more wisely than the younger generations. A clear distinction was made between digital skills and social competences involved in this use. While the elderly were seen to be lacking in the former, the younger were deficient in the latter. Young people's familiarity with digital media was thus perceived as a source of greater opportunities, especially material and practical ones; at the same time, however, it is perceived as a loss in human, cultural, and moral terms. Some of the grandmothers emphasized that the technical skills of the younger generation do not go hand in hand with a careful evaluation of the costs and benefits in the use of technologies. In particular, from the point of view of human relations, if the technologies offered young people notable advantages in daily and practical life, this help was not the same in terms of developing human relationships. This was encapsulated by one 76-year-old grandmother: *"In fact, the problem for young people is just this. They're interested, for example, in games, chatting with friends on Facebook Instagram. They're detached from reality. They have maybe 3,000 friends on Facebook and two friends nearby."*

The reflections the grandmothers made on the role of technology in everyday life clearly brought out the importance they attribute to comparing the different generations, old and young. Even more than cultural and social differences, characters and contexts, the seniors revealed that age is the most telling factor affecting the ways people use technologies.

Their generation and even more the next one are kind of superficial. I see my grandchildren who, although they still can't read, can use, decide, search. I also think that it's a matter of the generations. Young people are more skillful in using them but somewhat less prepared. (71 y/o)

Another told us:

Perhaps we come from a generation used to clear rules. I've often been over to my daughter's place recently and I've seen that all her friends live with their cell phones by their side. They talk and write at the same time; They send messages. We don't. For example, if we're at the [dinner] table, I might happen to get a phone call but I put away my smartphone. We enjoy the company. Now they're addicted to smartphones. (71 y/o)

In a more analytical way, different kinds of comparison were made. In quantitative terms, for example, the elderly criticized their younger relatives for their excessive use of ICTs. They see them both as a cause of their loss of human relations (as described above) and, in itself, like a kind of immoderate behavior:

I can notice it when my grandchildren come back to Italy for 2 months a year. When they come here, they chat with me a bit, and then they're always on the phone. Before, there used to be a chance to chat a little more. (76 y/o)

In reaction, our respondents were likely to criticize excessive use of ICTs, especially of chat sites and instant messaging (sometimes by their peers). What is intriguing in this attitude is a sort of intimate contrast between the personal standpoint and the reasons for being online or the rules of netiquette. The terms *limits* and *self-regulation* were often evoked as a solution to this contradiction:

When I receive too many [messages], I just delete them. There are contacts who even write these useless messages 10 or more times a day. The problem is that maybe in the middle of all of these there is an important message and it goes unnoticed. You have to regulate yourself. (66 y/o)

Sometimes the claim toward a more self-regulated use of smartphones and mobile devices was seen as a sort of distinctively personal behavior (in keeping with the meaning of distinction theorized by Bourdieu, 1979). According to the interviewed grandmothers, excessive use of ICTs means being a superficial person, deeply devoted to that kind of triviality. One commented, *"I even turn it off after a while. Otherwise even text messages and the most irrelevant things keep arriving, sometimes late at night. It's too much"* (65 y/o). Another said, *"I feel irritated whenever I pull out my cell phone. I feel I'm behaving like those empty young people"* (76 y/o).

Besides, in the words of our elderly respondents, the amount of time spent using ICTs is just the most evident indicator of their wrong use by younger people. They also went more deeply into the matter, making comparisons between being online and offline, which the excessive use of ICTs tends to blur. On the opposite side, the right use seemed to be the outcome of a complex trade-off between three different issues: the awareness of the netiquette of every single platform or device; striking a balance between being always online—in order to be easily reachable by children and grandchildren—and respect for their privacy; and the evaluation of the appropriate limits to be placed on sharing private and family contents.

The grandmothers involved in our focus groups were generally very conscious of the proper use of each platform or device. Most often, a sort of local suitability was at stake, as the result of a long negotiation between their family members (and sometimes their peers). And they indicated that they try to follow the common rules. *"I use voice messages a lot. My granddaughter wants a voice answer. She doesn't want me to answer her with a written message"* (68 y/o).

It is interesting to note how the grandmothers perceived strong differences in terms of correct use between the different services and platforms available. In other words, the different tones of a message, the identity of the interlocutor, the context, and the topic to be addressed called for different platforms and services, depending on the technical affordance but also a different netiquette. The grandmothers claimed that one has to follow a careful netiquette in deciding which technology to use and for what reason.

When my son wants to tell me important things, he sends me an e-mail because it is more serious. WhatsApp is also used for trivial things, like good morning messages and chain letters. So, for the most serious things, email is better. (66 y/o)

Let's say that SMS is more serious. You aren't playing; you're just sending a message. WhatsApp, on the other hand, is also very playful; it's fun. You can use emoticons. A voice message can express information or tell a joke. (71 y/o)

As a part of these common rules, the interviewed grandmothers often had to be easy to reach to enable their children to keep tabs on their health and safety or their grandchildren's, whenever they were being looked after by their grandmothers. *"During the day, to reassure her, I show my daughter-in-law that my granddaughter is eating or sleeping so she isn't anxious. If I don't send a picture or updates, she asks me how it's going" (66 y/o). "I call my daughter 'Mother Anxiety' because of these technologies and because they always have to communicate everything" (76 y/o).*

At the same time, the respondents seemed to be very proud of respecting the privacy of their children, unless in case of real need. But they also wanted to have the freedom to be disconnected. *"My sons are always busy and maybe they don't answer the phone, but I can always write them a message" (67 y/o). "Sometimes in the evening, I switch off my cell phone because I don't want to be dependent on it. Everyone knows that if they need anything, they can reach me on the landline" (71 y/o).*

But the issue our respondents were most sensitive to seems to be sharing. In their accounts, they hardly could understand the pressures of sharing private and family contents with other people. Once again, comparisons often were made between the different generations and their habits.

I personally don't feel like sharing what I'm doing with everybody. I only share with the people I want to share with. Even though I know that my daughter and my son are on Facebook and share photos with each other. I disagree and I don't do it. (71 y/o)

I think my children feel it is quite natural to post personal photos. They were born in a different age. We're more suspicious. (81 y/o)

As can be seen easily in the exchange between the participants quoted above, at stake here is not just the role of ICTs in everyday family life, but the more important distinction between the realms of direct and mediated experiences or between the close and intimate space of home and that of the social network. Overlapping the different realms or spaces can be, in their words, a source of personal frustration and family misunderstanding:

I belong to a generation that sees a phone call or personal meeting as more important when you have something to say or share, instead of sending a video or photo. I often wonder whether all these people who photograph and share everything in the end really enjoy everything they share. (71 y/o)

Being in touch and connected all the time also leads to lots of problems with others, the family. Even in young couples, it causes a lot of divorces, in my opinion. (70 y/o)

It is noteworthy that the whole issue of the right use of ICTs involves a generational discourse as well as a gender one. While the former is related to the family space, children, and grandchildren, the latter refers to husbands. From this point of view, our grandmothers often described their motivation in ICT use as a form of emancipation from their male family members and declared that they used ICTs more correctly than their husbands did. In the words of our respondents, learning to use ICTs properly opened up a space of independence for them,

with a new set of tools for making themselves more self-sufficient and a new field in which to demonstrate their skills.

I started taking a computer course 3 years ago and now from Internet I've passed to the smartphone. I did this because I wanted to escape from my husband, who's been staying at home all day for 17 years in retirement. Then everyone used computers and I never did, so I started and now I'm really satisfied. (67 y/o)

I think women always want to prove something to someone while men don't. If men aren't interested, they just give it up, while women suffer if this happens. (65 y/o)

Reference to a woman's husband sometimes revealed an unusual role reversal, especially when our respondents' husbands failed to learn to use PCs and ICTs, refusing even when their profession required them to adopt some form of ICT. One grandmother told us, "My husband resigned when he was forced to work with a computer because he wasn't able to. To avoid using one, he opened an office of his own" (81 y/o). Another said,

My husband is a lawyer and he categorically refuses to learn anything. The only thing he can do is send e-mails and messages. For the rest, he even refuses to surf the Internet... I've tried to teach him millions of times, but I can't. He says he has secretaries and he doesn't need to. (81 y/o)

As this last quotation clearly shows, here a gender issue has become entangled with a matter of power. Generally speaking, having achieved better digital skills in using ICTs than their husbands, our interviewees saw this as revenge for their own historical gender inequality.

Women can multitask. And to achieve equality, we've worked, and we still have to work a lot harder. So we're much more motivated and much more committed. Men had their secretaries, and women in general were like secretaries who did things for them. (71 y/o)

Women want to be more independent; men already feel independent" (72 y/o).

In my opinion, women are more curious to learn things, maybe things that previously belonged to the male world alone. (76 y/o)

On the other hand, this kind of emancipation through ICTs can also generate a sort of resistance, especially when the ability to use PCs and digital devices is perceived as a new challenge or a further assignment to fulfill amid the many tasks of everyday family life. In this case, our respondents welcomed their husbands' greater skills (sometimes with a bit of maternal indulgence). "My husband even refused to use Internet. Then he learned to use it and now he also deals with the online bookings, arranging flights, hotel reservations et cetera. He's made a leap forward" (65 y/o).

Finally for the grandmothers, learning to use computers meant not only remaining in step with the times but having the opportunity to satisfy a growing need for entertainment. Far from being just a relational tool for keeping up contacts with family and friends, the Internet is increasingly a resource helping older people to extend and cultivate their passions. Hence, if ICTs are often understood by the family as useful technologies enabling grandmothers to stay in touch and in emergency situations, our interviewees perceived the importance of the role of the Internet as a personal leisure tool. "There was a very interesting site about learning how to play bridge. It was very useful. You could see the game and you learned something. I really like it for learning" (79 y/o).

Our grandmothers continuously negotiated the characteristics and affordances of ICTs. They were able to choose, from the numerous digital services available, the one that best met their needs, interests, and values. The grandmothers did not perceive technology as a monolith that had to be accepted as a whole, but rather as a series of tools that can be adapted to specific forms of use and gratification.

I use Facebook to watch my son's concerts but not for friendships. On YouTube, I look at the recipes. With friends, I use Whatsapp. The tablet is for games and photos; the computer for the e-mail of our association; Skype for talking with in-laws in Russia. With my husband, I only use the phone. Everything has its function, (72 y/o)

DISCUSSION

In this work, the effectiveness of the qualitative and ethnographic methodology is shown to support a non-normative view of the adoption of ICTs in the older generations. As we expected, this methodology stimulated the reflectiveness of the subjects interviewed, in particular with regard to the motivations in using (or not using) ICTs. It also was effective as we explored the differences between the use of the Internet as performed by the elderly and that of the younger users in both intergenerational and intragenerational dimensions, as well as the social role of age.

We sought firstly to investigate how grandmothers experienced their use of the Internet as a tool to facilitate family communication with family members—especially relationships among grandmothers, their children, and their grandchildren—as the main motivation to go online. Starting with the aim of understanding the dynamics of intergenerational exchange through online platforms, we analyzed grandmothers' reflections concerning the role of the Internet in their daily lives and their use (or nonuse) of digital services. This included comparison with the ways ICTs are used by the younger generations as well as by the participants' peers, seen in an intragenerational perspective. Against this background, the issue of what is considered the right use of ICTs clearly emerged and was supported by the participants' comments. We can now propose a more systematic reflection about these issues.

Focusing on the motivations for going online or the resistance in doing so, one can clearly see the pressures of a variety of external forces that our respondents adapted to. The most evident was the need to maintain a connection with children and grandchildren in a context of increasing personal and family mobility, relatively unknown in the Italian society of the past. Learning new digital technologies is perceived as convenient (if not a real social duty) in order to have tools for communicating efficiently within the family network. Similarly, just as some respondents learned to use PCs in their earlier working lives, nowadays they are driven to learn to use ICTs in order to perform their new social or familial tasks (e.g., as volunteers or caregivers). More deeply, what is at stake here is a matter of social inclusion: the need to keep up with the times, be like others, accept a challenge (with themselves or others), stay young (compared to their peers who reject new technologies), and be independent (in the case of home banking). All in all, these types of use of ICTs act like a form of reaction, an antidote of sorts, to the perception of an ongoing social and family exclusion, marginalization, and dependency.

While digital communication tools are considered to be central to maintaining and nurturing up distant relationships with children and grandchildren, the role of ICTs becomes more problematic in building intimate relationships among people in everyday contexts. Daily use of ICTs reveals a complex relationship with the younger generations regarding technological issues, often characterized by different competences. The grandmothers' answers tell us that the relational experience accompanies and continuously supplements the adoption of new technologies. While in the public discourse (Aroldi & Colombo, 2016) the motivations for the adoption of ICTs by the elderly are always linked to the idea of digital citizenship and of active and healthy aging, the most important motivation for the elderly, as evidenced by actual experience, is the need for human contact in relational, not individualistic, ways.

Nevertheless, the self-reflective awareness of our participants is manifested in the understanding of personal limits in the full use of ICTs and the consciousness that family members are not always good teachers. The difficulties in interacting with their families in the use of ICTs emerged from the statements by the elderly about the role of ICTs in ways that we define as generational. Our interviewees made it clear that being older means speaking a different language and having different needs, even when using the same technologies.

We also can add that the perception of risks in the use of ICTs is probably a consequence of the particular reflectiveness that we have illustrated. Our interviewees highlighted the potentially alienating effect (on themselves) of certain ICTs more intensely than the opportunities. Our respondents seemed more focused on the potential impact of ICTs on their relational environment than on the opportunity for performativity offered by technologies. According to the interviewed grandmothers, it was not just a matter of adopting ICTs as a new means for communicating but also of adopting a particular mindset—one that they see contrasts with what they value as relational needs and values.

For our elderly participants, the “correct use of ICTs” meant an adapted use, requiring an adequate work of self-adaptation to new contingencies and new technological tools. Adequacy is thus the first and true standard measure of their right ICTs use. In a subtler way, especially when comparing their use of ICTs with those of their relatives (husbands, children, and grandchildren), the interviewed grandmothers applied another yardstick. They seemed to negotiate the technological affordances of platforms and devices with their personal needs, interests, and values in a very dynamic process (Costa, 2018; Davis & Chouinard, 2016). Here, a more complex idea of appropriateness comes into play: Our respondents attributed great importance to the use of the digital technologies they considered to be correct, fair, and appropriate, and they were very reflective about it.

Yet differences in the use of ICTs by the members of older and younger generations cannot always be justified or described solely in terms of different degrees of literacy, technical skills, and familiarity with digital languages. It rather seems to be a matter of different labels applied by the elderly to ICTs. Several grandmothers affirmed they use the technologies correctly in a wise and moderate way. By contrast, they say that the younger people often use them in an antisocial and unregulated way, in some cases verging on pathology and dependence. Elderly people perceive that they are less skillful in technology use than the younger people, but they feel they use technologies with more common sense and moderation.

The interviewees invariably encountered difficulties and felt anxious. They often saw technology as a quarry that escapes their complete comprehension and control. Technology was sometimes considered dangerous, excessive, and intrusive—capable of throwing away

and spoiling beautiful moments (i.e., when the smartphone is intrusive and spoils face-to-face relationships)—and wasting the younger peoples' time. But the grandmothers were generally confident of their own abilities to avoid these dangers. They affirmed with pride that their age, their experience with complicated things in life, their wisdom, and their moderation can protect them from the risks and excesses of digital communication.

In particular, the grandmothers said they consider with attention both when to use technologies and which media and services to use for a certain aim (e.g., playful, formal, intimate). They chose from a wider range of available platforms and technologies on the basis of previous experiences, as well as of platform affordances. According to Costa (2018), this shows how social media affordances have to be seen always as “affordances-in-practice”: not fixed and stable technical properties, but “the enactment of platform properties by specific users within social and cultural contexts” (p. 11).

As we have presented, according to the interviewed grandmothers, an appropriate use of technology is a moderate use in quantitative terms. It has to avoid triviality. It has to maintain a balance between being contactable and invading others' privacy. It is grounded in both personal and social competences about digital platforms and their netiquettes. Finally, the elderly seemed in particular to resist and criticize a use of ICTs that leads to a collapse of contexts due to “the lack of spatial, social, and temporal boundaries” (boyd, 2008) between private and public space and between close friends or family members and distant acquaintances. They seem also to resist the phenomenon of coalescence—that is, the entangled connection between online and offline, mirroring and shaping each other (Boccia Artieri et al., 2017).

Reflections on the role of the Internet among the elderly, their digital literacy, and their evaluations of what is right or wrong in using ICTs often are linked to their own technobiographies and their generational belonging, as well as to gender identity. In short, the use (or nonuse) of ICTs by the elderly is related to a mindset concerning the role of technologies in their everyday lives. But a “technological mindset” (Bowers, 1988) is not a normative way of using technologies: It is shaped in the daily use of technologies in reciprocal observation of the use of technologies by other members of the family or among friends.

CONCLUSIONS

We sought to investigate the possible relationships in place between grandmothers, children, and grandchildren, with the aim of understanding the dynamics of intergenerational exchange, and how grandmothers experience the use of the Internet as a tool to facilitate communication with family members. We analyzed grandmothers' reflections on the role of the Internet in their daily lives and the use (or nonuse) of digital services. The focus rested in particular on the point of the right and appropriate use of ICTs as part of a generational reflectiveness among our interviewees. Taking into account how the elderly (individually and as a part of a group) reflect on the role of ICTs in their lives allows us to emerge at least partially from a perspective of adequacy as normative discourse (Fernandez-Ardevol et al., 2017). Rather, it places the emphasis on the experience of the subjects and not on their adequacy to use ICTs. In this sense, the consideration of correctness indicates the point of view of the subjects and not that of normativity.

Our hypothesis is that the reflectiveness about the correct use of ICTs of our interviewees is linked with generational belonging and the “we-sense” of the grandmothers. Nevertheless, the small number and other features of the participants in our focus groups exclude any possibility of generalizing our results. The grandmothers involved in the research represent an uncommon profile of the Italian elderly. They are middle- and middle-upper class and are involved in community activities in one of the richest Italian cities (Milan). Thus, the grandmothers we interviewed are a wealthy and active niche of the Italian elderly population. Further research should explore the differences in uses among the elderly people with different social and cultural backgrounds and should be supplemented with quantitative surveys that make it possible to generalize the results.

Secondly, but no less important, the interviewed grandmothers belong to a generation of people who are not digital natives (Prensky, 2001). Rather, they started using digital technologies only in their adulthood (although not necessarily only in recent years). At present, it is not possible to clarify whether the resistance shown towards ICTs is generational (due to their having grown up and learned to live without ICTs) or age-related (becoming elderly means living with more moderation generally, including the use of technologies).

For these reasons, our research leaves some questions open:

- Is the technological mindset of today’s elders a generational mindset? What will happen with the next generation of digital seniors, who today (as young or mature adults) are experiencing and accepting the collapse of contexts (boyd, 2008)? Will they continue to see communication technologies as a place for context collapse? Will the elders of the future, belonging to another generation, accept coalescence (Boccia Artieri et al., 2017) because they have grown up in a generation that accepts this technological mindset?
- Or is the mindset of today’s elders a matter of age? Do users become resistant to coalescing as they grow older? Will the elders of the future refuse coalescence because it is old age that favors a resistant approach to this feature of ICTs?

Answering these questions will be possible only through longitudinal research that studies the evolution of the generations and their relationships with new technologies in the coming years.

Future research also will need to consider gender. Our research has investigated only grandmothers, who probably are more involved in intergenerational (digital) relations with children and grandchildren than grandfathers (Fernández-Ardèvol et al., 2017; Fortunati, 2017). The decision to study only grandmothers, however, has consequences and leaves some questions open. The first question concerns how the level of literacy of our interviewees was affected by the fact that older women are the least digitized and literate cohort in Italy and that most grandmothers have started to use ICTs only in the last few years.

A second question concerns the normative attitude of grandmothers: Can we say that grandmothers have a normative attitude not only to the use of ICTs but in general in their approach to life? Further research involving also grandfathers will be able to answer these questions and clarify the role of gender in ICTs adoption and use.

Finally, there is the cultural dimension. The role of grandmothers in families, and generally the role of the elderly in society, is culturally and socially orientated (Bramanti & Meda, 2012). Hence the relational use of ICTs could be influenced by the role that society gives grandmothers. For these reasons grandmothers in different countries might have a different approach to ICTs. Again, an in-depth, cross-national analysis could provide useful

insights into the role of ICTs in the everyday lives of grandmothers and a comparison of different approaches and roles given to digital media in intra- and intergenerational relations

IMPLICATIONS FOR APPLICATION AND POLICY

The role of media and communication technologies in improving the quality of life, health, and care of the elderly is today a key issue in the academic and political debate (Colombo & Carlo, 2015; European Commission, 2010). In some cases, policies do not take into account the real reasons why some seniors seem to resist the adoption of certain technologies and the use of some public digital services (Carlo, 2017).

What we stress from our research is that, while it is true that ICTs are a useful resource for the elderly and can improve their health, the care they receive, and their role in society, it is equally true that they are used by the elderly for social and familial relations and pure entertainment. Moreover, our research shows that the main resistance to the use of technologies among the elderly is not related to low literacy or incomprehension of the opportunities offered by ICTs. Such resistance is often cultural and social (and generational). Faced with the pressure to be always connected and techno-enthusiasts, the elderly claim the freedom to choose their degree of digital inclusion. Public policies of digital inclusion for the elderly must therefore take these elements into account in order to be really effective.

ENDNOTES

1. In Italy, 30.8% of 65-74 year-olds and 8.8% of those over 75 use the Internet; 5.5% of women over 75 have access to Internet, 13.5% of males over 75 are Internet users. The digital divide in Italy is therefore accentuated with age and gender, helping to define a large area of digital exclusion that overlaps with that of social isolation and affects, in particular, older women who live alone and with fewer resources, both economic and cultural (Colombo et al., 2015; Centro Internazionale Studi sulla Famiglia, 2017).
2. We define technobiography as the personal stories of the elderly about how technologies are inserted in their biographies and in the personal lives of the users, whether or not elderly were born, grew up, studied, or worked in a digital world (Fernández-Ardèvol et al., 2017; Kennedy, 2003).
3. Third age (over 65 years old) is the period after middle age (45–64 years old). With the extension of life expectancy, the fourth age has become a new period after the third. Starting at about age 80 or 85, the fourth age includes the last years of life (Colombo, 2011).
4. Almost half of the over-65s who use a computer today learned to do so before the age of 50 and another third before the age of 60 (Colombo et al., 2015).
5. Researchers carried out the project in collaboration with an international network (Canada, Romania, Peru, Israel, Italy, Spain, and Colombia) coordinated by Shannon Hebblethwaite, Department of Applied Human Sciences of Concordia University, Montreal, Canada. Research was funded by Social Sciences and Humanities Research Council of Canada and by the centers of research/departments involved in the network (for Italy, OssCom – the research center on media and communication of Università Cattolica).

6. In terms of education, 6 had a university degree, 2 did not complete university, 12 participants had completed high school, 4 had not completed high school, and 4 less than high school. Only one participant said that she did not have the Internet at home. All participants were retired, retired but involved in voluntary activities, or not employed. Our sample is not representative of Italian elderly population, especially in term of education level: In the north of Italy, only 5% of elderly women have a university degree, 15% had completed high school, 23% had not completed high school, and 57% had completed only elementary school (Istituto Nazionale di Statistica, 2017).
7. Università Cattolica Ethics Committee approved the project. According to Università Cattolica Ethics Committee, methods of research and managements of potentially sensitive personal information of participants comply with the European Privacy Policy and Helsinki Declaration.
8. The data quotes presented here have been translated from Italian by the authors.
9. Home computers and Internet connections became common in Italy in the 1990s/2000s.

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THE ORGANIZATIONAL USE OF ONLINE STOCKPHOTOS: THE IMPACT OF REPRESENTING SENIOR CITIZENS AS ETERNALLY YOUTHFUL

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Abstract: The digital divide due to age is declining quickly. But this does not necessarily mean that the willingness to use stock photos depicting older people accompanying digital information is the same among all senior citizens. Three research questions are at the core of this paper: (1) To which extent can various senior citizens (women and men, younger old and older old, living alone or together, full of vitality or fragile) identify with online stock photos of older people accompanying information about pensions, income, health and housing?, (2) Which are the connotations of the visual signs used in such stock photos? and (3) What are the policy implications for organizations aiming at offering digital information for a diverse group of senior citizens? The results of a Dutch study among 31 older adult are used to get insight into the ways they identify with stock photos. Finally, implications for research and society are sketched.

Keywords: *identification, online stock photos, senior citizens, visual ageism.*



INTRODUCTION

In the Netherlands, the number of older people having access to the Internet has risen considerably within the last 5 years. The percentage of persons 65–75 years old having Internet access grew from 85.0% in 2013 to 94.8% in 2018; for persons 75 years old and older, these percentages rose from 48.7% in 2013 to 74.2% in 2018 (Statline/CBS, 2018). The so-called first digital divide between those who have access to digital media and those who do not, and the second digital divide between those who have the skills to use them and those who do not (Hargittai, 2001), are disappearing.

With the growing access and use of the Internet, senior citizens are being exposed to—and required to access—sites that use photos for various reasons, and many times those are stock photos. Such photos represent older people in many ways, and the organizations that use these photos select them to communicate with that target group. The point I would like to make in this paper is that, even though the first and second digital divides due to age are declining at a rapid pace in many countries, this does not necessarily mean that the appreciation for or willingness to use online stock photos depicting older people that accompanies digital information is the same among all senior citizens, even from the same country.

As people grow older, the psychological and physiological differences between them widen, a phenomenon that is labeled “aged heterogeneity” by gerontologists (Nelson & Dannefer, 1992; Robnett & Chop, 2018; Stone, Lin, Dannefer & Kelley-Moore, 2017), and that is often overlooked in society and science. Loos (2013) and Loos et al. (2017) showed that organizations often represent older people as a homogeneous group and do not consider the differences related to age, civil status, and health condition on their Web sites. For this reason, the following three research questions are at the core of this paper:

- To what extent can various senior citizens (women and men, younger old and older old, living together or alone, full of vitality or fragile) identify with online stock photos of older people accompanying information about pensions, income, health and housing?
- What are their connotations of the visual signs used in such stock photos?
- What are the policy implications for organizations aiming at offering digital information for a diverse group of senior citizens?

To define the concept of identification, I followed Ashforth & Mael (1989, pp. 20–21), who make use of the social identity theory. According to their description of this theory, people tend to classify themselves and others into various social categories, such as organizational membership, religious affiliation, gender, and age cohort (Tajfel & Turner, 1985), and they argued that

Social classification serves two functions. First, it cognitively segments and orders the social environment, providing an individual with a systematic means of defining others. ... Second, social classification enables an individual to locate or define him- or herself in the social environment. According to SIT, an individual’s self-concept is comprised of [sic] a personal identity encompassing idiosyncratic characteristics (e.g., bodily attributes, abilities, psychological traits, interests) and a social identity encompassing salient group classifications. (Ashforth & Mael, 1989, pp. 20–21)

In this paper, I focus on people's identification with segments within the older age cohort by paying attention to the role of idiosyncratic characteristics (i.e., visual signs referring to sex, age, living together or alone, one's [self-reported] vitality/fragility). To analyze these visual signs, I use a visual semiotic approach (Harrison, 2003; Kress & Van Leeuwen, 1996). To answer the three research questions above, I first review the literature on visual representation and discuss the origins of the trend toward positive (i.e., well-being, vitality) visual representation of older people. This will be followed by an explanation of my explorative qualitative empirical study conducted in the Netherlands among 31 senior citizens who were exposed to a variety of stock photos depicting older people used on the site of the Dutch association for older people (ANBO) in spring 2018. Finally, I will introduce the concept of designing for diversity approach as a fruitful way toward an organizational digital information policy for a diverse group of senior citizens. I argue that organizations can use a mix of photos in digital information sources that do justice to the diversity within the older population group by adopting the principle of designing for dynamic diversity. I conclude with a sketch of implications for research and society.

STUDIES ON VISUAL REPRESENTATION

Portrayals of certain social groups in society, as well as the type of characteristics depicted in those portrayals, matter in societies that value social justice and power balance. These representations, visual and otherwise, can reinforce stereotype formation. Encountering such stereotypes in the media can negatively impact the self-esteem, health status, physical well-being, and cognitive performance of older people (Levy, Slade & Kasl, 2002; Levy, Slade, Kunkel & Kasl, 2002). As Williams, Martins, Consalvo and Ivory (2009) found, "groups that appear more often in the media are more 'vital' and enjoy better status and power in daily life" (p. 818).

So one fundamental question is, will those who cannot identify with the older persons depicted in such pictures turn away from the presenters of the related digital information and, as a consequence, not use it? Or do those who cannot identify with such pictures feel attracted by them (e.g., would images of healthy older people attract older people who are not healthy themselves)? An explorative empirical study conducted by Loos (2013) involved collecting all images of older people on the Web sites of the three senior citizens' organizations in the Netherlands to get insight into the ways these organizations visually represent their members. The results indicated that depicting older people together and older people alone appeared to be a reasonable balanced representation on two Web sites (53.7% vs. 44.3%, respectively), while, on the third Web site, older people alone were a minority (30%). The most common category of pictures on that third Web site was that of an older woman and man as a couple (25%), while on the other two Web sites, it was a man alone (28% and 25%, respectively). On all three Web sites, the older people were unanimously still enjoying their "third age" (e.g., playing sports or leisurely cycling; Laslett, 1991; Loos, 2013); however, the "fourth age," characterized by severe health problems and inactivity was absent (Loos, 2013).¹ Loos et al. (2017) conducted an empirical study examining the ways older people are visually represented on Web sites of organizations for older people in seven European countries (Finland, UK, the Netherlands, Spain, Italy, Poland, & Romania) while adopting an analytical approach based on visual content analysis. The results clearly demonstrated that, in all seven countries, older people were visually represented most

often as healthy and active, reflecting a dominant “aging well” discourse (Chapman, 2005; Loos, 2013; Orpin, Walker & Boyer, 2013) in Europe. This perspective is characterized by pictures of eternally youthful, interactive older people that do not represent large groups of senior citizens who have either bad health, live alone, or both. Before presenting my empirical study examining the impact of such positive stock photos, I first explicate how this trend toward a positive visual media representation of older people can be explained.

ORIGINS OF THE TREND TOWARD POSITIVE VISUAL REPRESENTATION OF OLDER PEOPLE

Loos and Ivan (2018) showed in their literature review of studies conducted in the last 40 years in Europe and North America that the turning point of positive visual representations of older people in print, television advertisements, and television programs occurred within the last few decades. One possible interpretation is to see this as a trend toward the right direction, away from a negative, stigmatized way to represent older people. Loos and Ivan (2018), though, coined the notion of “visual ageism” to describe this phenomenon as “the social practice of visually underrepresenting older people or misrepresenting them in a prejudiced way” (p. 164).

Another possible explanation for this clear trend toward positive representations of older people is that marketers realized that many older people represent a wealthy and healthy target group (Loos & Ekström, 2014). Knowing that most people want to stay young and vital, the advertising industry began using images invoking eternal youth. Thus, the concern of one’s own mortality is tempered by the concept of the third age. It is no surprise that the human desire to be eternally young is commercially exploited; the narrative of eternal youth has deep historical roots and taps into the universal yearning to live a long and healthy life, as presented in artwork (see Figure 1). The concept of the third age also enables public authorities to combine positive messages (i.e., most citizens will live longer in good health) with explicit warnings (e.g., each citizen is personally responsible for compensating for the loss of resources in later life; Loos, 2013). Katz (2009) argued that

much gerontological research is increasingly affiliated with governmental projects to responsabilize a new senior citizenry to care for itself in the wake of the neoliberal programs that divest Western welfare states of their health, educational, and domestic life course commitments and extend their political power to new areas of micro-social management and community affairs. (p. 99)

Loos and Ivan (2018, p. 169) argued that the act of visually representing older people in a positive way is embedded in a larger discourse of successful aging (e.g., Rowe & Kahn, 1997, 2015; Ylänne, 2015) and active aging (e.g., World Health Organization [WHO], 2014), a discourse highlighting “the avoidance of disease and disability, the maintenance of high physical and cognitive function, and sustained engagement in social and productive activities” (Rowe & Kahn, 1997, p. 433)

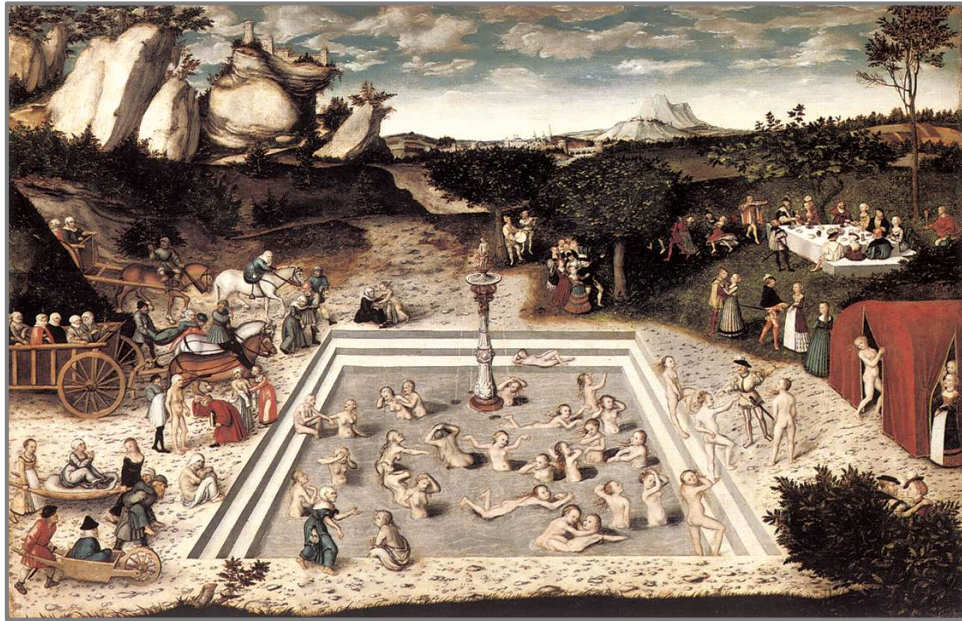


Figure 1. Fountain of Youth (1546) by Lucas Cranach, the Elder.
Reprint permission by Staatliche Museen Berlin.²

On the one hand, the promotion of optimistic ideas associated with well-being in later life may have positive consequences, such as people adopting an active lifestyle, maintaining functional health, and enhancing one's capacities. These, with the individual's fiscal responsibility and civic engagement, will result in the reduction of older people's dependence on public system provisions (Neilson, 2006). On the other hand, numerous negative consequences also can result, which are debated largely in the current literature (e.g., Calasanti & King, 2007; Coupland, 2009; Neilson, 2006), such as the marginalization of the process of growing old and the societal exclusion of older people (Loos et al., 2017).

If one were to interpret the popular discursive formation in a critical way, one could even say that older people, especially those in the so-called fourth age, are not able to meet the obligation imposed on them by the dominant successfully aging discourse. In such a discourse, the argumentation typically is as follows: People's increased life expectancy means that they will spend a longer time in the third age, characterized by well-being, while their fourth age will be reduced to a short, painful descent into decay (Loos, 2013). It is striking that, in the Netherlands, for example, public authorities make use of the concept of the third age: The third age receives ample mention in policy memorandums, while the fourth age is quietly ignored (Loos, 2012).

METHOD

In spring 2018, I selected five sets of stock photos (Sets 1 to 5, below) that were used on the Web site of ANBO, the Dutch association for older people. The stock photos depict a variety of older people (age, sex, living arrangements, vitality) reflecting their current life situation and accompany information about pensions, income, health and housing, important issues for older people.

Then, I interviewed a diverse group of 31 Dutch senior citizens (age range 50–59, 60–69, 70–79 and 80+ [see more information below], women and men, living together or alone, self-reported degree of vitality) to examine the extent to which they identified with various kinds of stock photos. Respondents were recruited from the family and friends of this researcher and his research assistant (a master's student) as well as people at a public library. As I wanted the respondents to express their opinions as freely as possible, I did not audio-record their answers but transcribed their explanations for later analysis. Table 1 gives an overview of the subcategories composing this group. The respondents saw all the photos in each set simultaneously before proceeding to next set. All respondents were familiar with the use of the type of Web site described as the framing for the photos: a site dealing with pensions, income, health, or housing. The head of department of the author's institute gave his ethical approval and informed consent was used so all respondents were aware of the study's aim and their right to stop their collaboration at any time.

Although estimating a person's age from a photo is difficult, I have roughly divided the people in the photos into two groups based on the color of their hair (gray or not gray) and the visible wrinkles on their skin (wrinkles or no wrinkles), the former considered as older old (80+ years) and the latter as younger old (50–59, 60–69, 70–79)—a distinction I needed to investigate if there is a difference between the ways younger old and older old people identify with pictures.

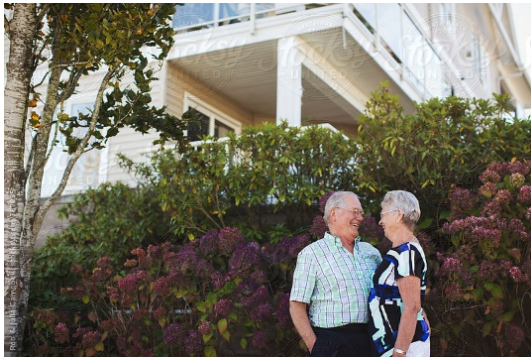
I asked the respondents to imagine that they were looking for information about pensions, income, health, or housing information on a Web site. Then, I asked them to choose, from each set, the stock photo they most identified with and to explain why they selected that photo. As mentioned in my introduction, I aimed to answer the following three research questions:

- To what extent can various senior citizens (women and men, younger old and older old, living together or alone, full of vitality or fragile) identify with online stock photos of older people accompanying information about pensions, income, health and housing?
- What are their connotations of the visual signs used in such stock photos?
- What are the policy implications for organizations aiming at offering digital information for a diverse group of senior citizens?

During the empirical research, I noted the respondents' favorite (in the sense of identification) stock photos and their explanations. Images can be analyzed in various ways, for example, by focusing on the cognitive, social, or emotional effects or consequences for the respondents. Because studies in the field of visualization often focus on "cognitive effect and neglect its

Table 1. Number of Respondents for Age Groups, Sex, Living Together/Alone, Self-Reported Vitality (Total $N = 31$).

Age groups	Sex	Living Together/Alone	Self-reported Vitality
50–59: 6	Female:16	Together: 20	+ 17
60–69: 11	Male: 15	Alone: 11	+ - 11
70–79: 8			- 3
80+: 6			



(P1)³



(P2)



(P3)

Set 1. This set comprises three photos to examine if older old respondents and those living together would choose P1 (older old 80+) and if younger old respondents (50–59, 60–69, 70–79) would choose P2 or P3, and whether the younger old persons would choose photo P2 with the foreign background (hills, a holiday setting).



(P4)



(P5)

Set 2. This set comprises two photos to examine the role of sex: Do female respondents identify with depicted women and male respondents with depicted men?



(P6)



(P7)

Set 3. This set also comprises two photos to examine the role of sex.



(P8)⁴

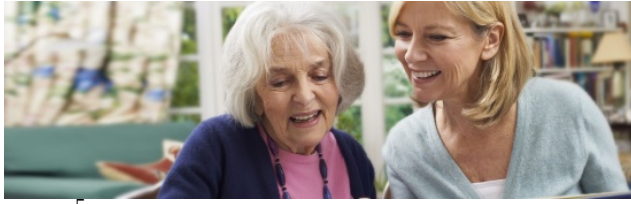


(P9)



(P10)

Set 4. This set comprises three photos to examine if living together or alone would affect the choice between P8 versus P9 and P10.



(P11)⁵



(P12)



(P13)

Set 5. This set comprises three photos to examine the role of the different categories (age, sex, living together or alone, degree of self-reported vitality) for the choice of a favorite photo.

social and emotional consequences” (Bresciani & Eppler, 2015, p. 8), I paid special attention to the social and emotional connotations of the visual signs, following a visual social semiotics approach (Harrison, 2003; Kress & Van Leeuwen, 1996; Van Leeuwen & Jewitt, 2001). This field of study was defined by Jewitt and Oyama (2001, p. 134) as “the description of semiotic resources, what can be said and done with images (and other means of communication) and how the things people say and do with images can be interpreted.” I define social connotations as the meaning evoked by signs related to other persons and the emotional connotations as the feelings the signs evoke.

PRESENTATION AND DISCUSSION OF THE RESULTS

As a start, I present an overview of the favorite stock photo gathered from the respondents’ comments of identifying with the image. Table 2 presents each set of photos with the favorite

noted in bold. I discuss each set of stock photos in the light of the overall score for the 31 older respondents, and then the main differences, if any, related to the different categories (age, sex, living together or alone, degree of self-reported vitality). Respondents' explanations for their favorite stock photo are presented by quotations in italics.

The marginally preferred (most self-identifiable) stock photo in Set 1 for the 31 respondents was P2 (younger old couple near a car with hills in the background, suggesting a holiday setting that does not reflect the Netherlands): 38%. *Enjoying life together* was the expression frequently used, an explicitly positive emotion. Multiple comments regarding *the beautiful landscape in the background* also provided a visual sign with positive connotations. But looking at the age categories of our respondents, there was one clear exception: All respondents 80+ and older selected P1 (older old couple before an apartment), frequently commenting that the image reflected a *happy couple, living nicely*. This contrasted with younger old respondents who did not identify at all with this stock photo, commenting that the people depicted were *much too old; I am not so old yet*. Additionally, 67% of those who reported their lack of vitality chose P1 as their favorite. This could be due to the fact that the older old couple is standing in front of an apartment building, a housing situation they can positively identify with (i.e., more accessible because of fewer barriers than in a house). Another important exception was the category of younger older persons who favored P2 (a younger old couple near a car with hills in the background) and, to a lesser extent P3 (a younger old couple sitting in a park), which could be due to the setting evoking holidays/relaxation, and leading to positive emotional connotations such as *enjoying life together in a nice landscape* (P2) and *cozy, together* (P3). Finally, it is interesting that only a small percentage of older people living alone (17%) chose P2 as their favorite photo, which could be due to the fact that they do not identify with a traditional couple living together (*too romantic; for me that's something from the past*).

For Set 2, the favorite stock photo of the 31 respondents was clearly P5 (63%; an older old man sitting next to a young man). Respondents explained this by stating that this is a *father–son relationship, a good relationship, partners on equal terms*; these are clearly social connotations. Within the categories of older men and older people living alone, P5 also was clearly the favorite (60% and 91%, respectively), compared to P4 (a sitting older old woman accompanied

Table 2. Favorite Stock Photos of All Respondents (Highest % in Bold).

	% of all respondents in favor of a stock photo		
Set 1	P1 31%	P2 38%	P3 31%
Set 2	P4 37%	P5 63%	
Set 3	P6 52%	P7 48%	
Set 4	P8 18%	P9 36%	P10 46%
Set 5	P11 24%	P12 28%	P13 48%

by young woman, laughing together). Apparently older men identify easier with persons of the same sex, represented as having a bond with each other (eye contact, social connotation). One respondent stated: *This photo reminds me of my own father who passed away; it's a positive memory.* For older women, there was almost no difference between P4 and P5.

For Set 3, no clear favorite stock photo emerged from the respondents. In this set of photos, the category of older men chose P6 (60%; older old woman accompanied by young woman in a familiar setting), with comments such as *older woman gets help, they enjoy life together, authentic, faces visible.* This compares to P7 (older old man accompanied by young man with a hand on the shoulder of the older one). However, 63% of older women chose P7. This might be due to the social caring connotation related to the opposite sex (i.e., hand of the younger man on shoulder of the older one) that led some to comments about the *social connection, authentic, love.*

For Set 4, older people living alone chose P9 (an older man; 45%) and P10 (an older woman; 45%) as their favorite stock photo, and not P8 (an older couple sitting in a park; only 10%). One of the reasons mentioned by older people living alone was that the younger old couple in P8 *look like they found each other on Tinder.*

The favorite stock photo in Set 5 for the 31 respondents clearly was P13 (48%; younger old couple at a beach with a cocktail). This image evoked comments such as *holiday, enjoying life, relaxation, enjoying life together.* There were no differences related to the different categories (age, sex, living alone or together, degree of self-related vitality) to which the respondents belonged. Apparently, many older people feel positive emotions when viewing a couple in a holiday setting. This could be a scenario that they envision for themselves. See also Nichols and Schumann (2012) about aspirational models in marketing communications.

CONCLUSIONS

Which conclusions can be drawn from the explorative qualitative empirical study I conducted? The conclusions will be presented below for each of the research questions.

To what extent can various senior citizens (women and men, younger old and older old, living together or alone, full of vitality or fragile) identify with online stock photos of older people accompanying information about pensions, income, health and housing?

In general, older people identify with stock photos that relate to their life stage, for example, where and how they live and relax. A good example is P1, depicting an older old couple in front of an apartment. This image was the favorite of respondents 80+ and of those who reported a lack in their vitality.

It is interesting to observe that there was only one stock photo (P13, younger old couple drinking a cocktail at the beach) that most older people favored, no matter which subcategories of age, sex, living arrangements or vitality reflected their current life situation. The findings provide no clear pattern for the way women and men identify with persons from the same or other sex. Living alone played a role especially for P2 (younger old couple near a car with hills in the background): Almost no older adult who lived alone chose P2 as a

favorite (in the sense of identification), which could be due to the fact that they do not identify with a traditional couple living together.

It is also remarkable to see that older people living alone chose P9 (an older man; 45%) and P10 (an older woman; 45%) as their favorite stock photo, and not P8 (an older couple sitting in a park; only 10%).

What are their connotations of the visual signs used in such stock photos?

Signs related to the setting seem to play a role as they were perceived as related to the life stage that the older persons are in. So, an apartment as background invokes positive emotions by respondents aged 80+ and by those who report decreased vitality. This could be an accessibility issue, less barriers in an apartment than in a house, or perhaps the point of aging when older people look for simplicity in life. Another example is that a holiday setting (beach and cocktails or a landscape distinct from their home country) seems to have positive emotional connotations for a lot of older people. Social connotations seem to play a role for older men, who identified more often with photos depicting persons as having a bond with each other, regardless of their sex. Older women, on the other hand, chose as a favorite a stock photo with the focus on a social caring connotation, even if that related to the other sex. Their comments demonstrated this: *social connection, authentic, love*.

What are the policy implications for organizations aiming at offering digital information for a diverse group of senior citizens?

Older people's identification with others of their generation in pictures representing them offers much potential for research. In this study, I conducted an explorative and qualitative study (i.e., a visual semiotic analysis) that aimed at generating preliminary insights into the different ways older respondents make sense of stock photos on Web sites. Organizations have a clear interest in the outcomes of this research in that their choice of images do not need to represent simply space fillers or an attractive Web page design. This research demonstrates that older target groups can also identify with the persons depicted in stock photos accompanying the products and services organizations present on their Web sites. If these organizations wish to be as inclusive as possible, they should take into account the diversity of ways the heterogeneous group of older people identify with images in general and stock photos in particular.

I agree with Cole who already in 1992 took a critical stance toward positive images of old age, a plea that is still valid today for balanced visual representation, avoiding representing older people uniquely as eternally youthful senior citizens. This might help them to identify with depicted older people in stock photos that resemble themselves or the situation in which they live as much as possible, so they would be willing to use this information instead of turning away from it.

I have no desire to denigrate the accomplishments of science and medicine or to return to the "good old days" of Calvinism when people were reconciled to the vicissitudes of aging and death by virtue of faith. ... For all its accomplishments, the cultural hegemony of science intensifies the pathos of aging in a society devoted to the limitless pursuit of individual health and wealth. In the last twenty years, we have witnessed an important

social movement aimed at eliminating age discrimination and at generating new positive images of old age. But this recent attack on ageism—as valuable as it is—has yet to confront the de-meaning of aging rooted in modern culture’s relentless hostility toward decay and dependency. (Cole, 1992, p. xxvi).

Multiple approaches exist to help organizations to pay attention to aged heterogeneity on their Web sites. One particularly fruitful approach is using a designing for dynamic diversity approach for an organizational digital information policy for a diverse group of senior citizens. This approach, developed by Gregor, Newell and Zajicek (2002, p. 152), originally aimed at enabling designers of computing systems to be aware of “the decline in the cognitive, physical and sensory function” of older people. However, Gregor et al.’s insights also can be used to underscore the need to visually represent older people in a dynamically diversified way by taking into account differences related to age, sex, housing situation (e.g., living together or alone), and the degree of vitality. So, organizations could use the research design and insights from this study to set up focus groups (Morgan, 1996) that would help them understand diversity in identification before putting stock photos on their Web sites. After such focus groups, individual interviews could be conducted and observations be made regarding how such stock photos affect senior citizens by making use of the visual semiotic research tool focusing on older people’s connotations. Once the results are known, Web designers could put a mixture of photos on their organization’s site that takes into account the various ways a diverse group of older people identifies with such pictures, and thus the accompanying products and services the older people need.

IMPLICATIONS FOR RESEARCH AND SOCIETY

This explorative qualitative empirical study aimed at offering insight into the role of online stock photos in the identification processes of a diverse group of senior citizens. The methods used to collect and analyze the data could be used for future quantitative studies in this field and expanded to include international context. This might lead to a better information policy that takes into account the significance of visual identification when providing services for senior citizens.

As noted above, a variety of research methods are available for organizational Web designers to consciously address visually the diversity of senior citizens represented in the stock photographs (or any other images) when deciding the design elements of their site. When in doubt, employing a designing for dynamic diversity approach would be most beneficial. Using focus groups to test the salience, valence, and potency of thoughts and feelings of senior citizen informants regarding their identification with options under consideration by the designer would be an essential step in the designer’s well-informed decisions on inclusive images.

While the above implications are important for organizations and their designers, the importance of these images goes beyond how senior citizens identify with the images of their age cohort on Web pages. These images also can influence and impact younger viewers in their impressions of old age and old people. In societies that emphasize equality and full, active citizenship in all stages of adult life, complete and accurate visual representations of senior citizens benefits the society as a whole.

ENDNOTES

1. Reprint permission by Staatliche Museen Berlin.
2. The third age is a long period of well-being (Laslett, 1999; Loos, 2013) that precedes the concept of the fourth age, a short, painful descent into decay (Higgs & Gilleard, 2015; Loos, 2013).
3. ANBO, the Dutch association for older people, bought the stock photos from <https://www.istockphoto.com/nl>, <https://www.shutterstock.com/home> and <https://www.nationalebeeldbank.nl/#0> and allowed me to use them for this paper. Despite several attempts, the photographers of these images could not be determined at this time.
4. This same photo was P3 in Set 1, but this time I used this photo to examine if living together or alone would affect the choice of the most identifiable photo.
5. This set includes two photos used previously as P6 and P7 in Set 3. However, this time I used these two photos to contrast them with P13 to examine also the role of age (older old 80+) versus younger old (50–59, 60–69, 70–79), the situation of living together or alone, and/or how the holiday setting would affect the choice of the most identifiable photo.

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PROFESSIONAL STAKEHOLDERS' VIEWS OF THE USE OF DIGITAL TECHNOLOGIES IN SPANISH LONG-TERM CARE

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Abstract: *Demographic change in Europe has resulted in an aging population, which presents new challenges for implementing and managing long-term care (LTC) systems. One solution aims to increase the efficiency of LTC by using digital technologies. This article focuses on professionals' opinions of the use of digital technologies in the administration of Spain's long-term care law (Law 39/2006, December 14, LAPAD). This qualitative research is part of SoCaTel, an H2020 project on the co-creation of LTC services in Europe. Ten focus groups were held with health professionals, care-taking relatives, and care workers, and six semistructured in-depth interviews were conducted with care recipients in Catalonia, Spain. This article presents the data collected from professionals. Professionals reacted positively to the use of digital technologies, in contrast to some previous studies that highlight professionals' strong resistance to digitalization. Professionals saw digitalization as a way to speed up and simplify administrative processes. However, they also identified serious obstacles to efficient digitalization.*

Keywords: *digitalization, long-term care, LTC, social services, Spain, LAPAD, ICT, digital technologies.*



INTRODUCTION

This article sheds light on the use of digital technologies in long-term care (LTC) services in Spain, which are mainly managed through social services and by social workers. We focus on the opinions of professionals—particularly those directly involved in LTC services as care agency managers, social workers, or caregivers—about the use of digital technologies in the implementation of Spain's LTC law, titled “Promotion of Personal Autonomy of and Care for Dependent People” (Law 39/2006, December 14, LAPAD; also known as the “Law of Personal Autonomy” and the “Dependency Law”). This law went into effect January 1, 2007. Citizens—particularly people with disabilities and older adults and their families—as well as social and care work professionals considered the LAPAD an important step for addressing care needs. On one hand, it facilitated women's participation in the labor market by funding eldercare services, and on the other hand, it promised to decrease the family care burden.

The LAPAD was passed within the context of Europe's “crisis of care” (Fraser, 2016), emerging as a consequence of demographic change. Welfare states urgently need to cope with this challenge and to find more cost-efficient ways to implement and manage LTC systems in their aging societies (Organisation for Economic Co-operation and Development [OECD], 2013, 2015). The broad use of digital technologies is seen by the European Union (European Commission [EC], 2014) as a means to satisfy the increasing demand for social care in a context of restricted public expenditures. We follow EUROFOUND (2017, p. 2) in defining digital technologies as “chip-based technologies and devices developed for information processing, storing and communicating purposes, with exponentially growing possibilities for recombination and new applications.” One use of digital technologies is digitalization, which we define as the process of converting from analog to digital form a variety of LAPAD administrative procedures, such as the application process, the provision of information, and official interaction between the administration and end users. Digitalization allows an increase in the number of people assisted with reduced costs, enabling “more efficient management and delivery of health and social care, as well as increasing opportunities for community- and self-care and service innovation” (EU, 2007, p. 3). The digitalization of health services and social services is seen as a mechanism for improving these systems (EC, 2016a; Harris & White, 2009; Hill & Shaw, 2011; OECD, 2016; Scottish Executive, 2006). The general aim of our research was to understand professional stakeholders' views of the use of digital technologies in long-term care services in Catalonia (Spain), especially in the context of the implementation of the LAPAD.

The Spanish Care System

Spain's social services system was developed in large part during the 1980s, later than in other Western countries. This process occurred with the arrival of democracy to Spain. The social services system currently faces a great demographic challenge. In 2016, Spain had 8.7 million people over 65, 18.7% of the total population. The number of centenarians is also increasing (Instituto Nacional de Estadística [INE], 2017). Spain is near the top of the list of European member states in terms of the proportion of the population aged 80 or more. According to EUROSTAT (2016), Spain comes in third with 6% of its population, following Italy (6.7%) and Greece (6.5%).

In 2015, 1,265,435 people in Spain applied for LTC services and benefits under LAPAD (approximately 2.7% of the population). Of these, the Older Adults and Social Service Institute (IMSERSO, 2015) reported, 63% (796,109) received LTC services and benefits within the same year, while 30% (384,326) were approved for the benefits but were to receive them later than 2015. The remaining 7% (85,000 people) were still waiting for a response to their application at the end of 2015. Meanwhile, the waiting list for LTC (often referred to as “dependency limbo”) had increased by 8,031 people by the end of 2017 (Asociación de Directoras y Gerentes en Servicios Sociales [ASGSS], 2017). As of 2018, the number of people in dependency limbo, either awaiting assessment or the start of services, is about 320,000. Approved applicants who died (often before receiving any benefits) greatly outnumbered the applicants awaiting review. The Spanish Association for Social Services’ Directors and Managers decried the fact that 100 people die every day in Spain before having received their LTC benefits (ADGSS, 2017).

Three levels of administration are involved in implementing the LAPAD: national, regional, and municipal (Comas-d’Argemir, 2015; Deusdad, Comas-d’Argemir, & Dziegielewska, 2016). Spain is divided into regional governments (known as autonomous communities) with a certain amount of administrative autonomy. The officials of each region decide how to design and implement the various benefits, but service provision and follow-up are performed by municipal social workers. Because the LAPAD is run by municipal social services and not by the health department, a major challenge of the law is to coordinate the efforts of social workers, health professionals, and health-care providers. Regional governments in Spain are fully responsible for social services according to Article 148.1.20 of the Spanish Constitution. Thus, each of the 17 regions has its own social service law. In the case of Catalonia, where we carried out our fieldwork, local municipal social services are responsible for primary social care (Catalan Social Services’ Law 12/2007, 11 October). Primary social care includes providing social assistance benefits and care services and benefits (although the latter are assessed and evaluated by regional government agencies). Although through the LAPAD older citizens have a basic right to benefits, each region provides services in its own way. Services are conditioned firstly by each region’s portfolio of services and then by each municipality’s resources. The main services and benefits established by the LAPAD are

- Day centers
- Care homes and nursing homes
- Telecare
- Home care
- Home care allowance (provided to a family carer living in the same home)
- Personal assistant (although uncommon except for in the Basque region).

The application process is quite long. First, applicants must apply for benefits from the LAPAD, and it can take as long as 6 months for them to receive a response. During this time, applicants are assessed externally to identify their degree of dependency (i.e., 1 = moderate, 2 = severe, and 3 = total). Even after applicants have been approved for care, they sometimes wait an additional year to be assigned one or more of the benefits mentioned above. The provision of each benefit is decided by the municipal social worker in conjunction with the care recipient and his/her family.

As already explained, the LAPAD is administered separately by each of Spain's regional governments, and the use of digital technologies also varies by region. Here we describe the use of digital technologies in the autonomous region of Catalonia. LAPAD applicants and/or their family carers can download the application form from the regional government (*Generalitat de Catalunya*) Web site. The application must be printed and taken to the applicant's GP (medical general practitioner) for a medical report and to the applicant's bank for a stamp. Finally, the applicant or the family carer must submit all paper documents to a local, regional, or national office involved in the LAPAD. None of these stages are digitalized.

Once the application is registered, all data is entered into an electronic file by a subcontractor of the regional government. The Catalan applicant has no online access to his/her application.¹ The telephone number provided to applicants offers only general information and thus no information on application status. The only person who can learn the status of a given application is the LAPAD manager at the corresponding municipal Social Services. This manager can retrieve the status of applications by checking the ProDep system (i.e., the Program for Fostering, Planning and Promoting Personal Autonomy and Care for Elderly and Disabled People). The future care recipient or his/her family can have online access to the waiting lists for services for older adults. However, the Web site interface is not user friendly and requires digital identification through an electronic signature and/or certificate (idCAT). Moreover, the interface is poorly publicized and most applicants and their families are unaware of it.

The role of family members in this complex application process is crucial. We use the term "family carer" to refer to relatives in charge of an older adult with care needs. Family carers typically oversee the LAPAD process (application, enrollment, meetings with social workers, etc.) and may also be responsible for helping the care recipient with the basic activities of daily life. This care burden is often distributed among family members (usually the husband or wife and their children). This family involvement in care is partly a remnant of traditional Mediterranean family care strategies, which have continued even after women's incorporation into the labor market. Families also use this strategy to cope with a deficient state care system, as has been noticed even in Nordic countries (Jolanki, Szebehely & Kauppinen, 2014). The term family carer attempts to capture the state's reliance on family members in handling the LAPAD's complex procedures. We adopt it instead of the alternative "informal carer" (Häikiö & Anttonen, 2011), a less precise term that also includes irregular care workers coming from migrant communities.

Challenges of Digitalization in Care and Social Services

The digitalization of health care services and social services is seen in different studies as positive and complementary to face-to-face interaction. However, some challenges are emerging and further research is needed, for example, on areas such as how digital technologies can enhance social interaction and how patients and professionals use "social networking" (Griffiths et al., 2012). Digitalization has both direct and indirect effects, some of which cannot be predicted in advance (Loos, 2016). Some social workers view the use of digital technologies in their day-to-day practice as a form of de-professionalization that depersonalizes social work practice (Parrott & Madoc-Jones, 2008), raises ethical issues (López, 2014; López-Peláez, Pérez-García &

Aguilar-Tablada, 2017), and decreases managers' control over social workers' activities (Loos, 2016). These attitudes can create a significant barrier to the acceptance of digitalization.

Digital technologies can be used to mechanize the entire process of allocating benefits, thus eliminating the need for direct interaction between professionals and care recipients. For this reason, some social workers see digitalization as contradicting the essence of social work practice, which is based on face-to-face contact. Another potential downside of digitalization is that increased automation means decreased flexibility. Analog "street-level bureaucracy" (Harris & White, 2009; Lipsky, 1980) allows professionals to use their discretion to decide how policies will be implemented and to adapt procedures to the needs of a given care recipient. Digital processes can reduce professionals' room for maneuver, leading many social workers to resist digitalization.

One of the main concerns of social workers in Spain is the bureaucratization of social work and care work (Hidalgo-Lavié & Lima-Fernández, 2018; Viscarret, Ballester, Idarreta, & Úriz, 2016). Social workers, who are in charge of implementing social care, face a double mandate. On one hand, they must display the essence of direct social intervention, defending citizens' rights. On the other hand, they must implement governmental mandates using the bureaucratic systems in place (Viscarret et al., 2016). According to Lipsky (1980), this is understood as a final level in policy-making, where public servants (social workers, in this case) have to make decisions quickly and in a way that will be understandable to citizens.

According to Sourbati (2009), the lack of digital skills and the "perception of irrelevance" (p. 1095) of the tools introduced are seen as the two main factors holding back the use of digital tools among social work and care professionals from organizations. Another challenge to digitalization is the "digital divide" among social services' and care services' users. Marginalized groups, such as ethnic minorities and nonEuropean immigrants, often have little access to digital technologies (Foley & Ram, 2002), even though mobile phones increasingly are used widely among all social groups. People who are digitally illiterate or use little or no technology tend to have less social engagement than those using digital technologies. At the same time, other studies highlight the fact that social capital enables individuals to overcome the digital divide in terms of access, general use, and online communication (Chen, 2013). Beyond the question of access, we see differences related to the amount and/or type of online activities carried out, including the use of social networking sites (e.g., Facebook or Twitter). Online activities and social media have been defined as a second and third digital divide, respectively. The existence of multiple digital divides implies that more tailored policy interventions are needed, which reflect Internet use as an activity that can lead to isolation even as it allows users to perform a range of tasks (Haight, Quan-Haase, & Corbett, 2014; Petrovčič, Fortunati, Vehovar, Kavčič, & Dolničar, 2015).

Another obstacle is a generation gap that makes it hard for older adults to take full advantage of digital technology when they engage with social services. Older adults are generally slower to adapt to new technologies. Some studies have described this generation gap as merely a temporary phenomenon because today's youth are growing up with nearly universal access to digital technology. For example, in 2013, 50% of people over age 65 in the UK used the Internet (Sourbati, 2015). However, the majority of adults in their 80s have never used the Internet at work. And in later life, when they become frail, older adults have difficulties using many digital technologies. When they do use them, it is through "familiar media practice" rather than through active and intense engagement (Nimrod, 2014). A range

of variables have been shown to act as impediments: for instance, arthritis of the hand, low education level, low income, and no access to a computer (Heart & Kalderon, 2013; Selwyn, Gorard, Furlong, & Madden, 2003; Vorrink et al., 2017). Lee, Chen, and Hewitt (2011) revealed four dimensions of constraints on older adults that fall into two categories: internal factors and external factors. The internal factors include intrapersonal factors (i.e., participants felt they were too old to learn and/or that digital technologies are useless or too complex) and functional ones (i.e., participants showed a decline in memory and/or logic). The external factors include structural ones (i.e., participants found digital technologies too expensive or had no access) and interpersonal ones (i.e., participants had no one to teach them and/or no one with whom to use digital technologies).

Note that doubts about older adults' abilities to learn or to adapt to changes often manifest an ageist stereotype rather than objective facts. As pointed out by Sourbati (2015), older adults are treated as a "residual category" when new media technologies are analyzed. Generally, the only older adults to be depicted on social services Web pages are frail, making it difficult for other, more vibrant older adults to identify with the images they see on these sites. However, older adults' lack of representation online does not mean they do not use the Internet. In fact, a survey carried out in 2007 in 27 European countries showed that 31% of men and 19% of women aged 55–74 used the Internet at least once a week (Koch, 2010). According to Lee et al. (2011), the ability to access a computer does not depend principally on age; rather, it is linked to education level, income, and living situation (solitary or shared). Differences between the sexes correlate with education and income, as well as other variables such as ethnicity, and show the diversity in using new technologies (Friemel, 2016; Sourbati, 2015). The concept of "age heterogeneity" implies inequalities within the older population, determined by restriction in social space, communication facilities, health, and leisure, among others (Sourbati, 2015).

Older adults' resistance to using digital technologies has often been interpreted as evidence that digital technologies are not appropriate for them. Selwyn et al. (2003) pointed out that older adults make little use of digital technologies not because they lack the necessary knowledge, but because these tools offer them relatively few advantages. These findings suggest that professionals need to refocus efforts to get older adults to use digital technologies. In short, the problem lies not in older adults themselves, but in the fact that technologies designed for their use have not been sufficiently accessible. Researchers and care providers should consider adopting models of technology that better suit the needs and interests of older adults. According to several studies, older adults adapt technologies that address their needs, especially when services are co-created (codesigned and coimplemented) with care recipients to address their real needs (Baillie & Schatz, 2006; Hyppönen, 2007; McLaughlin, Rosen, Skinner, & Webster, 1999). Evaluations by older adults can be very useful in developing and improving digital technologies (Hyysalo, 2007; Mäyrä et al., 2006) and can empower the older user (Parrott & Madoc-Jones, 2008). Even when older adults cannot use digital technologies directly, their carers can take advantage of simple, popular technology (such as smartphone applications) to improve their quality of life.

Despite the challenges of digitalization that we have described, particularly the need for professionals to know how to use digital technologies, the International Federation of Social Work is fostering the use of digital technologies among professionals (Hidalgo-Lavié & Lima-Fernández, 2018). This trend is occurring in the context of established eGovernment practices boosted by the European Commission and DG Connect (EC, 2016b, 2017). A

particularly bright spot in the use of digital technologies has been the successful use of mobile phone applications, as in the case of GPs who use continuous tracking for patients with dementia (Miskelly, 2005) or facilitate community support for older adults who are aging in place (Sixsmith, Mihailidis, & Simeonov, 2017). Other examples include mobile phone apps that allow diabetes patients to manage their care (Durso et al., 2003) and mobile phone cameras that facilitate the diagnosis and treatment of skin lesions (Kroemer et al., 2011). Also, text messages may be increasingly supplanting the use of emails in communication between patients and care providers (Petrič, Petrovčič, & Vehovar, 2011; Ramirez, Dimmick, Feaster, & Lin 2008). Finally, mobile phones play an important role in older adults' emotional support through social networks (Petrovčič et al., 2015).²

This increasing array of applications and other digital technologies for care and health purposes is not being used widely in LTC in Spain. For now, conversations on digital technologies in Spain focus on the digitalization of administrative processes rather than on care or health. Our study asks how professional stakeholders view the use of digital technologies and digitized materials in long-term care services in Spain. Identifying professionals' views will provide scholars and policymakers with essential information for improving services. Research on stakeholders use and practice of new technologies has been carried out recently in Spain (Hidalgo-Lavié & Lima-Fernández, 2018); our research goes a step further in offering a qualitative look at stakeholders' views of the use of digital technologies in eldercare, revealing their attitudes, their current practices, and opportunities for the future of eldercare.

METHOD

Research Sample

The results presented in this study are part of a Horizon 2020 European project, SoCaTel, based on the use of technologies for the co-creation of LTC services in Europe. The SoCaTel project includes four case studies representing different welfare models (Finland, Ireland, Spain, and Hungary). This paper is based on the Spanish case. Between January and April 2018, we held 10 focus groups of three to eight participants, involving health professionals (geriatricians, general practitioners, nurses), social workers, care workers, care managers, LTC recipients, family carers, and older adults without care needs. Most of the focus groups were homogenous, allowing us to measure how certain groups of people reacted to a similar set of problems and experiences (see Tracy, 2013). Participants were recruited through social services departments in the provinces of Barcelona and Tarragona in Catalonia, Spain.

In one case, we opted for a focus group including care recipients and relatives so that the relatives could support the care recipients. Additionally, we held six semistructured interviews involving one or two participants. A total of 57 people participated in the study, covering a wide range of viewpoints, although the current analysis focuses only on our exchanges with 29 professional stakeholders. The professionals ranged in age from 30 to 59, while older adults ranged from 65 to 96 years, and family carers ranged from 54 to 78 years. Participants had differing educational backgrounds (high, middle, lower, or none); the professionals participating in this study came from middle and high educational backgrounds. Data saturation

was reached and recruitment was stopped when we noticed that new participants expressed the same ideas that earlier participants had expressed and no new viewpoints were emerging.

Focus groups and interviews were carried out in four areas of Catalonia: Vilanova i la Geltrú (Garraf district, Barcelona province), Tarragona, Reus (Baix Camp district, Tarragona province), and Viladecans (Baix Llobregat district, Barcelona province). Gatekeepers (key stakeholders who have established contact with other stakeholders in their sector) were crucial to contacting participants and our gaining access to their field. This was done through social services and health services departments. Our participants fell into the categories as presented in Table 1. However, in this article, we present data only from the professionals.

Interview Guides

Focus groups and interview questions for this part of the study centered on the professionals' views of the implementation of the LAPAD, particularly their views related to the use of digital technologies in implementing the law. One set of questions helped us understand how professionals were implementing the LAPAD in their daily work, including the application process, eligibility criteria for care recipients, and the dependency assessment process. For example, we asked which procedures were currently digitized and which were conducted in

Table 1. Breakdown in Categories of Interviewees for the Overall SoCaTel Project in Spain.

PROFESSIONALS*	12 Social workers: municipal social workers (Vilanova social services); social workers at primary care centers, social workers at nursing homes; social workers from the LTC team at the municipality (EAD) 4 physicians: general practitioners in primary care; geriatricians from hospitals 4 care workers from private companies working for the municipality 5 primary care nurses 4 care managers: nursing home managers, home care managers, day care center managers
FAMILY CARERS: relatives in charge of care duties, who organize care tasks and are in regular contact with care workers, social workers and doctors, and other professionals involved in care.	12 relatives (sons, daughters, husbands, wives, nieces and nephews) who take care of older adults
CARE RECIPIENTS	11 older adults who have applied for LTC benefits and services through the LAPAD, including older adults with dependency degrees 1, 2 or 3; older adults who live at nursing homes and care homes; older adults who live at home with family carers
OLDER ADULTS WITHOUT CARE NEEDS	4 older adults 65–75 years old

*Additional demographic information on this study's participating professionals is provided in the Appendix.

person. We also asked more specific procedural questions, such as how professionals received information about an applicant's degree of dependency and how applicants were selected from the waiting list to receive services. Another set of questions focused on the professionals' opinions of the procedures and how they could be improved. For example, we asked how the digitalization of social services should be carried out, how coordination between health services and social services could be improved and, which procedures could be speeded up. Finally, we asked a series of questions that were specific to each profession.

Procedure and Ethical Considerations

Focus groups lasted between 1 and 2 hours and interviews lasted 30 minutes to an hour, depending on the availability of the informants, their level of fatigue, and the flow of the conversation. All focus groups and interviews took place face-to-face in a comfortable setting. The first set was carried out with Vilanova Social Services in a building dedicated to care services and LTC services. The second set took place at the Department of Anthropology, Philosophy and Social Work of Rovira i Virgili University (Tarragona). We also carried out interviews in two nursing homes in Cambrils and Viladecans and in a convalescent hospital in Reus. Focus groups and interviews were conducted in Catalan or Spanish, languages in which the participants were fluent. The quotations presented here were translated into English by a professional translator.

Before starting each focus group or interview, the researchers introduced the project and its goals and provided participants with an information sheet, a participant consent form, and a confidentiality statement. In addition, the researchers explained to the participants that their data would be recorded and anonymized and that they had the right to withdraw from the study at any time.

Participants were given time to read and sign the documents, and then the interviewer opened the conversation. The role of the other researcher(s) present was support: to take notes, to help manage turn taking, and occasionally to ask follow-up questions. At the end of each session, the researchers gave the participants a thank you letter and asked them to fill in a sociobiographical survey for quantitative data.

Data Analysis

The recordings of interviews and focus groups were transcribed (anonymously) so that we could perform a qualitative analysis using atlas.ti. We coded transcripts deductively according to key categories linked to the main topics (i.e., LAPAD, coordination, digitalization and digital technologies, aging in place, digital technologies and older adults, etc.). We also used open, inductive coding (e.g., lack of agility in implementing the LAPAD, lack of information surrounding the LAPAD, digital technologies and care, once-only principle for providing information, digital technologies and professionals) as needed.

RESULTS: PROFESSIONALS' VIEWS ON DIGITALIZATION AND DIGITAL TECHNOLOGIES

Our findings illuminate how professional stakeholders view the use of digital technologies in LTC services in Spain. They are presented here in three sections: professionals' attitudes about the use of digital technologies, how professionals currently use digital technologies, and opportunities for more effective digitalization.

Professionals' Attitudes About the Use of Digital Technologies in LTC

The professionals in our study were more open-minded about the use of digital technologies in LTC than prior research has suggested. They supported their use as long as face-to-face contact with care recipients and their families was not impeded. Technology was seen as a tool to speed up and simplify administrative procedures, but not as a substitute for the social workers' role in deciding on care services and supervising care. They also highlighted that care recipients needed to have contact with a person who can support them in their use of digital processes, as reflected in this comment by a care manager:

P50: There are lots of procedures that are very speedy and practical on the computer, but I think that, behind any resource, there has to be a person who can clarify things face-to-face. Like when they go, especially, to Social Services, people receive so much information in such a short time that when they come to you, you have to explain it to them again.

The care workers' task is to tend to the care needs of older adults rather than to handle management and/or administrative issues, which have a more technological emphasis. Not surprisingly, care workers and other professionals were skeptical of older adults' ability to use electronic devices. Although older adults can face challenges in using digital technologies, as described above, the idea that they cannot learn to use them seems based in an ageist stereotype. For instance, older adults use telecare, which has spread all over Spain (Carretero, Stewart, & Centeno, 2015). The following exchange among care managers reflected the idea that older adults cannot learn or enjoy new technologies:

Researcher: *And WhatsApp works well for you?*

P52: Yes, because it's a very direct form of contact that I have. It's different, very different. It's a very direct form of contact with family members.

Researcher: *With the care recipients themselves too, or just with family members?*

P52: More with family members; the recipients themselves are very old to be--

Researcher: *Yeah. [But] some of the recipients that we've interviewed are in pretty good shape. They use mobile phones, and they told us they'd like to take computer classes. Not a lot of them, but some.*

P50: Yes, they're starting to have cell phones.

Despite its increasing use, WhatsApp is raising concerns about ethics and privacy. This was clearly demonstrated in this exchange among care managers:

P52: I was really hesitant about using WhatsApp for information, but the family members--

P51: *I was a bit scared about data protection, and so sometimes, always, when I use it, it's "Call me; we have to talk [about]" or something like that. And then, that way, they see it at some point. Because sometimes you spend all day calling them and they don't pick it up, or you leave a message, and they don't call you back for-- And sometimes, yes, I have used it [to provide information] with a few families in particular.*

Researcher: *So, you don't give out information on WhatsApp?*

P51: *Look, no, I don't. Because I don't know...I still don't know. It's about data protection, and you don't know at what point--*

P49: *Like with emails. The ones they send you have to be encrypted with a password. Because otherwise, in terms of data protection, depending on the kind of information it is, you can't send it.*

Some of the professionals pointed out particular challenges that care recipients faced in using digital technologies, such as illiteracy or poor overall health. This was contained in comments from two care workers:

P12: *I have a lady who doesn't know how to read or write, and she signs for me [on the tablet]. And I feel so satisfied to see that the lady marks an X—and for her that's a whole new world and for me it's a joy. [She says,] "It turned out crooked." [I say,] "Perfect. They'll pay me just the same." ...We're talking about people in their 80s, and here I go and give an old man a tablet and it's already enough for him [to manage with technology].*

P14: *It depends on what it is; that's what I say. If it's an application that you have to touch the screen with your finger, it's okay. They can do it with no trouble. And signing—whoever signs will be able to sign.*

The majority of professionals we spoke with (especially social workers, nurses, and GPs) were open to the use of technology, despite concerns that they might have about care recipients' ability to use it. Sometimes these concerns were legitimate, and sometimes they were based in stereotypes. On the whole, we found professionals open to the use of digital technologies as long as it took into account care recipients' level of functioning and the ongoing need for face-to-face contact between care recipients, professionals, and families.

How Professionals Currently Use Digital Technologies

Social workers, and, above all, care workers, were enthusiastic about digital technologies that would enable them to get in touch with care recipients' families quickly. Although they were accustomed to using e-mail, they reported that e-mail was not fast enough. Personal cell phones in general, and WhatsApp in particular, are becoming a popular way for care managers to keep in touch with families. Care workers are not allowed to use their personal mobile phones with care recipients. However, it is acceptable for managers from care work companies to use their phones both for internal communication and for communication with family carers, as seen in the following examples, the first from a care worker and the second from a care manager:

P15: *We're not allowed to give our phone numbers to the user. In the homes that I visit, for example, I have the phone number perhaps of the son. "I'm leaving my phone number here in case something happens." But I have to call from the home's landline; I'm not*

allowed to call from my cell phone. If I go to the home and there's something, maybe "Look, this is missing" or whatever, I can call but I can't give my phone number.

P52: For example, I do [use WhatsApp] because everything that's, of course, I'm responsible for it all. So everything that has to do with families, it's better to send me the issue through WhatsApp, all the changes, everything, rather than call me every minute. ...They're creating groups for me with the families: the user, the family, and of course, me, the administrator. Any problem that comes up, "He's gone to the doctor"... So of course, especially with this gentleman, it works great because before, what you said, you told one person and the other person gets lost. You put it there [in WhatsApp] and everyone is informed: "He's been to the doctor, his medication has changed, this has changed..."

For internal communication between home care workers and their managers, WhatsApp also was used. The following exchange between care workers explained how it might work:

Researcher: Do they take a photo of the schedule and send it to you by WhatsApp?

P13: Only if there's a change, not always.

P15: For example, this week, since we had the course and they changed my schedule for the hour before and the hour afterwards, they sent it to me by WhatsApp, and I have it there.

Professionals also mentioned using GerApp, a tool similar to WhatsApp. However, they pointed out two drawbacks to GerApp: It is less user-friendly than WhatsApp and it is unidirectional (meaning that they can send out messages to families but families cannot respond). In the following exchange among care managers, we saw the challenges presented by GerApp:

P51: What I see is that, for lots of sons or daughters or relatives, opening up an application--

P50: WhatsApp is already more internalized for them.

P49: Because of the [advanced] age of many of the carers that we have, at least ours, it's a bit difficult.

P50: Well, they're getting there. They're younger and younger. We're considering doing it somehow with a mobile phone that's... not my mobile phone, a mobile phone that would be there at the nursing home and that would only be used during working hours or something. We're thinking about it, because there they use e-mail a lot. There are lots of people that give you their email address, but then they don't check it. Sometimes we ask for their email address when they check in or when they start at the day center. And sometimes you send memos of things—I don't know, like we're remodeling or whatever—and you see that a lot of people, you don't know it, but you realize later that a lot of people haven't even seen it and you don't even know if they've opened it or not.

Opportunities for More Effective Use of Digital Technologies and Digitalization

The advance of digital technologies offers a clear opportunity, as noted by professionals: The digitalization of administrative processes increases the efficiency and quality of care. In particular, our participants noted that it could aid the coordination among professionals in different areas and could facilitate the provision of information to care recipients and their

families. In terms of coordination at the moment, professionals working with a given care recipient often lack access to files maintained by other professionals on that recipient. LAPAD is implemented by the Department of Social Services, but it is inextricably linked to Health Care Services because care recipients must submit a medical report to apply for LAPAD benefits. However, when GPs or geriatricians in hospitals have older adults with care needs and health problems, they have serious difficulties in figuring out the trajectory their patients might have had at Social Services related to their care needs and/or to other situations. Clinicians only have access to patients' Shared Medical Record and not to their history of interactions with Social Services. Furthermore, families are generally not familiar with the procedures laid out by the LAPAD, which are quite complex. This lack of coordination between professionals and departments is one of the main obstacles presented by the LAPAD. This lack of coordination wastes time and financial resources. It means that professionals often cannot access information that they need to perform their jobs, as explained by a nurse in the following example:

P46: I think that the social information is unknown to the family because there isn't, there isn't good coordination between the health team on-site and social workers, no matter how many visits they do together. We normally do visits together, when we can, because we don't have the same schedule and availability of a social worker. But the social information is information that the family doesn't know how to give. They don't know how to tell you that this is what my coworker told them, right? They don't know the degree of dependency. When you ask them, it's very complicated for them. The social history is more complicated and for us, well, it's looking for a shared history.

Coordination can be difficult even within the same department. Only one manager for each social service area had access to the detailed information, which in turn led to a considerable slowing down of the entire process, as this social worker described:

P3: This can be the case if you just want to know if the person has already applied for dependency or not. You don't want to know more. It's to know if someone started the process, carried out a review... What do you do? And of course, you're supposed to get in touch with the manager by e-mail or telephone. I think this is a waste of time for both professionals. If there were any other way...

Digitalization could help solve these problems. It would also connect the Department of Social Services with the Health Department, making it possible to share patients' social welfare and clinical histories. Then, professionals could check the patient's file and perform the necessary follow-ups. Professionals' difficulties in accessing the clinical history and the social welfare information of patients digitally implies that care recipients and their relatives have to go to different administrative offices to request and submit the different forms required for the LAPAD application. A geriatrician described the situation as follows:

P18: I have the feeling that we treat the end users like messengers [couriers] because they ask me for a report. Ok, I generate a report...and I have to give it to the user so that he can go to the social worker and give him or her the file. But, for example, when my colleagues ask us for an evaluation from doctor to doctor, I get it through the computer. That is, we don't have to treat the end-user like a messenger.... For me the ideal situation would be if this platform could unify information. The social information, whether it comes from City Hall or from wherever, would be part of [the] patient's

clinical history, and I could have access to it from the hospital... or the hospital social worker could have access to it, too.

Another opportunity offered by digitalization is the provision of information to care recipients and families. Patients often do not know whether they have already applied for the LAPAD or what degree of dependency they have been assigned. They do not understand the difference between dependency and disability (e.g., an 85% disability does not mean a high degree of dependency according to the LAPAD). Furthermore, the “once-only principle” is not respected, in the sense that care recipients have to provide standard data more than once to several departments and administrations. Because information is not easily available through digital means, social workers provide key support to care recipients and their families during this process. Concretely, they identify the need (together with physicians), explain the process, help patients during the application and follow-up, coordinate with other departments, inform about benefits and services, and manage services. If all these procedures were handled digitally, the workload would decrease and decisions would occur faster. The complexity of the LAPAD application procedure places significant pressure on social workers, who have to meet with applicants to provide information about their application status. Such meetings are a waste of time and professional resources, and they in turn slow down the provision of care. The following comments by a care manager and a social worker, respectively, clearly illuminated the complexity of the process and the need for digitalization:

P53: I also think that for any query, no matter how small it is, you end up having to ask for an appointment to speak with a social worker and maybe—because it's normal: they have a lot of work—you have to wait for two months, and it's only to find out what number someone is on the waitlist.

P9: —Even for filling out the papers. You have to keep in mind that a lot of carers or family members have difficulty in filling out that form that they go to pick up. They [officials] give it to them and they have to fill it out. To make these things easier would be really good, because it's hard for them [the clients and/or carers]—what we talked about first, that it will still be a few years for technology and older people. It's difficult for the majority of them, and they don't have the flexibility or the opportunity to do it. Making things easier would be really key because it's really unwieldy when they have to start the process.

According to the professionals, digitalization of social services could be a solution to facilitate LTC procedures. However, any digital system should be user-friendly and quick to avoid the risk of slowing down processes rather than speeding them up. For instance, the hardware and software that Social Services uses to carry out its work under the LAPAD are not optimized. Professionals complain about poor Internet connections, programs that are not user-friendly, and old PCs. In its current state, digitalization is not seen as making tasks quicker or easier, as explained by this social worker:

P4: I really think that instead of digitalization, which is great, but there's a lot of work in digitalizing. And you should really do the screening work of saying what you really need, what you don't need. And the tools that we have should really make our work easier. That is, the goal is to improve the work of professionals, and sometimes I think that it slows them down and that instead of helping—be it because the programs of the Generalitat [regional government] are slow, because access is difficult, because of your

PC—you find yourself in that situation. Sometimes I get really angry; it's an obstacle in your daily routine and you say, "This is slowing me down." Sometimes we've done a screening process to say which documents we digitalize and which we don't. The program we have for digitalization at Social Services is completely obsolete; It's slow.

DISCUSSION

The purpose of this study was to investigate professional stakeholders' opinions about digital technologies in LTC so as to understand whether and how these tools can improve the procedures of the LAPAD. Our participants were optimistic about the use of digital technologies, as long as they did not impede face-to-face contact. One attitude that must be overcome is the professionals' skepticism that older adults can themselves use digital technologies.

Digital technologies could assist professionals in meeting the LAPAD's objectives, but, according to professional stakeholders participating in this study, use of such technologies is ineffective. Information provided for applicants and professionals online is insufficient, and platforms for accessing online information are not user-friendly. These obstacles affect professionals, care recipients, and their families. Additionally, applicants and their relatives are forced to act as "couriers," delivering paper forms between different administrative departments and services involved in the application process. Finally, the once-only principle has not been implemented, and applicants find themselves providing the same information multiple times.

Despite the challenges, the professionals agreed on the positive consequences that digitalization and digital technologies could have in implementing the LAPAD. In particular, digital technologies could be used to simplify the application process, improve communication between and within departments, and manage access to social welfare and health department files. Table 2 summarizes the opportunities and challenges that we have identified in the use of digital technologies in administering the LAPAD.

As a preview study has shown (e.g., Hidalgo-Lavié & Lima-Fernández, 2018), technology is seen as a positive for management and administrative tasks. The negative stereotypes about technology are overcome when technology reduces bureaucratic burdens, facilitates contact with family carers, and improves coordination among professionals. This

Table 2. Opportunities and Challenges in the Digital Administration of Spain's Long-term Care Law (Law 39/2006, December 14, LAPAD).

Opportunities	Challenges
Overcome bureaucratic burden	Difficult for some older adults to adopt
Improve coordination	Some citizens are digitally illiterate
Address citizens' needs through co-creation	Out-of-date digital services and equipment
Make the system more agile	Complexity of encryption
Provide information to citizens	Digital divide
	Professionals' stereotypes about older adults' ability to use technology

practical and utilitarian use of digital technology for internal management of social services does not generate resistance. In this regard, digital technologies are seen as practical tools to help in coping with the increasing bureaucratic burden. Professionals see that digitalization can not only simplify their administrative tasks, but also reduce time spent on them, in turn allowing them to invest more time in care recipients' needs. In short, the effective use of digital technologies could allow professionals to spend more time on social intervention and less on administrative tasks.

Professionals' main goal is not to use technology per se but to engage in high-quality social work and health care practices through direct contact with users. Their view of technology is purely instrumental: They are not interested in technology for its own sake. This needs to be understood in a context where the use of digital technologies against the backdrop of previous barriers and resistance to digitalization among social workers and health professionals is becoming relevant, although face-to-face contact with users is still considered necessary. All in all, professionals were found, in this study, to be open to new forms of eGovernment and, above all, to facilitating coordination among professionals (EC, 2017).

CONCLUSIONS

Our focus groups with professionals highlighted the difficulties that families face in coping with increasing everyday care needs of aging, disabled, and infirm family members. The lack of public resources continues to put families under pressure. Professionals, people with disabilities, older adults, and their relatives greeted the LAPAD with hope and high expectations. However, implementing the LAPAD has presented a serious administrative burden for professionals and families, which we suggest can be overcome with the careful digitalization of administrative processes. Professionals in Spain do not yet seem to be debating the use of digital technologies in health and care practice. But they are very much interested in using digital technologies for health and care administration; they see digitalization as a practical approach for coping with management and administrative duties. Effective digitalization could make the LAPAD application process smoother for professionals and applicants, while also saving time and making it possible to monitor an application's progress. Digitalization also provides an opportunity to lighten professionals' administrative burden and, in so doing, give them more time to dedicate to social intervention with care recipients. In short, the LAPAD's professional stakeholders tend to see digitalization as an opportunity rather than a threat. Nevertheless, digitalization needs to be accompanied by training, and it should respond to real citizens' needs and capacities.

In our assessment, we must take into account that, in 2011, as a response to the economic crisis, the Spanish government introduced its first cutbacks. In these cutbacks, the allowance for family carers was reduced, and copayments and use of the private sector were increased. Some people died without receiving benefits or services as the result of long waiting lists (Deusdad et al., 2016). The application process can take up to 2 years, and during this time, applicants often have no information about the status of their applications. This situation generates anxiety and a deep sense of abandonment by the State. These difficulties are exacerbated by the fact that, by definition, families applying for the LAPAD are living through a complex and painful time. Moreover, many of the family carers are themselves older adults.

Our analysis in this paper has focused on professional stakeholders' views of the use of digital technologies in the implementation of the Spanish LTC law. The need for further research on older adults' opinions and use of digital technologies, so as to glimpse possible ageist views from professionals and citizens, point to the limitations of this study. Future research should also take into account other health care and social work professionals from other countries and other professional areas. Comparative international research would help to identify similarities and differences across contexts. Likewise, other areas of social work should be explored to identify similarities and differences in the acceptance of digital technologies, training opportunities, and possible contradictions between digitalization and social work practice and cross-disciplinary interactions (i.e., health care and social work). Research focusing on professionals' participatory involvement in codesigning and coimplementing technologies for their practices will also be needed, following a bottom-up approach to ensure that digitalization will be fully useful for professionals.

IMPLICATIONS FOR APPLICATION AND POLICY

From our data, we identify three practical ways that digitalization could be used to improve the implementation of the LAPAD in Catalonia. First, the application system could be simplified and digitalized, making it as understandable as possible for applicants and ensuring that it conforms to the once-only principle. Second, digital channels for providing information to applicants and their families' could be created. These could take the form of a video, Web page, and/or app that would offer information about the available LTC benefits and services and the application process. This initiative could help applicants and their families, as well as the general public, which is ill informed about the LAPAD. Third, a significant proportion of social workers' time is taken up by informing care recipients of the status of their applications. Providing a digital means for care applicants and their families to check their application status—and an administrative specialist to support them when necessary (e.g., a help desk)—would significantly reduce the administrative burden on social workers. To ensure the success of these new systems, professionals, care recipients and their relatives will need to be trained in their use. Also, whenever possible, they should be involved in co-creating the systems, to ensure that the designs will respond to real stakeholders' needs.

ENDNOTES

1. Although residents of Catalonia do not have digital access to their application once it has been submitted, other autonomous regions, such as Murcia or Madrid, do provide online access to LAPAD applications. However, the system for doing so is complex and thus rarely used.
2. Nevertheless, one of the main concerns about using smartphones and social media for professional purposes is whether privacy can be guaranteed (Antheunis, Tates, & Nieboer, 2013; Hidalgo-Lavié & Lima-Fernández, 2018).

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Appendix

Table A1. The Codification and Profile Information on the Professional Participants.

Participant #	Position	Sex	Age	Focus Group (FG) or Interview (I)
P1	Social worker	F	45	FG1
P2	Social worker	F	32	FG1
P3	Social worker	F	42	FG1
P4	Social worker	F	39	FG1
P5	Social worker	F	31	FG1
P6	Social worker	M	32	FG1
P7	Social worker	M	41	FG2
P8	Social worker	F	29	FG2
P9	Social worker	F	41	FG2
P10	Social worker	F	40	FG2
P11	Social worker	F	40	FG2
P12	Care worker	F	59	FG3
P13	Care worker	F	58	FG3
P14	Care worker	F	38	FG3
P15	Care worker	F	51	FG3
P16	General practitioner	F	42	FG4
P17	General practitioner	F	48	FG4
P18	Geriatrician	M	39	FG4
P19	Geriatrician	M	56	FG4
P38	Nurse	F	43	I
P45	Nurse	F	48	FG8
P46	Nurse	F	42	FG8
P47	Nurse	F	47	FG8
P48	Nurse	F	50	FG8
P49	Care manager	F	58	FG5
P50	Social worker	F	47	FG5
P51	Care manager	F	35	FG5
P52	Care manager	F	42	FG5
P53	Care manager	F	46	FG5

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