Anthropology & Aging
Journal of the Association for Anthropology & Gerontology

Societal Participation of the Elderly

Information and Communication Technologies as a "Social Junction"

Peter Biniok & Iris Menke

Furtwangen University
contact: bip@hs-furtwangen.de; iris.menke@gmx.de

Abstract

The technoscape as a global configuration of technology influences lifestyles and living conditions; conversely, developing, implementing and utilizing technologies all shape the technoscape. Starting from this interdependence between human action and technoscape, we examine how sociotechnical configurations determine social participation among the elderly in rural regions. The primary question is how social space, concretely participation space is shaped by the use of information and communication technologies. Specifically, our study seeks to investigate the extent to which social participation of the elderly population may be enhanced by the use of technological devices suitable for everyday life. To this end, a tablet PC with a self-developed communication platform was submitted to a field test. Through the provision of low-threshold access to information and communication technology, newly developed or renewed virtual contacts and relationships were expected to lead to real-life interactions. The results of our qualitative analysis show three diverse developments concerning the interrelation between social life and the technoscape: the emergence of a new participation space, the extension of established participation space and engagement within the existing participation space. Technology as a "social junction" can thus have positive impacts on the social participation of the elderly.

Keywords: *social inclusion; assistive technologies, rural regions, participation space*

Anthropology & Aging, Vol 36, No 2 (2015), pp. 164-181
ISSN 2374-2267 (online) DOI 10.5195/ aa.2015.102

Societal Participation of the Elderly

Information and Communication Technologies as a "Social Junction"

Peter Biniok & Iris Menke

Furtwangen University

Introduction

Currently, the development and distribution of assistive technologies such as monitoring systems, intelligent house infrastructures and information and communication technologies are strongly supported by state funding, as these technologies are expected to help meet the future challenges of demographic change (cf. Becks et al. 2007; Georgieff 2009; Lancioni and Singh 2014 for "Ambient Assisted Living").

Starting from the superordinate question of how the quality of life of the elderly in rural regions may be enhanced, our study investigates to what extent the implementation of information and communication technologies produces effects on the social participation of senior citizens. The study is part of the joint project "SONIA – social inclusion by communication devices in urban-rural comparison"[1] and focuses on the Southern Black Forest region in Germany. This rural region is characterized by a sparse population, isolated farms in relatively inaccessible valleys, improvable infrastructures, long winters with heavy snowfall and inhabitants who are generally viewed as introverted and somewhat stubborn (cf. Dorer 2012). Furthermore, the region suffers from rural depopulation and cuts in public transportation and medical services (cf. LEADER Aktionsgruppe Südschwarzwald 2009). The general trends of rural regions are also evident, such as above-average property ownership and long periods of residence. Integration in local networks and care systems is strong, which, in addition to normative values and high social pressure, hampers the acceptance of professional care (cf. Walter and Altgeld 2002). Further characteristics include comparably lower incomes and lower educational levels, shorter distances between places of residence for extended families (cf. Bohl 2005) and a limited range of leisure activities and other opportunity structures (cf. Scherger, Brauer and Künemund 2004).

Participation space depends on many of these and other factors and may be enhanced by various mechanisms that can extend the possibility space of the elderly. One of these mechanisms is the implementation of new information and communication technologies (ICT). Based on a needs assessment, a communication platform referred to as "space of exchange" was developed for tablet PCs and tested by the elderly. It was hypothesized that by providing user-friendly access to information and communication technology, newly developed or renewed virtual relationships would lead to real-life contacts and interactions. Dependent on individual competencies and living conditions, different effects on social participation were observed. Ultimately, we can report a positive impact for information and communication technologies; however, this success is tied to requirements and efforts that go beyond technical issues.

Vol 36, No 2 (2015) ISSN 2374-2267 (online) DOI 10.5195/aa.2015.102 http://anthro-age.pitt.edu

Theory: Social Participation and (Participation) Space

The technoscape, understood as the global configuration of technology, is intermingled and intertwined with other spheres of society (cf. Appadurai 1990). As Appadurai states, the result is a "global cultural flow" (Appadurai 1990, 301). This global cultural flow does not exist irrespective of space and time, but differs from one place to another and from one timespan to another. Worldwide shared cultural "rules" must be imported into and adapted (as well as translated) to local settings.[2] Conversely, locally produced "rules" infiltrate global cultural patterns. This interdependency characterizes the technoscape as well.

Technoscape: Technology, Humans and Space

In our view, the technoscape is first of all a global phenomenon with local manifestations. It stimulates the worldwide flow of information (e.g. the World Wide Web), products (e.g. commercial chains) and people (e.g. traveling). At the same time, local configurations of the technoscape can look entirely different, dependent on specific sets of factors. Some local technological landscapes are extremely high-tech (e.g. "Silicon Valley" in Saxenian 2000), while other areas are low-tech (e.g. agribusiness in South America); in some locations, 'technocities' arise (cf. Downey and McGuigan 1999; also 'global cities' in Sassen 2001), whereas in small villages, a day-to-day bricolage is often observable (cf. Lévi-Strauss 1968; Harper 1988).

The development of technologies is shaped by social and cultural factors (cf. Bijker and Law 1992; MacKenzie and Waycman 1999), and the application and usage of technologies have an impact on social life (cf. Oudshoorn and Pinch 2003; Nye 2007). Every technological development opens up new courses of action and/or limits human action. Machines and devices, local landscapes of technology and the overall technoscape all influence human lifestyles and living conditions. In turn, by developing, implementing and utilizing technologies, humans shape the technoscape. Human life is a technological life, and thus the technoscape includes humans and technologies. A third dimension of the technoscape is also of importance: space.[3] People inhabit space: They not only fill in the space, but also adopt and shape it according to their needs and desires. Conversely, space affects and influences people's lives (cf. Gieryn 2000; Löw 2001; Schroer 2005). In this sense, space is a social environment: "Social environment refers to the societal space and the human action space, i.e. the space is set up by actors (subjects) and not only the reified place (objects)"[4] (Kessl et al. 2010, 25; see also Riege and Schubert 2005).

In sum, the three dimensions of sociality, technology and space are virtually inseparable; rather, we find sociotechnical configurations (cf. Rammert 2007) on different scales that are more or less stable but change over time.

Social Participation and Participation Space

Starting from the interdependence between human action, technology and space, we investigate how (local) configurations of the technoscape may determine the social participation of the elderly in rural regions. One definition describes social participation as participation in social, economic and cultural life (cf. Köster, Schramek and Dorn 2008; see also Askonas and

Stewart 2000; Wansing 2005; Schütte 2012). The preconditions for participation are therefore the abilities to move, to act and to interact. Activities and activity space (cf. Dangschat et al. 1982) diminish in old age due to limited mobility and other factors. The same is true for participation space as a subset of activity space (cf. Baumgartner, Kolland and Wanka 2013). In comparison to other subsets of activity space, this is the specific space where social contacts are stimulated and fostered.

From a network perspective, there are two different mechanisms involved in participation in social life: bridging and bonding (cf. Putnam 1995). The local participation space emerges out of processes of bonding and develops as a network of trust between family members and/or the immediate neighborhood. In contrast, the extended participation space emerges out of processes of bridging, e.g. by using a car to leave the proximate social milieu, participating in networks of 'weak ties' (cf. Granovetter 1973) or utilizing information and communication technologies (see also 'mobility turn' in Urry 2007). This last aspect was of special interest to us.

Participation Space and Technoscape

Depending on societal circumstances and structural conditions, human actions and interactions shape the technoscape and at the same time the activity space (cf. Straus 1993). Activity space and therefore the social participation of individuals may be enhanced by increased possibilities of action and interaction (cf. 'opportunity structures' in Merton 1996). This can be achieved either by the modification of structural circumstances or by an increase in individual competencies and resources (cf. Läpple 1991 and 1992; Bourdieu 1987). Attaining knowledge is one way to increase one's educational level – or, in Bourdieu's terms, the 'cultural capital'. On the level of living conditions, the availability of community colleges or other educational institutions is one factor that can facilitate an increase in cultural capital. The more competencies and resources an individual has on hand, the greater the possibilities of action and interaction and the broader the realm of opportunities. In this way, the participation space may be extended.

Information and communication technologies have the potential to extend participation space on both the social (societal) and the cognitive (individual) level. In this perspective, the societal level includes – among other aspects – technological artifacts, semiotic systems and standardization, as well as large technological systems and infrastructures. On the individual level, factors such as know-how, competencies and affinities come into play, directly influencing everyday technopractices. The integration of new technologies into the lifeworlds of individuals must occur on both levels: "Access to ICT for the promotion of social inclusion cannot rest on providing devices or conduits alone. Rather, it must engage a range of resources [...]" (Warschauer 2003, 47). In addition to the provision of physical (computers, internet connections) and digital (online material) resources, it is important to provide human (literacy, education) and social (community, societal structures) resources as well.

In our study, we investigated the extent to which the use of information and communication technologies ('bridging') increases the opportunity structures of the elderly, extending their participation space and thereby their social participation. The aim was to foster technology-based interaction and communication and thus to enable meetings in real life.

Research: Methods, Needs Assessment and the "Space of Exchange"

The research question under investigation was how information and communication technologies may be employed to increase the social participation of the elderly in rural regions. Methodologically, we applied qualitative research methods and followed a user-centered approach. Through this participatory design (cf. Green and Thorogood 2014), we met the challenge to focus foremost on human beings rather than technology. The empirical data was collected in the Southern Black Forest region in Baden-Wuerttemberg, Germany. These data include a needs assessment at the beginning of the study and a long-term field test involving participant observation and semi-structured interviews.

Needs Assessment and Communication Concept

The needs assessment sought to reveal the needs and desires of the elderly in rural regions and the extent to which elderly people participate in social life (cf. Biniok and Selke 2014; Biniok, Menke and Selke fc.). Under the general topic "life in old age", we conducted 26 semi-structured interviews with narrative sections (cf. Schütze 1983; Hopf 2005) on biographical backgrounds, social participation, everyday practices, age (and care) in society, support in daily life and the use of technology. The target group of people between 60 and 85 years old has been chosen following specified criteria to ensure a broad variety in terms of personal networks, monetary resources and mobility (meaning both physical fitness and cognitive abilities). These central dimensions of comparison are regarded as indicators of risk and protection respectively and are frequently used in similar studies (cf. Mollenkopf and Kaspar 2005). The participants were recruited via ads in local newspapers, flyers, workshops and the intermediation of the local domestic nursing services. Besides this, over the course of the interviews the use of snowball sampling could be made. The interviews were transcribed by a professional office that specializes in the local dialect.

The analysis largely followed the 'grounded theory' (cf. Strauss and Corbin 1990) approach and was based on a category system developed out of the core statements. Using 'thematic coding', enhanced by the 'open coding' approach (Schmidt 1997 and 2005; Kuckarzt 2010), we found correlations that lead us to the development of a consistent notion of aging in rural regions. The results of the needs assessment capture both individual biographies (self-perception) and living conditions (outside perspective) and were used to develop and implement a communication concept referred to as the "space of exchange". This online platform was tested by the elderly, which in turn allowed us to analyze and deduce its impact on social participation.

The needs and desires of senior citizens in rural regions primarily relate to three issues. First, being mobile (both at home and outside) and able to drive a car is essential in rural areas in order to get to doctors, go to theatres or do one's shopping, since the local transportation services have a very limited schedule. If elderly individuals are unable to drive they become dependent upon their families, neighbors or service providers. Second, support services (e.g. delivery services, medical support) are vital. Here, the importance of family structures becomes evident, together with the relevance of a vivid neighborhood as a local resource. This latter factor is, however, of indeterminate duration: neighbors from the same generation will need help in the future as well. Third, the need for participation in associations and leisure activities (such as

hiking and sociality) is stressed. It should be noted that in many towns and villages, associations are faced with membership declines and the problem of finding new leaders. When senior citizens become immobile, when supporting structures decline and when associations are closed down, then they are likely to lose possibilities to participate in social life.

From the data, general issues that could be addressed by enhancing communication (such as the motivation to go for a walk or support networks in the village) were extracted and needs that could be satisfied with information and communication technologies were selected: establishing new personal connections, information on (medical) services, campaigning for associations and amusement, among others. Subsequently, a concept for technical support was developed and put into practice.[5] The aim was to meet the needs and the requirements of social participation in accordance and compliance with already existing regional social and organizational structures (such as community colleges, local foundations, clubs and associations). The core of the conceptual framework was a "space of exchange" that was realized as an online platform with several applications grouped under thematic topics with indigenous terminologies (see Figure 1).

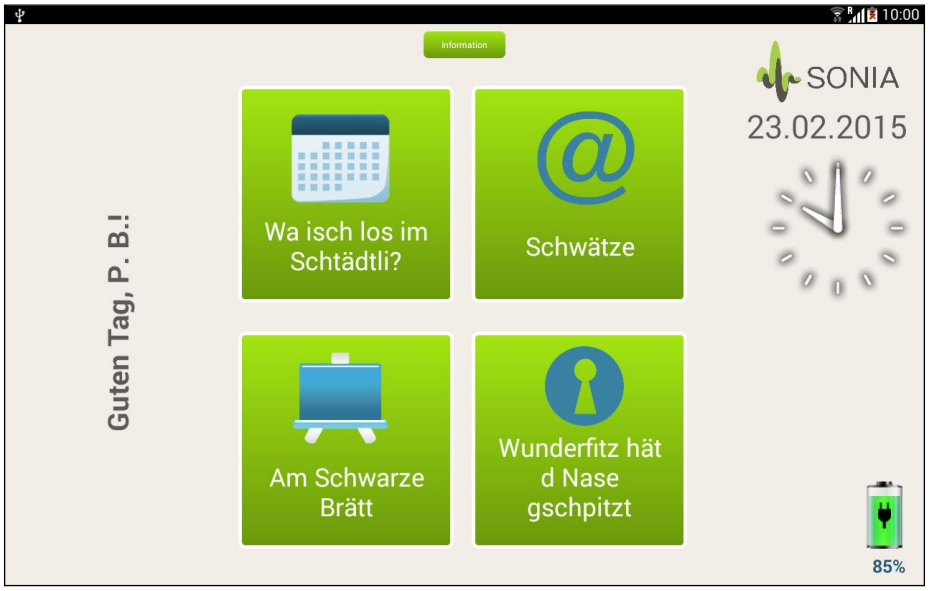

Figure 1: "Space of Exchange"

Technology, Platform and Field Test

The technological solution was based on an existing platform that was modified in accordance with the results of the needs assessment.[6] The elderly were granted access to a "space of exchange" using tablet computers. There, four thematic clusters were provided: a calendar to broadcast association activities ("*Wa isch los im Schtädtli?*"), a bulletin board to exchange assistance ("*Am Schwarze Brätt*"), information on local news and citizens' bus ("*Wunderfitz hät d Nase gschpitzt*") and a chat function to make appointments or just to shoot the breeze

("*Schwätze*").[7] Many of the applications on the platform were standard apps on the tablet (for instance, email, chat, address book). Other functions, such as local weather and newspapers, were integrated as feeds. In addition, some applications were carried over from the basic technology and modified (the bulletin board and the calendar). The advantage of our platform compared to standard online forums is a tailor-made solution to the needs of our target group, especially the regional anchoring and the suitability for senior citizens. The overall objective of the platform was to stimulate and foster interactions in real life.

To examine the impact of the technology, a field test with 30 participants between 60 and 85 years old was conducted over a period of at least 6 months; two out of three were female. Most of the elderly had also participated in the interviews at the beginning of the study (needs assessment), others joined by use of intermediators and snowball sampling. The group of participants was composed of people from various social milieus (farmers, workers, teachers, etc.) and of both natives and newcomers to the region. Most of the participants had never used modern information and communication technologies such as smart phones or tablet PCs before, although some of them were IT-literate and had used PCs or laptops. Very few were familiar with ICT or acquainted with applications or technological infrastructures. Thus, technical skills and affinities varied greatly among the participants. The same was true of individual personal networks, financial resources and mobility (meaning both physical fitness and cognitive abilities).

Each participant received a tablet PC with the "space of exchange" application on it. During the first few weeks, the participants only had access to this space. This was important because many of the elderly participants had never used any smart technology before. Over the course of the field test, the tablet was "unlocked", and all the other functions of the tablet became accessible. During the field test, training was offered in cooperation with the local community college that provided us facilities. Other courses took place at Furtwangen University (see Figure 2). To this end, we received support from a group of volunteers who acted together with the researchers as instructors and as technical contact persons. Furthermore, feedback on the technological and substantial aspects of the platform was collected constantly and the platform was improved incrementally.

The analysis of impacts on social participation by use of the "space of exchange" included group discussions, observations and one-on-one interviews during the field test. Group discussions were conducted in the middle and at the end of the field test to gather information on essential problems and to learn about the benefits of the "space of exchange". Observations were done during the training sessions. Here we collected data on individual usage schemes and group dynamics.

The interviews at this point of the study were problem-centered (cf. Witzel and Reiter 2012) and focused the handling of both tablet PC and platform as well as the changes in everyday life. Subsequent to each interview a protocol which included a self-reflective review was recorded. The researchers regularly discussed these notes concerning possible influences e.g. the setting of the interview or differences of observed gender-specific answers. Only minor factors became apparent, e.g. one researcher feeling uncomfortable in a house as to a very strong smell or the fact that female participants were more likely to talk to a female researcher about their feeling of independence from their husbands. In general, we came to the conclusion that

Figure 2: Schooling session at Furtwangen University

compared to the "bias" owing to the lack of participants of minority groups, as we were not able to recruit e.g. immigrants or disabled persons, this probably only caused insignificant influences.

However, our project seems to stimulate communitization effects based on social and not only technological mechanisms. In fact, the meetings, the training and the group discussions already stimulate social participation. This is what we described elsewhere as 'paradox of intervention' (Biniok, Menke and Selke fc.). In our view this is characteristic for public research and shows that along with technological solutions comes social structuration. Without the specificity of the project – the virtual platform on a tablet PC – this structuration would not have occurred. There is strong interdependence between socializing and technization. Insofar the study itself can be regarded as part of a dynamic process, which is followed up and will be analyzed.

Results: Participation Space – Emergence, Extension and Engagement

In accordance with the diversity of the participants' personal backgrounds, the motives for participation in the research project and especially the field test were very heterogeneous. They varied from simple curiosity to the urge to combat a long-standing feeling of exclusion from new technologies. "Nowadays it is almost impossible to get any information without access to the World Wide Web. Even printed papers refer to this or that homepage" (Luise, 82 years old).[8] Others took part in order to acquire new knowledge or to bring themselves up to date. And some who were already well versed in IC technologies regarded their participation as a possibility to engage socially and help others improve their knowledge. "I simply like to help others. And it's also interesting to watch the different ways in which people find a solution to a problem" (Gerhard, 76 years old).

As mentioned above, one idea behind the study was that territorial space in the perception of the participants would be extended through the use of communication technologies. Virtual space would then be added to the physical space in which activities are performed. This growth of the interactivity radius might take place on an individual and/or a collective level. In our view, the interactivity radius refers to the physical, virtual and cognitive movements of individuals that enable them to participate in social life. The results of the study reveal that the implementation of new technologies (i.e. the tablet PC and the "space of exchange") led to changes in the virtual space and consequently to changes in real life with regard to the social participation of the elderly.

Three typical developments related to the change in the participation space could be observed: the emergence of a new participation space, the extension of the established participation space and engagement in an existing participation space.

Emergence of a new participation space

The most impressive changes observed in our research project occurred when someone who had none or almost no previous experience with computers became an active and excited user. Several participants lost their fear of the new technology and became so skilled that they were able to help others. They even infected the group with their enthusiasm. "Things that used to scare me are fun now. I'm getting addicted. […] My neighbor was totally frustrated after the first month and wanted to quit. But I was able to convince her to stay" (Maria, 72 years old).

The use of technological devices changed the structure and issues of everyday life. "It [the tablet PC] is always here on the dining-room table. The first thing I do in the morning is check the weather" (Agathe, 71 years old). Participants began to use the tablet PC with great regularity; for example, emails were checked several times a day. Applications that were previously of no interest attained a central role in daily routines. "Until recently, I thought I didn't need the internet. Now the first thing I do when I come home is check whether there is a new message" (Elena, 68 years old). For these participants who had "discovered" the internet for the first time in their lives, a new space emerged with new possibilities of action. However, most of them did not perceive the internet as a (virtual) space. They regarded the internet as more of a book, a boundless encyclopedia. The internet, like the tablet PC and platform, was nothing more than an additional tool to help the participants stay informed about daily life and to fill gaps in their knowledge.

Although there were frequent challenges to deal with (e.g. technical understanding, the English language and the lifelong imprint of gender roles), in most cases the participants found creative solutions. For instance, a 74-year-old participant who lived in an isolated homestead with no internet access due to the mountains solved this problem by writing emails offline and then cruising around with the tablet PC in her car until she heard the sound that indicates that the emails have been sent. "You can also get free Wi-Fi at Furtwangen city hall. I have arranged for access. But then you have to sit on a park bench in the marketplace – only a good-weather option."

Not only did technopractices change, but self-esteem increased as well. Elderly participants were praised and supported by family members and friends when they engaged in learning and using ICT. The participants identified several aspects that made these achievements possible. For one thing, regular training was crucial. In addition, learning in same-aged groups in

an informal atmosphere was perceived as stimulating. Going to a class at a university was also regarded as very special: "It's just great to say: I'm going back to university" (Gabriele, 83 years old). Mutual assistance was a further aspect of low-threshold education of the elderly. Meeting outside project events, trying out the platform and advising one another were welcome chances to exchange knowledge. The children (and younger generations) were often not even asked for help, as they were perceived as being too impatient and rushing through the instruction manual.

Regular use of the tablet PC and the conversations about its usage contributed to the knowledge acquisition of the elderly participants – or, in other words, to the accumulation of individual 'capital'. More important was its effect at the structural level: new participation space emerged in addition to the activity and participation space previously accessible by physical movement. New forms of communication and meetings in real life created new opportunities for interaction. "I knew one of them [a participant] from our schooldays, but we lost sight of each other. Now we've gone on a city trip to Dresden together" (Marita, 76 years old). Some people who did not previously know each other socialized and stayed in touch. "I met Mrs. Mueller in class, and I knew she always went to the Spanish conversation regulars' table. I didn't dare to go there alone, but now we go together" (Christa, 67 years old). Others used video-phone programs to get in contact with family or friends abroad or with the younger generation. Participants' grandchildren often expressed pride in their grandparents' ability to communicate via an instant messenger program. Furthermore, female participants reported that they were envied by their neighbors and that they had accomplished personal development through participation, especially a feeling of independence from their husbands: "Now I have my own computer, and I don't need to ask my husband to look something up" was a typical statement. In this way, the technology even contributed to a kind of emancipation or empowerment.

This new participation space for elderly people emerged through a modified technoscape and increases in quantity and quality. New devices, new applications and new skills were the basis for new opportunity structures. The technology is adapted to daily routine and regularly used. With this enhancement of self-determination, even the quality of life of the elderly participants may have been improved. Furthermore, it was observed that the increase in the participation space was particularly noticeable in individuals whose participation space had been reduced in the recent past, e.g. widows who had spent several years caring for their husbands or people who had moved and thereby lost their social network. In the process of the emergence of participation space the technology turns out as a strong social junction.

Extension of established participation space

Another group of participants described changes in day-to-day life that were not as striking as in the former case. The modification of the participation space through the use of new communication technology in this case led to a growth and intensification of social contacts and interactions. These participants often had prior experience with IC technologies, with PCs or laptops from leisure activities or with PCs in former job constellations. For them, the obstacles to using the new technology were definitely less daunting. Consequently, the change in their use of technology for communication was less dramatic and sometimes not even realized when asked. It was generally reported that activities such as writing emails that used to be done with a PC were now done on the tablet. Some used the tablet as a second TV. In addition, the participants were enthusiastic about the new technology. The advantages of the tablet PC they mentioned included:

it is always operational, it works quickly, it has a handy size and it can be taken everywhere. "I love it! I regularly check emails to see if anyone has written. It is much more fun than I had expected" (Franziska, 76 years old).

Nevertheless, the impact on their social life was notable. Instead of an emergence of new participation space, here the extension of existing participation space occurred. With regard to changes in social relationships, many of the participants reported that they already knew the majority of the other participants by sight or from local activities in clubs and associations. Their circle of friends and acquaintances did not expand as quickly or distinctly as in the group described above. However, social contacts became closer; people who lived in the same neighborhood started to carpool to the classes and changed the form of address from using the formal "*Sie*" to the informal "*Du*". People who had previously been strangers or had known each other only by name became integrated into closer social circles. As in the case of the emergence of participation space, various people supported the use of the new technology: neighbors, family members and other participants of the field test. Three women who had already known each other established a regular meeting for coffee and practicing together. In other cases, close neighbors met sporadically to support one another in using the platform. The intergenerational exchange within families was also intensified, especially via chat and video chat with family members living abroad. One popular function of these applications was the transfer of photos. "My daughter lives in France. She is so enthusiastic when I send her a picture. The communication is more direct. And I get an answer immediately" (Sybille, 77 years old).

All in all, with the use of the SONIA communication platform, the participation space definitely extended. Notably, the qualitative level of communication and interaction changed rather than the pure quantity. Conversations and relationships deepened and grew more varied in their thematic orientation. Interestingly, in some cases, the distinctions between milieus or origins no longer played a role. In this case the technology has to be considered a medium social junction, as modifications of the technoscape as well as of the participation space are caused to some extent also by social processes.

Engagement in existing participation space

A third group exhibited only slight changes with regard to the use of technology and social relationships. These individuals were either already "IT-experts" or were "resistant" towards new technological options. Whereas most of the participants intended to learn something new and also to make new acquaintances, the "experts" regarded themselves as voluntary supporters of the project and ascribed themselves a different role. The interest of the experts lay in the potentials of new technologies in comparison to known ones. Like many other participants, they already had a broad circle of friends, were involved in several clubs and societies and saw no necessity to establish new contacts. "Actually, I don't really need this. I'm a very active person, I have several hobbies" (Paul, 70 years old).

Nevertheless, this group's social interaction patterns changed during the course of the project. Due to their willingness to support our research and to act as authorities in cases of technical or other problems with the platform, they often came into contact with other participants. Although they were consulted quite frequently even in their spare time by other elderly participants, these interactions were seen as professional rather than personal. "I have

already made at least five home visits" (Helene, 75 years old).[9] This engagement of volunteers in existing participation space stabilized their own social relationships and those of other elderly participants using the new technology.

The "resistance" of other advanced users resulted, for instance, from difficulties using the new technology. They generally preferred tools and techniques they had already used before (i.e. writing emails with a PC with a keyboard instead of using the tablet's touchscreen, as they made too many typos). "When you are used to a keyboard, data entry with a touchscreen is very exhausting" (Franz, 68 years old). In addition, specific advantages of the platform were not recognized. Communication styles did not change, and applications beyond the internet chat function were of no interest. The only advantage was the opportunity to look for information on the World Wide Web very quickly.

With regard to the use of technology, here only marginal changes in social participation could be observed. The tablet PC and platform were regarded as one technology amongst many others and served few specific needs. However, with regard to the participation space, the project had an impact on this group's social life. For one thing, technology and research became the subject of conversation during accidental encounters at the market or at the doctor's office. In addition, the engagement itself facilitated social participation for the "experts" and "resistors" as well as for the other elderly participants. Technology is then a weak social junction taking effect only in combination with social processes.

Conclusions

In this section, first conclusions of our study are drawn and further questions are discussed. It has shown that ICT may have the function of a social junction. In this perspective, devices and artifacts have more than a merely technical function. Clearly, they digitize, processes and distribute information, but more importantly, they also possess the ability to have a positive effect on social life. As part of the 'seamless web' of humans and technology, devices and artifacts act as junctions, mediators and links (Hughes 1986; Latour 1998; Esposito 1993). They bring people together, facilitating new and strengthening existing opportunities for interaction and social life. However, some open questions remain.

Challenges and further questions

Although individual competencies and the know-how of elderly participants increased, one epistemic challenge remains: for the elderly, the internet remains a "black-box". It is a useful tool, but it is uncertain how it works. This could present a problem when the interconnectedness, synchronization and autonomous actions of devices lead to unexpected effects and interruptions. In such moments, the elderly often are unable to cope with the technologies. There should be age-appropriate learning centers and education schemes that target the issue of understanding the function of the internet, the World Wide Web and the like. Here, regional government and education providers are responsible for their citizens and will have to create the corresponding structures.

This points to the challenge of sustainability of an interventional study. Research projects always have a limited duration and here the question arises how the initiated processes can be stabilized and continued after the end of the project. On the one hand, we tried to delegate

responsibilities to the group of the participants. Meanwhile they run training courses themselves twice a month. Furthermore they are interested in common leisure activities and organized for instance a summer party on their own. On the other hand, we aim on deepening the cooperation with the local community college and try to acquire public funding for an extension of the present training and schooling courses.

Apart from these goals to foster the success of our study, two observations suggest further lines of research. First, several female participants reported that their participation in the SONIA project had encouraged them to make use of new technology and that they had lost their fear of making mistakes. With their own PC in hand, they became independent from their husbands, and some even felt that they had gained the upper hand with regard to IT knowledge. Further research is required to determine whether new technologies can provide support for emancipation, in what way and to what extent.

Second, most of the participants reported that their families were enthusiastic about their participation in the project. Several received accessories for the tablet PC (e.g. a cover or a rack) as Christmas gifts from their children. In particular, the contact between grandparents and grandchildren seemed to benefit from the project. However, some of the participants have not yet dared to tell their family members that they took part, planning instead to surprise them when they feel confident in the use of the new technology. Subsequent research could cover the issue of the promotion of intergenerational exchange through new ICT.

Finally, there is also a methodological challenge. As participation in the SONIA project was voluntary, a predictable bias must be considered. The people who participated were already interested in sociability and were willing to learn something new and to cope with all kinds of challenges. But how can we reach elderly people who live in very isolated situations and/or did not participate for physical or other reasons? In fact, we spoke to a number of such people, but they did neither engage in our project nor the field test. However, the individuals who took part noted that they felt more prepared for future health restrictions or mobility impairments. In this way, the study also shows a preventive effect.

Summary: ICT as a Social Junction

Successfully implemented new technologies as "social junctions" can have a positive impact on the participation space of elderly people. If the elderly had no or little ICT experience, now use such technologies regularly, and benefit from new skills and new forms of communication after the implementation we speak of a strong social junction (type 1). Participation space emerges and increases due to technology use in quantity and quality. If senior citizens had some ICT experience before, now use these technologies more often, and the established participation space extends we speak of a medium social junction (type 2). The new skills and new forms of communication are effects of the technology use, but coupled with effects of socializing. If the elderly had high ICT experience before and there is no significant change in the use of the technologies, we speak of a weak social junctions (type 3). The existing participation space is fostered less by technology usage, but by effects of supporting others in using these technologies and the development of new skills.

However, the use of new technologies does not automatically lead to a growth in participation space. The corresponding modifications of the technoscape that occur on different levels must be initiated. People shape the technoscape, and they are able to construct new

sociotechnical landscapes. These construction activities correlate and depend upon existing cultural patterns of technology.

First of all, in our study, elderly people were able to acquire new knowledge and competences. In the best case, information and communication technologies became part of their daily routines. The elderly participants were ready and able to master the use of new ICT. Moreover, tablet PCs are suitable technologies for inexperienced users to enter the realm of modern devices and the internet (cf. Köbler et al. 2011). A crucial aspect in encouraging the use of new technologies is a noticeable benefit from that usage. Here, applications for communication were of special interest. Dealing with ICT had specific impacts on interaction patterns – initially, without regional community-building. Family members or friends abroad became accessible or easier to contact. On that individual level, it is important to provide low-threshold learning strategies, regular training courses and comprehensive support. Such cognitive modifications are one aspect of a future technoscape.

Second, community life was stimulated. At the group level, processes of communitization led to new, renewed or intensified actions and interactions in real life. Regional activities were fostered by local roots. Here, it is important to have or to provide real places that can be easily reached where the elderly can meet, and to integrate local providers of IT services, educational institutions and the like. This relates to the question whether the elderly are regarded as a relevant group of the society, and not only seen as consumers. The implied modifications of the technoscape concern local and regional structures.

Third, the use of technologies may lead to further modifications of the technoscape, e.g. buying Wi-Fi access or a smartphone. This points to the need for technological infrastructures – a precondition for enabling people to participate in "virtual life" and only one aspect of the 'digital divide'. Especially in rural regions, the lack of infrastructure is an established fact, and the technoscape needs to be improved in its trans-local configuration.

All in all, the results of our study demonstrate that the implementation and use of modern information and communication technologies lead to new technopractices and a modified technoscape. This, in turn, can enable elderly people to increase their participation in social life. The inclusion of new technologies in day-to-day practices contributes to the sedimentation of global cultural patterns in local milieus and the modification of the daily routines of individuals. This can have positive effects, as we have seen. However, it also entails challenges that senior citizens should not face alone. In this respect, technology should always be examined with regard to its effects on social life. Moreover, the use of technology should be connected to supporting social structures. Only then can technologies improve the quality of life as "social junctions."

Notes

1.This project (www.verbundprojekt-sonia.de) is funded by the Ministry of Labor and Social Affairs, Families, Women and Senior Citizens of the Federal State Baden-Wuerttemberg, Germany. We thank our project partners at Furtwangen University, the Fraunhofer Institute for Industrial Engineering (IAO) and the Fraunhofer Institute for Systems and Innovation Research (ISI) at the University Hospital Tübingen, as well as our collaborators at the company "Entwicklungszentrum Gut altwerden" and the foundation "Paul Wilhelm von Keppler", for their efficient cooperation and inspiring

discussions. Furthermore we are indebted to both of the reviewers, who gave us thoughtful feedback. Lastly we are grateful to Claire Bacher assisting us during the translation of our manuscript.

2. For the case of scientific fields, see the volume edited by Merz and Sormani (fc.).

3. Our use of the term "space" is cognizant of the discussion about the differences and relationships between "space" and "place". Our focus here is on social participation and its relationship to the usage of technology.

4. Excerpts from the German-language texts have been translated by the authors.

5. We thank our project partners at Furtwangen University, the Fraunhofer Institute for Industrial Engineering (IAO) and the Fraunhofer Institute for Systems and Innovation Research (ISI) at the University Hospital Tübingen, as well as our collaborators at the company "Entwicklungszentrum Gut altwerden" and the foundation "Paul Wilhelm von Keppler", for their efficient cooperation and inspiring discussions.

6. The underlying technology was developed by the company nubedian (Karlsruhe, Germany). We thank our project partners from Furtwangen University for the extensive modification, adaption and improvement of the SONIA platform.

7. Translation of the local dialect: "Wa isch los im Schtädtli?" = What's going on in town?; "Wunderfitz hät d Nase gschpitzt" = to be curious about something; "Am Schwarze Brätt" = On the bulletin board; "Schwätze" = Schmoozing.

8. Names and age of participants have been changed for reasons of anonymity.

9. Here, the participant used the German word *Hausbesuch*, which is normally used for a home consultation with a medical doctor.

References

Askonas, Peter and Angus Stewart, eds.

2000 Social inclusion. Possibilities and tensions. New York, N.Y.: St. Martin's Press.

Baumgartner, Katrin, Franz Kolland, and Anna Wanka

2013 Altern im ländlichen Raum. Entwicklungsmöglichkeiten und Teilhabepotentiale. Kohlhammer.

Becks, Thomas, Johannes Dehm, and Eberhardt, Birgid

2007 Ambient Assisted Living. Neue „intelligente" Assistenzsysteme für Prävention, Homecare und Pflege. Frankfurt am Main: DGBMT im VDE.

Bijker, Wiebe E. and Jonh Law, eds

1992 Shaping Technology/Building Society. Studies in sociotechnical change. Cambridge, Mass.: MIT Press.

Biniok, Peter, Iris Menke and Stefan Selke. fc.

2015 Social Inclusion of Elderly People in Rural Areas by Social and Technological Mechanisms. *In* Ageing and Technology: Perspectives from the Social Sciences. Emma Domínguez-Rué and Linda Nierling, eds. Pp.*** Bielefeld: transcript.

Biniok, Peter and Stefan Selke

2014 "Öffentliche Forschung zu sozialer Teilhabe älterer Menschen auf dem Land." *In* Forschungsbericht 2014/2015. Pp. 42-44. Furtwangen: Hochschule Furtwangen.

Bohl, Karl Friedrich

2005 "Sozialstruktur." *In* Handwörterbuch zur ländlichen Gesellschaft in Deutschland. Stephan Beetz, Kai Brauer, and Claudia Neu, eds. Pp. 225-233. Wiesbaden: VS Verlag.

Bourdieu, Pierre

1987 Sozialer Sinn. Kritik der theoretischen Vernunft. Frankfurt am Main: Suhrkamp.

Dangschat, Jens, Wolfram Droth, Jürgen Friedrichs, and Klaus Kiehl

1982 Aktionsräume von Stadtbewohnern. Eine empirische Untersuchung in der Region Hamburg. Opladen: Westdeutscher Verlag.

Dorer, Bernhard

2012 Wälderleben. Geschichte und Geschichten der Landwirtschaft im Hochschwarzwald im Wandel der Zeit. Freiburg im Breisgau: Badischer Landwirtschafts-Verlag.

Downey, John and Jim McGuigan

1999 Technocities. Thousand Oaks, CA: Sage.

Dracklé, Dorle, ed.

1998 Alt und zahm? Alter und Älterwerden in unterschiedlichen Kulturen. Berlin; Hamburg: Reimer.

Esposito, Elena

1993 Der Computer als Medium und Maschine. ZfS 22(5): 338-354.

Georgieff, Peter

2009 Aktives Alter(n) und Technik. Nutzung der Informations- und Kommunikationstechnik (IKT) zur Erhaltung und Betreuung der Gesundheit älterer Menschen zu Hause. Karlsruhe: Fraunhofer-Institut für System- und Innovationsforschung.

Gieryn, Thomas F.

2000 A Space for Place in Sociology. Annual Review of Sociology 26:463–496.

Green, Judith and Nicki Thorogood

2014 Qualitative methods for health research. London: Sage.

Glaser, Barney G. and Anselm L. Strauss

2009 Status passage. New Brunswick N.J.: Aldine Transaction.

Granovetter, Mark S.

1973 The Strength of Weak Ties. American journal of sociology 78(6):1360–1380.

Harper, Douglas A.

1987 Working knowledge. Skill and community in a small shop. Chicago: University of Chicago Press.

Hopf, Christel

2005 Qualitative Interviews – ein Überblick. *In* Qualitative Forschung. Ein Handbuch, Uwe Flick, Ernst von Kardorff and Ines Steinke,eds. Pp. 349-360. Reinbek bei Hamburg: Rowohlt.

Kessl, Fabian, Christian Reutlinger, Susanne Maurer, and Oliver Frey. eds.

2005 Handbuch Sozialraum. Wiesbaden: VS.

Köbler, Felix, Martin Hoekrich, Philip Koene, Philipp Menschner, Andreas Prinz, Jan Marco Leimeister, and Helmut Krcmar

2011 Benutzerfreundlichkeit von mobilen Applikationen zur Nutzung von virtuellen Netzgemeinschaften für die Generation 50+. *In* Mit AAL-Dienstleistungen altern. Nutzerbedarfsanalysen im Kontext des Ambient Assisted Living. Daniel Bieber and Kathleen Schwarz, eds. Pp. 97-114. Saarbrücken: iso.

Köster, Dietmar, Renate Schramek and Silke Dorn

2008 Qualitätsziele moderner SeniorInnenarbeit und Altersbildung. Oberhausen: Athena.

Kuckartz, Udo

2010 Einführung in die computergestützte Analyse qualitativer Daten. Wiesbaden. VS Verlag.

Lancioni, Giulio E. and Nirbhay N. Singh. eds.

2014 Assistive Technologies for People with Diverse Abilities. Berlin: Springer.

Läpple, Dieter

1991 Essay über den Raum: für ein gesellschaftswissenschaftliches Raumkonzept. *In* Stadt und Raum, Hartmut, Häussermann, Detlef Ipsen, and Thomas Krämer-Badoni, eds. Pp. 157-207. Pfaffenweiler: Centaurus-Verlag.

1992 Thesen zu einem Konzept gesellschaftlicher Räume. *In* Die aufgeräumte Welt. Raumbilder und Raumkonzepte im Zeitalter globaler Marktwirtschaft. Jörg Mayer, ed. Pp. 29-52. Rehburg-Loccum: Evangelische Akademie Loccum.

Latour, Bruno

1998 Über technische Vermittlung. Philosophie, Soziologie, Genealogie. *In* Technik und Sozialtheorie. Werner Rammert, ed. Pp. 29-81. Frankfurt am Main: Campus.

LEADER Aktionsgruppe Südschwarzwald

2009 Zum Kuckuck! Der Schwarzwald wird alt. St. Blasien.

Lévi-Strauss, Claude

1968 Das Wilde Denken. Frankfurt am Main: Suhrkamp.

Löw, Martina

2001 Raumsoziologie. Frankfurt am Main: Suhrkamp.

MacKenzie, Donald A. and Judy Wajcman. eds.

1999 The social shaping of technology. Buckingham: Open University Press.

Merton, Robert King

1996 On social structure and science. Chicago: University of Chicago Press.

Merz, Martina and Philippe Sormani. eds.

n.d. The Local Configuration of New Research Fields: On Regional and National Diversity. Dordrecht, Heidelberg, London, New York: Springer.

Mollenkopf, Heidrun and Roman Kaspar

2005 Ageing in rural areas of East and West Germany: increasing similarities and remaining differences. European Journal Aging 2: 120-130.

Nye, David E.

2007 Technology matters. Questions to live with. Cambridge, MA: MIT Press.

Oudshoorn, Nelly and Trevor Pinch

2003 How Users Matter. The Co-Construction of Users and Technology. Cambridge, MA: MIT Press.

Putnam, Robert D.

1995 Bowling Alone: America's Declining Social Capital. Journal of Democracy 6 (1):65-78.

Rammert, Werner

2007 Technik – Handeln – Wissen. Zu einer pragmatischen Technik- und Sozialtheorie. Wiesbaden: VS.

Rammert, Werner and Cornelius Schubert. eds.

2006 Technografie. Zur Mikrosoziologie der Technik. Frankfurt am Main: Campus.

Raitelhuber, Eberhard

2011 Übergänge und Agency. Eine sozialtheoretische Reflexion des Lebenslaufkonzepts. Opladen, Berlin. Budrich University Press.

Riege, Marlo and Herbert Schubert. eds.

2005 Sozialraumanalyse. Grundlagen - Methoden - Praxis. Wiesbaden: VS.

Sassen, Saskia

2001 The global city. Princeton, N.J.: Princeton University Press.

Saxenian, AnnaLee

2000 The Origins and Dynamics of Production Networks in Silicon Valley. *In* Entrepreneurship. The Social Science View. Richard Swedberg, ed. Pp. 308-331. NY: Oxford University Press.

Scherger, Simone, Kai Brauer, and Harald Künemund

2004 Partizipation und Engagement älterer Menschen – Elemente der Lebensführung im Stadt-Land-Vergleich. *In* Lebensformen und Lebensführung im Alter. Gertrud Backes, Wolfgang Clemens and Harald Künemund, eds. Pp. 173-192. Berlin: Springer.

Schmidt, Christiane

1997 «Am Material»: Auswertungstechniken für Leitfadeninterviews." In Handbuch Qualitative Forschungsmethoden in der Erziehungswissenschaft, edited by Barbara Friebertshäuser and Annedore Prengel, 544-568. Weinheim, München: Juventus.

Schroer, Markus

2006 Räume, Orte, Grenzen. Auf dem Weg zu einer Soziologie des Raums. Frankfurt am Main: Suhrkamp.

Schütte, Joannes D.

2012 Soziale Inklusion und Exklusion: Norm, Zustandsbeschreibung und Handlungsoptionen. *In* Handbuch Armut und soziale Ausgrenzung. Ernst-Ulrich Huster, Jürgen Boeckh and Hildegard Mogge-Grotjahn, eds. Pp. 104-121. Berlin: Springer.

Schütze, Fritz

1983 Biographieforschung und narratives Interview. Neue Praxis 13 (3): 283-293.

Strauss, Anselm L.

1993 Continual Permutations of Action. New York: Aldine.

Urry, John

2007 Mobilities. Cambridge: Polity Press.

Strauss, Anselm; Corbin, Juliet

1990 Grounded Theory Research: Procedures, Canons and Evaluative Criteria. Zeitschrift für Soziologie 19 (6):418-427.

Walter, Ulla and Thomas Altgeld

2002 Alter(n) im ländlichen Raum – Resümee und Ansätze für eine vorausschauende Gesundheits- und Altenpolitik. *In* Altern im ländlichen Raum: Ansätze für eine vorausschauende Alten- und Gesundheitspolitik. Ulla Walter and Thomas Altgeld, ed. Pp. 318-327. Frankfurt am Main: Campus.

Wansing, Gudrun

2005 Teilhabe an der Gesellschaft – Menschen mit Behinderung zwischen Inklusion und Exklusion. Wiesbaden: VS.

Warschauer, Mark

2003 Technology and social inclusion. Rethinking the digital divide. Cambridge/Massachusetts: MIT Press.

Witzel, Andreas and Herwig Reiter

2012 The problem-centred Interview. Washington DC: SAGE.