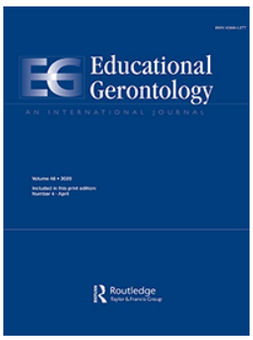

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ARTICLE

'For older folks like me, these things are over us…': The challenge of embedding tablet computers in everyday life within a geriatric hospital in Uruguay

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ABSTRACT

Much research has focused on the introduction of information and communication technology (ICTs) into the lives of older people, but it has generally understood them as external factors who act as a sort of independent variable that impacts the seniors' lives. There remains a dearth of empirical research into how aging and technology are co-constructed, namely, research that focuses on older people's relationship to technology as a socio-technical network. We therefore contribute to this field by analyzing the development and establishment of a network in a geriatric hospital in Montevideo, Uruguay. Uruguay has been developing a one-tablet computer-per low-income-senior policy since 2015. In this research, we deployed a qualitative ethnographic research comprised of semi-structured interviews, jottings, and field notes where we explore the adoption of tablets within the corresponding actor-network. Our findings suggest that objectively, not only was the establishment of the sociotechnical network rife with complexities, disruptions, and fissures, but subjectively, seniors in the hospital were heavily influenced by their self-perception of the potentialities of ICTs.

The issue of how information and communication technology (ICT) affects older people living in geriatric hospitals has been of increasing focus for researchers since the mid-1990 s, with the widespread adoption of the internet, and even more in the new millennium (Baecker, Sellen, Crosskey, Boscart, & Barbosa Neves, 2014; McConatha, McConatha, Deaner, & Dermigny, 1995; Ramprasad, Tamariz, Garcia-Barcena, Nemeth, & Palacio, 2019; Sherer, 1996). Literature on the introduction and use of computers has focused on the positive impacts of artifacts that can improve seniors' lives among a typically non-stimulating environment, such as the hospital (e.g. Neves, Franz, Munteanu, & Baecker, 2018). At the same time, researchers have suggested that ICTs indeed can prevent and be a treatment for cognitive deficits for older people in residential homes (Günther, Schäfer, Holzner, & Kemmler, 2003).

Seminal research from the 80 s and 90 s, for instance, demonstrated how the use of computers in geriatric hospitals increased seniors' motivation given that it fosters independence, suggesting that the use of ICT "adds a type of functional dimension back into their lives which increases their self-concept" (Groves & Slack, 1994, p. 1). Similarly, McConatha et al. (1995) found that computer training could help in reintegrating hospital residents into the larger community and counteract limited mobility as it could be used to develop skills such as communication, consumer education, and shopping. This was echoed by Purnell and Sullivan-Schroyer (1997, p. 62) who claimed that "nursing home residents can indeed become active citizens of the technological world".

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Scholarship on the role of ICTs in the daily lives of older adults, in the last decades, has thus focused primarily on the positive effects of introducing new technologies into the field of hospital facilities (Cotten, Anderson, & McCullough, 2013; McConatha et al., 1995; Ramprasad et al., 2019; Sherer, 1996). Other early research, however, has been more cautious about the relationship between seniors in hospitals and new technologies pointing at the *social shaping of technology*: technology has to be analyzed within a social context, and is, in fact, an actor that negotiates with a preexisting social fabric (Abramson, Stone, & Bollinger, 2001; Fisher, 1986). More recently, Neves, Franz, Munteanu, Baecker, and Ngo (2015) noticed that the use of technology by seniors in a seniors' long-term-care facility could certainly be positive but is nevertheless complex, as it involves, for example, problems such as staff's and administrators' lack of training and interest. In other words, the universe of social actors where a technology is introduced, matters.

Furthermore, Tak, Beck., and McMahon (2007, p. 37) have attuned to such changes and stated that "The attitudes toward offering computer and internet access to residents have shifted from 'little gain' to 'a good idea,'" given that people for whom technology is part of their daily lives are growing older. As a matter of fact, providing seniors with technology will be necessary given how ubiquitous ICT currently is. Recently, Seifert, Doh, and Wahl (2017), for instance, claimed that, in Switzerland, Internet has reached the long-term care sector and plays an important role in the lives of their residents, and this tendency is only to be expected to develop in increasingly more parts of the world as technology-use expands. Indeed, several scholars have documented the emergence of networks, connections, and practices created as part the adoption and uptake of new internet communications devices by seniors, such as the smartphone and tablet computers (Jacobson, Lin, & McEwen, 2017; Neves et al., 2018; Quan-Haase, Mo, & Wellman, 2017; Quan-Haase, Williams, Kicevski, Elueze, & Wellman, 2018).

Recent scholarship is also attuned to many of the challenges, problems, and barriers faced related to the adoption of new technologies, and to the practices of resistance that older citizens engage in avoid uptake (see Berenguer et al., 2016; Colombo, Aroldi, & Carlo, 2018; Hargittai & Dobransky, 2017; Quan-Haase, Martin, & Schreurs, 2016; Vulpe & Crăciun, 2019; Wang, Chen, & Chen, 2018). This body of work highlights the unique experiences that seniors have with ICTs and, in particular, the specific barriers to ICT inclusion that older individuals possess due to a variety of social mechanisms – from understanding a generational 'digital divide' whereby seniors are not 'digital natives' because they have known been socialized into using new technologies (see Abbey & Hyde, 2009) to suggestions that seniors face specific challenges to ICT adoption in part because of the lack of support systems such as family, peers, and educational networks (Schreurs, Quan-Haase, & Martin, 2017). At the same time, there is a more mundane factor to consider, namely, that seniors may not find computers useful in their lives (Richardson, Zorn, & Weaver, 2011; Selwyn, 2006). It is necessary to recognize that technology is not necessarily useful or inherently good for people's lives, and that people indeed decide the role that it should play within their context.

Current research indicates that tablets, in particular, are useful tools to include older adults digitally (Seifert & Schelling, 2015; Tsai, Shillair, Cotten, Winstead, & Yost, 2015). Thus, in this article, we extend this literature by focusing on the particular context of a geriatric hospital and suggest that in order to understand how technology is adopted, it is necessary to look at the complexity of the socio-technical networks involved. Central to our argument is that several actors betrayed the network of senior-user of the tablet, such as the hospital's internet infrastructure. We noted how the use of the tablet was diffuse and complex, as the devices were praised more for their potentialities rather than for their actual use. We argue that the tablets play a mediating role in seniors' lives, but the mediating role is one of potentiality rather than instrumental. What we mean by this is that more or less perceive affordances on the tablet such as communication with relatives (Aagaard, 2018), but they cannot bring them into fruition by themselves given their needs, skills, self-perception, and the context of the hospital they are living in. Furthermore, their awareness is explained because seniors perceive the potentialities of the tablet based on the techno-optimist prevailing discourse – that is, dominant notions of technological utility. At the same time, it is

very hard to keep all the entities enrolled to the network of the senior-tablet-user. In order for seniors in the hospital to use the tablets in a meaningful way, all the entities should remain loyal to the network to prevent betrayal, given that other actor-networks try to enroll seniors too, such as televisions and radios, for which most have long-enduring relationships.

Uruguay has developed new and innovative policies aiming at the digital inclusion of its population. In 2007, for instance, it developed a nationwide one-laptop-per-child program – Plan Ceibal – and in 2015, it started a program that aims at the digital inclusion of retired lower-income older adults called Plan Ibirapitá. Through Plan Ibirapitá, retired seniors who receive a monthly income of $36.152 Uruguayan pesos (approximately 969 USD) or less (as of January of 2020) receive a tablet computer for free. Given this context, Uruguay offers an interesting case study in the development, implementation, and consequences of introducing new internet communications technology (ICTs) for older individuals and, in particular, in the context of a geriatric hospital, for which previous literature has stressed the need of further research (Hunsaker & Hargittai, 2018; Seifert et al., 2017).

This study looks to contribute to the growing body of literature seeking to illuminate the ways in which older people use or do not use, resist, adopt, and negotiate their daily lives with new ICTs (Berenguer et al., 2016; Haight, Quan-Haase, & Corbett, 2014; Jacobson et al., 2017; Quan-Haase et al., 2016). The qualitative data were collected through a series of interviews (n = 15) and ethnographic field research from undergraduate-student volunteers who worked closely with older adults in the geriatric hospital Piñeyro Del Campo, located in Montevideo, where Plan Ibirapitá was implemented. As part of a larger project that includes an experiment which tested the effect of Plan Ibirapitá's tablets on cognitive outcomes of seniors in the same hospital (Cid, Sotelo, Leguisamo, & Ramírez, 2020), the present paper aims to illuminate the ways in which the adoption of new ICTs impacts the daily lives of seniors and the actors involved with such uptake. In order to further understand the meaning of the technology on Uruguayan seniors' lives, we propose returning to the well-established theories of actor-network theory (ANT) and postphenomenology, which are two complementary ways of understanding the relationship between humans and technology (Rosenberger, 2017; Rosenberger & Verbeek, 2015).

Theoretical framework

Actor-network theorist John Law (2009, p. 141) described that actor-network theory is not strictly a theory, but a set of tools that may be utilized to develop descriptive accounts of often-messy realities. Indeed, the world of Piñeyro Del Campo hospital is one such messy place, where both human and non-human actors are involved in complex networks of social interaction. Making sense of those interactions, however, is a very challenging task. Bruno Latour (2005) dealt with this problem by, as he put it, 'following the actors' – defined here as "any element which bends space around itself, makes other elements dependent upon itself and translate their will into a language of its own … It defines space and its organization, sizes and their measures, values and standards, the stakes and rules of the game" (Callon & Latour, 1981, p. 286). The nature of the entities that make reality in this case is relational and symmetric – a social fact established by Michel Callon's (1986) classic investigation on St. Brieuc's Bay.

Callon's (1986) study was an exploration of how scientists worked to enroll Fishermen and scallops into their network in order to tackle a problem of their decline in the Northern France Bay during the 1970 s. What Callon (1986) showed in his study is the relevance of non-human entities and how they have to be conceived as having agency that is susceptible to re-define networks in whole new ways – an idea he defined as 'generalized symmetry.' He demonstrated how an entity's identity can be defined relative to the network in the process defined as *translation*, where actors – in this case, fishermen, scallops, and scientists – are 'domesticated' in a process through which humans and non-humans are relationally understood. In other words, human and non-human actors are both equally significant for determining a social order. This entails an anti-essentialist approach to the social world, where people and objects' meanings and identities are negotiated and established

relatively in a network fashion. Nothing is fixed, but rather meanings and identities depend on the strength of a network to keep all its actors in place.

Postphenomenology is another theoretical lens through which to study human-technology relations. It establishes that technologies are mediators of how we experience the world (Verbeek, 2016). It conceives subjects and object in terms of a relational ontology, where technologies are not *in themselves* but in relation to how humans relate to them, and it is in this process that they co-shape subjects and their world. Rosenberger and Verbeek (2015) give the example of a telescope: through the telescope's mediation, people are constituted as observers and the sky as observable.

There are indeed similarities between postphenomenology and ANT, especially with respect to the roles of artifacts as mediating entities that fundamentally change the relationship between humans and their world. In other words, while ANT provides with the tools to study how an artifact is established in a network in relation to other actors, postphenomenology provides concepts adequate for the examination of the contextual use of a technology. We adopt both approaches in our study of the uptake, negotiation, and deployment of ICTs in the context of the hospital Piñeyro Del Campo.

The research setting

The Hospital *Dr. Luis Piñeyro del Campo* is a public geriatric center. It was founded in 1860 as *Asilo de Mendigos* (Beggar's Home). Today it houses hundreds of elderly people in vulnerable situations. All of them have a low-income background. Some have been assigned by a judge to stay there. In general, they lack an actively present family.

The structure of the hospital is made up of wards, which could be described as large blocks that communicate with each other through a large garden, or small park. Figure 1 shows a plan view of the hospital premises.

(1) Ward A is for residents with high dependency – specifically with high physical dependence and low mobility.
(2) Ward B is for residents with low dependency in general, they are the ones that are in better conditions, since they lack mental problems and are self-able in physical terms.
(3) Ward C is for residents who suffer from psychiatric problems.
(4) Ward D is for people who suffer dementia. For security reasons, preventing attempts to escape, the ward is metal fenced.

Each ward has a different structure, but they all have two floors. On the upper floor is the dining room and the women bedrooms, and on the floor below the male bedrooms and a smaller dining room.

Finally, there is an occupational therapy ward, which is a space with books and computers, little used for these purposes, but where painting workshops are held. Some patients come only during the day to the hospital, but reside at their own homes, using the Day Center.

The hospital provides the following health benefits: prevention, evaluation, and comprehensive geriatric treatment; psychiatric care; nutritional assessment and food planning; dental service, control, and treatment including dental prostheses; nursing care; physiotherapy and occupational therapy; physical education; recreational gymnastics; podiatric care, hairdressing, and manicures; medication and diapers or other devices for incontinence.

It also has intervention and stimulation programs (therapeutic horticulture, recreation group activity, workshops of cognitive stimulation; selection, adjudication and loan of walking aids and substitutes: canes, walkers, wheelchairs, etc.) as well as it holds religious services.

Figure 1. Top view of Piñeyro del Campo Hospital. 1-Secretariat; 2-Ward A; 3-Ward B; 4-Security; 5-Ward C; 6- Assembly Hall; 7-Day Center; 8-Ward D; 9-Occupational therapy ward.

Methods

Research design, questions, and participants

This project consists of a broadly qualitative ethnographic approach with data collected from semi-structured interviews, field notes, and jottings of social interactions between tablet-users, technologies, network infrastructure, and undergraduate volunteers. To understand this sociotechnical network, our guiding research question aimed to identify the role that the government-delivered tablets play in the daily lives of seniors at the hospital. Subsequently, we were interested in providing insights into a series of sub-questions: how is the sociotechnical network of tablets in the hospital constructed, mobilized, and deployed? How do those involved in the sociotechnical network resist or reject adoption? How do users of the tablets navigate and deal with technical failures? And, finally, how do such failures influence the self-perceptions of new ICT users?

Undergraduate students from University of Montevideo trained seniors to use the tablet. Volunteers were assigned to work steadily one-on-one with a senior. Seniors were very excited at first; however, it could be because of the attention they received from young people and not so much for what they expected from the tablet – a critique made by Dickinson and Gregor (2006) to previous research. The training sessions were highly personalized and focused on the interests of the hospital resident. At first, the tablets were stored in the management's office, so the volunteers had to go there retrieve the tablets. Each tablet had a number and name corresponding to the resident for which it is assigned. The volunteers would go to meet the resident they are responsible for training. We encouraged those seniors who were motivated and lucid enough to go there and retrieve their tablet. We also encouraged for them to ask the nurses to go get them. However, users remained reluctant to use the tablets. What was done, then, was installing lockers and padlocks allowing the people who were more lucid to store the tablet close to them. The reason for keeping the tablets locked was for preventing them getting stolen. However, in general, even if they had their tablet there, they would not use it.

The undergraduate volunteers from University of Montevideo applied semi-structured interviews to 15 participants: 10 from Ward B, 3 from ward A, and 2 from Ward C. Most of them were from Ward B because they were the most apt to participate in such an intervention, but other individuals from Wards A and C were also considered capable and thus included as well. The average age of the participants was 73 and has been in the hospital for an average of 84 months. Except two of them, the participants did not have previous contact with ICT such as smartphones, computers, or laptops. Several of the participants were capable to leave their section to go to the hospital's garden, the assembly hall, or the occupational therapy room. Two of them even had special permits to leave the hospital and do things such as going to the grocery store or to the bakery.

Grounded theory

This research used a qualitative inquiry based on ethnography and semi-structured interviews. Different scholars (e.g. Aagaard & Matthiesen, 2016; Hutchby, 2001; Verbeek, 2016), have demonstrated the important role that conversation analysis plays in examining how technology composes people's reality and how a meaningful 'world' with technology is constructed. We thus used semi-structured interviews in order to grasp the mediating role of the tablets in seniors' daily lives and analyzed the resulting data with principles of conversational analysis established in the literature.

According to Denzin and Lincoln (2011), qualitative research is fundamentally about understanding the human attribution of meaning. Thus, to explore meaning attribution in the context of new ICTs in the hospital, student-volunteers from University of Montevideo interviewed the fifteen seniors in good cognitive condition, participating in our intervention. Interviewers were overseen and guided by the authors, and volunteers were asked to write memos of their interactions with participants, as well as field notes and jottings of what they were experiencing. The interviews were transcribed verbatim for coding purposes guided by a grounded theory approach. Grounded theory is defined by Strauss and Corbin (1998, p. 12) as theory that is derived from data, systematically gathered and analyzed through the research process – a primarily inductive rather than deductive process. This entails "not only conceiving or intuiting ideas (concepts) but also formulating them into a logical, systematic, and explanatory scheme." (Strauss & Corbin, 1998, p. 21). To make a mass of data coherent in this way, researchers use a process commonly referred to as coding; it entails developing concepts and categories in a way that goes from the concreteness of the data toward an abstract connection between them (Strauss & Corbin, 1998, p. 22; see also Charmaz, 2014).

We first read the transcripts in detail to familiarize ourselves with the data. This was followed by a line-by-line coding in which we grouped similar events, concepts, ideas, and narratives under specific themes. As Strauss and Corbin (1998, p. 103) explain, "a concept is a labelled phenomenon. It is an abstract representation of an event, object, or action/interaction that a researcher identified as being significant in the data." We used the research assistants' memos and field notes as heuristic tools that assisted us in developing patterns and themes when coding the data. In our case, after reflexively seeing how the fieldwork was developing, we quickly realized that a postphenomenological lens could be applied and that we could empirically develop its complementarity with ANT. Thus, we had these theories in mind when developing our codes that were grounded in the data (see Figure 1). Following Tavory and Timmermans (2014), we therefore adopt what can broadly be defined as an *abductive* approach to grounded theory. The categories we discovered were then articulated with these technological mediation theoretical perspectives – ANT and postphenomenology – which provide with insights to look at the deployment of the tablets in the hospital.

Results

Actor-network of senior-users of the tablet in the hospital

Here we describe the set of actors that are relevant in the actor-network of the senior-user-of-the-tablet: seniors, volunteers, tablets, Internet and Wi-Fi, volunteers' cell-phones, nametags, lockers, padlocks, hospital's staff, and stairs, televisions, radios, and cell-phones. Let us start with seniors. Whereas some of them were engaged, others did not see a use for the tablets. Age was a common justification, and some stressed that the tablets were not for them but for the younger generation. They said things such as 'I am not in a stage to learn this, if I was younger [I would use it]'; 'the tablet is for the youth' or 'I would like it if I was younger. I'm 83′. They constantly mentioned the problems intrinsic to being old according to them:

> 'I used to learn things, now I don't know whether I can learn. Keep in mind that I am 76 years old'

> 'For older folks like me, these things are over us. It may be useful to somebody else, but to people like me, I changed'

> 'I am a nervous person and I don't have the patience'

> 'For the old ones like myself, it is over. For a young man it is different than for an older one like me. It is of not use for me, others might find it useful … one has already changed'

Seniors could be considered the actors whose identity we wanted to enroll in a network of users. The government's (and ours') objective through Plan Ibirapitá was to 'anchor,' or better said, *enroll* seniors to the network of tablet-user so that they can reap the benefits of the digital world. The goal was to translate their identity from a 'person excluded from the benefits of the digital world' into a tablet-user, surfer of the Internet who harvests the fruits of the web and its applications. However, some seniors were unruly, or they succumb to the temptations of other networks such as that of television and radio that do not demand much from them. This is because one can just lie in bed and watch TV or listen to the radio, and one is more of a passive recipient. In addition, TV and radios are devices of their time that they know how to use, whereas tablets, even though they might be useful, require much work and are complicated to manage. This why a senior stated, 'Nothing has changed much [with the tablet] because I have the television right there,' whereas another one said, 'I enjoy watching TV. It entertains me a lot.' In addition, cell-phones are another example of competing network:

> 'I'm going to tell you the truth. At the beginning, I started, I asked for the tablet, because I thought that it was easier and I had a wider spectrum to communicate with my family and with the people I love. But as time went by, I have found the cellphone to be easier than the tablet. Because I turn the tablet on and push on the social network icon, and there is a silence that tells me nothing, and no familiar faces show up on the tablet's screen. I found that to be frustrating.'

Other senior also pointed out problems with the internet:

> 'I don't have the time, you see. I would have the time if I was determined to, but as I have to have internet and all that, I grab a book which is easier, or I listen to the news on TV, or something like that. I'm pretty well informed that way.'

Another senior mentioned the easiness of TV compared to the tablet adding the prohibitions he was inflicted from the staff, from the Wi-Fi, and the charger:

> 'I'm going to be honest with you, with the tablet I cannot watch the news. [TV] is much easier and I access images and sound. With the tablet I look for information, I mean, I look for channels but I can't. I go round and round but I can't connect to any channel. [if he had internet] and they allowed me, I could go outside with the tablet. I could sit somewhere where I don't bother anyone, turn the tablet on, and watch [a news program] and the other in channel 4. … There are some Turkish soap operas on TV that I can't stand and then I think about [the tablet], that I have to charge it, I have to look for the icons and I can't find them. So then, why would I grab it, you see?'

Or another senior combined the difficulty to manage the tablet with issues of age:

> 'I don't like it [the tablet]. I watch TV, it is more practical. More comfortable. I don't care about the world of [the tablet], I leave that to younger people, for kids, the grandchildren. It is a different epoch when the first tablet, computer appeared, it is a different stage now. I arrived here and that's it … With my age I want to live comfortably. [The tablet] is bad because of the time that takes from what amuses me, from the distractions, better said than amusements, that is the TV.'

Student-volunteers were the 'obligatory passage point' (Callon, 1986) as they were generally the ones who grabbed the tablets from the management office and took them to the pavilions where the seniors were. Without them there could have not been network at all; they *problematized* the seniors' identity. Along with the tablets, they translated all of the other actor's identities toward the network of senior-user. At the same time, the tablets carry certain social order to specific places such as the hospital. Moreover, they transport the government's script (Akrich, 1992) that technology is good for older people and that it can help them improve their lives. The tablets tried, sometimes successfully, to translate seniors' interest and free time toward being a tablet-user and active senior through its components such as games. And indeed, sometimes it worked, as one senior remarked, 'I had nothing to do before, but now I have the tablet.' Another one said: 'The tablet has been a window toward entertainment,' and one volunteer noted that: '[one senior] likes being plugged to the tablet, radio or TV, not to think.'

Let us now introduce a couple of traitors to the network: Internet and Wi-Fi. These two go hand in hand and were fundamental to enroll seniors into the network. When they failed, seniors lost interest in the tablet. The quotes below attest to this:

> 'The problem is that I cannot communicate from bed [using the tablet] and sometimes I don't feel well enough to get out of bed and I want to communicate to tell [his daughter] that I don't feel well, that I need her. Although I know she won't show up because she is working in Buenos Aires. I want to communicate and tell her how I feel but I can't.'

> 'Sometimes I get so angry that I want to throw [the tablet] to the ground when I can't communicate. I just want to smash it. I just do it here [on the dining room] because I have wi-fi here. In the bedroom I don't. I turn it on 25,000 times, and 25,000 times I press on the icons that they told me I have to press, and nothing.'

> 'Right now I don't use it because it always asks to connect to the internet. I can't get internet.'

> 'I love how you [volunteer] teach, but the problem is that I left it aside because as the thing to connect to the Internet popped up and I don't know how to connect.'

One volunteer noted:

> 'It is not comfortable for him [the senior] going to the dining room. He doesn't find the time as they are always serving food or cleaning. He says he should go at 11PM but it's too late then. He cannot go to the assembly hall because it is always closed.'

In a way, the Internet is key in holding the network together, but often times it does not do its job properly nor efficiently. This provoked human actors such as the fieldwork supervisors to call the Internet provider (a government-owned company) in order to try and keep the network together, but the restoration of the Internet often took days. However, an association of human and non-human actors provided solutions on several occasions: the volunteers and their cell-phones that can share Wi-Fi. Together, these actors offered networks of solution when Wi-Fi was failing and held the network together in momentary times of failure or futility.

Other fundamental actors are nametags, lockers, and padlocks, that provide anti-programs to other actors who threaten the network – namely, thieves and unwanted patrons. A program of action is related to a script. It is the inscribed function to a device, namely, what the device is determined to be for (Latour, 1992). These elements counteract the human robbers' program of action, namely, stealing the tablets from seniors, but also against some senior's laziness of not wanting to walk all the way to the management offices to use the tablet. Lockers were assembled close to seniors to

encourage those more avid users to use the tablet more assiduously and thus fortify the network. The thieves' program was also counteracted using padlocks and nametags glued to the tablets.

Other actors that worked against the network were stairs and staff. On the one hand, stairs attempted to prevent seniors, especially men, to move themselves to the places where they had Internet access. On the other hand, human entities such as nurses or employees both hindered the seniors' use of the tablets by not helping in moving seniors to those places where there is intermittent Internet access, even when fieldwork supervisors requested for help (see Neves et al., 2015).

Postphenomenology – mediating role of the tablet

One thing has to be made clear: mediation, as described by postphenomenology, goes beyond mere use and includes the potentiality of technology. In this sense, Aisle Kiran (2017, p. 8) argues that the artifacts that compose our lives "configure the manners of our being-in in the 'physical world' as well as the 'social world.'" This means that technological mediation transforms human's projects, agency, possibilities, and their selves. Technology's actuality, then, does not provide with a comprehensive account of the significance of technology in the lifeworld, so that we need to also put our attention on what Kiran calls 'technological presence' other than on artifacts *in use* (Kiran, 2012, p. 79). This way we can consider technology's influence in their potentiality rather than their contextual actuality. It refers to the fact that technologies carry 'virtual' actions which are side effects of what they were designed to do. Technology, thus, affects our lifeworld with the possible mediations it provides: "We become the kind of subjects that we are through throwing ourselves into projects. The projects we regard ourselves to be able to undertake, throw us into, is very much related to the technological possibilities we recognise in our lifeworld" (Kiran, 2012, p. 80). In other words, our projects define how we perceive reality showing us the affordances for our goals (see Brey, 2017). Kiran (2012) puts forward the notion that the technologies organize our lifeworld as it opens up the potentialities of what we might become, so that 'the 'world' becomes the potentiality enabled by things.' In this sense, we maintain that our projects and affordances are established by the actor-network we are a part of. We move through the world according to the associations of entities in particular contexts, or, in Kiran's (2012) terms, our 'existential horizon.'

Thus, the tablets, as non-human entities, mediate seniors' realities in a complex fashion, mostly not through use or actuality but through its potentialities, the perceived affordances or what Rogers (2003) defined as the awareness-knowledge of the artifact. This way, they co-constitute seniors' reality within an actor-network.

With our interviews analyzed with grounded theory tools, we arrived at the following scheme in Figure 2.

We found that the main category is that of the tablet's potentiality as well as its diffuse uses. This is because the seniors we interviewed appreciated the tablet more by its perceived potential affordances, technological presence, or awareness-knowledge, rather than by its actual use:

> 'What happens is that I like to talk a lot and I would like to have things such as communication with my daughter. But then I would need to know how to use it properly.'
>
> 'I dreamt I would be able to communicate with my family through the tablet. I want to do it by myself and every day.'
>
> 'If I want to watch a football game and I am away from the pavilion, how do I do? I have to go out with someone, otherwise I can't. I would like to go out with the tablet instead of being inside trying to watch the football game unsuccessfully.'
>
> 'I didn't know what the tablet was for. I imagined I could listen to the BeeGees. Because I watched that [another resident] used the tablet with one of the guys that comes here and they could play with the tablet.'
>
> 'I would like to use it to communicate in order to learn to knit. You see, I knit, but I want to learn other styles or other stuff related to knitting.'
>
> 'I don't know … to communicate, to follow the news … I have a daughter in Buenos Aires.'

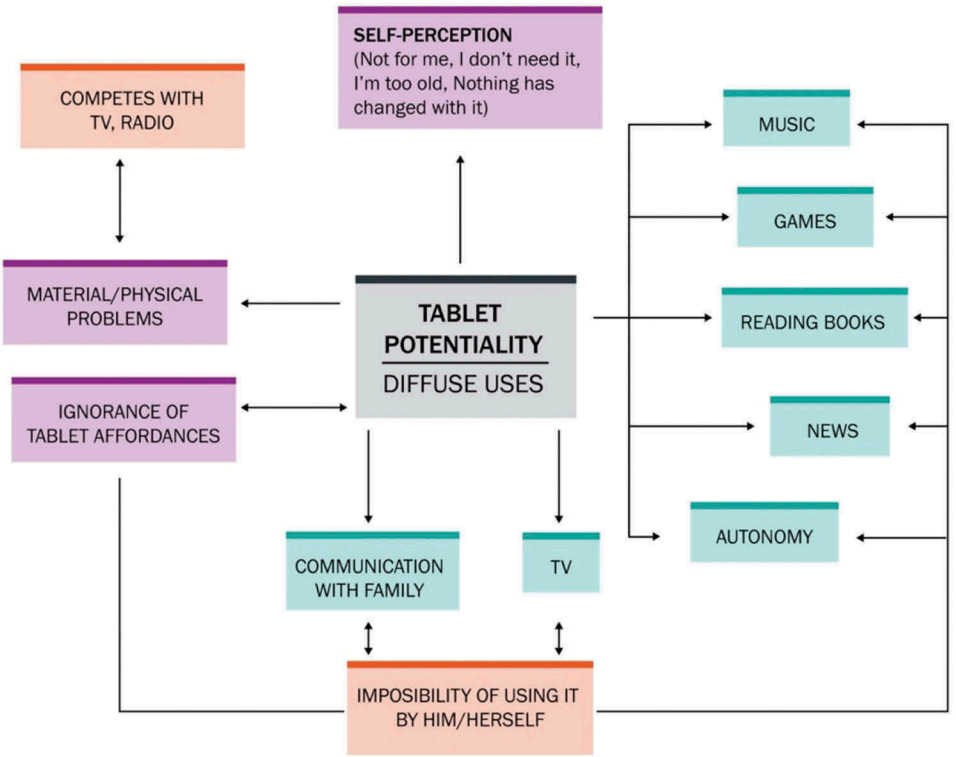

Figure 2. Conceptual schema of socio-technical network at hospital piñeyro del campo.

In addition, almost all of the times, seniors needed the volunteers to be with them in order to engage with the tablet. The awareness-knowledge that different seniors brought up in the interviews were that of being able to communicate with family, listening to music, playing games, reading books, checking the news, watching TV on the tablet, as well as a perceived autonomy they got through the tablet. In spite of this, however, they largely ignored how to use it and they seemed to repeat what the volunteers explained to them in the training sessions without really using it by themselves in most cases:

> 'As of now, [the tablet] has not been useful. It is if I get help from somebody else who knows. I can't communicate.'

> 'I would try it, but as I tell you, I don't want to waste your time and the other kid's who are so good to me [referring to the volunteers]. I'm on a different stage now. If I was younger, then yes. But at my age I am with one foot here and another one in the other world. So for my kids, grandchildren, yes. They are in an age to use the current technology, but I am lazy.'

> 'I haven't used it recently because it says that I have to connect to the internet, and I don't know … '

These perceived potential benefits were accompanied by something that seems contradictory, that is, the fact that seniors tended to explain that they were too old to manage the tablet, that they do not need it, and that nothing has changed with it. So even if they felt that the tablets could be beneficial, they found excuses not to use them through that self-perception. These excuses were also fed by material and physical problems such as that the tablets need to be charged, and that many seniors had different physical issues such as mobility or vision problems. This, at the same time, was synergic with the aforementioned easiness of watching TV or listening to the radio:

'I haven't used it. I have played with it, but I haven't used it much. I haven't used it because I had to charge it the other day, I had it uncharged, and now I plugged it in for charging again.'

'It is not a lack of will, but the problem is that I can't see well. It's a waste of time.'

'The advantage of TV is that it does not affect my vision'

'If I was in good conditions, 'brand new', I think I would like it.'

'It is a waste of time … I barely do my own things and I don't ask for anyone's help. I'm always busy.'

We could say, then, that the social space created by the tablet is one determined by a discourse that recognized potential benefits to using device, but that those are 'not for me,' or 'I could use it but I'm too old for it.' The tablet does co-constitute seniors' reality in a fashion that is not directly by its use, but through the technological presence that Kiran (2012) describes, and the actor-network that co-constitutes their agency. That is, through the perceived potentialities and diffuses uses that seniors tend to engage with the volunteers' help.

Discussion

Previous research has explored issues such as the benefits and barriers of computers, internet or e-mail use by older adults focusing on human elements such as the feelings of connectedness or of frustration with the technology (Gatto & Tak, 2008; Quan-Haase et al., 2017). Also, emphasizing the human aspect, others have suggested that attitudes, experience of use, and perceived benefits are components that must be considered as key variables for older people's use of technology (Hernández-Encuentra, Pousada, & Gómez-Zúñiga, 2009; Seifert, Hofer, & Rössel, 2018). Tablets, in particular, have been indicated as devices useful for older people's digital inclusion because of their ease of use (Seifert & Schelling, 2015; Tsai et al., 2015). However, in this study, we understand the relation between human and technology in terms of a sociotechnical network rather than only focusing on the human side of technology use. We found that the borders of an apparently simple technological artifact such as a tablet are diffuse in so far as many actors have to be in place in order for the tablet to be used, translate people's identity, and establish – in our case – a senior-user in a geriatric hospital. We suggest that ANT and postphenomenology bring an interesting way to design, understand, and apply technological policies that are implemented in that type of setting. This implies moving away from simple (and often deterministic) appropriation models to include the many human and non-human actors that are involved in the techno-social.

In this sense, our findings suggest that even when a technology is accompanied by training, ongoing support, and stimuli to use it – as Hernández-Encuentra et al. (2009) suggested –, there are influences from the larger social context that prevent seniors' identities being translated into users. These influences are revealed when including in the analysis non-human elements as proposed by ANT and postphenomenology.

We found that the actor-network of the hospitalized-senior user of the tablet is fragile, as there are several actors that attempt against the network. For instance, an Internet and Wi-Fi that sometimes do not work properly do not allow seniors to connect from their bedrooms. This disrupts one of the activities that is most interesting for seniors, which is communication with family. Through the theoretical lens of postphenomenology, we noticed that the mediation (that is, the constructing role of seniors' reality through the technological medium) and concomitant seniors' agency are based on potential-perceived affordances (see Kiran, 2012), namely, the basic knowledge of what the tablet is for, which does not mean an actual know-how (see Schreurs et al., 2017). This led to a diffuse use of the tablet by the seniors, which basically consisted in playing games.

Previous literature (e.g. Cotten et al., 2013) agrees on the fact that technology could help seniors living in care facilities have a better life, added to the fact that they are susceptible to isolation (Prieto-Flores, Forjaz, Fernandez-Mayoralas, Rojo-Perez, & Martinez-Martin, 2011). That is why

policies such as Plan Ibirapitá could be helpful. However, this should not be framed in a technologically deterministic fashion, because context is fundamental. Such a perspective has been backed up by recent scholarship has argued against paternalistic views in the design and implementation of technological innovations that sees older people as mere recipients of devices (Peine, Rollwagen, & Neven, 2014). These paternalistic stances usually carry rhetoric about technological innovation being a sort of morally necessary solution for many of seniors' problems that are usually intertwined with ageist stereotypes (Joyce, Peine, Neven, & Kohlbacher, 2016). Thus, scholars have indicated the necessity of looking at how older people use technology in the socio-material context of their lives (Neven & Peine, 2017).

The study's limitations include, on the one hand, the cross-sectional design given that seniors' lives are dynamic, and the meaning of technology can thus shift across time (as pointed out by Peek, Luijkx, & Vrijhoef et al., 2019). On the other hand, data were collected from a single hospital in Uruguay and the participants were homogeneous in terms of socioeconomic status and previous experience with technology. In addition to developing a longitudinal approach, further research could compare the technological realities of economically privileged seniors who are also living in a context in which they also need constant care, the same as our participants at Piñeyro Del Campo hospital.

Conclusion

This study aimed to understand the complex and interrelated impact that tablet computers play in lives of senior residents in a geriatric hospital in Montevideo, Uruguay. As ICT are increasingly identified as a need for older people's well-being (Gardner, Kamber, & Netherland, 2012), the adoption of new devices amongst older individuals is an important area of concern for public policy. Scholars have also recently stressed the need of expanding the existing literature with studies focusing on seniors living in different contexts such as supportive care settings (Hunsaker & Hargittai, 2018; Seifert et al., 2017), thus this paper contributes in this sense by developing a description of the reality of Uruguayan seniors living in such a setting.

This project sheds light on how sociotechnical networks constructed and negotiated in the context of new ICT introductions in older adult's physical space. We also aimed to uncover how do those involved in the sociotechnical network resist or reject such new technologies and how users navigate and deal with technical failures – particularly with respect to how such failures influence the self-perceptions of new ICT users.

Our study finds that technology adoption by older adults is not straightforward nor can be understood in traditional binaries of accept or reject. The social context inclusive of a host of diverse actors (both human and non-human) and technologies must be considered as an important aspect of the mutual relationships between older individuals and ICTs. In other words, we must understand this relationship in terms of a sociotechnical network, rather than two-way relationship between user and device. This is an important theoretical contribution precisely because it shifts our attention away from reductionist understandings of new user technology uptake and could therefore be of great value to program development and policymakers looking to advance the uptake of ICTs amongst those on the other side of the digital divide.

The second contribution of this paper is focused on challenging the optimistic view of technology within techno-policies such as Plan Ibirapitá. While certainly, most approach the uptake of new technologies amongst traditionally reluctant groups to be a progressive and monolithically beneficial development, our research indicates that any such techno-optimism must be nuanced. Older individuals – in particular, those in already challenging environments such as long-term care facilities or geriatric hospitals – may not be in a position where ICT devices such as tablets are necessary or even useful. These nuances must be accounted for in the development and refinement of new ICT adoption policies and programs implemented in Uruguay and elsewhere.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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References

Aagaard, J. (2018). Magnetic and multistable: Reinterpreting the affordances of educational technology. *International Journal of Educational Technology in Higher Education*, *15*(1), 4. doi:10.1186/s41239-017-0088-4

Aagaard, J., & Matthiesen, N. (2016). Methods of materiality: Participant observation and qualitative research in psychology. *Qualitative Research in Psychology*, *13*(1), 33–46. doi:10.1080/14780887.2015.1090510

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

Abramson, C. I., Stone, S. M., & Bollinger, N. (2001). Internet access for residents: Its time has come. *Nursing Homes Long Term Care Management*, *50*(4), 6–7.

Akrich, M. (1992). The description of technical objects. In W. Bijker & J. Law (Eds.), *Shaping technology/building society: Studies in sociotechnical change* (pp. 205–223). Cambridge, MA: MIT Press.

Baecker, R., Sellen, K., Crosskey, S., Boscart, V., & Barbosa Neves, B. (2014, October). Technology to reduce social isolation and loneliness. In *Proceedings of the 16th international ACM SIGACCESS conference on Computers & accessibility* (pp. 27–34). New York, NY: Association for Computing Machinery.

Berenguer, A., Goncalves, J., Hosio, S., Ferreira, D., Anagnostopoulos, T., & Kostakos, V. (2016). Are Smartphones Ubiquitous?: An in-depth survey of smartphone adoption by seniors. *IEEE Consumer Electronics Magazine*, *6*(1), 104–110.

Brey, P. (2017). The strategic role of technology in a good society. *Technology in Society*, *52*, 39–45. doi:10.1016/j.techsoc.2017.02.002

Callon, M., & Latour, B. (1981). Unscrewing the Big Leviathan: How actors macro-structure reality and how sociologist help them to do so. In K. Knorr-Cetina & A. V. Cicouvel (Eds.), *Advances in social theory and methodology: Towards an integration of micro and macro-sociology* (pp. 277–303). Boston, MA; London: Routledge.

Callon, M. (1986). Some elements of a sociology of translation: Domestication of the scallops and the fishermen of Saint Brieuc bay. In J. Law (Ed.), *Power, action and belief: A new sociology of knowledge* (pp. 196–233). London, UK: Routledge.

Charmaz, K. (2014). *Constructing grounded theory*. Thousand Oaks, CA: Sage.

Cid, A., Sotelo, R., Leguisamo, M., & Ramírez, C. (2020). *Tablets for deeply disadvantaged older adults*: *Challenges in long-term care facilities* [Manuscript submitted for publication]. Department of Economics, Universidad de Montevideo.

Colombo, F., Aroldi, P., & Carlo, S. (2018). "I use it correctly!": The use of ICTs among Italian grandmothers in a generational perspective. *Human Technology*, *14*(3), 343–365. doi:10.17011/ht/urn.201811224832

Cotten, S. R., Anderson, W. A., & McCullough, B. M. (2013). Impact of internet use on loneliness and contact with others among older adults. *Journal of Medical Internet Research*, *15*(2), e39. doi:10.2196/jmir.2306.

Denzin, N., & Lincoln, Y. (2011). Introduction: The discipline and practice of qualitative research. In N. Denzin & Y. Lincoln (Eds.), *The sage handbook of qualitative research* (pp. 1–20). Thousand Oaks, CA: Sage.

Dickinson, A., & Gregor, P. (2006). Computer use has no demonstrated impact on the well-being of older adults. *International Journal of Human-Computer Studies*, *64*(8), 744–753. doi:10.1016/j.ijhcs.2006.03.001

Fisher, S. (1986). Increasing participation with a computer in an adult day care setting. *Activities, Adaptation & Aging*, *8*(1), 31–36. doi:10.1300/J016v08n01_04

Gardner, P. J., Kamber, T., & Netherland, J. (2012). "Getting Turned On": Using ICT training to promote active ageing in New York city. *The Journal of Community Informatics*, *8*, 1.

Gatto, S. L., & Tak, S. H. (2008). Computer, Internet, and e-mail use among older adults: Benefits and barriers. *Educational Gerontology*, *34*(9), 800–811. doi:10.1080/03601270802243697

Groves, D. L., & Slack, T. (1994). Computers and their application to senior citizen therapy within a nursing home. *Journal of Instructional Psychology*, *21*(3), 221–226.

Günther, V. K., Schäfer, P., Holzner, B. J., & Kemmler, G. W. (2003). Long-term improvements in cognitive performance through computer-assisted cognitive training: A pilot study in a residential home for older people. *Aging & Mental Health*, *7*(3), 200–206. doi:10.1080/1360786031000101175

Haight, M., Quan-Haase, A., & Corbett, B. (2014). Revisiting the digital divide in Canada: The impact of demographic factors on access to the internet, level of online activity, and social networking site usage. *Information, Communication & Society*, *17*(4), 503–519. doi:10.1080/1369118X.2014.891633

Hargittai, E., & Dobransky, K. (2017). Old dogs, new clicks: Digital inequality in skills and uses among older adults. *Canadian Journal of Communication*, *42*(2), 195–212. doi:10.22230/cjc.2017v42n2a3176

Hernández-Encuentra, E., Pousada, M., & Gómez-Zúñiga, B. (2009). ICT and older people: Beyond usability. *Educational Gerontology*, *35*(3), 226–245. doi:10.1080/03601270802466934

Hunsaker, A., & Hargittai, E. (2018). A review of Internet use among older adults. *New Media & Society*, *20*(10), 3937–3954. doi:10.1177/1461444818787348

Hutchby, I. (2001). Technologies, texts and affordances. *Sociology*, *35*(2), 441–456. doi:10.1177/S0038038501000219

Jacobson, J., Lin, C. Z., & McEwen, R. (2017). Aging with technology: Seniors and mobile connections. *Canadian Journal of Communication*, *42*(2), 331–357. doi:10.22230/cjc.2017v42n2a3221

Joyce, K., Peine, A., Neven, L., & Kohlbacher, F. (2016). Aging: The socio-material constitution of later life. In U. Felt, R. Fouché, C. Miller, & L. Smith-Doerr (Eds.), *The handbook of science and technology studies* (pp. 915–942). Cambridge, MA: The MIT Press.

Kiran, A. H. (2012). Technological presence: Actuality and potentiality in subject constitution. *Human Studies*, *35*(1), 77–93. doi:10.1007/s10746-011-9208-7

Kiran, A. H. (2017). Mediating patienthood—from an ethics of to an ethics with technology. *Nursing Philosophy*, *18*(1). doi:10.1111/nup.12153.

Latour, B. (1992). Where Are the Missing Masses? The Sociology of a Few Mundane Artifacts. In W. Bijker & J. Law (Eds.), *Shaping Technology/Building Society: Studies in Sociotechnical Change* (pp. 225–258). Cambridge, Mass: MIT Press.

Latour, B. (2005). *Reassembling the social: An introduction to Actor-Network Theory*. Oxford, UK: Oxford University Press.

Law, J. (2009). Actor network theory and material semiotics. In B. S. Turner (Ed.), *The new Blackwell companion to social theory* (pp. 141–158). London, UK: Blackwell.

McConatha, J. T., McConatha, D., Deaner, S. L., & Dermigny, R. (1995). A computer-based intervention for the education and therapy of institutionalized older adults. *Educational Gerontology*, *21*(2), 129–138. doi:10.1080/0360127950210202

Neven, L., & Peine, A. (2017). From triple win to triple sin: How a problematic future discourse is shaping the way people age with technology. *Societies*, *7*(3), 26. doi:10.3390/soc7030026

Neves, B. B., Franz, R. L., Munteanu, C., & Baecker, R. (2018). Adoption and feasibility of a communication app to enhance social connectedness amongst frail institutionalized oldest old: An embedded case study. *Information, Communication & Society*, *21*(11), 1681–1699. doi:10.1080/1369118X.2017.1348534

Neves, B. B., Franz, R. L., Munteanu, C., Baecker, R., & Ngo, M. (2015, April). My hand doesn't listen to me! adoption and evaluation of a communication technology for the 'oldest old'. In *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems* (pp. 1593–1602). New York, NY: Association for Computing Machinery.

Peek, S. T. M., Luijkx, K. G., Vrijhoef, H. J. M., Nieboer, M. E., Aarts S., van der Voort, C. S., ... Wouters, E. J. M. (2019). Understanding changes and stability in the long-term use of technologies by seniors who are aging in place: A dynamical framework. *BMC Geriatr*, *19*(236), 2019. doi:10.1186/s12877-019-1241-9

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

Prieto-Flores, M. E., Forjaz, M. J., Fernandez-Mayoralas, G., Rojo-Perez, F., & Martinez-Martin, P. (2011). Factors associated with loneliness of noninstitutionalized and institutionalized older adults. *Journal of Aging and Health*, *23*(1), 177–194. doi:10.1177/0898264310382658

Purnell, M., & Sullivan-Schroyer, P. (1997). Nursing home residents using computers: The Winchester House experience. *Generations*, *21*, 61–62.

Quan-Haase, A., Martin, K., & Schreurs, K. (2016). Interviews with digital seniors: ICT use in the context of everyday life. *Information, Communication & Society*, *19*(5), 691–707. doi:10.1080/1369118X.2016.1140217

Quan-Haase, A., Mo, G. Y., & Wellman, B. (2017). Connected seniors: How older adults in East York exchange social support online and offline. *Information, Communication & Society*, *20*(7), 967–983. doi:10.1080/1369118X.2017.1305428

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

Ramprasad, C., Tamariz, L., Garcia-Barcena, J., Nemeth, Z., & Palacio, A. (2019). The use of tablet technology by older adults in health care settings—is it effective and satisfying? a systematic review and meta analysis. *Clinical Gerontologist*, *42*(1), 17–26. doi:10.1080/07317115.2017.1322162

Richardson, M., Zorn, T. E., & Weaver, K. (2011). Older People and New Communication Technologies Narratives from the Literature. *Annals of the International Communication Association*, *35*(1), 121–152. doi:10.1080/23808985.2011.11679114

Rogers, E. M. (2003). *Diffusion of innovations* (5th ed.). New York, NY: Free Press.

Rosenberger, R., & Verbeek, P. P. (2015). A Postphenomenological Field Guide. In R. Rosenberger & P. P. Verbeek (Eds.), *Postphenomenological Investigations: Essays on Human-Technology Relations* (pp. 9–41). Lanham, MD: Lexington Books.

Rosenberger, R. (2017). On the hermeneutics of everyday things: Or, the philosophy of fire hydrants. *AI & Society*, *32*(2), 233–241. doi:10.1007/s00146-016-0674-3

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

Seifert, A., Doh, M., & Wahl, H. W. (2017). They also do it: Internet use by older adults living in residential care facilities. *Educational Gerontology*, *43*(9), 451–461. doi:10.1080/03601277.2017.1326224

Seifert, A., Hofer, M., & Rössel, J. (2018). Older adults' perceived sense of social exclusion from the digital world. *Educational Gerontology*, *44*(12), 775–785. doi:10.1080/03601277.2019.1574415

Seifert, A., & Schelling, H. R. (2015). Mobile use of the Internet using smartphones or tablets by Swiss people over 65 years. *Gerontechnology*, *14*(1), 57–62. doi:10.4017/gt.2015.14.01.000.00

Selwyn, N. (2006). Digital division or digital decision? A study of non-users and low-users of computers. *Poetics*, *34*(4–5), 273–292. doi:10.1016/j.poetic.2006.05.003

Sherer, M. (1996). The impact of using personal computers on the lives of nursing home residents. *Physical & Occupational Therapy in Geriatrics*, *2*(14), 13–31. doi:10.1080/J148v14n02_02

Strauss, A., & Corbin, J. (1998). *Basics of qualitative research: Techniques and procedures for developing grounded theory* (2nd ed.). Thousand Oaks, CA: Sage.

Tak, S. H., Beck., C., & McMahon, E. (2007). Computer and internet access for long-term care residents: Perceived benefits and barriers. *Journal of Gerontological Nursing*, *33*(5), 32–40. doi:10.3928/00989134-20070501-06

Tavory, I., & Timmermans, S. (2014). *Abductive analysis: Theorizing qualitative research*. Chicago, IL: University of Chicago Press.

Tsai, H. Y. S., Shillair, R., Cotten, S. R., Winstead, V., & Yost, E. (2015). Getting grandma online: Are tablets the answer for increasing digital inclusion for older adults in the US?. *Educational Gerontology*, *41*(10), 695–709. doi:10.1080/03601277.2015.1048165

Verbeek, P. P. (2016). Toward a Theory of Technological Mediation: A program for postphenomenological research. In J. K. Berg, O. Friis, & R. C. Crease (Eds.), *Technoscience and Postphenomenology: The Manhattan Papers* (pp. 189–204). London, UK: Lexington Books.

Vulpe, S., & Crăciun, A. (2019). Silver surfers from a European perspective: Technology communication usage among European seniors. *European Journal of Ageing*, 1–10. doi:10.1007/s10433-019-00520-2

Wang, K. H., Chen, G., & Chen, H. G. (2018). Understanding technology adoption behavior by older adults. *Social Behavior and Personality*, *46*(5), 801–814. doi:10.2224/sbp.6483