Social Inclusion of Elderly People in Rural Areas by Social and Technological Mechanisms

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1. Introduction

Is there a need to enhance the social inclusion of the elderly by means of technology? Is the use of contemporary information and communication technologies a way to improve the life of the elderly in rural regions? If so, how can suitable devices, platforms and software be integrated into everyday life in order to facilitate communication, contacts and exchange of information among senior citizens? These are pressing questions arising against the background of the steadily increasing senior population, its impact on society, and related disparities between urban and rural areas.

Our research, part of the joint project "SONIA – social inclusion by communication devices in urban-rural comparison" (2013-2015), addresses these questions. Furtwangen University is located in the Southwest of Germany, 1000 meters above sea-level, in a remote region of the Black Forest. Traditionally, there is an intensive interchange between the University and its region based on an ongoing culture of technical and social innovation. This lends itself to investigate the specific conditions of the rural population as a so called 'reality lab' (cf. Groß/Hoffmann-Riem/Krohn 2005; Schneidewind/Scheck 2013) in which the dialogue between researchers and citizens is intensified systematically.[1] Methodologically, we additionally apply qualitative research methods combining semi-structured interviews with focus group discussions and document analysis, to capture both individual biographies

1 | By mentioning the male function function designation in this text, always both sexes are meant if not indicated differently.

(self-perception) and the participants' living conditions (outside perspective).

In our paper we focus on the issue of improving the quality of life of the elderly in rural regions. Thereby we strengthen arguments about aspects of autonomy and the enhancement of social inclusion. In this respect, we analyze how information and communication technologies may be utilized to enrich human interaction in real spaces. We thus seek to illuminate the relation between aging and technology by highlighting the valued dimensions of communication, identity and interpersonal contacts. Below we sketch out the results of our initial needs assessment and the ideas concerning our online platform concept that presents a "space of exchange" (*Raum des Austauschs*) for the elderly. This virtual space is understood as a catalyst to enable seniors and other people to get in contact and, consequently, to interact in real life places.

By the given example of our research, we finally discuss how communicative cross-linkage in virtual space revitalizes existing and establishes new personal contacts and hence fosters social inclusion. We argue that the enrichment of routinized (habitual) practices with new computational devices extends the scope of action of individuals and therefore their social inclusion. This, however, could have been expected. Unexpectedly, we found remarkable effects before the implementation of technology which we call 'paradox intervention': considering the effects of this paradox intervention, our approach questions the often stated overall increase of autonomy by assistive technologies. Taking the intervention effects into account, we introduce the concept of 'contingent autonomy growth' as a complementary perspective towards the use and effectiveness of assistive technologies.

2. Social Inclusion, the Elderly, and Rural Regions

Our study is based on the assumption that social inclusion is one dimension of 'quality of life' (cf. Nussbaum/Sen 1993; Beck et al. 1997; Nussbaum 1999). In its broad sense, social inclusion refers to societal participation of individuals achieved by interacting with other individuals. Characterized by processes of self-determination, affiliation and integration, this form of participation strongly depends on the availability of specific resources and means (cf. Wansing 2005; Lenz 2007; Schütte 2012).

Resources and Means for Inclusion

The theoretical background of our study is on the one hand informed by Bourdieus (1987) concept of types of capital (social, economic, cultural, symbolic), supplemented by the idea of corporal capital (cf. Schroeter 2005), to cover individual factors of living conditions. On the other hand, Läpples (1991) concept of societal space complements our view to make sense of specific enabling and constraining circumstances of daily life: societal practices (e.g. meeting friends), the material substrate or topography (e.g. hills, long winter), and the normative regulation system (e.g. membership in clubs and associations), as well as the system of symbols and representations (e.g. articles about the elderly in local newspapers). The various individual and structural determinants take effect as nested arrangements more or less directly on the personal, interactive, organizational and societal level (cf. Schroeter 2005).

In this way we conceptualize social inclusion as a phenomenon depending on both individual resources *and* the societal framework:[2] their combination constitutes a social environment (*Sozialraum*) people live and interact in. Social environments are understood not only as territories but as spaces of action –, so by focusing on the elderly population we assess that a "social ecology of age(ing)"[3] (Wahl 2002: 50) evolves. The more resources are available in the environment, the broader is the course of action, and the higher is the social inclusion of the inhabitants. That means that participation in everyday life requires the mobilization and transformation of appropriate means and is achieved at least by resource adjustment within the several ecologies.[4] It is important to note that social inclusion is a societal practice itself and underlies specific dynamics (cf. Wansing 2005). Social inclusion is accomplished by allocation, distribution, yet also by withdrawal of resources. Furthermore, it depends on individual biographies due to the accumu-

2 | A similar approach refers to lifestyle (*Lebensführung*) and conditions of life (*Lebenslage*) (cf. Backes et al. 2004; Backes/Clemens 2013; in addition see Hurrelmann/Bründel 2003) representing the two dimensions that affect social inclusion. Obviously action as well as structure (cf. Strauss 1993) has to be addressed simultaneously to modify the state of inclusion and participation.

3 | This and other quotes we translated from the original German texts.

4 | Cf. Keating (2008) for the question of the 'best fit' between elderly people and rural contexts.

lation and reinforcement of including as well as excluding factors (cf. Heusinger 2008). Following Läpple (1992), the social environment is not only something surrounding human actors – it traverses their very corporeality, their interactions, their forms of expression and ways to fulfill themselves.[5]

In the light of the demographic change (cf. Tews 1999), it is of special interest to us to observe how intensely elderly people participate in societal activities as well as to examine how participation may be increased. Therefore, the overall aim of our research is to find out the multiple ways to generate and/or re-activate possibilities to increase the number of actions and interactions of the elderly. What information is needed to stimulate interactions? How can opportunities for leisure activities be distributed? What is of special interest within a social environment?

Aging and the Rural

There is no single category of "age" as age-dependent classification, as the group of people older than 60 years is very heterogeneous.[6] This heterogeneity results from different lifestyles and circumstances as well as from a wide range of social inequality patterns, correlating with previous educational and employment opportunities (cf. VDE 2008). On the one hand, age and aging may be associated with positive attributes like gaining serenity and foresight, and a rise in the quality of life (cf. Jakobs et al. 2008). On the other hand, age encompasses rather negative aspects, such as physical degeneration and social exclusion (ibid.). Studies on aging mostly target urban regions and have a limited focus on core themes, as for instance on living conditions concentrating on habitation and quarters (cf. Oswald 2002; Büscher et al. 2009; Kaiser 2012), or on issues of care and health protection (cf. Heusinger 2008; Walter/Schneider 2008). More often than not, "aging in rural regions is frequently idyllic transfigured or negatively exaggerated" (Walter/Altgeld

5 | Cf. Gieryn 2000 for a place-sensitive sociology and Löw 2001 for a concept of space that integrates action and structure.

6 | Staudinger and Schindler (2002) for example suggest distinguishing at least three phases of age and aging: young elderly in their sixties, elderly between 70 and 85 years old, and old and very old people over 85.

2002: 318) and studies that explicate on aging in rural regions more appropriately remain underrepresented.[7]

There are various differences between urban and rural regions (cf. Walter/Altgeld 2002; Wahl/Schilling/Oswald 2002; Scherger/Brauer/Künemund 2004; Bohl 2005). Some central characteristics of the rural are: low density of population (with about 100 inhabitants per km^2), decrease of health care in line with population and centrality, infrastructure as crucial problem, and a low range of leisure activities and other opportunity structures.[8] In general, families have a higher number of children and large households with commonly property ownership and long periods of residence. Distances between generations of one family are low. Additionally, one finds a strong integration in local structures and support systems as well as normative values and high social control hampering the acceptance of professional care. These aspects of the social environment have been commonly expressed by our interviewees when asked about their needs and wishes (see also section 4).

To recapitulate, our research follows the question of how social inclusion of the elderly population may be fostered with regard to the modification of the individual resources (types of capital) *and* the transformation of societal framework conditions. While the elderly are able to configure their activities relative to their life styles (cf. Kolland/Rosenmayr 2007), informal ties and contacts especially have the most positive effects on their life satisfaction. Yet, the elderly need help and assistance on different levels and with regard to their social, material and technological environment, e.g. administer medicine, housekeeping or companionship (cf. Isfort 2013). In this respect, we also examine how information and communication technologies may be utilized to enrich human interaction and communication. The question of how the quality of life of elderly persons can be enhanced by using computers, tablets or smart phones is investigated. In this, we seek to contribute to the research field of assistive technologies, which increasingly receives public funds under the 'umbrella term' (Rip/Voß 2013) "Ambient Assisted Living".

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7 | There are several exceptions that steadily fill this gap, e.g. Schilling/Wahl 2002, Mollenkopf/Kaspar 2005, Keating 2008, Hofreuter-Gätgens et al. 2011, Hennessy/Means/Burholt 2014.

8 | For further discussions on formal indicators of rural regions see Bohl 2005, Neu 2010 or Penke 2012.

3. Ambient Assisted Living: Funding, Baselines and Expectations

Ambient Assisted Living (AAL) refers to "living in an environment supported by 'intelligent' technologies, which react sensitive and adaptive on the presence of humans and objects and fulfill various services" (Becks et al. 2007: 3). The enfolding field AAL "includes concepts, products and services, which increase and secure live quality by use of information and communication technologies" (Georgieff 2008: 23). Ambient and assistive technologies are in this perspective the 'good folk' (cf. Rammert 1998) that hide and come up if needed (assistive), and otherwise monitor themselves and human actions and interactions in the background (ambient).

Thinking about Aging

Scientific research on AAL is nowadays intensively funded by the German government and thus framed by political-normative assumptions. The discourse of demographic change is the starting point for different initiatives on the national level, as for example the research agenda "age has future" (*Das Alter hat Zukunft*) or the main funding area "man machine interaction within demographic change" (*Mensch-Technik-Interaktion im demografischen Wandel*)[9] (cf. BMBF/VDE 2011). These efforts go hand in hand with an increasing public interest in aging and with shifts in our understanding of what age means (cf. Denninger et al. 2014 for the detailed description of this change; cf. Pauly 1995 for the general approach of 'shifting baselines').[10] This development leads Reindl (2009: 168) to state: "The prevalent image of age and aging predetermines stereotypes that differ heavily from traditional interpretations of age and aging."

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9 | Cf. http://www.das-alter-hat-zukunft.de and http://www.mtidw.de.

10 | These efforts grow out from the changing role of the nation state. Following a critical perspective (cf. Denninger et al. 2014) one may scrutinize, whether or not the state slowly abdicates liability towards its citizens and transfers responsibility on individuals, technologies ('adiaphorization' as stated in Bauman/Lyon 2013) and local solidarity networks and liability communities (*Verantwortungsgemeinschaften*). Simultaneously in all areas of society the responsible self is proclaimed, be it as 'entreployee' (*Arbeitskraftunternehmer*), in health protection or pension planning.

As opposed to the 1980s notion of earned retirement and withdrawal from active live (known as 'disengagement'), viewpoints of productive and active aging predominate today (cf. in general WHO 2002; taken up for instance in Walker 2002). Politics specially promote volunteer work and civic engagement to use and increase the potential of age, which is in line with the postulation to increase the social participation of the elderly population. This can be found, for instance, in the aging report from the German Government: "Against the background of demographic change, the [German] Government pursues the goal to *foster the potential of engagement of the elderly*. In our society of long life it is important to stay active as long as possible, and to participate, to commit oneself, be it in work life, in civic engagement, or in family" (Deutscher Bundestag 2010: VII, emphasis added). The aging population is seen as a fit and adventurous population, consisting of 'silver surfers' and 'best agers'. Through assistive technologies, the 'activation society' (*Aktivierungsgesellschaft*) offers the necessary means to achieve more autonomy and self-determination and the underlying paradigm of the active elderly manifests itself in the technology-prospective framework of AAL.

Technology as a Resource

With regard to the afore-mentioned interdependence of resources and social inclusion, we identify a technology-deterministic argument for the use of technologies within the field of AAL (Georgieff 2009: 26, emphasis added; see also Lancioni/Singh 2014): "Technologies have to be seen as a *crucial resource of the environment of the elderly*. On the one hand they help to compensate capacity losses and disabilities and on the other hand technologies optimize life quality and enrich day to day aging." Consequently, technologies as a resource will be of increasing importance in the future. Technologies are seen as suitable devices to support aging and caring, while simultaneously implying market potential and the saving of costs, e.g. in the health care system (cf. Georgieff 2008; VDE 2008; Wichert/Norgall 2009). The resource technology needs to be used to relieve, for instance, caring relatives or (mobile) nursing services. Beyond that, information and communication technologies are probable means to increase autonomy and security of the elderly themselves. Smart homes and smart living represent the ideal of staying home for lifetime – whether healthy, ill or otherwise care-dependent.

Such a technology-driven (if not deterministic) perspective mostly neglects the human factor, e.g. the wish to disengage, a lack of societal struc-

tures to use technologies meaningfully, or missing competences in the usage of information and communication technologies (cf. Pelizäus-Hoffmeister 2013). Moreover, concepts of AAL often oversee that the elderly are not a homogeneous cohort or group and a variety of engineered lifestyles exist (cf. Mollenkopf 2006). Accordingly, it will be difficult to develop age-appropriate technologies (cf. Hogreve et al. 2011) or 'personalized technologies' (as, for instance, within the upcoming approach of 'personalized medicine'). Lastly, studies on effects and utilization of existing assistive technologies hardly exist (cf. Brandt et al. 2011; Anttila et al. 2012).

Regional (Funding) Contexts

Apart from funding and research agendas at the German national level, federal states like Baden-Wuerttemberg also position themselves as proponents of research on aging and care, while strongly supporting programs and projects on the regional level. One of these efforts following the current image of age and aging is the impulse program "Medicine and Care" from the Ministry of Labor and Social Affairs, Families, Women, and Senior Citizens.[11] Starting from the paradigm "outpatient instead of inpatient", concepts of technology-based maintenance are being developed to enable diseased and old people to stay at home and to support caring services.

Within this program, the joint project "SONIA – social inclusion by communication devices in urban-rural comparison" is funded. One of the aims in this project is to investigate the social inclusion of people older than 60 years in rural and urban regions. Due to the potential need to increase social inclusion, we further determine the adaption of existing information and communication technologies to serve these needs. SONIA combines multiple disciplinary and scientific perspectives and approaches on the development of assistive technologies. In the following sections, we present the *social-scientific point of view* and our preliminary findings from the rural case study. The rural region in our project is exemplified by the village Furtwangen and its adjoining municipalities, where Furtwangen University is located and where we conduct our research. This focus is not (only) due to practical reasons: rather, the major feedback on our efforts to encourage people to participate in the project came

11 | The program is carried out in cooperation with the Ministry of Finances and Economy as well as the Ministry for Science and Art.

from that region. Besides that, during our research we realized that our concept of social inclusion has to be connected to local structures and actions.

4. Needs, "Space of Exchange" and the 'Paradox of Intervention'

With our user-centered approach we met the challenge to put human beings in the first place instead of technology: we started our research with a needs assessment to learn about the wishes and demands of the elderly.[12] Our needs assessment combines qualitative methods, such as personal narrative interviews to learn about the biography and living environment, focus group discussions, and document analysis (cf. Schütze 1983; Hopf 2005). The results of the needs assessment were used to develop and implement a communication concept called "space of exchange". This online platform is tested by the elderly, which in turn allows us to analyze its impact on social inclusion.

Getting into Conversation

The target group for the interviews 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 et al. 2001; Oswald 2003; Mollenkopf/Kaspar 2005). To recruit the elderly, we organized workshops, launched ads in local newspapers and printed flyers. In addition, we made use of several intermediators to get in contact with our target group, e.g. the local domestic nursing services. Besides this, over the course of the interviews we made use of snowball sampling. Altogether, we conducted 26 interviews with 16 men and ten women,

12 | Similar approaches as for instance 'scenario-based design' one can find in Compagna et al. (2011) and Cieslik et al. (2012). For the general idea of participatory technology development see Giesecke (2003) or Bieber/Schwarz (2011). However, technology-based approaches differ in their methodological orientation and sometimes disregard social-scientific concepts and methods (cf. Pelizäus-Hoffmeister 2013).

mostly between 70 and 80 years old and respective to available resources on average in good constitution.[13]

As for the data collection, apart from the personal interviews with the primary users (the elderly), several workshops and focus group discussions with secondary users (representatives of local nursing services, clubs and societies) were conducted, as they play a central role concerning the implementation of technological devices to enhance the social inclusion of the elderly. After we presented them the results from the interviews, they were asked as experts to discuss and conceptualize the virtual "space of exchange" which in the end is supposed to lead to social inclusion in real life.

Necessity Matrix and Central Challenges

Our notion of aging in rural regions is formulated under usage of a *necessity matrix* that will only be sketched at this point. Three core dimensions generate the matrix: "interactive self-organization" as the wish for autonomy and the independent arrangement of day structure and leisure activities, "intergenerational relationships" and "interactivity radius" (see Table 1).

Interactive self-organization includes possibilities to (inter)act independently and shows four characteristics: obligations are not negotiable (as care roles), periodicals are important but not necessary (shopping, group of regulars), options are at choice (a cup of coffee in the neighborhood, go for a stroll, go to the movies), and coincidence means single or irregular incidents (traveling acquaintance). Relevant groups of agents were pointed at in the interviews and actions of divergent autonomy correspond to these agents. As a result, a network of relationships linked to specific activities reveals social, cultural and cognitive distances; this is represented in the dimension *intergenerational relationships*. The constellation of agents concerning activities shows six different manifestations: alone, with partner, with family (without partner), with "the young" (field-specific term for the younger generation), with the same generation, and with strangers. The territorial space, in which

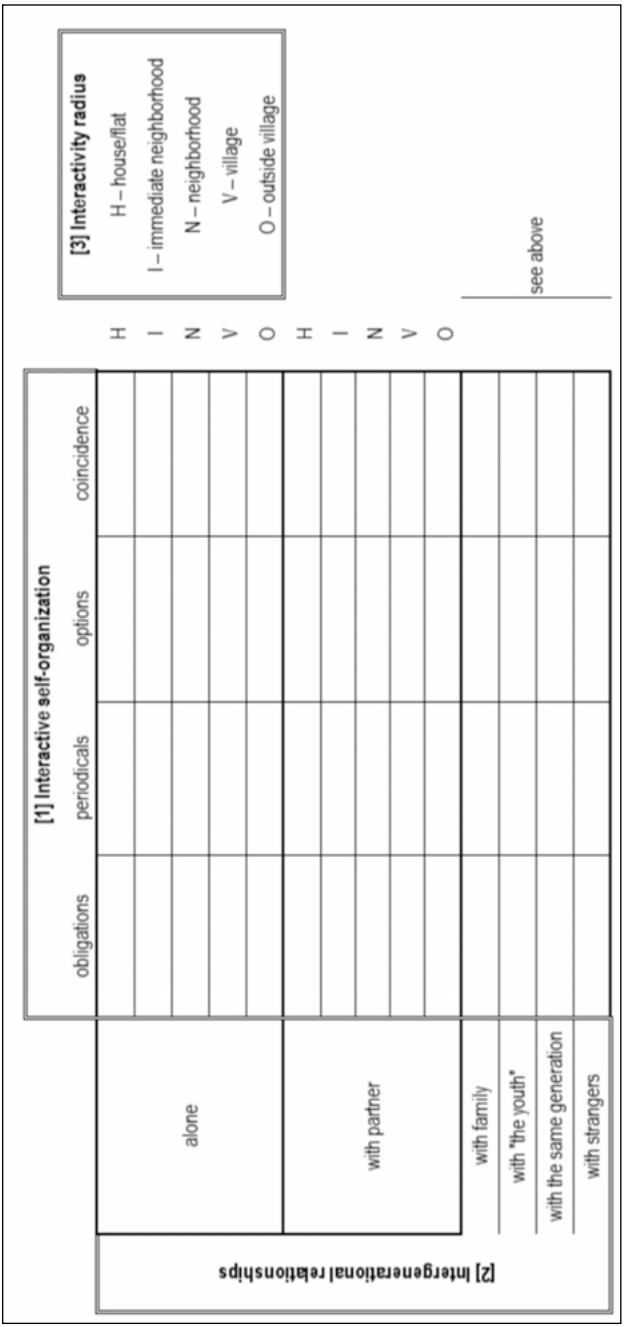
13 | The interviews were transcribed and analyzed with the aid of the qualitative data analysis software MAXQDA, following a category system developed on the basis of the core statements. Using 'thematic coding', enhanced by the 'open coding' approach (cf. Strauss/Corbin 1990; Schmidt 1997, 2005; Kuckartz 2010), we found correlations that lead us to the development of a consistent notion of aging in rural regions.

activities are performed, comprises the more or less well known surroundings of the interviewee. This space to which the range of activities relates is reflected in *interactivity radius*. Concerning the range of activities, five manifestations can be determined: in the house or flat, immediate neighborhood, in the neighborhood, in the village, outside the village.

Crossing these three dimensions generates a variety of arrays. The arrays represent typical everyday situations which are, regarding social inclusion, satisfied, showing up conflicts or have not yet occurred. In this way the matrix serves as a useful heuristic tool to identify daily challenges and characteristics of aging in rural regions. A description of specific situations to be improved or even realized derived from the empirical data. They have been determined and lead to the identification of the needs of the elderly. Moreover, the determination of needs is interconnected to individual and contextual factors. On an abstract level, we identified three significant wishes: the wish for safety by horizons of possibilities, the wish for everyday life without obligations, and the wish for socializing despite disengagement.

In more detail, central needs and wishes of the senior citizens in rural regions correspond to the typical features of the Black Forest's landscape, its long winter and agriculture (see section 2). This influences, first of all, *mobility*: being mobile (both at home and outside), traveling around, and driving a car (cf. Mollenkopf/Kaspar 2005; Jakobs et al. 2008). In rural regions it is unavoidable to drive a car to get to doctors, to theatres or to shopping, because the local transport services run very rarely. If elderly persons are unable to drive, they become dependent upon their families or neighbors or service providers. The same is true in winters with deep snow and iced-up hillsides. Therefore, and secondly, *supportive services* (e.g. delivery services, medical support) are of importance. Concerning this matter, the impact of family structures has become evident in our study (cf. Schilling/Wahl 2002; Jakobs et al. 2008) together with the relevance of a vivid neighborhood as local resource (cf. Rädler/Schubert 2012). This is, however, of indeterminate duration: the same-aged neighborhood will especially become problematic as resource in the future. Thirdly, the need for the *work of associations and leisure activities* (as hiking and sociability) is stressed (cf. Baumgartner et al. 2013). Here it has to be remarked that in many towns and villages associations are faced with membership decline and the problem to find new chairmen.

Table 1: Necessity Matrix



Conceptualization: From Needs to Apps

From this collection of wishes and needs, we firstly extracted those relatively general issues that could be addressed by strengthening communication (such as the motivation to go out for a walk or support networks in the village). Further, we selected needs that could be satisfied with information and communication technologies: establishing new personal ties, information on (medical) services, support associations, diverting social contacts, and others. After identifying these wishes and needs, a concept for technical support was developed and subsequently put into practice. Our aim was to meet the needs in accordance and compliance with already existing regional social and organizational structures (such as community college, local foundations, clubs and associations). For that reason, we focused our research activities on the existing structures in the region Furtwangen (Black Forest).

The core of our conceptual framework is a "space of exchange" that is carried out as an online platform with several applications grouped under thematic topics with indigenous terminologies (see Figure 1). The elderly access the "space of exchange" with tablet computers. There we provide, for example, a calendar to broadcast association activities ("Wa isch los im Schtädtli?"), information about the local civic-mobile or local news ("Wunderfitz hät d Nase gschpitzt"), a black board to exchange assistance ("Am Schwarze Brätt") and a chat function to make appointments or just to jabber ("Schwätze"). This virtual space exceeds provision and exchange of information. It also facilitates entertainment, the launching of discussions as well as mutual supply of and demands for assistance. The overall objective is to stimulate and foster interactions in *real life*.

We consider our platform to be distinctive from other forms of assistive technologies for three reasons: (1) social inclusion operates as self-enabling social practices of participation instead of externally governed integration mechanisms, (2) our platform is assistive in terms of an interactive communication portal – not a technology in terms of a reactive monitoring and information system, and (3) technology is a means or a medium that does not substitute social contacts and face-to-face interactions. To have our platform tested by the elderly and to investigate its effects on their life and on social inclusion is the current step of our project.

Figure 1: "Space of Exchange" Start Screen[14]

'Paradox of Intervention' – Re-structuring the Social Landscape by Research

To get in contact with the rural population has been our initial activity. We interviewed them at home, we talked to them on the telephone, and we met them at workshops and information events. Interestingly, we observed a lot of engagement among the elderly even before we deployed the technology. Since our project seems to stimulate effects based on social and not technological mechanisms, we describe these foregoing activities from the project's perspective as a 'paradox of intervention'. In general, it is obvious that attention on the part of (social) sciences is a positive irritation – a welcome change in day to day routine, especially for the elderly. The engagement of our participants can be described as follows.

With regard to our interviews, we *first* notice only a slight reflection on aging. Our research now opens up the opportunity for seniors to deal with the issue "good life in rural regions". The questions we ask, – such as provision for old age, neighborhood, or sacrifice and loss – stimulate our dialogue partners to think more intensely about their contentment and position in society. Moreover, our workshops are the locus for the re-generation of ideas and

14 | The underlying technology ("CareBW") has been developed by the company nubedian (Karlsruhe, Germany).

the recall of past hobbies or leisure activities. One woman comments on the black board of our platform and has the consideration to invite people on the occasion of her baking a cake – something she loves to do but has not done for years. Others for example think about sharing a car to go to the doctor.

Secondly, the participation in our study is understood by the elderly as self-commitment. Apart from their continuous interest and curiosity, the participants stake out claims. After one of the workshops, an angered woman inquires the following morning why she had not been invited while her friend has been: she stresses to have been among the first persons to have contributed to our project as interviewee. This is an example of how our research influences expectations and behavior of our participants. Their self-commitment goes hand in hand with the assumption that we as researchers commit ourselves to the task to enhance the life quality of the elderly population – so some elderly voiced their displeasure if we were not in contact with them for weeks. Of course there are more motives to join our project than that, as for instance keeping up with new technologies or an interest in scientific research per se, but to be taken seriously as citizens seems to be a crucial factor to participate.

Thirdly, we notice a steady creation and re-activation of personal contacts and strengthening of networks. That is especially fostered by our meetings. As one participant stated, "We never met in this constellation – this is fantastic". To run our platform the characteristics of the locality Furtwangen require the establishment of different teams for administration, training courses and support.[15] Here we can access volunteers who support our research. Therefore, with our project, we structure the social landscape as net-workers or net-builders more or less intentionally. Such meetings and informal conversations between researchers and population generate communication on a high qualitative level with regard to the solution of societal problems and is not mere an increase in number.

This 'paradox intervention' is a result of our research, but was not intended. Following our research plan, the intervention begins with the test of our "space of exchange", but now the question arises: What does social inclusion (yet) depend on?

15 | This is different from the parallel sub-project concerned with a quarter in an urban region where a central management and community center exist.

5. Conclusions: Social Inclusion by 'Man' or 'Machine'?

Is there a need to use information and communication technologies to enhance the social inclusion of the elderly in rural areas? This summarizing question can be answered as follows. Information and communication technologies do not need to be applied, but can be applied and work great as mediators. Starting from the assumption that the elderly are restricted in their activities and gain access only to a little course of actions and small 'opportunity structures' (Merton 1996), ambient assisted technologies are intended to increase such possibilities and thereby increase autonomy too. In table 2 this process can be thought of as a move from box (1) to box (3).

As we have shown, on this *ostentatious* level a wide range of normative mechanisms take effect on scientific and technology development (see section 3). The term ostentatious refers to the discursive level of scientific practice. In our view the postulate of autonomy is demonstrative and purposefully put on display. A lot of projects are funded to investigate the darker sides of aging and how the elderly population can be supported and assisted. We argue that the promises associated with technology are often overstated or stated too universally, and that the enhancement of autonomy and self-determination is limited or do not necessarily take place, as clarified by box (4) in table 2. Inside the field of AAL, autonomy and safety are usually central ideas that are much claimed and demanded but less challenged (cf. Selke/Biniok 2015). There are barely experiences and differentiations regarding the effects and benefits of assistive technologies.[16]

We implemented our assistive technology and observed effects on the day to day life of the elderly on a *performative* level of scientific practice. In difference to asserted (ostentatious) effects, initial changes unfold with regard to action and interaction. In table 2, this is expressed by a move from box (1) to box (2). There seem to be social mechanisms and rules that enhance social en-

16 | Correspondingly, we experience a skeptical attitude towards our research. Criticism is expressed especially with regard to missing structures (organizer, moderator, and 'troubleshooter') on behalf of the public and the economic interests related with our project and with the implementation of an assistive technology. Without the necessary social structures, our project is considered as an unsuccessful endeavor, but this prejudice can be read as a criticism of AAL and its projects in general.

gagement and inclusion, so we have the paradoxical situation of an intervention before the intervention originally intended by the project. This paradox is not new: two lines of reasoning beyond placebo or bias can be suggested.

Table 2: Social Inclusion and Intervention

	Many opportunities and high autonomy	Few opportunities and low autonomy
Social mechanisms	(2) Increase by research and/or "by chance"	(1) Demand for investigation and intervention
Technological mechanisms	(3) Increase by AAL	(4) No or limited effect by AAL

From a socio-psychological point of view, our activities with their orientation towards the social environment follow an approach (cf. Albrecht 2008) known as 'social environment pastoral' (*Sozialraumpastoral* or *sozialraumorientierte Pastoral*). The idea behind this approach is to strengthen local or regional communities by paying attention to the needs and wishes of the citizens, using available resources and connecting various actors. That means the altruistic engagement of third parties – e.g. churches – can help people to feel better and/or become more active: "Care is perceived as relief and enrichment in many cases only by its presence." (Wingenfield/Schaeffer 2001: 144) Even though pastoral acting results from religious objectives, these motivations fade from the spotlight in daily practice. In a similar way, as we show interest in the life of the elderly in rural areas, and take them seriously, we evoke re-actions by perceived support.[17]

In a more scientific and methodological perspective, we bring about a 'Hawthorne effect' (Roethlisberger/Dickson 1939) on the one hand and some kind of 'serendipity of science' (Merton/Barber 2006) on the other. The former effect refers to the fact that a mere participation in an experiment or

17 | Social work (*soziale Arbeit*) follows similar objectives and orients itself towards social environments (cf. Debiel et al. 2012).

a study affects the behavior of the participants.[18] Again, it is the degree of attention that leads to actions and interactions, which in turn give rise to new personal networks, new alliances and modifications of living conditions. This observation of unanticipated results during our research is what Merton and Barber call serendipity. Although the structure of our study presets it differently, we found by chance social factors influencing social inclusion. The paradox intervention before intervention is now the basis of our future research and serves as a model to deepen our understanding of social inclusion influenced by social *and* technological determinants.

That points to the potential of assistive technologies. In our view autonomy (or self-determination and independence) grows out especially from available courses of action within the living environment: multiplication of opportunities of action generates autonomy. These opportunities are usually limited, only limited expendable, and emerge only under specific conditions and with regard to specific social groups and timescales. For that reason, we suggest speaking of 'contingent autonomy growth' instead of the normative demand for autonomy. At present we feel that empowerment in its ideological manifestation is misleading. We argue that the delegation of responsibilities to individual citizens has to be linked with catalyst mechanisms, whether they are social or technical. Personal responsibility is as crucial as the transformation of societal contexts.

To spur somebody into action does not reach far enough. Instead, as our project does, an opening of possibilities for interaction has to occur. Technology, if then, has to be fit in as artifact on the structural level and as something 'handiness' (Heidegger 1927) on the practice level. *In sum*, autonomy is a fluid mosaic consisting of existing and missing opportunities in life, which obtains its dynamics from changing circumstances of life and modified ways of living. Technologies only should be inserted and applied if there is more knowledge of dependencies, specific needs and wishes, and living environments.

18 | Already Thomas and Thomas (1928) point out: "If men define situations as real they are real in their consequences."

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