

Use of Mobile Phones and Tablets amongst Spanish Seniors: Barriers and Motivations

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Abstract: Spain has a rapidly ageing population that still faces a large digital divide. This preliminary study aims to research the barriers and motivations that Spanish older adults experience with mobile phones and tablets. To investigate it, semi-structured interviews and participant observations were carried out with seniors living in Madrid. An anthropological approach was taken, to look at the social profile and cultural context of the seniors. The preliminary results indicate that the tablet and the smartphone are not common devices among the participants. The seniors also remarked that huge physical barriers, poor design, and a general aversion hinder the use of mobile technologies, although these greatly depend on the social context of the participants. Nevertheless, the devices have been acknowledged to be supportive for communication, safety, entertainment, etc. Future studies will broaden the research topic and include a more diverse population.

1 INTRODUCTION

The Spanish population is estimated to be the oldest in 2050, as 32% of the population will be aged over 65 (Sancho Castiello, Abellán, Pérez Ortiz, & Miguel Polo, 2002). Furthermore, Spain faces a large digital divide in 2018: 48% of seniors (henceforth people over 65) between 65 and 74 years old had not used the internet in three months whereas 98% of youngsters between 16 and 24 had, although this gap has been reduced by 27% since 2007 (Abellán et al., 2019).

Rice and Katz (2003) stated that a high income, working full time, being married and high education levels affect positively the use of ICT (Information and Communication Technologies). However, other researchers as Kang and Maity (2013) confirmed that low-income users use phones heavily. In this regard, González-Oñate, Fanjul-Peyró, and Cabezuolo-Lorenzo (2015) manifested that the recent economic crisis in Spain has constrained the incorporation of Spanish seniors in ICT. They surveyed Spanish

seniors who responded that the mobile phone is the most used technological device (81%), that are used it to keep in touch with other people (69%), for entertainment (18%), to talk (10%) and only 2% claimed to use it for training and education. Rosales and Fernández-Ardèvol (2016) indicated that Spanish older adults use calendar, notes and address book more often than other age groups and older adults use smartphones less often in stable locations with Wi-Fi than young people.

Various models explain mobile technology adoption, among them, Kwon and Chidambaram (2000), Phang et al. (2006) and Mobile Phone Technology Acceptance Model (Van Biljon & Kotzé, 2007). Nevertheless, closer to this research, Renaud and Van Biljon (2008) suggest “Senior Technology Acceptance & Adoption Model” (STAM) with a focus on mobile technologies. The latter model consists of user context, perceived usefulness, intention to use, experimentation and exploration, ease of learning and use (innovative feature in the models), confirmed usefulness and actual use. In their

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investigation, most of the seniors did not buy a phone device by themselves and consider spending money on it very carefully. Rejection of these devices is caused because of bad experimentation and a perception that the phone is too difficult to use.

Mobile technologies facilitate seniors' social interaction, entertainment, brain stimulus and serve as memory aids (Chen, Chan, & Tsang, 2013). Elderly people use mobile technologies for health tracking (Ghaffari, Navabi, & Gannat Alipoor, 2016) and safety, e.g. for Alzheimer's users to avoid getting lost (De Leo, Brivio, & Sautter, 2011). Mobile phones have also been studied to decrease isolation (Ojembe & Kalu, 2019; Preston & Moore, 2019) simultaneously allowing the user to live independently (Vicente & Lopes, 2016). The first person to whom they call is the partner (Kurniawan, 2007) and grandchildren usually teach seniors how to use these devices (Mallenius, Rossi, & Tuunainen, 2007), although this might vary by the country where the research was carried out.

Rejection of these devices among seniors may be caused because of several factors. Low quality of interface seems to be a predominant reason to discard mobile technologies (Abascal & Civit, 2001). In addition to this, the absence of clear pricing, a small screen, complex menu, small buttons and a small font of characters also limit its usage (Mallenius et al., 2007). Deficient evaluation of user needs and incomprehensible manuals and instructions are major shortcomings for the mobile industry (Ibid.). Phones are also known to provoke a great readjustment of seniors' life routine, which becomes a limitation for its use (Ling, 2008).

There are also physical barriers playing a big role in the use of mobile technologies among seniors. For example, Czaja et al. (2006) describes cognitive barriers that encompass memory and processing speed. Other physical limitations that deter potential use of phones are visual, auditory and motor control abilities (Eek & Wressle, 2011). The mental barriers that seniors experience include privacy concerns, security and safety (Chiarini, Ray, Akter, Masella, & Ganz, 2013) and low confidence (Mitzner et al., 2010). In this sense, seniors become lost, return more often to the top of the menu and spend more time with tasks (De Leo et al., 2011).

Previous research has focused on the barriers and facilitators that older adults experience with mobile technologies, however, there is not enough qualitative research concerning this in the Spanish context. This literature review thus fosters an inquiry to explore qualitatively what is the actual use of mobile technologies by Spanish older people. The main goal

of this article is to investigate what are the barriers and motivations of Spanish seniors when using mobile phones and tablets. The research has been framed within an anthropological investigation with an attempt to explore associations between the social background and cultural context of the participant and his or her technology adoption. For that, qualitative methods, that are elaborated in the next section, have been applied among 15 Spanish seniors dwelling in Madrid.

2 METHODS

The methods performed have been semi-structured interviews and participant observations. Interviews are defined by Kvale (2007) as conversations with structure and purpose. The interviews were semi-structured so as to let the senior participant speak freely but remaining within the mobile technologies' topic. Besides that, participant observation helps ethnographers to gain an understanding of the actors' activities in a natural environment (Kawulich, 2005). Participant observations used to be carried out in exotic settings, although recent ethnographers shifted the researched site to where ethnographers live. Spradley (1980) states that ethnographers observe social situations that are composed of actors, activities and a place. Once the observer knows the social situation, he or she can try to link other social situations around by looking at clusters of situations in one place, networks of actors' proximity and situations of similar activities (Ibid.).

The semi-structured interviews were composed of two central topics. Firstly, we asked about their lives and the current social context of the participant which was useful to empathize with. Then, the topic of discussion narrowed down, so we addressed closely the topic of mobile technologies. Interviews and observations happened in the same setting and time. The observations have occasionally been nonparticipant to avoid interference when the participant was dealing with the device and give freedom of error and success. In contrast, the informants asked us a few times how to use certain functions of the device, thus we had to intervene in the process, making our observations slightly participant.

The interviews have taken place in quiet spaces where the elder was able to focus on the device and explanations. When he or she knew us beforehand, the interview occurred at their houses. In other cases, the interview was held in neutral places (cafeteria,

hospital, etc.) when we were not enough known by the elder.

Some interviews were held in couples (wife and husband), which on one hand limited the freedom of speech of the partner, but on the other hand, it made the interview richer in terms of data. The seniors, in general, spoke on behalf of the partner, in this sense not having an individual approach. Furthermore, carrying out some of the interviews in couples enabled not to overload the participants, as two interviews were held at once.

The participants signed a consent form and we made voice recordings to transcript the interviews. The interviews lasted approximately 1h 30', in which around half of the time was meant to foster rapport and the second half to address the topic of research. We have also used jottings to create field notes of the person, setting and methodological lessons. Jottings are short sentences or keywords to aid the researcher to keep the situation memorized (Bernard, 2011).

The data collected from the interviews (transcriptions, pictures, and field notes) has been coded by NVivo whose one of the functions is to generate a map of codes that helps frame an investigation. Coding the data has been performed by doing a thematic analysis, so we made a prior list of codes of the first interview that has evolved over we analysed more interviews. For instance, an emerging code that we did not address in the interview guide was "Landline Phones", but the participants talked about it often. The language used in the interviews has been Spanish, thus the quotes cited in this article have been translated into English.

2.1 Access to the Field

We firstly got access to observe and talk with seniors who were part of the SPRINTT project. This is a European investigation that, within Spain, happened at *Hospital Universitario de Getafe*. Its team was formed by physiotherapists, doctors, and nutritionists. Our laboratory has had an earlier relationship with this team which eased our access to some of the participants.

We came to two of the sessions to initially get to know the participants. They had a prior walk to warmup through a corridor, so we walked along with them to build trust. They later had to do some physical exercises (zigzags, squads, etc.) and then performed other exercises in another room: stretch muscles, lift weights, etc. In the beginning, we simply sat beside them waiting for the session to finish, however, we repeated the same exercises in the last days as it seemed to us a reasonable way to get their trust. We

talked with different seniors every session and, as soon as we felt that we strengthened rapport, we scheduled an interview. In SPRINTT, we interviewed 4 seniors until the project finished by mid of October 2019.

Prior to the interviews, we asked the participant to bring his/her phone to see how he/she uses a known device. We brought an external tablet to the interview, as in case they had one, it is not an easy device to carry for the participant. Furthermore, we presumed that most of them would not have a tablet nor know what it is, therefore it would be easier to bring it and be able to discuss what a tablet entails.

Being known by the participant has facilitated our access to them greatly. As an opposite example, a participant who did not know us beforehand suspected that the interview was meant to sell her a phone. Getting trusted by Spanish seniors might be tough, especially with older people who are going through economic struggles or previous difficulties during and after the Spanish Civil War.

When the SPRINTT project finished, we sought seniors that are part of our social networks: they live close to us or they are friends' relatives. With this approach, 11 older adults were interviewed. The prior condition was that they belonged to a middle/low socioeconomic background. However, the participants have eventually come from diverse socio-economic contexts and we decided to include people with a high level of education and apparent high incomes, in this way the research strategy evolved. Generalizations in this article are founded in the dominant patterns that the majority of participants mentioned. The quotes represent common interview themes, in contrast, if processes or themes are not general these are not discussed. The sample is diverse and their insights are useful to be examined. Furthermore, this is a preliminary investigation and we preferred to do an in-depth analysis and lengthy observations of the participants through qualitative methods assuming that we would be limited to interview a large number of seniors.

2.2 Population

Up to this point, 15 senior citizens have been interviewed and their names have been anonymized. The following data contains the information that they expressed in the qualitative interviews and our observations.

The mean age of the participants is 78.5, being 65 the youngest and 90 the oldest. 10 interviewees were women and 5 men. 11 seniors have had manual jobs in the past (cleaner, assembler, taxi driver, housewife,

etc.) and no more than elementary education. In contrast, 4 participants have had skilled jobs (director ICT company, engineer, etc.) and university education. We observed that 12 were physically fine and 3 looked frail. The participants currently live around Madrid and 7 come from rural areas in Spain having lived a mean of 57.6 years in Madrid. 8 seniors remarked not to participate in public activities with other elderly people while 7 seniors reported participating in social activities.

3 ANALYSIS

The analysis is divided into 2 sections. The first focuses on the motivations that the seniors experience using mobile technologies. The second part emphasizes the barriers that limit the senior participants using them. The tablet has not been a frequent device among the participants, thus it is not often mentioned in the analysis. Two examples of the participants' mobile phones can be seen hereinafter and it is noteworthy that 5 seniors have the Alcatel 2008G (the phone on the left) whereas only one senior owns the Sony XA1 Ultra (the phone on the right).



Figure 1: Examples of seniors' mobile phones.

Some preliminary results of the fieldwork can be seen in the next table. The second, third and fourth columns detail whether the participants possess the devices, the fifth informs about for how long time the mobile phone has been used and the last column indicates the frequency of use. When "x" appears, it means that there is no such information:

All participants have a phone, except for a couple that has one for both. However, there are only 8 holders of smartphones, which represent almost half of the sample. Owning a tablet is less common as only 5 participants reported having one. The length of time using mobile technologies has been on average 14.4 years, with a large disparity between the participants. The frequency also varies, but 8 seniors use the phone

Table 1: Preliminary results.

Cases	Phone	Smartphone	Tablet	Years of use	Use frequency
I1	Yes	Yes	No	22	x
I2	Yes	No	No	8	x
I3	Yes	No	No	8	x
I4	Yes	No	No	10	Once 15 days
I5	Yes	Yes	Yes	20	On holidays
I6	Yes	Yes	Yes	x	On holidays
I7	One for both	Yes	No	x	Once a day
I8	One for both	No	No	x	Once a day
I9	Yes	No	No	2	Twice a day
I10	Yes	No	No	1	Twice a day
I11	Yes	Yes	Yes	x	Not often
I12	Yes	No	No	7	Once a day
I13	Yes	Yes	Yes	30	Constantly
I14	Yes	Yes	Yes	20	Constantly
I15	Yes	Yes	No	30	Constantly

at least once a day. Furthermore, the participants reported using the former mobile devices of their adult children and grandchildren, whereas a few seniors bought mobile technologies by themselves. Concerning the learning process, 6 older adults expressed to have learned to use the phone on their own, whereas 9 were taught by their close relatives.

3.1 Motivations to Use Phones and Tablets

The most common reason reported by the participants to use mobile technologies is to get a feeling of security. The mobile device makes the seniors feel safe when going out as they have the possibility to be in contact. Some of the participants expressed to use the phone solely on the street, unlike others who never take it out not to be monitored by their children. Other seniors acknowledged being obliged by their children to carry the mobile phone outside for safety. To illustrate safety with an example, a couple of participants said:

Because of the stroke, they advised us to have one phone for each, as he sometimes goes for a walk while I cook and tidy up the house, and the walk takes too long, then I call him and he tells me he is with so-and-so. (I9-I10)

Other senior participants reported using mobile phones to communicate with their sons and daughters. Apart from this, the device allows the elder

to live independently, so seniors might not need to be accompanied by a caregiver. Smartphones' owners manifested to use the technologies to request taxis and to read online newspapers. A couple of participants remarked on the usefulness of the public transport app, EMT Madrid. This couple appreciates that smartphones help decrease isolation and allow take pictures of the environment. This couple of seniors who have higher education, have had skilled jobs and are frequent users of tablet and smartphones, expressed:

Now you look dumb if you don't have a phone, you're isolated. If it wasn't for the phone, I wouldn't have communication with many friends. Because the landline phone is not used by anyone. (I5-I6)

The older adults, who reported to prefer to keep their cellphones instead of switching to smartphones, stated a lack of confidence to learn to use the latter. However, none of the participants explicitly acknowledged feeling anxiety or fear towards unfamiliar mobile devices, although we could observe them on some occasions. In contrast, smartphones' owners expressed that they hold these devices because of their beauty, practicality, and usefulness. In relation to landline phones, four participants stated to have a preference for them over mobile phones. Those seniors reported landline phones being less difficult and have a longer shelf life than mobile phones. They also manifested to remember easily landline' numbers as they are used to. A senior couple who possess cellphones, a landline phone, and they do not want to buy a smartphone, expressed:

It is easier to remember the numbers on the landline phone because you dial them, and here in the cellphone is more complicated with the phone book. (I2-I3)

Holders of Alcatel 2008G, the cellphone previously displayed, did not have troubles when unlocking, muting, calling, taking a call and dialling (in the case they had no low vision). This device has big buttons and numbers that facilitate the aforementioned functions. The unique senior who owns a Sendo S330, I4, reported not having problems when charging the phone, refilling the balance, turning it off and on, calling and taking calls. Besides, the holder of a Samsung Galaxy S3, I1, finds the screen well-sized and with a proper interface quality. Other participants who own smartphones did not give an account of difficulties to take pictures, and other basic functions such as call, hung up, etc.

The seniors who reported using mobile technologies regularly, hold a tablet and a

smartphone, at the same time did not claim barriers when using these devices. These participants (I5, I13, I14, and I15) have previously worked in organizations in high contact with technologies, have higher education and demonstrated to master a lot of the given functionalities of mobile technologies. For instance, a senior woman, who is a frequent user of her smartphone and her tablet, differentiates the use of both technologies:

I use the tablet less, although when I am in the room I use the tablet. So as not to drain the whole battery life of the phone, I use the tablet. I use the phone for calls and the tablet to look at a few apps and some programs, as I already have it and I have to use it. The tablet is not hard for me to use, as well as the phone, both are Samsung (I13)

In relation to tablets, the sixth participant has one and uses it to seek information on recipes, trips, fashion, transport, and weather. This participant uses this device more frequently than her husband who prefers the computer. The eleventh senior participant showed us all the kinds of devices she has at her flat: TV, computer, tablet, smartphone, landline phone, cordless vacuum, etc. She uses the tablet to listen to the radio, read online newspapers, play board games, navigate in Amazon, listen to audiobooks, use Facebook and watch gossip on YouTube. This elder remarked to have a preference for the tablet over the mobile phone because it is bigger and has a lot of things to be entertained. She also uses her smartphone for health, namely, she sets up reminders to take medicines and make appointments for the doctor through the public healthcare app, "Cita Sanitaria Madrid".

3.2 Barriers When using Mobile Technologies

The participants of this research reported having several troubles with tablets and mobile phones that in general surpassed motivations. An adverse attitude towards technologies, particularly tablets and mobile phones, has been common. The seniors deemed in the interviews the technological hazards that especially affect young people: addiction, absence of physical communication, etc. However, they acknowledged some of the benefits that technologies bring for society. The senior participants also felt that technologies are changing so rapidly that they cannot get on their track. In contrast, the seniors who have higher education, had skilled jobs, and use technologies frequently were less reluctant to tablets and mobile phones than the rest of the participants.

Concerning physical limitations, we perceived 10 seniors have them and they also acknowledged them. For example, some older adults manifested to suffer a limited memory to remember the steps to reach some functions in the smartphone and to recall the phone numbers. We also observed that many participants have low vision, due to cataracts and myopia, thus struggle with locating things on the phone screen. Furthermore, the seniors showcased poor thumb performance, as a result of high hand tremor and finger clubbing. They, therefore, did not accurately press the different functionalities of the touchscreen. Some participants reported having deafness, as another physical limitation to hear calls and listening to the caller's voice.

Some of the owners of smartphones stated to find the keyboard too small. For example, a user of Samsung Galaxy S3 considered rough texting in WhatsApp, thus she needs to communicate by voice recordings. The same elder is a football fan and frequently reads the sports app *Marca*. However, she has low vision and reported ignoring how to regulate the letter font. She thereby struggles when reading texts in the app and she needs to be guided by the logo of the teams to find things.

The holder of Sony XA1 Ultra once typed the wrong direction in the app MyTaxi which made the journey more expensive than planned. Furthermore, the same participant uses the Amazon app that asks her to create a new account each time she logs in. Concerning WhatsApp, she was once sending a voice recording and forgot to stop it, thus she sent follow-up private conversations unconsciously. She talked about how hard is texting in WhatsApp (which is a communication app extensively used in Spain), in this regard she said:

I do not know how to type in the phone because the keyboard is too small and when I click on "a" either it gets in capital A or a number is displayed or I get out of the app, I don't know how to write in WhatsApp. (I11)

In relation to the senior participants who own cellphones, e.g. Sendo S330 and Alcatel 2008G, declared the great difficulty of texting. The letters and numbers are tiny and there are three letters in each number which makes texting and dialing numbers harder. They also narrated how tough is to find a person in the list of contacts for calling. A couple of seniors, who are owners of one Alcatel for both, sometimes turn on the flashlight accidentally and cannot turn it off. In the interview with them, the woman elder declared to be afraid of doing something wrong with the device, as her husband gets angry

when she uses it. This example showcases a lack of confidence and the gender gap in technology:

We always go out together and he doesn't let me touch the phone because he says that I damage it. He says that anything I touch I bust it, I am afraid of touching everything! (I7-I8)

The eleventh participant, the holder of a Sony XA1 Ultra, complained about the lack of warnings when the phone tariff finishes. Her smartphone does not notify her either when she neglects to hang up after a call. The same senior sometimes takes unintentional photos and finds the menu highly complex. A couple, holders of Alcatel 2008G, asked us to teach them how to reach access to the messages inbox to delete 64 old messages unread. In this case, the interview became slightly participant as mentioned in the methodology. This couple did not know that, apart from the function OK, there is a grey square which points to the right, left, up and down:

We didn't know that the phone has certain movements, we thought that it simply had the centered button (OK). The messages are displayed in Basque, that's because of my sons. (I let them try, they have 64 unread messages) One needs to learn to delete them. Can one write with spelling errors? (I answer, yes). I don't see the letters properly (thus, I advise them to call rather than text) (I9-I10)

Despite the seniors regarded a negative attitude towards the technologies or claimed not to know certain functions of the device, we observed some inconsistencies over the course of the interviews. For example, the fifth and sixth participants firstly indicated to use the phone only on holidays, then confirmed to use it only when notifications pop up and finally acknowledged to use it before going to sleep. Other seniors alleged not to know what a smartphone is regardless they have one. It seems to us that the participants proved good performances and frequent use of the devices, yet pretended an adverse attitude towards mobile technologies as that is what society expects from them.

We observed other potential inconsistencies among the participants. For instance, an elder expressed to feel confident when using the phone but at the same time repeatedly manifested that technologies are not her thing, falling the mobile technologies into disuse. Furthermore, some participants reported feeling careless with technologies that we understand as a barrier to use them. The seniors explained carelessness as a lack of excitement with technologies, plus the fact that their grandchildren already use them a lot. In this regard,

a couple of users linked such attitude with a lack of confidence:

As we know we can't manage them, as we can't remember data, we haven't worried about this (I9-I10)

These inconsistencies might be due to the societal perception of older adults with technologies. In other words, as youngsters and adults do not expect seniors to handle mobile technologies, seniors might reject these devices and eventually prove the society that they do not use these devices, regardless they do.

4 CONCLUSIONS

The research question of this preliminary investigation is to find out what barriers and motivations Spanish seniors experience with mobile phones and tablets. This article has also examined the social profile of the participant, however, it has not been central to the article. In order to answer the question, the fieldwork has been carried out with seniors living in Madrid.

All participants of this research have mobile phones, yet only half of them hold smartphones and one-third own tablets. González-Oñate et al. (2015) and Rosales & Fernández-Ardèvol (2016) still outline the increasing relevance of smartphones among Spanish older adults. In this research, the time and frequency of use have varied among the participants. We have observed that these indicators are associated with social factors such as level of education and previous experiences with technologies. This is aligned with Rice and Katz (2003) who state that belonging to higher social status affects ICT use positively. It is however different from Kang and Maity (2013) who report that low-income people use phones frequently. Although both authors do not focus on elderly people.

Most of the participants indicated that they did not buy their phone by themselves, so they either use their relatives' former devices or they were given a phone by their children. The seniors also remarked that they do not prefer to spend a lot of money on the mobile phone. Concerning the learning process, the participants, who have no previous work experience with technologies and have elementary education, usually are taught by their grandchildren and children, which is associated with the studies of Mallenius, Rossi, and Tuunainen (2007); Conci, Pianesi, and Zancanaro (2009) and Barnard et al. (2013).

The motivation to use mobile technologies was extrinsic and not intrinsic, as the participants use smartphones and tablets for external reasons. Nevertheless, this might be due to the way we guided the interviews which specifically focus on the reasons that trigger the use of these technologies. The senior participants reported feeling safe as one of the main reasons to use mobile phones, already found by De Leo, Brivio, and Sautter (2011). Aligned with Chen et al., (2013), the seniors also use mobile technologies to communicate with relatives, namely, seniors' children and partners the most frequently called. Besides, the seniors considered that mobile phones allow them to live independently and at the same time reduce their loneliness which is a current social problem among Spanish older adults. Smartphone owners also indicated health reasons to use these technologies, e.g. reminders to take pills or to make appointments for the doctor. Concerning tablets, they are used mainly for entertainment.

The participants who manifested a positive attitude towards mobile technologies, concurrently, own smartphones and tablets, use them frequently and belong to higher societal status. The owners of smartphones reported that they are happy with their current devices and they would not go back to cellphones. Modern mobile technologies thereby seem to solve more problems for Spanish older adults than foster them. Nevertheless, the elders who own cellphones were reluctant to switch to a smartphone and acknowledged a lack of confidence to learn these new devices. These elders additionally showed a preference for landline phones over their cellphone. However, despite smartphones are not accessible for the participants, cellphones are not either a solution to adopt mobile technologies. This chimes with Kurniawan (2007) who said that out-of-date devices for seniors do not help reduce the digital divide.

A general negative perception of the technological world, in particular mobile technologies, has been observed among the participants, especially those who still hold cellphones. Such an apathetic attitude was shown despite the good performance of their devices. However, the senior participants, over the course of the interview, shifted the negative perceptions towards more positive, thus being somewhat inconsistent. We assume that society expects Spanish seniors to have an adverse attitude towards technologies, in this way they exhibit it in public, being incongruent with the aforementioned observations.

The reported barriers comprise physical limitations, such as low vision, limited memory, deafness, and hand tremor. These definitely hinder

the use of mobile technologies which however are not accessible to seniors with those conditions either way. Concerning the devices' limitations, these have been observed in touchscreens with small keyboards, which prevent the elders from texting messages and dial numbers. This could be especially taken into account in the design of WhatsApp, which is the dominant communication app in Spain. A solution for this could be bigger keyboards such as tablets, as they have bigger touchscreens, and senior training to use voice recordings in WhatsApp. The tablet is, however, a heavy and spacious device to carry which does not easily fit in a pocket or purse, although retired seniors who spend most of their time at home could benefit from it.

Moreover, the systems of smartphones and apps should be adapted to respect the privacy of a senior person who is not used to mobile technologies. Our senior participants experienced problems in this regard when they sent unconscious voice recordings or forgot to hang up a call. In cellphones, texting becomes truly challenging when the elder seeks a tiny letter out of three in each number, as in the keyboard of Alcatel 2008G. This problem is common since 33% of our participants had this phone because it is one of the most popular devices for seniors in Spain which only serves for calls, as the elders reported.

This in-depth and preliminary investigation has a sample of participants who generally have a low technology adoption and belong to lower social classes, but some exceptions. Thereby, for future research, the sample should be widened and balanced in terms of gender, education and social class so as to be able to generalize to the Spanish elderly population. It shall also equate senior participants with apparent high and low technology adoption. In addition, the fieldwork could take place in seniors' homes to prompt real home-scenarios, as not all of our interviews did.

Furthermore, researchers should do lengthy fieldwork with seniors observing their performances and potential inconsistencies, as this allows to reach valuable understandings of older adults. Nevertheless, the researcher should be aware of keeping distance and not to become a "native" in the field. As a way to build rapport and be involved with participants, a reasonable research strategy could be to participate in technology education programs while researching within them. Besides, the connections between social contexts and technologies' adoption should also be considered more profoundly.

Spanish population still faces a big digital divide, as stated by Abellán et al. (2019). In our opinion, the digital divide is due to a short democratic lifespan and

poor performance by the decision-makers, which results in social inequalities. Spain should aim to reach an integration between senior citizens and technologies, adapting the latter to the Spanish seniors' needs. The governments should invest in educational programs of technologies to empower seniors. In addition, we consider necessary to provide proper technological facilities for senior citizens living in rural areas, those from low socioeconomic backgrounds and female elders to close the technology gender gap. We also deem relevant to stand against ageist attitudes that older people embrace as their own attitudes and expectations.

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