PRESENCE 2008

Proceedings of the 11th Annual International Workshop on Presence
Padova, 16-18 October 2008

When Simple Technology Affords Social Presence: A Case Study for Remote Family Members

Antonia Lucinelma Pessoa Albuquerque, Andrew Perkis

Centre for Quantifiable Quality of Service in Communication Systems. Centre of Excellence.
NTNU - Norwegian University of Science and Technology. Trondheim, Norway.
{nelma@q2s.ntnu.no, andrew@iet.ntnu.no}

Abstract

This work explores how simple technologies are being adopted in family life as support for remote family members' interaction. We analyze the feeling of being closer to their remote relatives when using different types of interaction, based on users' report that live in countries geographically far from their families. The users' declarations reveal some benefits from those technologies. Our main goal is to bring insights and suggestions for future developments. By presenting the strategies that people create to improve their feeling of closeness, we expect to contribute to the conception of new technologies aiming to make this communication more effective.

Keywords--- **Social Presence, Remote Interactions, Family Life**

1. Introduction

Our work will focus on communication with remote others when there is emotional involvement, approaching the topic of how family members, living in different countries, are using technology to improve social presence.

From this point of view, the popular technologies have been playing an important role on daily people's life, and have made the difference in families' relationships by allowing relatives and close friends overseas to interact and keep in touch more frequently, in a simple and cheaper way. However, very little are known about the benefits of those media on families' life, and how much the availability of those media applications has being changing the way people communicate and improving their feeling of being together.

Some researches have been approaching technologies in family context, and are also concerned about decreasing the digital divide, which means, firstly people that have access to computer technologies and/or are computer literate and secondly those that have neither access nor computer literacy. Since the digital divide is related to socio-economic aspects, indirectly it increases geographical distances between developed and developing countries for online communication.

Presence research bridges media research and perception studies [1]. We focus on analyzing social presence and the feeling of being together with family members that are living in far away countries, when they use different modalities of media and different feature combined in those media, in order to communicate. We also investigate the reasons why people use each technology and which are the changes in their habits in order to interact with their beloved.

To obtain that information, users were asked to answer a questionnaire. The main requirement to be part of our sample group is to be living in a country away from family and relatives, and that for some reasons it is not possible to visit the family often. This constraint makes people to depend on technologies to catch up with each other and to limit the missing of close contacts.

With this experiment we expect to generate valuable material that differs from laboratory experiments, involving people that report real and emotional daily situations, with different cultural and social backgrounds.

Our main goal is to bring insights and suggestions for the future developments of technologies and projects concerned to the improvement of remote family members' communication.

2. Social Presence and family remote interactions

Social presence refers to the feeling of being together with a virtual or remotely located communication partner [2]. In this section we present some related researches involving social presence and family context.

Often, the studies about Internet use for online communications are more concerned on understanding how people make new relationships through Internet, the social and psychological aspects of this communication [3]. While others are concerned with the negative side - looking at how the Internet use can disrupt familiar relationships [4].

The HomeNetToo project [5] deal with the social impact of Internet use, looking for answers such as "*if the internet use undermine or benefit social involvement and psychological well-being of low-income users*" and "*what factors influence the social impact of Internet use on the other side of the digital divide*". Social involvement and psychological well-being

appeared to be higher among close friends and even higher for close relatives. Another interesting result is that, according to their conceptual model, Internet use itself did not predict social involvement neither psychological well-being, and has no effect on those aspects of low-income users.

J. van Baren, IJsselsteijn, Markopoulos, Romero, de Ruyter [6] resume very well the human needs for social interactions and communication. They investigate real-life communication between family members as a requirement for the development of a measurement questionnaire. Their work remarks that by communicating with family we exchange emotions, when media are developed to support the exchange of information, and introduce the concept of *connectedness – the feeling of staying in touch within ongoing social relationships.*

Awareness systems are systems designed to give a peripheral awareness of each other's activities. The ASTRA project [7] develops research intending to support close family members living apart to keep in touch with each other, under the awareness systems concept.

"Periphery is used to name what we are attuned to without attending to explicitly. A calm technology will move easily from the periphery of our attention, to the center, and back" [8]. Kinoe and Cooperstock [9] approach the communication among geographically distant family members to propose what they called an augmented communication environment based on peripheral telecommunications.

The projects presented above reinforce the importance of this subject and the tendencies of new technologies to improve such interactions.

However, little are known about the benefits of networked media in families' life nowadays and how much popular Internet applications have changed the way families communicate remotely. Our work intends to reduce this lack of information and contribute to the conception of new technologies that aim to promote the efficacy of this communication.

The following section describes published evidences of those benefits.

2.1. Evidence and examples on how networked media benefits family life in distance

The following anecdotal cases illustrate benefits of popular technologies in remote family members' communications.

Published at NYTimes.com, Thursday, December 4, 2003 [10]:

"*When Technology Is Heartwarming.*

It was about 5:30 p.m., meaning that it was 12:30 p.m. at home. On the chance that my wife was at her computer, I fired off an e-mail to her, suggesting that we try out an intercontinental video call..., ...and then, suddenly, there it was: My wife Jennifer's live image and her voice, transmitted in real time 3,500 miles across the globe -- instantly, crystal clear and, by the way, free. ...There's a lot of junk in technology, a lot of hassle and frustration, a lot of

disappointment. But this moment was like a TV commercial. It was an emotional, powerful, simple, perfect example of how technology can change a moment, solve a problem and despite the gulf of time and distance, bring you face to face with the people you love."

Published on April, 2006, on The Middleton (Ohio) Journal:

"*Father watches daughter's wedding from laptop at hospital. Al Decatur doesn't miss daughter's big day, thanks to technology. As Allyson Decatur walked down the aisle — with her two older brothers, Adam and Thomas, at her side — she scanned the crowded church for her cousin. He was holding a laptop computer. She stopped, wiped away the tears, waved into the camera and smiled to her father..., ...while her father, Al, recovering from double pneumonia and awaiting cancer surgery, watched the ceremony on a web cam from a Cincinnati hospital lobby...*"

The project Computers in Homes [11] reported that Internet access brings benefits to families because it provides communication between members, allows them to re-establish links and have more frequent communication just by going online. In addition, they say, exchanging emails with video sequences included is opening up a new world of communication for families and affirm: "*broadband is beginning to play a key part in allowing effective and immediate connection between families by providing cheap telephone communication*".

In the next section, we will present an overview of the popular technologies available on Internet before discussing our study and the results obtained.

3. Technologies available for popular use

The most popular applications available on Internet are Instant Messaging, with or without camera feature, voice communication, and graphics virtual worlds. In our study, the graphics virtual worlds appeared out of the context and therefore we won't present it.

3.1. Instant Messaging and Videochat applications

There are some Instant Messaging (IM) programs available on Internet and the most popular ones nowadays are MSN Messenger [12], Yahoo [13], Skype [14] and Googletalk [15].

MSN Messenger started in the context of chatting; now it offers the videoconference service, the option for only voice service, only webcam with text chat and offline messages.

Yahoo Messenger is totally similar to MSN Messenger. The preference for using one or other program seems to be related to cultural aspects, but not the focus of our study.

Skype became strong in voice over IP with good quality on Internet, and cheaper than phone calls. Nowadays, after introducing camera feature, Skype is promoting the software for families use as shown in

Figure 28.

Figure 28 - from Skype website

Googletalk provides IM service online and offline, PC-to-PC voice calls, e-mail notifications, and file transfers.

All those IM programs allow sending and receiving files online, what is really helpful for families to exchange pictures, videos and music.

Our work approaches social presence in the context of communication with family members outside the home country, based on report of daily users of those simple technologies.

4. Our case study

Our experiment is concerned about the ways in which popular technologies are being adopted in family life as support for remote family members' interaction and its benefits.

As a direct form of evaluating subjective presence in those interactions, we interviewed a group of people that live in a country far from their relatives.

Due to the remote location of some participants, part of the interviews was made through the Internet.

4.1. Sample group profile

Twenty two users were interviewed, 60% males and 40% females, ages ranging from 24 to 50 yo. Most of interviewed people, 90%, have high level education and 75% are engaged in academic environment, where we can find a considerable number of people living far away from their families. 60% of interviewed people are living alone.

The distance and work commitment don't allow those people to visit their relatives often, and in many situations, they spend important dates separately, like birthdays, mothers' day, Easter, Christmas. This makes them rely heavily on technologies for communicating with relatives.

4.2. Questionnaire focus

Assuming that face-to-face is the ideal interaction and gives the highest social presence level, we will analyze the feeling of being together with the person when they interact remotely, related to different types of interactions. Users should grade it from 0 to 5. Respondents also were asked to tell the reasons and/or limitations why they use or not the different popular technologies.

Instead of analyzing the use of the programs itself we collected information about the types of interactions used by people in their communication, and how they are adapting their habits to improve closeness.

We considered the following options:

asynchronous communication: Email, SMS messages, Voice mail;

synchronous communication: phone call, internet voice only (ex: skype, googletalk), internet voice with text and emoticons, only text chat with emoticons (ex: Yahoo messenger, MSN messenger), webcam with text and emoticons (ex: Yahoo, MSN, Skype), webcam and voice (ex: Yahoo, MSN, Skype, or other), webcam and voice with text to support interaction (Yahoo, MSN, Skype or other).

4.3. Users report and qualitative analysis

Two interviewed people are not able to communicate through internet because family lives in small cities that have no internet access and they are limited to phone calls or traditional mail letter as the only mean for communicating. 100% of users use phone call in some situations, and consider it as the first option in emergency cases. For those reasons, we included the phone call among the synchronous type of communication.

4.3.1. Users feedback about the types of interaction and its benefits All quoted italic text presented below are declarations from users of our sample group.

• **Email** is often used to send photos, documents or to appoint future online talks. The ones that don't have good Internet connection use email often; just the opposite for those who can interact more. It was reported that some parents don't know how to send email. Email also helps with the time zone difference. Surprisingly, email received high grades from some respondents.

"…*I have email lists with my family…and we usually talk a lot by email…*"

• **SMS messages.** Some people told they are not able to exchange SMS with family because there is no compatibility between mobiles technologies from one country to another. SMS was reported as less asynchronous because feels like real-time.

"…*you know the person just sent it and was thinking on you in that moment…*"

• **Voice mail**. All of respondents don't use this type of interaction.

• **Phone call** was highly graded because all people like to hear the voice of the other person, and it is yet the easiest way to have direct contact. 100% of users complained about costs of phone call and that is the main reason why they don't use it much. But if there is an emergency they will place a phone call, when there is no option to find the other person online.

• **Internet Voice** is largely adopted by the ones who call from computer to home phone, or PC to PC, as a cheaper

option. Some people complained about delay in voice and then consider phone call better and more intimate.

"*...I think voice communication can convey most of information and it makes you feel together with the other one interactively...*"

"*…sometimes free of charge but not as personal and popular as a phone call...*"

• **Internet Voice with text and emoticons.** Text helps with some information that it is not clear in voice; it can be used to send phone number, for example. Emoticons were pointed as a way to bring new emotional quality to the conversation; it allows to show the emotion when the text can be confused.

• **Only text chat with emoticons** was pointed as an eventual resource. It is more used when both parts appear online, and for short conversations. The fact that text chat allows to save history of the conversation adds value because it makes possible to reread the conversation even some time later. Although text chat can be a fast communication, some parents don't type fast and prefer voice and image.

"*…It feels that the person is "live with you" but works well with young people - like sister, friends - but not with the old ones...*"

• **Webcam with text and emoticons** – this option is not much used for some that prefer the voice interaction. Many people told that would like to use camera but parents don't have it, or have slow connection, and in this case they send pictures as an alternative way to be seen. Some people also use one way webcam: they send image and voice while parents only type. This combination is also used for fast conversations when both parts occasionally meet online.

• **Webcam and voice** was appointed for almost all of people as the best option to communicate. There are still complaints about delay and lack of synchronism.

"*…the image of the person adds closeness to the interaction...*"

• **Webcam and voice with text to support** was the option highly graded by giving the higher feeling of being together. Few people reported that they don't use the text feature when they are using voice. Some others use text to support and reported to be very useful when it needs to send a link to a webpage, a phone number, etc. It was pointed by ones as the perfect combination; when some words are not clear in voice conversation than the text do the work.

"*…it seems that I can see my family and I have paper to write to them as well...*"

Exception – one interviewed person reported that the webcam image increases the feeling of distance. "*The bad quality of the image makes the person look different and then you realize the distance*". This person also declared that don't like to be in front of a camera neither the feeling of being seen.

The table below shows the average of grades obtained, from 0 to 5, for each type of interaction, related to the feeling of being together with the family members.

Types of interaction	Grades average
Email	2.37
SMS messages	2.2
Voice mail	0
Phone call	3.96
Internet voice only	3.7
Internet voice with text and emoticons	3.46
Only text chat with emoticon	3
Webcam with text and emoticons	3.45
Webcam and voice	4.62
Webcam and voice with text to support	4.86

Table 9 Types of interaction related to social presence

The average of grades appeared consistent with people declarations. The difference between phone call and Internet voice is quite small and confirm that **Internet voice** gives almost the same feeling of presence as **Phone call**, unless by the delay of voice in some situations, as mentioned by users.

The options for **Internet voice with text** and **webcam with text** had almost the same value. It infers that voice or image separately can add similar feeling of being closer to the other part during an interaction. This can be more investigated by other experiments.

100% of people like the phone calls because of voice quality and reported that hearing the voice of the other person is really important and gives a good feeling of closeness.

Delay in voice and image are still complaints for the online forms of interactions. Not all participants are able to use webcam mostly because of limitations in internet access from family side.

Just few people, two of our group, are concerned to the degradation of their image related to webcam image, and don't feel comfortable for that. Most of people that use webcam are more engaged in pleasure of seeing their relatives and to the fact that the family feels happy when see them.

The combination of voice with image appears to give a pretty higher feeling of being together, when related to the other modalities.

According to the results shown above, we can conclude that as more types of interactions are available more people feel closeness, even using those simple technologies.

5. Scenarios and trends from our sample group experience

When interviewed, some users of our sample group described quite interesting scenarios and creative ways of using those simple technologies in the context of more complex ones, without having any knowledge of it.

All quoted italic text presented below are declarations from users of our sample group.

5.1. About togetherness

The following reports of togetherness show that some people use the webcam, which is a synchronous technology, in the context of calm technology and awareness systems.

Scenario1. Two sisters that live in different countries and both far from parents reported the following scenario:

"*…when me and my sister are at our homes working at night, we connect and just let our webcams running and then, although we are not talking, we can see each other and have a strong feeling that we are in the same room, as we did before in our parents home...*"

Scenario2. Another scenario of closeness was described by a father that lives in a different country of wife and his small children:

"*…while I do some work on my computer at home, my wife connects the webcam at my children room; I can listen to their voices and see them playing. They are not exactly looking at me neither talking to me but it is just the feeling that I am in home with them…*"

Scenario3. This scenario was reported by a person that lives alone and likes to have the feeling that the mother is in home after the working day.

"*…when I arrive at home from work, it is almost time to my mother goes to bed. We connect, and while I prepare dinner and/or do some laundry, she stays watching me for a time, and I feel her company in home…*"

It is important to remark that those peripheral interactions described above include the transmission of sound with image. Each person is able to hear the background sounds from the remote environment. This makes the interaction seems more natural to them.

We believe that this information can contribute to the conception of awareness systems and calm technologies, also in the context of synchronous interaction. The popularity of those technologies would improve accessibility for a large number of families on the world and better promote their communication.

Reproducing natural interactions

People create virtual intimate situations to improve their sense of being together.

"*…I showed each part of my new apartment to my family just walking around and talking to them, holding my webcam and wireless laptop. It was very nice, like they were visiting me…*"

"*…sometimes I sleep with my laptop at my side, running the programs I interact with my beloved. When I wake up I can feel like they are there…*"

"*…I and my mother use to play cards on weekends, both running webcams, and we have some fun…*"

Behavioral responses

Some users of webcam reported some behavioral responses when interacting with family. They wave to each other, smile, send kisses, show like hugging the other part and use lots of facial expressions. They really increase the richness in communication by adding some non verbal cues.

5.2. Changes in parents behavior

Many users reported that their parents changed the habits related to computers and have showed interest in learning more in order to communicate with them.

"*…my parents like to use webcam just because they want to see me…*"

"*…my father created an IM account just because of me, and my mother bought a webcam just to see me…*"

"*…my mother is 82yo, had never used a computer before, but after I traveled she goes often to an internet café with my nephew. He just puts a headphone on her and we can talk and see each other. Lately, she is talking about buying a laptop and learning how to use it…*"

Because of age of our sample group, their parents are mostly elderly people and most of them have no computer literacy. The change in their behavior gives a good feedback about the use of those technologies by elderly people in family context communication. This fact also will influence the digital divide positively.

5.3. Trends in technologies

The necessity of strengthening communication among remote family members is evidence. People need an easiest and cheap way to catch each other, and are looking for what is cheaper and can afford better possibilities to communicate.

By investigating the feeling of being close to the remote others when using online and synchronous communication, we got a feedback on the unconscious use of peripheral information. The scenarios described in Section 5.1 confirm that people miss to share peripheral information in home with family. They were "virtually extending their houses", as approached in the Peripheral telecommunications project [9].

Could this tendency be afforded by calm technologies and awareness systems developments? That would possibly provide a more natural way of interaction and awareness for the remote parts, even for synchronous interactions.

People reported some difficulties to signal to remote other when they would like to communicate. SMS would be an option, but due to incompatibilities among mobiles technology from different countries, some people cannot send SMS to family. There is a lack of technology that allows instant connectedness for long distances.

The digital divide appeared as relevant factor, making difficult the communication between some family members. Could internet services become a public available service as telephone is for all over the world? And, important, keeping it cheap to expand the internet access.

Conclusions

We approached the communication with remote others over Internet when there is emotional involvement. In particular, people that live in countries geographically far from their families.

Fist we presented an overview on some projects relating remote family members and social presence. After, we reported some anecdotal and evidences on how popular technologies benefit family life.

We could conclude that nowadays little are known about the benefits of networked media on family members communications, as well as how the different types of interactions has been changing the way remote family members communicate.

Our case study analyzed social presence and the feeling of being together with family members that are living in far away countries, when they use different modalities of interaction. We also investigated the reasons why people use each technology and which are the changes in their habits in order to interact with their beloved.

Users were interviewed to report their daily experiences. The results are quite relevant information and differ from experiments performed at laboratories.

Our sample group provided valuable declarations and with the obtained results we expect to contribute to new developments and conceptions of technologies.

People are creatively sharing their peripheral information through the use of simple synchronous technologies, looking for increasing their sense of presence. This fact suggests that calm technology and awareness systems are trends in technology to enrich the systems available nowadays.

The popularization to Internet access in family context has been making elderly people and others with no computer literacy to become more motivated to learn and use those services, which contributes to decrease the digital divide.

This paper explored an important and relatively under-researched topic. It aims to look at the positive aspects of using popular Internet technologies, and rightly points out that there are new technological trends which can produce compelling new ways for people to connect to each other.

Acknowledgements

References

[1]   W. A. IJsselsteijn, B. Harper. T.P.R.W. Group. Virtually there? A vision on presence research. Presence-IST 2000-31014ECP. Public Deliverable (D2). Dicembre. 2001.

[2]   G. Riva, F. Davide, W.A IJsselsteijn. *Being There: Concepts, effects and measurement of user presence in synthetic environments.* Amsterdam: Ios Press. 2003.

[3]   V.Hlebec, K. Lozar M. V. Vehovar. The social support networks of internet users. New Media Society; 8; 9. DOI: 10.1177/1461444806058166. 2006.

[4]   N.H. Nie, D. Sunshine Hillygus. The Impact of Internet Use on Sociability: Time-Diary Findings. *IT and Society*, 1, 1-20. 2002.

[5]   L.A. Jackson, A. Von Eye, G. Barbatsis, F. Biocca, H.E. Fitzgerald, Y. Zhao. The social impact of Internet use on the other side of the digital divide. *Journal of Association for Computing Machinery*, 47, 43-47. 2004.

[6]   J. Van Baren, W.A. IJsselsteijn, P. Markopoulos, N. Romero, B. de Ruyter. Measuring Affective Benefits and Costs of Awareness Systems Supporting Intimate Social Networks. In: Nijholt, A., Nishida, T. (eds.) *Proceedings of 3rd Workshop on Social Intelligence Design,*. CTIT, Enschede. pp. 13-19. 2004.

[7]   P. Markopoulos, N. Romero, J. van Baren, W. Ijsselsteijn, B. de Ruyter, B. Farshchian. Keeping in touch with the family: Home and away with the ASTRA awareness system. In: *Proceedings of CHI'04*, 1351-1354. April. 2004.

[8]   M. Weiser, J. Seely. Designing Calm Technology. Brown Xerox PARC.   URL: http://www.ubiq.com/hypertext/weiser/calmtech/calmtech.htm. 1995.

[9]   Y. Kinoe, J.R. Cooperstock. Peripheral Telecommunications: Supporting Distributed Awareness and Seamless Transitions to the Foreground. *Pervasive Computing for Quality of Life Enhancement.* Berlin: Springer. pp. 81-89.2007.

[10]   NYTimes.com.   URL: http://www.nytimes.com/2003/12/04/technology/circuits/04PO GUE-EMAIL.html?ex=1201064400&en=5901ff15cfd6d8b7&ei=507 0.

[11]   Computers   in   homes.   URL: http://www.computersinhomes.org.nz/research.htm. 2006.

[12]   MSN Messenger. URL: http://im.live.com/messenger/. 2008.

[13]   Yahoo. URL: http://messenger.yahoo.com/. 2008.

[14]   Skype. URL: www.skype.com 2008.

[15]   Googletalk.   URL: http://www.google.com/talk.   2008.