Project FoSIBLE
Fostering Social Interactions for a Better Life of the Elderly

Deliverable

D6.1: Report on inHaus lab evaluation results

Responsible

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UDE

Participants

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Abstract

Our work on WP6 includes an online study and two lab studies in the Fraunhofer inHaus focusing on specific issues that will be specified in the following

The online study has been conducted very early in the project. We analyzed the behavior and the preferences of the elderly on social networks as a pre-study for gathering requirements for the social community of the FoSIBLE system. From a questionnaire filled by Facebook users over 50 years we learned about their behavior concerning the use of social networks, their ways to contact family and friends as well as their use of technology. The results indicate that FoSIBLE could be a good contact medium to family members (as social networks are), that privacy settings are an important issue and that the integration of games is relevant.

Concerning this last issue, in a lab study we investigated the potential of co-located playful interaction combined with TV watching. The results underline the need for sociability and interaction in such a reception situation. They also show that iTV games can foster social interaction during and after the playing situation. Moreover, the study revealed that playful interaction can lead to a new quality of interaction comparing it with a face to face situation. One of the most important strengths for FoSIBLE lies in its potential to bridge distance between family members and peers.

A second lab study conducted in the Fraunhofer inHaus was an evaluation on Awareness and Social Presence effected by different forms of visualization while watching different TV genres in a mediated Social TV environment like FoSIBLE. A pre-study showed that sports, comedy, quiz shows and soaps are social TV genres, where recipients want to communicate. Through the comparison of the visualizations buddy list, video representation of the other and photo representation we identified that peripheral Awareness information is relevant for Social TVs and that the TV genre should be considered when developing such applications.

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1. Introduction

1.1 Background and Related Tasks

Due to demographical changes, the number of elderly people increases. Not only our society but also our forms of living are changing. Traditional ways of living together in a multi-generation household are no more common. Instead, more and more (elderly) people live alone. This often leads to a feeling of loneliness or even a feeling of isolation especially for seniors living alone (Help The Aged, 2008). Local distance and insufficient time to care for elderly family members (because of adult childrens' work and other obligations) even increase the problem. Despite this, a strong fixation on the family by elderly people can be observed (Harriehausen, 2009). In conclusion, there is an urgent demand for new forms of sociability, which are easy to integrate in the daily life of all participants. Following Ducheneaut et al. (2008, p. 136) "sociability is becoming more and more distributed in this context as technology enables diverse remote interactions". Thus, technology can be a way to offer new interaction tools.

One possible starting point for creating distributed social situations is the activity of watching TV. TV reception has always been a social situation, which has been shown in many investigations (Morrison, 2001; White, 1986). It creates a common ground for the recipients and in this way provides reasons and topics for conversation. Moreover, it brings family members together at the same time and – traditionally – at the same place (Hepp, 1998). That is how it creates a feeling of being together (Hepp, 1998). Considering this, TV watching can be seen as a connecting point for the family members and can act as a "ticket to talk" (Sacks, 1992). Morrison (2001) distinguishes two basic roles TV takes: 1. an internal social function (the TV watching situation with the family) and 2. an external function (e.g. TV programs as topics of conversation).

Considering the demand of solutions creating social situations for elderly and their families as well as the potential of TV for sociability, combining TV watching with social tools seems promising.

The FoSIBLE system uses the TV set as the center of distributed social family interaction. Based on a social network structure, it provides different interaction possibilities like chat, fora and health applications. Therefore, the habits of elderly people regarding the use of social networks were examined in a pre-study presented in chapter 2.

In our main evaluations (chapters 3 and 4) we focused on the creation of sociability and social interaction during TV watching using presence and Awareness tools as well as playful components.

1.2 Scope of This Deliverable

Objectives of the WP

The objective of this work package is to gather first feedback results with respect to the quality and user friendliness of the developed system. To this end, the InHaus Lab facilities will be exploited in order to

1. Test the developed material in a controlled use situation,
2. Boost the quality of the developed products by deeply involving test users from the target community into the development process.

The InHaus Labs will allow collecting valuable user feedback by allowing them to test our system within a home environment. This shall enable non-technical skilled users to gain hands-on experiences with our system. Nevertheless, this work package is not intended to replace any real world field tests. Instead, it will be exploited to collect end user feedback information at an early stage within the development cycle. As a result, these tests will be executed on a regular basis whenever significant development or research results become available.

Description of work

Task 6.1: Early testing (mock-ups) (Responsible: FhG IMS and Uni DUE, Collaboration: Mauser Care): In the first evaluation phase mock-ups of the applications and components will be tested with end users in the InHaus Labs. These tests will be done applying a Wizard of Oz approach. The goal is to gain usability results about the system and its components in an early stage within the development phase.

Task 6.2: Prototype Testing (Responsible: FhG IMS and Uni DUE, Collaboration: Mauser Care): In the next lab evaluation the application and prototypes will be evaluated in a monitored InHaus2 environment by professional testers and members of the target user groups. In this lab study, the focus will be on bugs and usability aspects. These tests will be carried out in order to (a) detect bugs and errors which will be corrected as soon as possible and (b) to get better testing results; test tasks (in form of use cases) will be prepared. With given tasks every possible function of the software/hardware can be tested. Feedback on the tasks can help to find usability issues and fix them by interviewing the testers which had usability problems. (The two groups of testers will be used for different focuses of testing. The professional testers will have a deeper focus on bugs while the testers from the target user group will have a deeper focus on usability aspects. The focuses can be easily controlled by the tasks given to the testing persons.) After the first tests, the problems should be solved and the hard- and software should be redesigned and at this point be bug free.

Task 6.3: Usability tests: CURE with support of AIT will test individual measurement components in their Experience Lab in Vienna, Austria, prior to integration in the overall system that is tested in InHaus. The facility of CURE includes a usability lab, so both functional and usability testing can be performed.

Deliverables of the WP: no., brief description and project month of delivery

D6.1: Report on inHaus lab evaluation results. Delivery date: M30

D6.2: Report on usability tests. Delivery date: M36.

D6.3: Report on usability tests in laboratory in Vienna. Delivery date: M30

2. The Facebook Pre-Study

Our first evaluation was an online study on Facebook to analyse the basic wishes and behaviours of elderly people regarding different technologies as well as social networks. This was important for us to identify what functionalities could be integrated in our Social TV platform.

In the pre-study on Facebook we wanted to explore the following questions:

- What kind of community do elderly people want to have?
- Which functions are important for them?
- How is the living situation of the elderly like?
- Which communication devices do they use and with whom?
- Which technical experience do the elderly have?
- Do the elderly share their personal data publicly or only with friends?
- Do the elderly use social networks more frequently when their friends and family members live far away?
- What are the reasons why the elderly have begun to use the computer, the internet and social networks?
- What kind of friends and how many friends do the elderly have on Facebook?
- Do the elderly preferably use communities that are designed especially for elders or common social networks?
- What activities do the elderly mainly accomplish on the computer/the internet/in social networks?

2.1 Preparation

The survey started on 13.10.2011 and was conducted on the German Facebook. Because the FoSIBLE platform is designed for the elderly, the conditions for the subjects were that they are 50 years or older and that they use Facebook. The first step was to write private messages via Facebook to friends or family members from the researchers' friend lists who were 50 years or older.

After that we went through different groups like "Ü40" (german name of group for people over 40 years) or "Ü50" (german name of group for people over 50 years) to find other persons who could answer the questionnaire. We also contacted them via private messages. Another method to find subjects for the study was to search for typical "old fashioned names" like "Karl-Heinz", "Joseph", etc. When finding a person who fits in the study we asked them in private messages if they want to participate and if they could send the message to their friends who are 50 years or older.

Then we tried to find subjects by posting a public message on Facebook where we asked our friends to send the link of the questionnaire to possible subjects. In this way we hoped to spread the questionnaire over Facebook.

2.2 The questionnaire

The goal of the Facebook pre-study was to identify general needs, wishes and behaviors of elderlies regarding social networks. For this reason, the questionnaire includes – besides the elicitation of socio-demographic data - questions about their living situation, their communication patterns with others and their technical experience. Furthermore, the questionnaire was divided in three parts that concern computer, internet and social network usage. In the last part we asked questions about the behavior and the activities of the elderly on Facebook.

2.3 Results

Subjects

We experienced that it was very difficult to draw closer to the elderlies we wrote to. Most of them were very skeptical to click on the posted link because they did not know us personally. As a consequence, although we contacted altogether 80 German Facebook users, only 18 elder persons filled in the questionnaire. They had an average age of 55 (from 50 to 69 years). Ten subjects were female and eight male. Nevertheless, the data we could gather from these participants were very comprehensive wherefore the 18 persons were sufficient to get an overall impression on what elderlies need and wish in social networks and how they behave there.

<u>Living situation and communication patterns:</u>

88,9% of the participants lived together with their (marriage) partners and nearly half of them also together with their children in a household. At an average, they had 2 children.

77,8% of the participants were married. Consequently, most of the participants do not live alone (only 5,4% mentioned that they live in a single-household). Friends and other relatives of the participants often live in another city that is at most two hours away. On average, two other persons live together with a participant in one household.

Probably because of their living situation, 44,4% of the elderly have contact to their parents at least once a week, 22,2% of them at least monthly and the rest of them name that they see them never (what could depend on the fact that there are already dead). Most of the elderly (77,8%) see their children at least weekly. They mostly talk to them in face-to-face situations but 27,8% of the participants also mentioned that they often use the regular home phone to hold contact to their children. Grandchildren, friends and other relatives have contact to the older adults at least once a month.

Furthermore, it was interesting for us examining what communication devices are used to stay in contact with whom. The regular home phone was utilized with relatives. With friends, acquaintances and colleagues they use most frequently a mobile phone. Nevertheless, in general a high variety of communication devices is used with this three person groups (see figure 10).

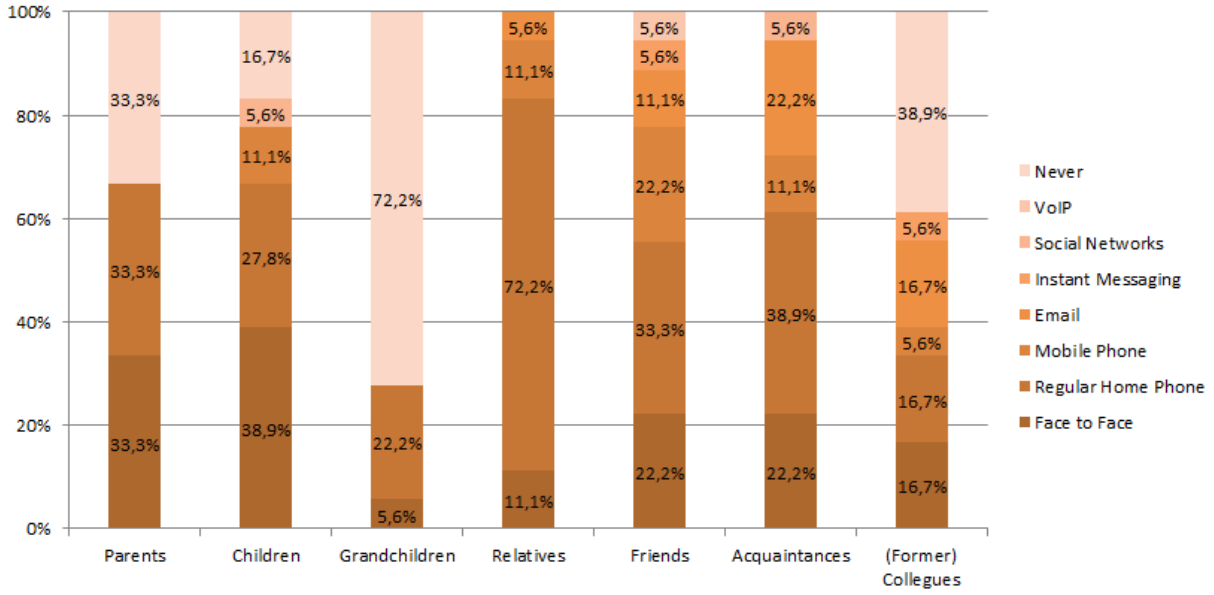

Figure 10 – How the elderly have contact to different person groups

General technical experience

We also explored which consumer goods elderly use how frequently. As a result we found that the motor car, the television, the regular home phone, the computer and the laptop are used most frequently. Technologies like a tablet, a game console and a video camera are often not available in the elderly's households. Figure 11 gives an overview of all requested consumer goods.

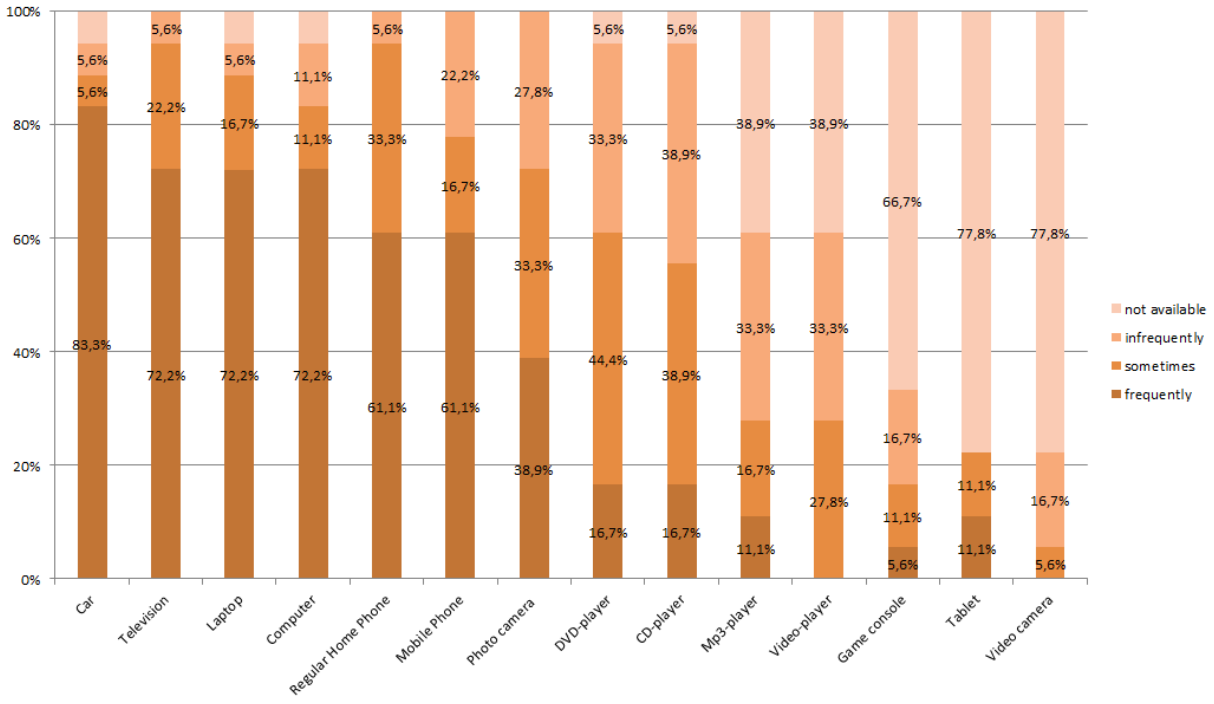

Figure 11 – Usage of different consumer goods

Computer use of the elderly

The elderly used the computer the first time when they were on average 30 years old. The most mentioned reason why they have begun to use the computer was their job, their friends or general curiosity. Connected to this, they also learned to use the computer through their job and by trying it out for themselves. Moreover, 22,2% of the persons visited a computer course and also 22,2% learned it through their children.

Now, 61,1% of the elderlies utilize the computer several times a day, 27,8% once a day and the rest of them several times a week. Consequently, the computer is a medium that is used frequently.

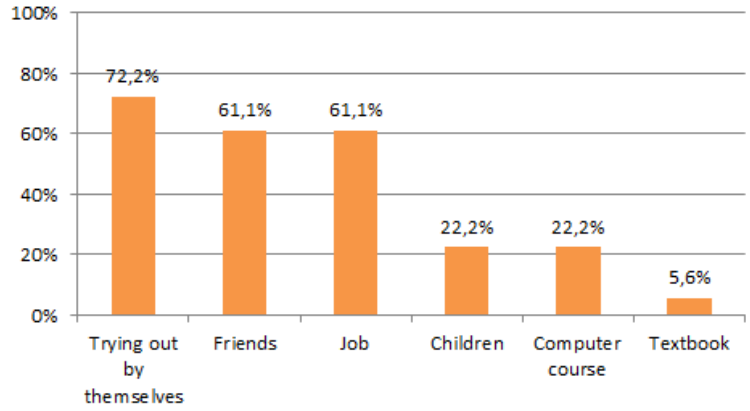

Figure 12 – How the elderly have learned to use the computer.

Furthermore, figure 13 illustrates what activities the computer is used for by the elderly. The most frequent activity is searching for information, but also contacting friends and family members and writing letters are relevant.

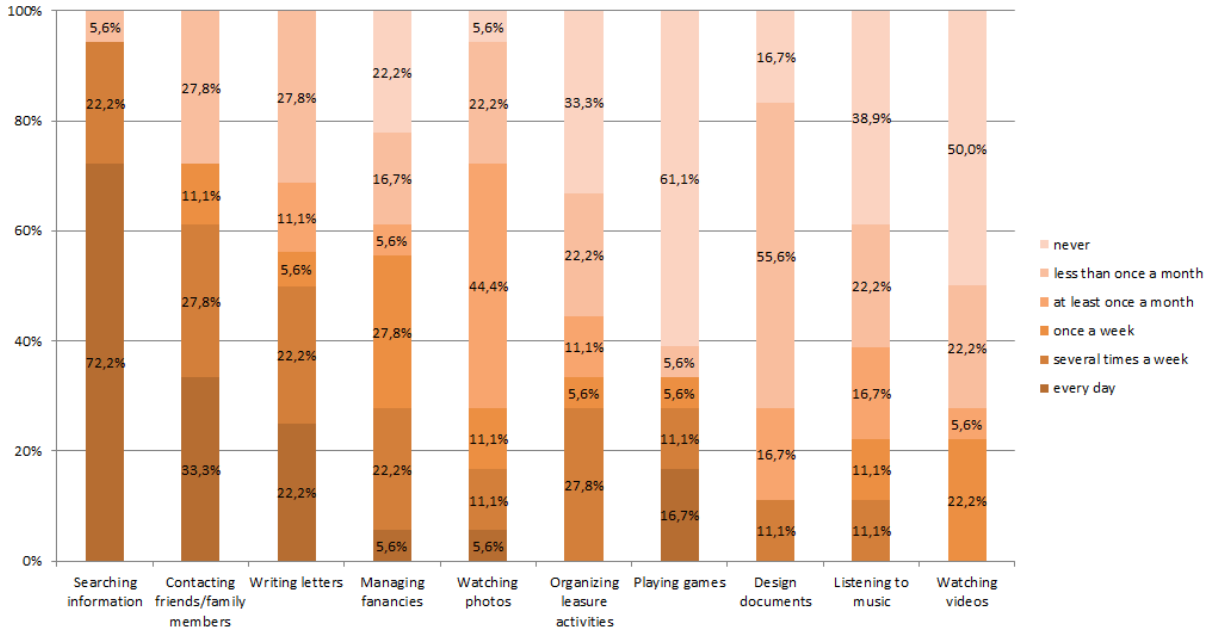

Figure 13 – Activities on the computer

Internet use of the elderly

The elderly deployed the internet the first time when they were on average 40 years old. Now, 61,1% of them use it several times a day, 27,8% once a day and the rest of them several times a week. That implies that internet usage is high. The most often mentioned reason why they have begun to use it was general curiosity, their job, good research and information possibilities and the fast data transmission. How the elderly learned the usage of the internet can be seen in figure 14.

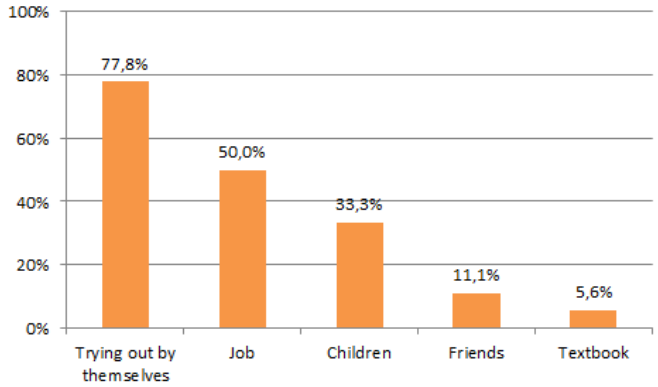

Figure 14 – How the elderly learned to use the internet.

The numbers represent the frequencies.

The following figure 15 shows for what activities the internet is used for by the elderlies. The most frequent activities are the usage for the job, sending and receiving emails and searching information. Activities like watching television, writing blog and forum entries, making telephone calls and reading e-books are only used by a few of the participants.

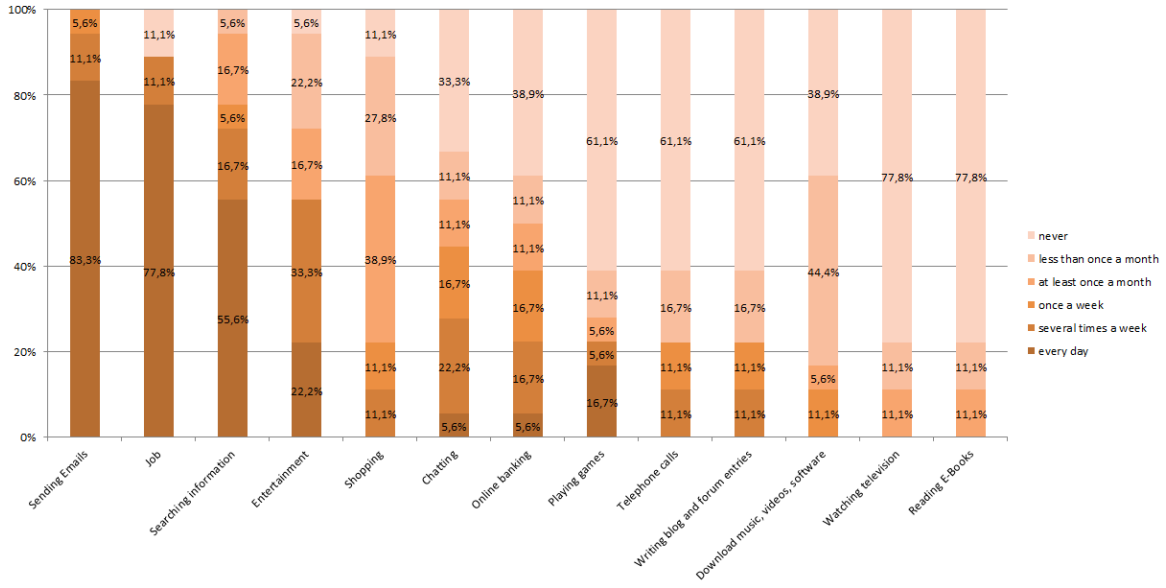

Figure 15 – Activities on the internet

Social networks use of the elderly

The elderly used social networks the first time when they were on average 52 years old. This suggests that social networks are a new medium for the elderly because the average age in this study is 55 years. Moreover, it is interesting that 11,1% of the persons that use social networks do not know what the term signifies although they use Facebook. They begun to use social networks because of their children and because they wanted to keep contact to friends and family members who live far away. In comparison to the learning of computer and internet use, social networks are not learned because of the job, by trying it out for themselves or through their children (see figure 16).

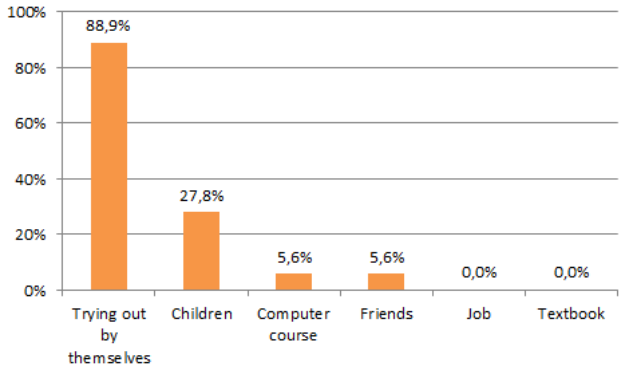

Figure 16 – How the elderly learned to use social networks.

The following two diagrams show what social network sides the elderly know and what sides they use how often. Because the study was distributed on Facebook, it is not surprising that all elderly know and use Facebook. Especially in figure 18 it is interesting to see that the elderly do not use social network sides that are primarily designed for older adults. Besides, Facebook, XING, Schüler/StudiVZ and Twitter are utilized more often than the other social networks.

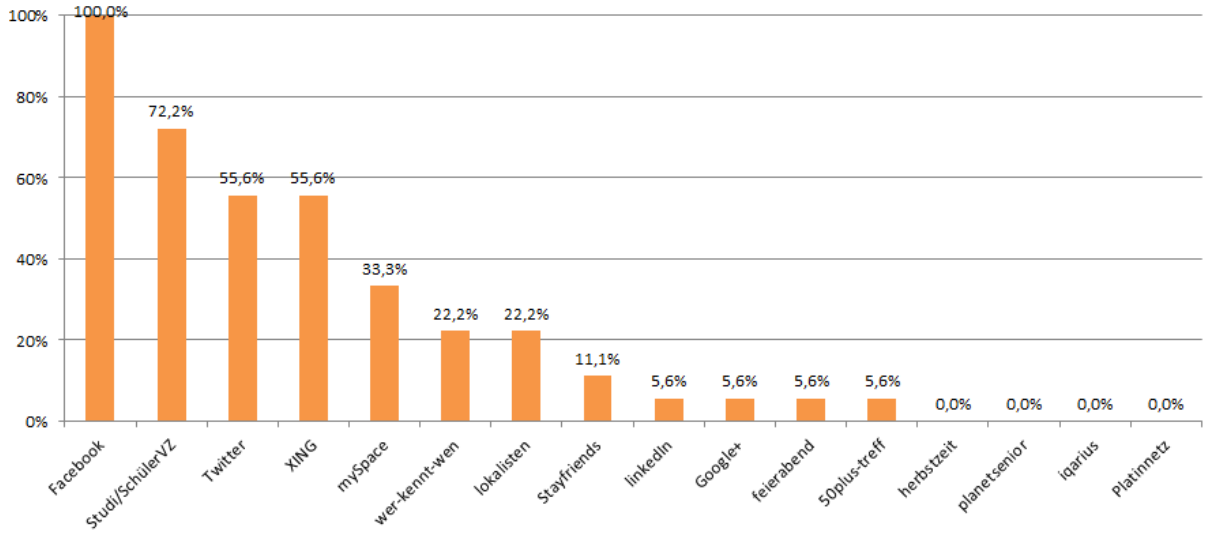

Figure 17 – What social network sides do the elderly know?

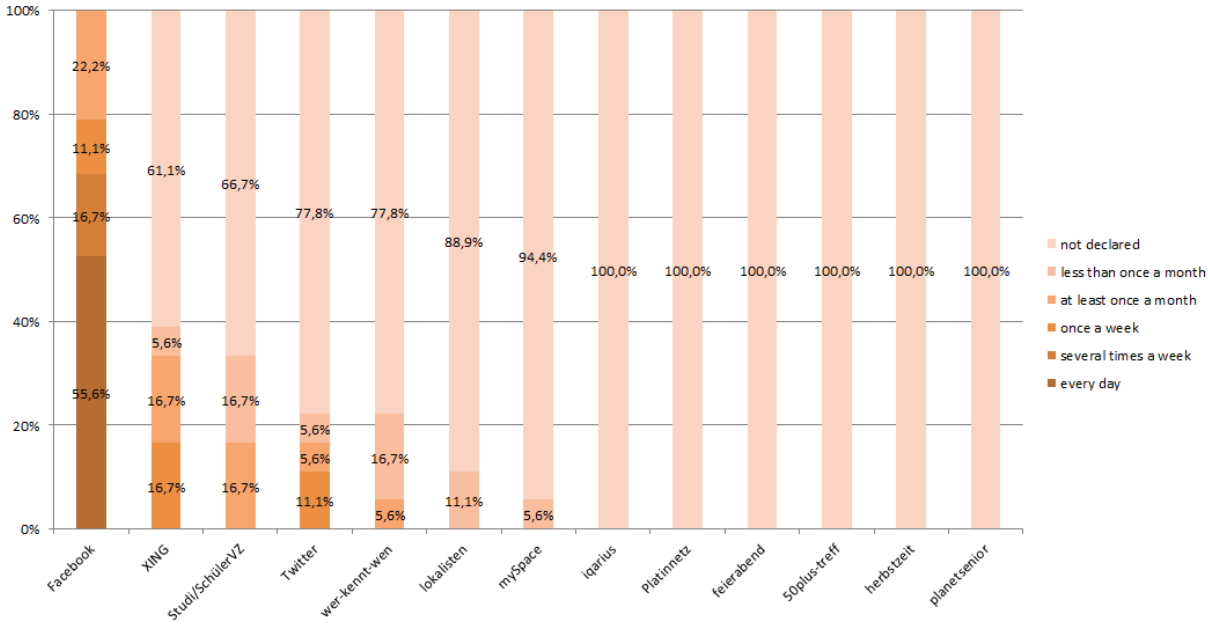

Figure 18 – How often do the elderly use these social network sides?

Facebook use of the elderly

Friends of the elderly:

The elderly have on average 61 to 80 friends on Facebook. Most of these persons are friends and acquaintances they know personally but 44,4% of the elderly also say that they have persons in their friend list that they became acquainted with on Facebook. This could be an indicator that social networks are used by the elderly in order to get to know new people. Only some of the elderly have parents or their partner as a friend in Facebook. A possible rationale for this could be that the parents of the elderlies are already dead or too old so that they do not have an account on Facebook.

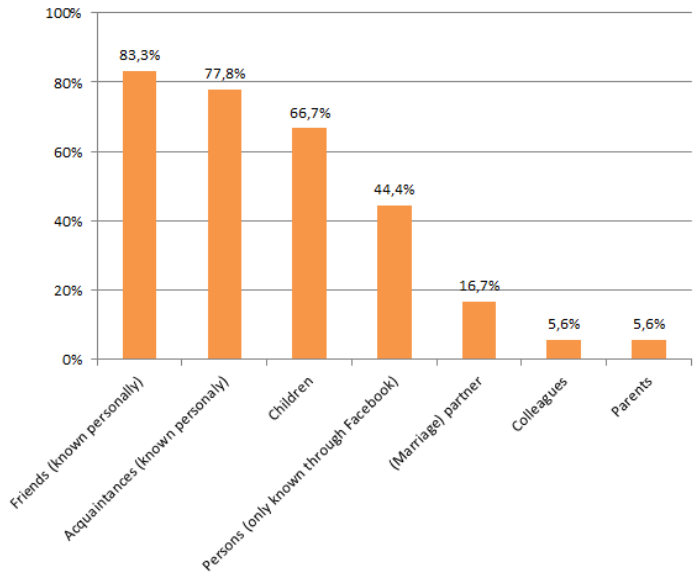

Figure 19 – What friends do the elderly have on Facebook?

Privacy:

Furthermore, we asked the elderly questions about some privacy issues. Most of the elderly did not register themselves with their full name but only with some parts of their name. The information they made visible publicly is their profile photo while information about their job, their interests, their sex, their address, their birthday, their relationship status and their email are only visible for friends. Their telephone number is only visible for themselves.

Activities on Facebook:

After that, we wanted to know what activities the elderly do on Facebook and how often (see figure 20). We examined that Facebook is mostly used for writing private text messages

and for chatting but also for looking at other profiles and links. Activities like building polls, organizing events or searching for groups are not used much. In this context we also asked about what topics the elderly talk on Facebook. The main topics are politics, family, news and traveling. In contrast to this, they do not talk about technology, relationships, finances, food, nature, fashion and religion. However, in this context it must be considered that this response behavior could depend on the options we gave the participants in the questionnaire.

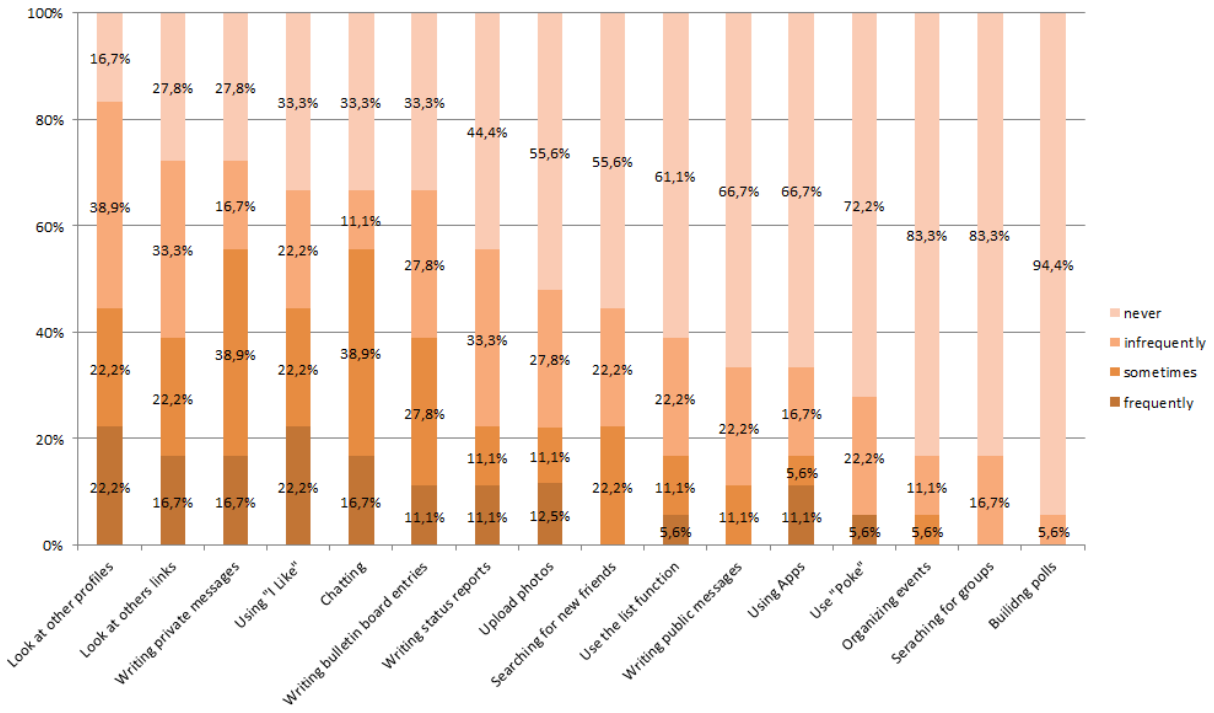

Figure 20 – Activities of the elderly on Facebook.

Independent of the functions that Facebook offers, we also wanted to know what communication methods the elderly *want* to have on social network sides, or in other words if they miss some functions. As a result we found that there are no alternative functions they want to use. Examples like Internet Video Calling or telephony are not wished for social networks. To the contrary, the subjects mentioned that they only want to write messages in text form with Facebook and that they for example want to use the regular home phone for voice speaking only out of Facebook.

2.4 Conclusion

Through the Facebook study we wanted to analyze the behavior and the preferences of the elderly on social networks because there are a lot of parallels to the social community of our FoSIBLE system.

In general, we figured out that social networks are used mainly for contacting children, friends and acquaintances. Nevertheless, face-to-face contact or contact via regular home

phone predominates for this person groups. This could accompany with the fact that social networks are a new medium for the elderly. But this medium plays an important role when becoming acquainted with new persons the elderly do not know personally but only through Facebook.

The most frequently used consumer goods are the television, the landline telephone, the mobile phone, the car, the computer and the laptop. The high importance of television confirms the FoSIBLE system concept as it is based on a TV set.

The computer usage was mostly learned through the job but also by trying out by oneself or through friends. In contrast to this, it is very interesting that social networks aren't learned through the job but by trying out by oneself. This indicates that social networks are not important for the job but for leisure activities. Also children seem to be a good motivator for the usage of computer, internet and social networks. This could be relevant for the maintenance of contact via Social TV applications like the FoSIBLE system to family members.

The elderly do not use social networks that are designed especially for older adults even if they know these websites. This could be an indicator that elderly want to have contact to different person groups like their children and not only to other elder people. This accompanies with the fact, that a lot of the elderly are linked with their children as friends in Facebook. Consequently, social networks like Facebook (and with this probably also Social TV systems like FoSIBLE) are primarily used to stay in contact with family members.

It is also important for the design of social network sites as well as for Social TV systems that the elderlies have the possibility of individual privacy alignments. The results show that they do not want to share their personal information like sex, job, interests and relationship status publicly but only with their friends. Because of this, the FoSIBLE system should provide according privacy settings.

It is also interesting that most of the elderly people only use the basic functionalities on Facebook like chatting, looking at other profiles, writing bulletin board entries and private messages and using the "I Like" functionality. Other special functions are utilized only infrequently or never. This could imply that for Social TV systems primarily basic functionalities are relevant and that too many other special communication possibilities should not be integrated. Nevertheless, this assumption has to be proofed in a real Social TV context.

Another confirmation of the FoSIBLE system approach is that many elderly like to play games on the computer, in the internet and also on social network sides. This is an indicator that also the integration of games in the FoSIBLE widget is a good solution. Because of this, in the next chapter we describe our realized study regarding playful interaction and it's possibility to effect sociability between family and friends.

3. InHaus Evaluation on Playful Interaction ("Gameinsam")

The main topic of FoSIBLE is effecting sociability between family members and peers with the help of an interactive TV-based system. Playful interaction is one of the components of the FoSIBLE concept, intended to create sociability. To investigate how playful interaction can foster social interaction, we used the iTV application "Gameinsam" and simulated a playing situation in a SmartHome laboratory.

This study and also the study described in chapter 4 focused on intergenerational aspects wherefore we included elder but also younger people as participants. This is based on the finding, that the basic human need is not limited to elderly people but that there is a general need to feel close to others (Wisneski et al. 1998, p. 4). To foster social interaction among elderly and their families requires that all generations are integrated in the evaluation process. Only when the Social TV application is attractive to younger and elder people, isolation and loneliness among elderly can be counteracted.

3.1 The application

"Gameinsam" (Herrmanny et al., 2012) is a widget for the Samsung Smart TV, which is also used for the FoSIBLE system. It has been developed by the researchers of UDE and presented at the international conference EuroITV 2012 in Berlin. Through this application elderly people can interact with their family members and peers in a game-based way while watching TV. The starting point is the TV program, e.g. a quiz show, as part of the playful interaction. The application offers the opportunity of "shared shoutability" (shoutability = the need to e.g. answer questions (aloud) while watching quiz shows), allowing each participant to watch the program at home and share his or her guessed answer using the standard remote control. The four colored buttons of the remote represent the three possible choices and a question mark, which may be used for signalising the other player(s) that one doesn't know the correct answer. The information which family members do watch the same program and which answers they choose is displayed in a buddy list. Players can correct their answers all the time as long as the question is active. This allows them to react to the answers of the co-players as they play together. Family members commonly achieve joint high scores offering a collaborative playful interaction. When the solution of a question is given in the program, the question is set inactive, the correct answers are colored green, the others red and the family score is updated. When there is a new question in the TV program, the interaction is set on active again, so that the users can make their input.

For this evaluation a bot has been integrated in the application. It simulates realistically the co-player's answer inputs and answer switches. This has been done because of technical aspects as the emulator used in the study is an instable system. In the study two emulators were necessary because at least two persons have to play and interact simultaneously. By using the bot, re-starts of both emulators could be avoided if one system crashed.

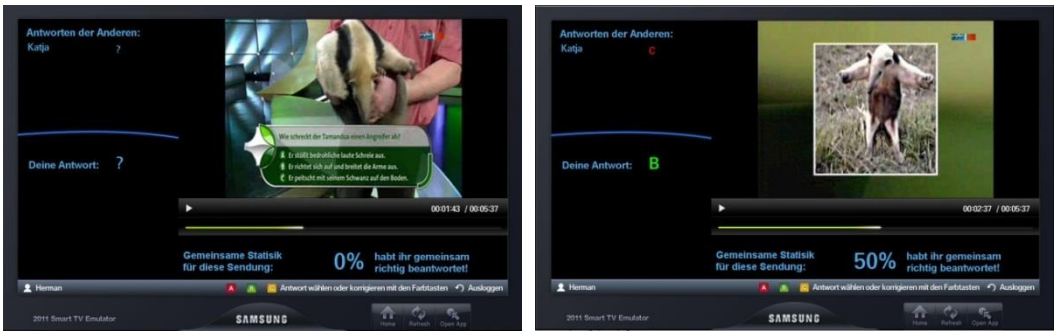

Figure 21 – Interface Gameinsam, question active and solution

Moreover, the prototype of the application used during the evaluation runs a video instead of real TV program.

3.2 Research issues

To investigate the potential of this kind of playful interaction for the FoSIBLE system, we realized an empirical evaluation. In this evaluation, the following research questions were considered:

1. **Does playing "Gameinsam" achieve typical social interaction effects like Social Presence and connectedness?**

   We took the perceived Social Presence and Social Connectedness as main indicators for sociability. Following Biocca et al. (2002) Social Presence is a „sense of being with another in a mediated environment" (Biocca & Harms, 2002, p. 10) and can have different hierarchical degrees. In a more detailed definition they describe Social Presence as "[…] the moment-to-moment Awareness of co-presence of a mediated body and the sense of accessibility of the other being's psychological, emotional, and intentional states" (Biocca & Harms, 2002, p. 10).

   Social Connectedness is simply defined as „the feeling of being in touch with the other" (IJsselsteijn et al., 2003, p. 927).

   This was measured with a questionnaire. The conception of this instrument is based on the Networked Minds questionnaire (Biocca & Harms, 2002; Biocca et al., 2001), measuring Social Presence, and the ABC-Questionnaire (IJsselsteijn et al., 2009), measuring Social Connectedness.

   Moreover, we surveyed behavioral interaction cues in the distributed TV watching situation using "Gameinsam" in the lab. We also observed the participants' behavior and conversations when they met again right after having played the game. This conversation might include cues for perceived Social Presence or Social Connectedness.

2. **How do users experience the playful interaction?**

   We also evaluated the hedonic experience effected by interacting with peers or family members in such a playful way. The hedonic value is important for the quality of the social interaction and for the prediction of the acceptance of the application.

   This was measured with a qualitative interview, held with the participants after the perception of the TV-program and interaction via the playful application.

3. **How does this form of distributed interaction differ from or correspond with face to face TV watching?**

   The differences and similarities to a face to face situation can be an indicator of having a feeling of watching TV together.
   To measure this, we mainly used an observation, realized in a face to face TV watching situation as well as in the distributed situation using the application "Gameinsam". In this observation we focused on social interaction cues.

4. **Does this kind of playful interaction replace usual interaction, does it foster the internal function of interaction and/or does it foster additional, external interaction?**

   Based on the question before, we wanted to identify the potentials of "Gameinsam" for new ways of (family) interaction in everyday life.

   In addition to the above-mentioned behavioral observation, we used a qualitative, semi-structured interview to learn about the influences of the distributed playful TV watching on social interaction between the users. (Some of the topics: Does the choice of the TV-channel differ if other people are online and playing? Do users think it could bridge distance and be additional interaction? Do users think it would even influence communication in face to face meetings?)

5. **What are the general attitudes towards and perception of "Gameinsam"?**

   To get a complete impression of the potentials of playful interaction, we also had a look at the general attitudes towards "Gameinsam" and the perception of this kind of interaction.

   This was measured with the above-mentioned interview after the collocated TV watching situation. (Some of the topics: Is "Gameinsam" easy to integrate in daily life? Is there a user acceptance of the application? Does the interactivity disturb the TV-watching?)

3.3 Method

To investigate these issues we simulated a playing situation in a laboratory. We invited pairs of participants, who already knew each other, to the Fraunhofer inHaus Centre in Duisburg. 42 participants (18 male) took part in the evaluation. As one of them could not be taken into account because of technical problems during the study, the data basis consists of 41 participants (18 male). They were 19 to 60 years old (M = 24.59 SD = 8.225) and most of them (38) were students. Four of the participants live together in one household with the other person, taking part at the evaluation together with them.

The participants described their relationship to the other one as a friendship (20), a close friendship (13), a parship (5) and knowing each other without having contact in their leisure time (3).

To create a semi-realistic atmosphere, two living room like areas in the service apartment of the inHaus2 were chosen for the evaluation and furnished with additional sofas and seats by Mauser. This atmosphere was important for better, more realistic results.

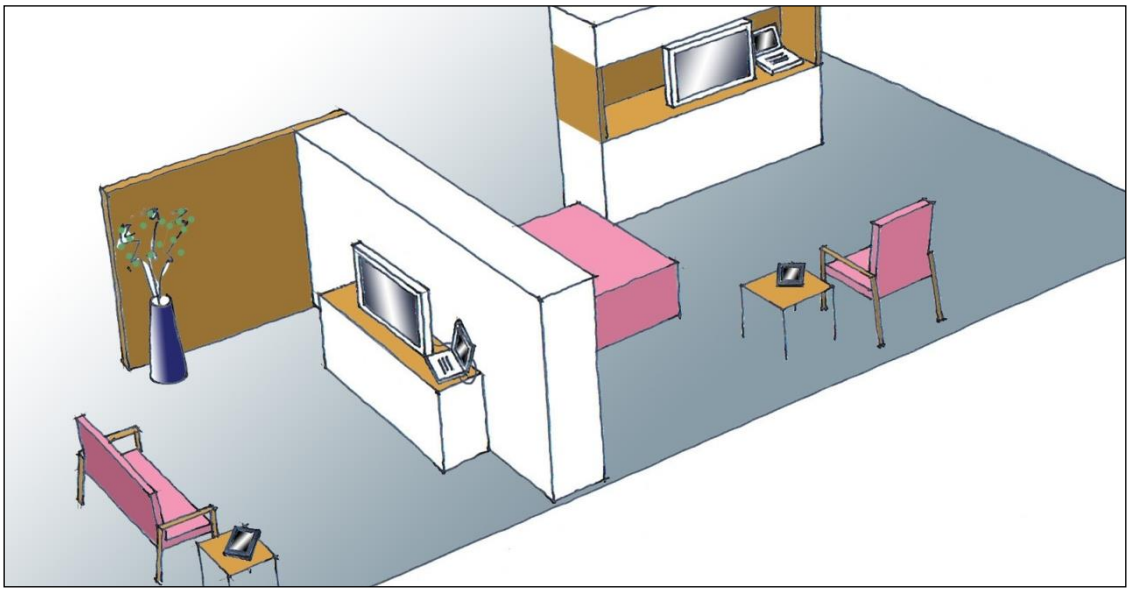

Figure 22 – Scribble of the lab situation in the Fraunhofer inHaus Centre.

During the study, first, the participants watched a quiz show together. Then they played "Gameinsam" simultaneously, each one in an own room. During these reception situations, the overt observation for the behavioral measure was done simultaneously by two researchers. It was also recorded by camera and evaluated in detail later. The observers scored the behavior according to a semi-predefined categorization scheme. Their conversation was recorded by camera. After the testing, the two participants got in the same room again. In this situation, their behavior and conversation were observed by the investigator, too. This was a covert observation. The participants were informed about this after the end of the study.

Then, participants filled in the questionnaire. After that, the qualitative interview took place with both participants together.

In this way we collected a wide range of qualitative and quantitative data.

3.4 Results

With a triangulation of different research methods and instruments we were able to collect a wide range of data which focus the topic from different points of view. The qualitative and quantitative data collected with the observation of the participants' behavior, with a questionnaire and with an interview, provide a good basis for the discussion about the research issues described above.

Social interaction, Social Presence and Social Connectedness

The data of the questionnaire showed that the playful interaction is able to create Social Presence and Social Connectedness. Specific sub scales of both (mutual Awareness, behavioral interdependence and empathy for Social Presence; staying in touch and group attraction for Social Connectedness) were investigated and all of them have revealed values higher than 1 (on a 7 point Likert scale), which means, that a feeling of Social Presence and Social Connectedness exist. The exact values can be seen in tables 1 and 2.

Except the subscale behavioral interdependence all mean values are above the middle item value. This shows clearly the potential such playful interaction has in creating sociability.

Table 1 – Means and standard derivation of perceived Social Presence

	M	**SD**
Mutual Awareness	5.65	0.97
Behavioral Interdependence	3.77	1.40
Empathy	4.82	0.98

Table 2 – Means and standard derivation of perceived Social Connectedness

	M	**SD**
Staying in Touch	4.20	1.30
Group Attraction	4.23	1.07

"Gameinsam" offers the opportunity to interact through answer input, which can be a reaction on the other's input, influence the others' choice or just be noticed by the other. The participants used this way of interaction. Nearly all participants stated that they noticed the answers given by the other one. Some of them told that they have been influenced by the other and a few participants even told that they tried to influence the other person. The interview revealed that there would have been more passive or active influences if the quiz questions were easier. As the users often did not know the correct answer and did not think that the other one knew it, they decided that influencing each other did not make sense.

Those who tried to influence the other one did this by a very quick answer input, by changing their answer or pressing the button that displays a question mark instead of an answer.

The observed participant's reactions to the above mentioned bot give also evidence of being influenced by the others.

From showing this Awareness of the others' answers and partly even an active or passive influence, one can conclude that social interaction takes place while playing.

The conversations between the users right after the distributed situation also give evidence of a feeling of having watched the program together. In most cases they talked about the content of the TV show, the choice of the answers, technical aspects or the hedonic experience as presented in figure 23. This does not only show a feeling of presence during the TV watching and playing situation, but also after the reception.

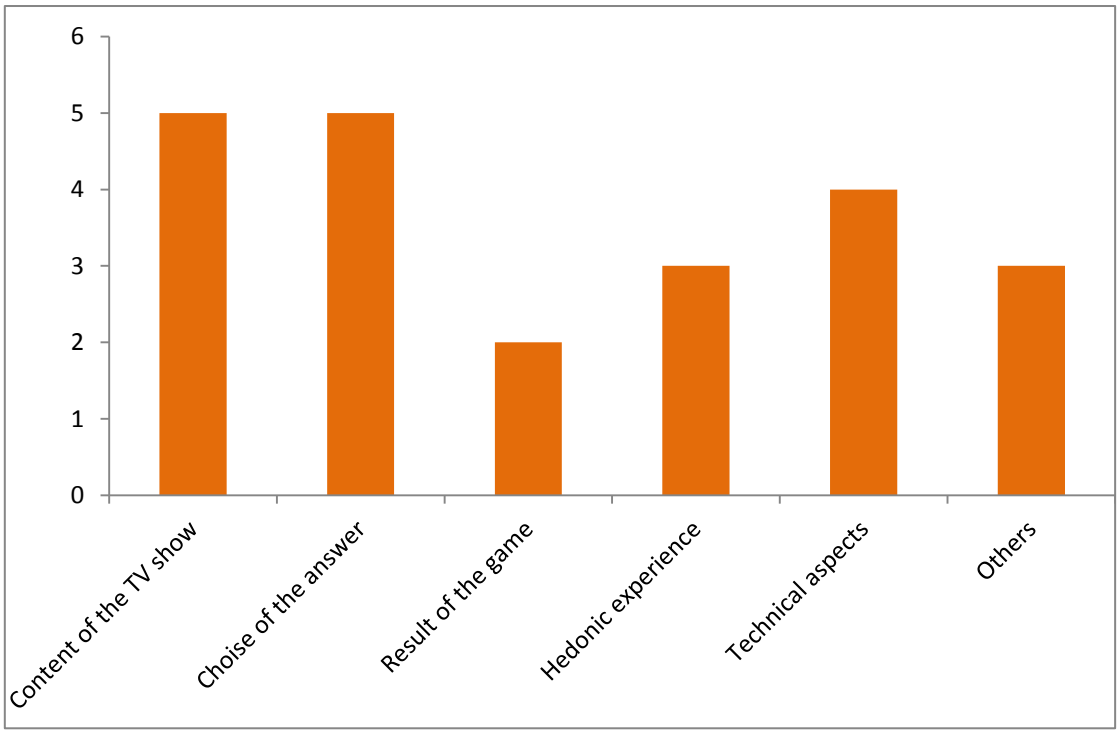

Figure 23 – Topics of the participants' conversation after using "Gameinsam"

In the interview, the participants were asked about possible co-users. The great majority of them told that they would use "Gameinsam" with their family and friends. Only very few could also imagine playing it with strangers, too.

Experience of the playful interaction

Participants evaluated the experience of the playful interaction very positive. Nearly all of them declared that they would use such an application in real life. The main reasons for using it are hedonic motivations like entertainment, fun and playing as well as staying in touch and a feeling of being together (see figure 24). The first impressions of the interaction were described by the participants with expressions like cool, funny, interesting etc.

Also the observation of the participants' conversation after using "Gameinsam" showed that the game component was one of the focused topics. They for example talked about the reasons for the choice of the answers and answer switches.

In the interview most of the participants told that they tried to be as good as possible and beet the existing high score.

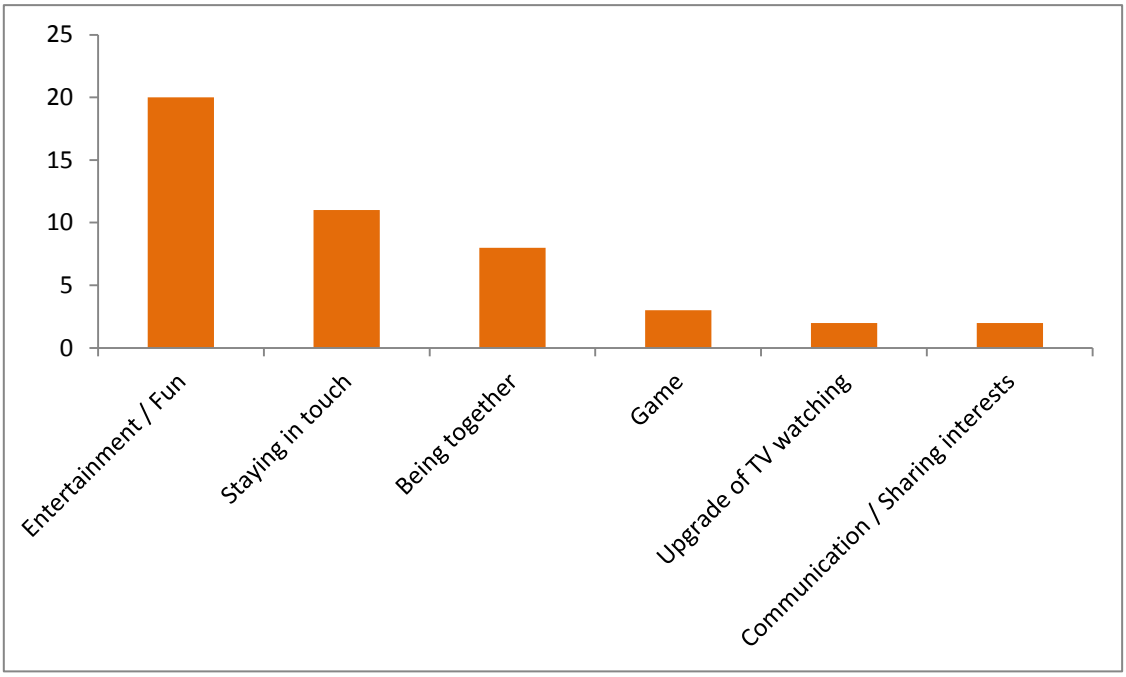

Figure 24 – Motivation for using "Gameinsam"

Difference and correspondence of face to face and distributed TV watching and its meaning for social interaction

The observation of the participants' behavior during the face to face TV watching and the distributed TV watching while playing "Gameinsam" showed weak observable interaction like facial expressions or gestures. In the face to face situation there were very short conversations, often existing of just one statement. In many cases the participants tried to

find a consensus concerning the guessed answer of the quiz. If there was eye-contact, it was only one or a few seconds, too. An example of participants' interaction during the face to face TV watching situation can be seen in figure 25.

In the distributed situation there was no conversation, neither eye-contact as the system doesn't provide this possibility. According to this, many participants mentioned in the interview a need for further integrated communication and interaction tools, like a text or voice chat, a video etc.

The way users interact in a face to face situation is different to the one in the virtual environment of "Gameinsam". In the interview, about half of the participants mentioned, that such an application cannot be a tool to keep contact with their family members or friends. Others could imagine using it as a contact medium, especially when living apart. Some interviewees even stated that they had a feeling of being together. However, there was a consensus that an application like "Gameinsam" could not be the only way of contacting family members and peers. It is seen in addition to face to face meetings.

Figure 25 – Interaction during the face to face TV reception

But, for many participants, such a game-based TV application offers another quality of interaction: The playful part was focused by the majority of the participants, describing the interaction with the other person and talking about the reception situation. As participants

clearly declared a need for even more interaction (e.g. via chat), the playful interaction seems to trigger interaction between family members and peers.

Another hint for this is the statement of many participants that their program choice and the switching behavior would be influenced by knowing what programs their peers are watching and if they could play with them.

The observed conversation after using "Gameinsam" in the evaluation indicates that playful interaction can foster communication even after the reception situation.

General attitudes towards and perception of "Gameinsam"

The general attitude towards "Gameinsam" was very positive. Some of the participants even were very enthusiastic, for example telling that they wanted to buy the application right now. Participants thought it would be easy to integrate this interaction in their daily life. The evaluation revealed a high acceptance of the application and this kind of playful social interaction.

Most of the participants wished to have more communication tools. They proposed text chat, voice chat, video or icons (thumbs up, emoticons etc.). Although there was a consensus about the need of a further communication possibility, the different tools were discussed controversially. One concern was whether the specific tools offer enough possibilities to interact or that it could draw too much attention so that it could be difficult to concentrate on the TV show. Moreover, some of the participants were concerned about privacy issues as watching TV is seen as a private situation. This topic has been focused in another evaluation presented in chapter 3.

3.5 Conclusion

The evaluation revealed high potential of playful interaction combined with watching TV for fostering sociability, especially in context with the FoSIBLE system.

This potential consists of different elements:

1. Playful interaction can be a form of social interaction.
2. By giving an occasion for interaction (knowing the other one is watching the same program), it can trigger additional social interaction in a distributed TV watching situation that did not happen without the application.
3. It also has the potential to trigger social interaction even after the reception by providing a common ground for discussion and conversation.

A limitation of the study is that it has not been conducted especially with the target group elderly persons. However, our goal was to foster social intergenerational interaction wherefore we included different age groups in our study. For the sake of completeness, at this point it should be mentioned that a comparison of the results of the elderly participants

with the ones of the younger participants showed no significant differences in perceived socialbility.

Although playful interaction is able to generate sociability and a feeling of Social Presence as well as Social Connectedness, interview results revealed that an application like "Gameinsam" cannot replace face to face interaction. It has to be seen in addition to face to face meetings, for example enabling users to bridge distance. Nevertheless, some participants reported a feeling of being together during the use of the application.

The majority of the participants wishes to have more communication tools implemented in "Gameinsam" to discuss their answers. Integrating "Gameinsam" into the FoSIBLE system would offer such ways of communication as it contains a text chat. As mentioned above, in the face to face situation, users tried to find a consensus concerning the given answer. Considering both, the need to discuss topics of the TV program and the trial to find a consensus, it underlines the need for a shared TV watching experience.

This stresses that playful interaction combined with watching TV is a useful addition for the FoSIBLE system, which can help fostering communication and social interaction between family members and peers.

4. InHaus Evaluation on Social Presence and Awareness

Awareness and Social Presence support are two important concepts when developing Social TV systems wherefore different possibilities of this support were evaluated in the FoSIBLE project. Starting point for this study is that "presence and awareness are two closely related factors in a Social TV context" (Zwaaneveld 2009, p. 1) and need to be taken into account when designing new ICT. For this study, the definition of Social Presence of Biocca & Harms (2002) that was already presented in chapter 3.2 is the starting basis. Awareness is – beside other definitions – declared as "a general sense of being close to one's family and friends" (Liechti & Ichikawa 1999, p. 194). Both concepts require being 'aware' of other recipients who are located at remote locations. To explore both concepts in the context of Social TV, three forms of visualizations of remote located recipients were evaluated:

1. A Buddy List that contains the names of the friends as well as their online status, and the TV program and channel they are currently watching,
2. a photo transmission that takes a photo of the co-watcher every ten seconds and displays it on the TV, and
3. a video transmission.

Beyond that, also the TV genre was involved in the study. Dezfuli et al. (2011) and Geerts et al. (2008) showed that watching television is often treated as a generic situation in research activities but that different TV genres lead to different (communication) behavior and needs. Because of this, in a first step, we analyzed six different TV genres in a pre-study in order to choose those genres for the main study that differ the most.

Also this study focused - as reasoned in chapter 3 - on intergenerational aspects wherefore we included elder but also younger people as participants.

In the following sub-chapters, first the realized pre-study and its results and subsequently, the main study with its detected results will be described.

4.1 The Pre-Study on Genre Characteristics

The main focus of the pre-study was the identification of special characteristics of TV genres so that these results could be involved in the subsequent main study. Altogether, the following research questions should be clarified through this study:

- Which TV genres are preferred to watch alone or in groups?
- With whom do the recipients want to watch which TV genre?
- During which TV genres do the recipients like to talk; when is communication bothering?
- During which TV genres do the recipients want only to consume the program and when do they concentrate on the content?
- In what situations do people want to watch which TV genre?

Based on these questions it can be clarified if the particular genres have a social character or if rather a solitary consumption is preferred.

4.1.1 Construction of the questionnaire of the Pre-Study

The pre-study was realized as an online questionnaire that was distributed via social networks like Facebook, fora and email. The six different genres film, soap, comedy, quiz show, documentation and sport were selected for this survey because of the possible comparability with thematically similar studies (e.g. Geerts et al., 2008; Dezfuli et al., 2011).

For each of these genres, a video clip that lasts up to a maximum of 90 seconds (otherwise the pre-study would have been too long and the cancellation rate too high) was shown to the participants. The videos were taken from the online video portals “YouTube” and “MyVideo”. In each test run, two of the six video clips were presented randomly. After each video, five questions with different items based on a 5-point Likert-Scale followed that refer to the above mentioned research questions. At the end, the sociodemographical data were collected.

4.1.2 Participants

In general, 124 persons answered the questionnaire. 47 of the participants were male, 77 female. On average, they were 28 years old (Range: 15 - 69). With 66,9%, most of the subjects have the Abitur as highest educational attainment. 10,5% have the advanced technical college certificate or the higher education entrance qualification, and 12,9% have absolved an apprenticeship. The other participants go to school or have a Certificate of Secondary Education or a Secondary school certificate.

4.1.3 Descriptive Results

In the following, the main results of each tested TV genre will be presented.

Genre: Sport (Football game)

We found that sport transmissions are very social events. The participants want to watch the games with friends or family and not alone. Communication is desired and does not disturb. This goes along with the result, that the content of the program is not really important. Furthermore, this TV program runs parallel to other activities. Nevertheless, recipients do not want to watch this genre after exhausting days or for relaxation.

Genre: Documentation (“Das Groove”)

Documentations are mostly watched without other persons and communication disturbs the TV experience. For this genre, recipients concentrate more on the content than on the people around them.

Genre: Comedy ("Upps – Die Pannenshow")

This comedy show is mostly watched with friends or the partner and not alone. It is not used for relaxation although people do not concentrate at lot on the content while watching. The main wish during this genre is the communication with other recipients.

Genre: Quiz Show ("Wer wird Millionär?")

"Wer wird Millionär" is watched with others (like the partner or friends) as well as alone. Communication is not disturbing during this genre. Mostly the show is received when the participants are bored.

Genre: Film (Tatort "Todesangst")

Mostly, (exiting) films are watched without other persons, except with the own partner. Nevertheless, communication is undesired. This goes along with the result that the participants concentrate on the content and watch the program mindfully.

Genre: Soap ("How I met your mother")

We found that the genre soap is watched often alone but also often with friends or the partner. The recipients do not concentrate a lot on the content of the soap but like to communicate with others. Often the show runs parallel to other activities.

4.1.4 Selection of the material for the main study

When we compared the results of the six genres, we first considered the viewing frequency. In this context we could exclude the genre comedy directly because the participants answered that they watch it very rarely.

A following comparison of the remaining five genres shows that the genres sport, film and soap contain the most significant differences in the explored characteristics wherefore they are selected for the main study. The subsequent table gives a short contrasting of the most relevant characteristics.

Table 3 - Comparison of the selected genres sport, film and soap

	Sport	Film	Soap
With whom the genre is watched?	- With friends - Partially with the partner	- Mostly alone - Sometimes with the partner	- Alone, but also with friends and the partner
In which situation the genre is watched?	- When friends are on a visit - Not for relaxation	- Not when friends are on a visit - Not for relaxation	- When friends are on a visit - For relaxation
(Communication-) Behavior	- A lot communication - No focus on the content - Recipients lean back	- Only few communication - Focus on the content - Recipients lean back sometimes	- A lot communication - No focus on the content - Recipients lean back

4.2 The Main Study on Social Presence, Awareness and Genre

The main study, which has already been presented at the AAL workshop at the international conference Mensch & Computer 2012, is focused on the procurement of Social Presence and Awareness through the representations (buddy list, photo and video) of recipients who are located at remote locations (Schering & Budweg 2012). This is relevant for giving lonely people the possibility to stay in touch with family and friends in order to make the "solitary TV situation" more social. In addition, the influence of different TV genres on Social TV applications should be identified because the different characteristics could have an effect on the rating of the different visualizations.

The main questions of the evaluation are:

- Which visualization leads to the strongest feelings of Social Presence and Awareness?
- Do the participants prefer different visualizations depending on the TV genre?
- Do the participants think that the visualizations attack on their privacy?
- How do the participants estimate the everyday use of the visualizations?

These research questions are relevant for the production of application recommendations for Social TV developers. In the following, the test design and the results will be presented.

4.2.1 Construction of the test design

As well as the study on playful interaction (chapter 3), this evaluation also took place in the Fraunhofer InHaus 2 Centre in Duisburg in which two separated, semi-realistic testing environments with a television were available. TV sets were used as output devices – the real system components were running on a laptop.

The TV program for a test run was recorded before. In total, it takes 30 minutes, but consists of three sequences of the three genres film, soap and sport that in each case last 10 minutes. Between the sequences, two short advertising spots were integrated each time. The order of the three sequences was varied in the different test runs in order to avoid possible sequence effects.

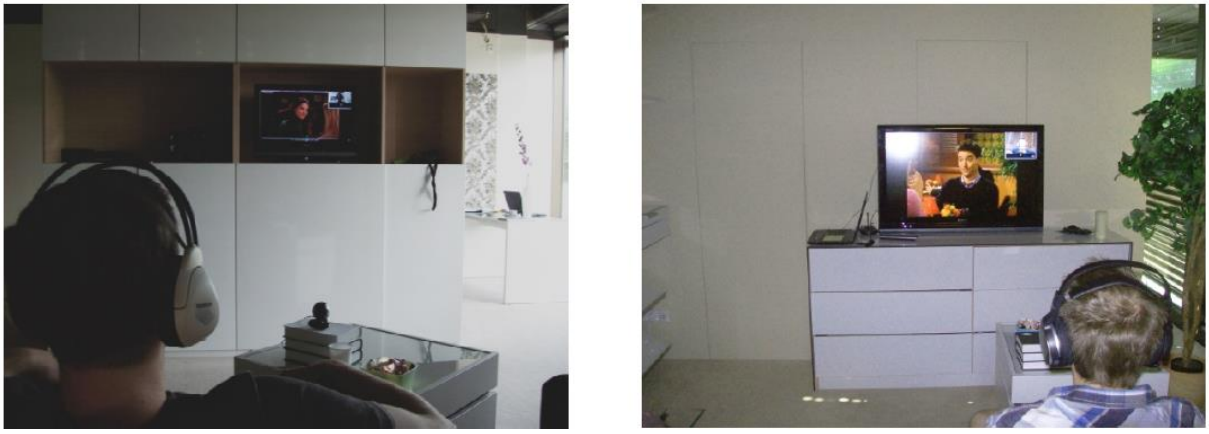

Figure 26 – Pair of participants during the experiment (condition: video transmission).

For the exploration of the feelings of Social Presence and Awareness, parts of the ABC-Questionnaire (IJsselsteijn et al. 2009) – the scales "Staying in Touch" and "Recognition" - as well as the Networked Minds Questionnaire (Biocca et al. 2001) - the scales "Behavioral Engagement" and "Empathy" - were integrated into a questionnaire. The different items had to be answered on a seven-point Likert-Scale (1= "totally disagree" – 7= "totally agree").

Through a semi-structured interview, the influence of the different TV genres was evaluated.

The participants had to participate in pairs because a remote TV situation should be simulated. They had to watch the TV program separated in the two testing rooms.

4.2.2 Participants

In general, 42 participants took part in the main evaluation. On average, they were 25 years old (Range: 19 – 60). 27 subjects were female, 15 subjects male. 88,1% of the participants were students, 4,8% employees, 4,8% pensioners and 2,4% officials.

4.2.3 Results

Which visualization leads to the strongest feelings of Social Presence?

We found through an empirical comparison of the three visualizations buddy list, photo and video with the ANOVA, that the video transmission evokes the strongest feelings of Social Presence. To our surprise, although the photo transmission transfers more visual cues than the buddy list, the feeling of social presence was lower as when using the buddy list. Figure 26 gives an overview on the means of all four scales.

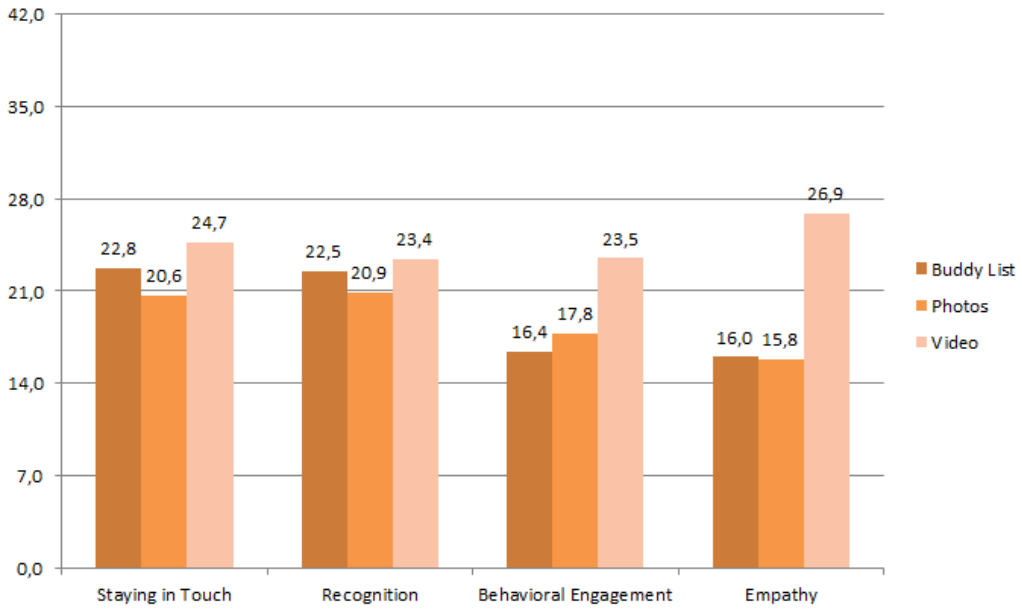

Figure 27 - Comparison of the three visualizations buddy list, photo and video regarding the feeling of Social Presence based on the scales Staying in Touch & Recognition (ABC-Q) and Behavioral Engagement & Empathy (Networked Minds Questionnaire).
The values are the overall means.

In general, the video transmission leads the most to a mutual influence of the recipients (regarding behavior and mood). It shows significant differences for the two scales "Behavioral Engagement" ($F(2, 39) = 5.380$, $p < 0.05$) and "Empathy" ($F(2, 39) = 9.494$, $p < 0.05$).

An inference statistical comparison of the two scales "Staying in Touch" and "Recognition" shows no significances. That implies that all visualizations cause a feeling that contact is maintained.

Which visualization leads to the strongest feelings of Awareness?

For the further analyze of Awareness we identified two factors through a factor analysis:

- Factor 1: "The Awareness of the other", and
- Factor 2: "The feeling of watching TV together with the other".

Table 4 - Means and standard deviation of the three visualizations regarding the two factors "Awareness of the Other" and "Feeling of watching TV together with the Other". Through the factor analysis, the means and standard deviations are standardized values.

	Buddy List		Photos		Video	
	M	SD	M	SD	M	SD

Awareness of the Other	-0.88	0.70	0.31	0.78	0.57	0.88
Feeling of watching TV together with the Other	0.28	0.85	-0.69	0.97	0.41	0.84

Regarding factor 1, the ANOVA shows significant differences between buddy list and video, as well as buddy list and photos ($F(2, 39) = 13.331$, $p < 0.05$). Also for factor 2, we found significant differences between buddy list and photos, as well as photos and video ($F(2, 39) = 6.492$, $p < 0.05$).

Do the participants prefer different visualizations depending on the TV genre?

The results of the semi-structured interview show that the rating of a visualization and the wish to see the recipient representation depends on the TV genre the participants watch.

The Buddy List:

In general, the buddy list was mainly evaluated positive because of the possibilities to know what others are watching and to talk over the program afterwards. Nevertheless, there was also criticism: the participants mentioned that they get only little information about the online friends. There was the wish for a communication possibility. Because of this, the participants had not really the feeling to watch together with others.

The Photo Transmission:

In contrast to the buddy list, the photo transmission was mainly rated negative. The main criticism was that the time shift between the different photos allows no targeted communication. This would lead to contradictions between the TV scene and the facial expression. Also in this experimental condition, the feeling of watching was not very intensive.

The Video Transmission:

The video transmission was rated the best because emotions and reactions can be shared. This evoked the feeling to not be alone. The unique criticism was the wish for a communication possibility in form of voice or text chat. Nevertheless, the participants had the feeling of watching together with others.

Dependency on the TV Genre:

During all experimental conditions it was shown that while watching exciting films no visualization was wished. Visualizations in this context would distract the viewer from the content and action of the film.

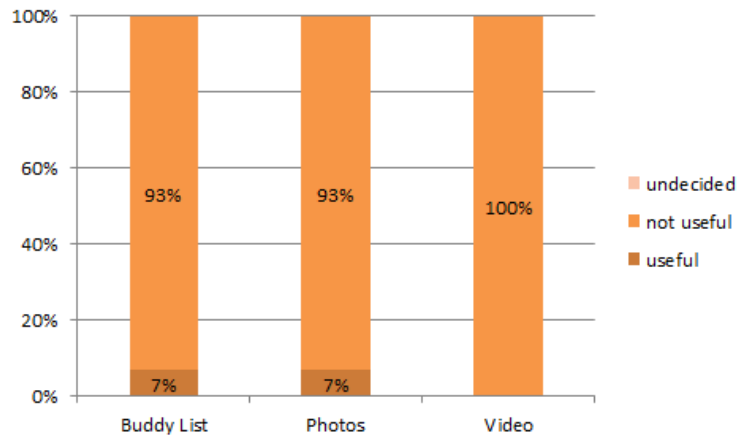

Figure 28 - Rating of the three visualizations during films.

Regarding the genre Soap, visualizations were wished in general. Moreover, it was conspicuous that the visualizations were rated more positive the more visual information of the co-watcher was transferred. This was also the reason why the buddy list was evaluated as the worst possibility to watch soaps (virtually) together. The photo and the video transmission were rated more positive because they gave the possibility to laugh together. Nevertheless, the time shift of the photos was a problem here, because the facial expressions sometimes did not fit to the content of the TV show. Therefore, the video transmission was most qualified to watch soaps together over distance.

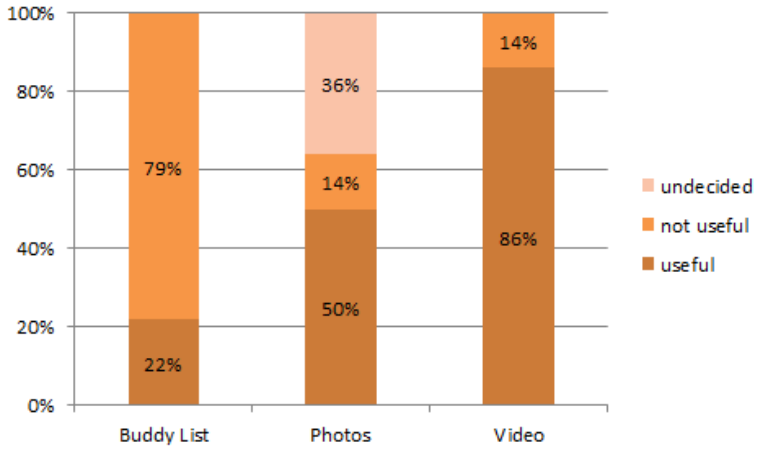

Figure 29 - Rating of the three visualizations during soaps.

Sport events on TV were valued as social events wherefore the participants rated visualizations generally as positive. Nevertheless, the missing of communication possibilities regarding the buddy list has leaded to the most negative rating. The reasons for the positive evaluation of photo and video transmission were similar: both visualizations conveyed a sense of togetherness because emotions could be perceived and shared. For those participants who were bored through the football game, the visualizations seemed to be a good alternative.

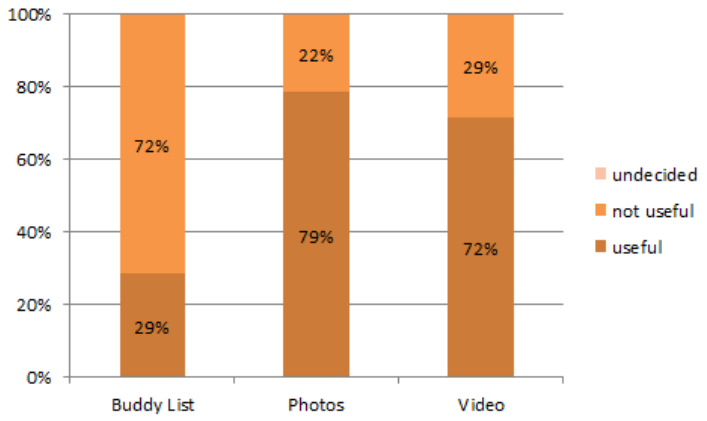

Figure 30 - Rating of the three visualizations during sports transmissions.

Do the participants think that the visualizations attack on their privacy?

All three visualizations allow a (varyingly) strong influence in the life of other recipients. For that reason, we asked the participants in our interview if they had the feeling that the visualizations are (too) invasive.

Buddy List:

64% of the participants would have concerns regarding privacy issues when there is no possibility to turn off the buddy list function. 44% of them criticize that other persons would know in every situation what you are currently watching. Moreover, they would know the daily watching length.

28,5% had only slight concerns. They mentioned that this depends on the persons in the buddy list and on the TV program.

Only one person states that there are no doubts regarding privacy.

Photo Transmission:

The feeling of an attack on privacy while using a photo transmission was indicated by only 28,5% of the participants. They mentioned that they have a feeling of continuous observation that they would not know who could see the photos and they were scared to forget that the photo camera was active.

The other 71,5% did not have the feeling that the photo transmission is invasive. Reasons are that you could turn off the camera. 50% of these persons also mentioned that it was not important when watching (virtually) together with known persons.

Video Transmission:

Regarding the video transmission, only 28,5% of the participants say that they only have concerns when the video camera was active all the time.

The other 71,5% did not feel disturbed in their privacy. Nevertheless, there was the requirement that there is the possibility to choose the persons with whom the video transmission is used.

How do the participants estimate the everyday use of the visualizations?

When considering Figure 31, it is conspicuous that most participants evaluated all visualizations as practical for the everyday use.

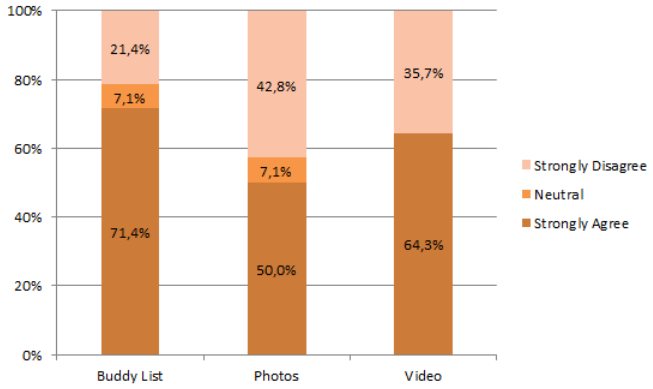

Figure 31 – Details on the responses regarding the item:
***I could image to use this visualization in daily life*.**

Surprisingly, the buddy list is rated as the best representation for the day-to-day life (71,4%), but also 64,3% of the participants would use the video transmission.

4.3 Conclusion

Supporting social relationships of elderly plays an important role for their well-being. This includes strengthening their ties with family and friends (Carstensen 1991, p. 198). In other words, the intergenerational contact of family members has to be fostered. For this very reason, we focused on different possibilities to intensify the relationships between different age groups through the use of peripheral information in the context of Social TVs.

In this connection, the results regarding Social Presence, Awareness and Genre presented in the previous sub-chapters provide insights into user preferences and needs for an intergenerational use of Social TV systems. Through our study, we could identify the important role of peripheral awareness information for Social TVs for different age groups and that a generalized use of the term “watching television” can be problematic.

Therefore, for the development of Social TV applications, genre should be considered as relevant and important. In this context, our results are similar to the findings of Dezfuli et al. (2011). Consequently, nobody – neither elder people - has always the desire to watch television (virtually) together.

In addition we found, that peripheral awareness information in form of visualizations can evoke a feeling of mutual television watching. Nevertheless, communication possibilities should also be integrated.

Because we identified no major differences in the general demands regarding awareness and interaction support of elder and younger participants of our study, we conclude that peripheral awareness support is important for both age groups. Summarizing, our results have contributed insights into the understanding of genre-related Social TV use as well as user requirements and needs to Social TVs and should be taken into account when developing such applications.

5. ANNEX

5.1 Interview Guide of the Evaluation on Playful Interaction

Fragen zum (Entertainment-)Erleben und zur Interaktion

- Wie haben Sie die Interaktion erlebt? Wie hat Ihnen die Interaktion gefallen? Warum?
- Haben Sie versucht die andere Person zu beeinflussen?
- Haben Sie auf die andere Person reagiert?
- Haben Sie versucht, besonders gut abzuschneiden / einen hohen Highscore zu bekommen?
- Hat sich Ihr Verhalten im Verlauf geändert?

Fragen zur realen Nutzung

- Würden Sie getrenntes Fernsehen mit oder ohne Interaktion bevorzugen? Warum?
- Nutzungskontext erfragen
    - Nutzungsmotiv: Weshalb würden Sie sie nutzen? (um mit Anderen in Kontakt zu sein; weil das unterhaltsamer ist als alleine,...)
      => Herausfinden, ob der Unterhaltungswert, der Wunsch nach Kontakt oder etwas anderes Hauptnutzungsmotive sind.
    - Mit wie vielen Leuten würden Sie sie gerne nutzen?
    - Mit wem würden Sie die Anwendung nutzen?
    - Würden Sie sich für eine Sendung verabreden oder könnten Sie sich vorstellen, dass es zu einem festen Ereignis wird bestimmte Sendungen „verteilt gemeinsam“ zu sehen?
    - Wären Sie bereit, bei der Auswahl Ihres Fernsehers auf Eignung für die Anwendung zu achten?
    - Wann würden Sie für eine solche Anwendung bzw. Unterstützung des gemeinsamen Spielens Geld bezahlen?
- Würden Sie die Anwendung Freunden empfehlen?

Fragen zur Motivation

- Würden Sie so eine Sendung eher einschalten, wenn Sie wissen, dass jemand anders sie auch sieht und sie miteinander raten können?
- Würden Sie seltener wegschalten?

Fragen zur Funktionalität

- Wie finden Sie die Anwendung? Sind die Funktionalitäten sinnvoll?
- Welche Funktionalitäten haben Sie vermisst? Welche weiteren Funktionen hätten Sie gern?
- Welche Schwierigkeiten gab es?
- Was hat Ihnen gut gefallen?

5.2 Interview Guide of the Evaluation on Awareness and Social Presence

1. Wie hat euch diese Möglichkeit des gemeinsamen Fernsehens gefallen (d.h. dass ihr immer seht, wer gerade ebenfalls fernsehguckt und was für ein Programm) bzw. habt ihr es überhaupt als gemeinsames Fernsehen empfunden?

2. Ihr habt vorhin drei verschiedene Fernsehgenres gesehen: Film, Serie und Sportübertragung.

   2.1 Wie habt ihr die Visualisierung während des Tatort-Films empfunden? Eignen sich solche Filme für eine derartige Visualisierung?
   2.2 Wie habt ihr die Visualisierung des Anderen während der Serie empfunden? Eignen sich Serien für eine derartige Visualisierung?
   2.3 Wie habt ihr die Visualisierung des Anderen während der Sportübertragung empfunden? Eignen sich solche Übertragungen für eine derartige Visualisierung?
   2.4 Wie habt ihr die Visualisierung des Anderen während der Werbung empfunden?

3. Habt ihr irgendwelche Bedenken bezüglich eurer Privatsphäre?

4. Könnt ihr euch Situationen vorstellen, in denen es unangenehm sein könnte, dass das Fernsehprogramm in Kombination mit eurem Namen angezeigt wird?

<u>Alternativfrage in der Foto-Bedingung:</u>

4. Könnt ihr euch Situationen vorstellen, in denen es unangenehm sein könnte, dass von euch Fotos gemacht und an den Anderen geschickt werden?

<u>Alternativfrage in der Video-Bedingung:</u>

4. Könnt ihr euch Situationen vorstellen, in denen es unangenehm sein könnte, dass der Andere eine Videoübertragung von euch während des Fernsehens sieht?

6. Literature

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