

**TimelyPresent: Design of technology to connect
3-generation families at a distance**

Hyesook Kim

THESIS SUBMITTED FOR A PhD QUALIFICATION

UNIVERSITY OF YORK
DEPARTMENT OF PSYCHOLOGY

AUGUST 2011

Abstract

Many designs have been suggested for connecting absent loved ones using technology. This thesis focuses on a particular user group: 3-generation families, where some members are separated by a large distance. The aim of this study is to design a communication technology that allows people with family members living abroad to feel more connected. The work started with a Probe study triggering deep feelings about relationship and communication. The findings from the analysis of this qualitative data were examined again to generate ideas for design. The concept of TimelyPresent was inspired from one of the design ideas and developed into a working prototype. Finally a field study of TimelyPresent was carried out.

The Probe study involved members of 3-generation families talking about their experiences of separation and communication using “emotional probes”. Six participants from these families living in the UK and three living in South Korea were recruited and interviews were conducted. Through the analysis of the data (17 interview recorded files with 134 pages of transcripts) using grounded theory analysis, 37 Selective Codes with 118 sections of text emerged. An example of one of these codes is: Sharing the moment – children’s laughter with happiness, example of quote, *“My husband said he wants to hear the children’s laughter every day”*.

While the above analysis says much about the emotions experienced by the families separated by large distance and time difference, it does not directly inspire design ideas for communication devices. An additional analysis was thus carried out to identify themes for design. Two design sessions were conducted for generating ideas to illustrate and clarify the needs of the families. Six design themes emerged including Finding time, Sending love, and Reflection. The quotes associated with these themes can be viewed as a rich way of expressing possible requirements for design. The latter two themes inspired the design of a device that would be used to send asynchronous media gifts based on - TimelyPresent.

TimelyPresent is a very simple to use device with which families can create gifts with special meaning to stimulate conversation and to act as long lasting keepsakes for reflection. The Archos 9 was selected as the platform, resembling an electronic photo album and providing touch interaction. The key features of this design are the metaphor of a present delivered after a time delay so that it arrives at the same time of day that it was created.

The aim of the field study of TimelyPresent was to understand the problems and opportunities provided by the participants trying out TimelyPresent and to allow them to tell us about their experiences using it. Four participant families were recruited and eight participants were interviewed after the first and second months of using TimelyPresent. In each interview, open

questions were asked about how they felt about making and receiving presents and changes in the relationship with remote family. Logs recording the traffic of use of TimelyPresent, transcripts of 15 interviews and 102 presents created by the participants were analysed. Themes that emerged included: different concept of communication, playful mode of use for creator, the value of laughter, anticipation for a new present to arrive, and feeling closer. Particular ways of making presents were also examined.

This thesis is unusual in the respect that we were able to go through the whole process of design from an open ended Probe Study to the design and field study of a prototype. In this process various methods were tested and their value demonstrated in this particular context. The contributions of this thesis are: (i) pointers as to where various methods may most effectively be used in design and, (ii) a novel demonstration of how asynchronous communication can be used to connect family.

Table of Contents

Abstract.....	i
Table of Contents.....	iii
List of Tables.....	vii
List of Figures.....	ix
Acknowledgements.....	xii
Author's declaration.....	xiii
CHAPTER ONE. LITERATURE REVIEW.....	1
1.1 Introduction.....	1
1.2 Theories of Emotion.....	2
1.2.1 Measuring emotions.....	2
1.2.2 Communication media and emotion.....	5
1.2.3 Social relations and emotion.....	8
1.2.4 Studies of long distance relationships (LDRs).....	10
1.2.5 Romero's Affective Benefits and Costs of Communication questionnaire.....	15
1.2.6 Conclusion.....	16
1.3 Technology for emotional communication.....	18
1.3.1 Devices with intentional input.....	18
1.3.2 Devices with incidental input.....	23
1.3.3 Conclusion.....	29
1.4 Structure of thesis.....	30
CHAPTER TWO. PROBE STUDY.....	32
2.1 Introduction.....	32
2.2 Review of methods for eliciting qualitative data in a design setting.....	32
2.3 Review of methods for analysing qualitative data.....	41
2.4 Probe study method.....	44
2.4.1 Ethical approval.....	44
2.4.2 Procedure.....	44
2.4.2.1 Interview 1.....	44
2.4.2.2 Interview 2.....	46
2.4.3 The Probes: Box of 'things to do'.....	47
2.4.3.1 Spirit of oracle cards with an invitation.....	47
2.4.3.2 Digital camera.....	48
2.4.3.3 Diaries.....	50
2.4.3.4 Journey with my family where I was very happy.....	51
2.4.4 The informants.....	51
2.4.4.1 Informants in the UK.....	52
2.4.4.2 Informants in South Korea.....	52
2.5 Results of GTA of Probe study transcripts.....	54
2.5.1 Overview of coding analysis.....	54
2.5.2 Results of Step 1: Open coding.....	54
2.5.3 Results of Step 2: Axial coding.....	56
2.5.3.1 Category 1: Happy & Fun.....	56
2.5.3.2 Category 2: Reassurance & Obligation.....	58
2.5.3.3 Category 3: Comfort & Yearning.....	60
2.5.3.4 Category 4: Identity & Hope.....	62
2.5.3.5 Category 5: Trauma & Upset.....	63

2.5.3.6 Category 6: Technology & Media.....	65
2.6 Discussion	66
2.6.1 Summary of results from open and axial coding	66
2.6.2 Effectiveness of the probe method.....	70
2.6.3 Positioning the coding method used here in Grounded Theory Analysis	72
2.7 Conclusion.....	74
CHAPTER THREE. IDEAS FOR INVENTIONS	75
3.1 Introduction	75
3.2 Literature Review: Design thinking and the creative leap	75
3.3 Method: The design sessions.....	77
3.4 Results: Design ideas and concepts illustrating them.....	79
3.4.1 Finding time.....	80
3.4.2 Sending love	86
3.4.3 Presence for small children with common activities	93
3.4.4 Reflection for comfort	97
3.4.5 Reassurance	100
3.4.6 Saying sorry.....	104
3.4.7 Combining ideas	105
3.5 Ideas for designing	105
3.5.1 Group 1 (G1): Asynchronous sending of media gifts timed to arrive at an appropriate time	106
G1-Scenario A: ‘Time for breakfast together’ or ‘time for dinner together’	106
G1-Scenario B: Teddy’s Night, night message	107
G1-Scenario C: Voice message of ‘I’m off now’, ‘I’m home now’	108
3.5.2 Group 2 (G2): Asynchronous sending of media gifts timed at a specific time	109
G2-Scenario A: ‘Time for sending gifts to loved one’	109
G2-Scenario B: Special meal for grandfather, James’ birthday	110
3.5.3 Group 3 (G3): Something for engaging grandchildren with fun	111
G3-Scenario A: A connection between grandparents and grandchildren - Chess Game.....	111
G3-Scenario B: Skype phone with stylised view	111
3.6 Discussion	112
3.7 Conclusion.....	113
CHAPTER FOUR. TimelyPresent.....	115
4.1 The basic design concept.....	115
4.2 Why “TimelyPresent”.....	116
4.3 Form factors, selecting the Archos 9	118
4.4 Controlling the time of delivery	119
4.5 The first screen with metaphors	120
4.5.1 Present metaphor	121
4.5.2 Always-on.....	121
4.5.3 Family photo.....	122
4.5.4 Clocks	123
4.5.5 Present deleted from sender’s TP after sending.....	123
4.6 Key functions	124
4.6.1 Opening a new present.....	124
4.6.2 Making a present.....	124
4.6.3 Looking again	127
4.6.4 Exiting from TimelyPresent.....	128
4.7 Technical detail.....	129
4.7.1 Compression and recording length	129

4.7.2 Server side	130
4.7.3 Unboxing and start up.....	130
4.8 Initial storyboard and how the design evolved.....	132
4.9 User testing and how it changed the design	137
4.9.1 Method.....	137
4.9.2 Results of user testing.....	141
4.10 Discussion and conclusions.....	143
4.10.1 Potential value to sender.....	144
4.10.2 Potential value to receiver	146
4.10.3 Potential value to sender and receiver	147
4.10.4 Conclusion.....	147
CHAPTER FIVE. FIELD STUDY of TimelyPresent.....	149
5.1 Introduction	149
5.1.1 Goals of field study.....	149
5.2 Method	149
5.2.1 Ethical approval	150
5.2.2 Procedure	150
5.2.2.1 Recruiting participants	150
5.2.2.2 Deployment of TimelyPresent	151
5.2.2.3 Log data	155
5.2.2.4 Interviews.....	155
5.2.3 Informants.....	158
5.3 Results.....	160
5.3.1 Results from analysis of logs.....	160
5.3.2 Results of analysis of content of presents.....	164
5.3.3 Results from the analysis of the interview transcripts	169
5.3.3.1 Value for both the creator and receiver of presents.....	169
5.3.3.2 Value for sender of presents	178
5.3.3.3 Value for receiver of presents.....	181
5.3.3.4 Technical problems and key features of TimelyPresent.....	186
5.4 Discussion and conclusions.....	190
5.4.1 Value of TimelyPresent.....	191
5.4.2 Suggestions for the re-design of TimelyPresent	193
CHAPTER SIX. CONCLUSIONS.....	194
6.1 Contribution to research	197
6.1.1 Methods	197
6.1.1.1 Emotional probes	197
6.1.1.2 Ethical approval	198
6.1.2 Understanding the emotions experienced by families communicating across continents.....	200
6.2 Contribution to design.....	202
6.2.1 Methodology: Systematic use of quotes with ‘nearly-do-it inventions’	202
6.2.2 Novel features of the design for TimelyPresent.....	203
6.2.3 Analysis of content of messages in field study	205
6.2.4 Meeting requirements for a design to connect family members.....	206
6.3 Further research.....	209
Appendix 1: Information for Participants and Consent Form (Study 1: Probe study).....	211
Appendix 2: A full list of open codes and references of probe study (see Chapter 2)	214

Appendix 3: A full list of 281 text sections with 118 open codes of probe study (see Chapter 2)	218
Appendix 4: The 37 axial codes with 118 quotes of probe study (summative results in Chapter 2)	252
Appendix 5: “First things” Instructions for setting up TimelyPresent (see Chapter 4)	265
Appendix 6: User manual for TimelyPresent (see Chapter 4)	270
Appendix 7: Results of cooperative evaluation with Christine and Nancy alongside comments given by Rio and Joshua (see Chapter 4)	272
Appendix 8: Results of de-briefing in user testing and changes made to the design (see Chapter 4)	275
Appendix 9: Results of second level of user testing with Lucy using instructional manuals (see Chapter 4)	276
Appendix 10: TimelyPresent Trial - Information for Participants 1 and Consent Form (see Chapter 5)	277
Appendix 11: TimelyPresent Trial - Information for Participants 2 and Consent Form (see Chapter 5)	280
Appendix 12: Example of an activity logs	282
Appendix 13: Letter for permission for the author to view a complete set of presents (see Chapter 5)	283
Appendix 14: Example of results of analysis of content of presents (Alice/Joshua-GP, see Chapter 5)	284
REFERENCES	290

List of Tables

Table 1.1 Items of the Affective Benefits and Costs of Communication questionnaire	16
Table 2.1 Summary of the features of the various probe methods reviewed above.....	41
Table 2.2 Informants, all names in this thesis are pseudonyms to ensure anonymity.....	53
Table 2.3 Codes used with more than 3 sections of text	55
Table 2.4 The links between axial codes open codes and interview text extract reference number for Category 1 Happy and Fun.....	57
Table 2.5 The links between axial codes open codes and interview text extract reference number for Category 2 Reassurance & Obligation.....	59
Table 2.6 The links between axial codes open codes and interview text extract reference number for Category 3 Comfort & Yearning.....	60
Table 2.7 The links between axial codes open codes and interview text extract reference number for Category 4 Identity & Hope.....	62
Table 2.8 The links between axial codes, open codes and interview text extract reference number for Category 5 Trauma & Upset.....	64
Table 2.9 The links between axial codes open codes and interview text extract reference number for Category 6 Technology & Media.....	65
Table 3.1 Design thinking and techniques. Techniques from three to seven explained by Cross in 1997.....	77
Table 3.2 Design themes and quotes ('T' number*) that specify the requirements of the families.	80
*'T' numbers' quotes can be found in the sections for each design theme and also in Appendix 4.	80
Table 3.3 Ideas associated with the theme, "Finding time" and the match to requirements and potential value.....	83
Table 3.4 Ideas associated with the theme, "Sending love" and the match to requirements and potential value.....	88
Table 3.5 Ideas associated with the theme, "Presence for small children" and the match to requirements and potential value	95
Table 3.6 Ideas associated with the theme, "Reflection" and the match to requirements and potential value.....	99
Table 3.7 Ideas associated with the theme, "Reassurance" and the match to requirements and potential value.....	101
Table 3.8 Ideas of "Saying sorry" and the match to requirements.....	105
Table 4.1 Design space for time setting	120
Table 4.2 Participants for user testing and commenting	138
Table 4.3 Tasks for user to perform in Cooperative Evaluation.....	140

Table 4.4 De-briefing questions	141
Table 5.1 Participant families and the deployment dates	154
Table 5.2 Interview summary (SK: South Korea, F: face to face interview, T: telephone interview)	154
Table 5.3 Questions about presents received	157
Table 5.4 Questions about making presents.....	157
Table 5.5 Questions about the change in the relationship with remote family	158
Table 5.6 Questions about usefulness for the design of TimelyPresent.....	158
Table 5.7 Number of presents previewed before sending them (in the UK).....	161
Table 5.8 Number of presents previewed before sending them (in South Korea)	161
Table 5.9 Number of presents uploaded and downloaded	162
Table 5.10 Counts of presents played	163
Table 5.11 Mean and maximum counts of presents played	163
Table 5.12 Number of three modes of camera used for creating presents.	165
Table 5.13 Functions of making presents.....	168

List of Figures

Figure 1.1 LumiTouch: telepresence picture frame - lights up (left) and is squeezed (right)	19
Figure 1.2 Lover’s cup: tangible, bi-directional interactions	19
Figure 1.3 The White Stone: making sense of presence by feeling temperature between two people.....	20
Figure 1.4 ASTRA: picture-based communication system.....	20
Figure 1.5 PersonCards.....	21
Figure 1.6 The Collage uses: photographs and text messages to a touch screen display.	21
Figure 1.7 HomeNote displayed in a kitchen area (left) and a boy scribbles on the screen.	22
Figure 1.8 A pair of Gustbowl prototypes (left) and a number of pictures captured by the Gustbowl (right).....	23
Figure 1.9 Tsunagari-kan communication system	24
Figure 1.10 The VideoProbe	25
Figure 1.11 The Sound Window	25
Figure 1.12 The Family Window	26
Figure 1.13 Examples of a) user’s codes, b) user’s motion trace (above) and MarkerClock showing two connected users (below)	27
Figure 1.14 Whereabouts Clock: family member’s location; home, school, work, out.....	28
Figure 1.15 Dimension of communication representation.....	29
Figure 2.1 A postcard: what is your favorite device (left two), Photo album (right)	34
Figure 2.2 Camera (left), A map: if Peccioli were New York (centre), A returned map showing zones of safety and fear in the Bijlmer.....	34
Figure 2.3 Sloganbench (left) and Imagebank (right).....	35
Figure 2.4 (a) A cultural probe contents and (b) a group design session with the parents	36
Figure 2.5 Prizes (left), personal treasure (centre), house model (right)	38
Figure 2.6 Self tree (left), fairy tale (centre), camera (right)	38
Figure 2.7 Blossom, Jayne Wallace	39
Figure 2.8 First interview procedure including probe activities.	45
Figure 2.9 Family map: a. English map, b Korean map	45
Figure 2.10 Prototype communication devices for sensitising to technology: a. Lover’s Cups, b. LumiTouch, c. HomeNote.....	46
Figure 2.11 Prototype communication devices for sensitising to technology: d. Whereabouts Clock.....	46
Figure 2.12 a. Probes box, b. Things to do in the box, c. Things to do.....	47
Figure 2.13 a. Cards with instruction, b. Responses to the cards from participants	48
Figure 2.14 Digital camera instructions.....	49

Figure 2.15a. Something to share with your husband, b. A connection to someone you love	49
Figure 2.16 a. Something to share with your son, b. Something to share with your husband	49
Figure 2.17 a. Digital camera with instructions/Diaries, b. Instruction of diary: pleasant occasion	50
Figure 2.18 a. Log of telephone calls form (above), b. Responses of telephone calls - English and Korean (below)	51
Figure 2.19 a. Journey probe response (left), b. Journey probe response (right).....	51
Figure 3.1 Ideas generated through brainstorming	79
Figure 3.2 Picture frame box (left) and a feather in a glass cone (right).	84
Figure 3.3 The working prototype consisting of a notebook with a scanner in its cover, and a small extension to the television’s remote control.....	90
Figure 3.4 Sonic gem bowl	91
Figure 3.5 The prototype of MissU.....	92
Figure 3.6 The Hug	93
Figure 3.7 Wayve in a participant’s kitchen and close up	96
Figure 3.8 Conceptual models of social interaction, solar (left) and the representations of social activity (right)	102
Figure 3.9 The Curtain intentional presence device (left) and Intentional Presence Lamp (right)	103
Figure 4.1 Picture of Chumby.....	118
Figure 4.2 Picture of Archos 9	119
Figure 4.3 Main screen of TimelyPresent	121
Figure 4.4 An example of the name of TimelyPresent displayed on the top-right corner of the screen	123
Figure 4.5 Opening a present	124
Figure 4.6 Making a present	126
Figure 4.7 Sending a present.....	126
Figure 4.8 Looking again at presents	127
Figure 4.9 Switching off TimelyPresent	128
Figure 4.10 Scenes of demo presents of TimelyPresent.	129
Figure 4.11 Archos providing a leg stand and a stylus pen hidden.....	130
Figure 4.12 TimelyPresent run on the Archos with an extended camera and the power supplier	131
Figure 4.13 Screen shots showing ‘Conntecting to the internet’ using the short-cut icon, ‘Network connection’	131
Figure 4.14 Initial screen layouts with the connectivity	134
Figure 4.15 Initial screen designs on new present, opened present	134
Figure 4.16 Storyboard designs on new present, opened present, thumbnail present.....	135

Figure 4.17 Storyboard designs on new present, opened present, thumbnail present.....	135
Figure 4.18 Final connectivity diagram: storyboards of interaction with TimelyPresent.....	137
Marking.....	158
Figure 5.1 The rate of camera use by all the participant families	166

Acknowledgements

I offer my sincerest gratitude to my supervisor, Professor Andrew Monk. I am in great debt to him. From the beginning to the end, he has guided me through the various stages of the PhD research with enthusiasm and intellect. The analytical thinking methods and research expertise of Professor Monk have provided a solid background for the research.

I would like to acknowledge the contribution of all the participant families in my thesis work. Special thanks to Gavin Wood at Culture Lab. in the Newcastle University for implementing TimelyPresent, Guy Schofield for the images of function buttons, and Patrick Olivier, Jayne Wallace and James Thomas for sharing ideas in the course of the second design session. Mark Blythe and Gilbert Cockton in the University of Northumbria have provided opportunities for discussing qualitative data analysis of the probe study. They have offered me inspiration and assistance, and have showed how GTA may be used to maximise its beneficial influence on the design process. I would particularly like to thank Jenny Parry who gave a great help in proofreading my thesis.

The Department of Psychology has provided the support and equipment I have needed to produce and complete my thesis. I would like to thank the members of Research Committee, Dr Julian Oldmeadow and Dr Marcel Zentner. Special thank to all the members of the University of York HCI group who have offered me advice and insight throughout my PhD work. The work required to build TimelyPresent was also part funded by SiDE, the RCUK Digital Economy Research Hub on “Social Inclusion through the Digital Economy”.

In my daily work I have been blessed with friendly and cheerful fellows in the University of York. I deeply appreciate Poppy, Carin, Sandra, Shinmin, Tianxiao, Vidas, Gitte, Tanja, Tulika, Kartini, Rachel, Katya, Lily, and Alessio for sharing the knowledge, ideas, and inspiration on my research.

I would also like to take the opportunity to thank Stanly and Youn for sharing information about design process, and Sarah for providing cards probe for my first study and showing her interest in my research. Many individuals also have provided me constant encouragement on my work and my life in York. I will remember Naira, Elizabeth, Cecilia, Fatma, Isabel, Ami, Boryung, Bomi, Eunkyung, and Myungjoo for their sincere friendship.

My deep gratitude goes to my two lovely sons, Hansol and Hanbie and my husband Ryu. Thank you for your tolerance and patience in the last stages of research, in particular.

Author's declaration

Prior to submitting the PhD thesis, four papers were published that were concerned with the material presented in the thesis. Kim and Monk (2009a and 2009b) provided the method of emotional probes and interview technique and the findings of the probe study. These are discussed in Chapter 1 and Chapter 2 of the thesis. Kim and Monk (2010) presented the method of analysing the interview data in detail and the outcomes that are concerned about understanding emotions experienced by families across continents and practical constraints with regard to communication and separation. These are discussed in Chapter 2 and Chapter 3 of the thesis. Monk, Blythe and Kim (2010) was concerned with what people want from the technology in their home that was jointly written. I declare that all the material presented in this thesis is based on my own work.

CHAPTER ONE. LITERATURE REVIEW

1.1 Introduction

We are living in an era of highly developed communication technology. With the help of such technology, people maintain more relationships with others and have more information available about them. However, they might miss the depth of relationships because of the lack of real dialogues to express themselves which would be available from unmediated interaction. Within the family, there may not be much time to devote to communication, especially with the demands of two working parents looking after their children and/or their parents. Moreover, many families have one or more members living apart from their household and the occurrence of such geographically separated families is increasing (Stafford, 2005). Even though they live far apart, they always want to be connected with each other and maintain good relationships as a family. They need to experience and feel the daily social context of their family members, which can be supported by product use, especially communication appliances.

In order to bring the social context of family members' communications into the design, it is necessary to become more aware of the users' experience, emotions, the situation of product use, and social/cultural influences. This thesis will investigate this design problem in user-product interaction.

The objective of this thesis is to design a communication technology which allows people with family members living abroad to feel more connected with each other within their social context. It focuses on a particular user group: 3-generation families where at least one member of the family is separated from the others by a large distance. It has a special interest in the emotions felt by the members of these families. For this reason, this chapter will review (i) theories of emotion from psychological research and (ii) affective communication technology and the claims made for it. Under (i) we consider a number of very different approaches to understanding human emotions ranging from attempts to measure emotion through physiological responses of the body and facial expression through to ethnographic studies of transnational mobility and conclude that the latter more nuanced approaches are more appropriate to the practical task we have set ourselves. Under (ii) we suggest a framework for thinking about and selecting from the many inventions for 'affective communication' that have been described in the Human-Computer Interaction literature. Methods that could be used to understand people's deep feelings with regard to communication and separation are reviewed at the start of Chapter 2.

1.2 Theories of Emotion

Studies of emotion have been developed in many areas with activity in clinical, developmental, personality, physiological, and social psychology (Ekman, 1993). In this section, five rather different ways of understanding emotion will be described: (i) measuring emotion; (ii) communication media and emotion; (iii) constructionist approaches to social relations and emotion; (iv) studies of long distance relationships, and (v) Romero et al.'s ABC-Q.

1.2.1 Measuring emotions

As an experimental science, psychology depends on operationalising concepts such as emotions in measures of one kind or another. Three approaches to measurement are considered here: self-report questionnaire, physiological reactions and facial expression.

One approach has been to measure the verbally expressed feeling states of people. Self-report questionnaires have been used to ask about levels of emotions such as happiness, joy, sadness or fear. For example, participants were asked about emotional responses to others in daily situations (Brandstatter, 1983). Twenty-four housewives recorded their momentary emotions experienced, several times a day for four weeks. In addition, they recorded their momentary situation such as place, activities, and other persons present and their subjective explanations of their mood states. On the basis of these data, they were able to demonstrate that both environment, e.g., where I am and who else is present, and personal characteristics as measured by personality tests, contributed to the emotion experienced.

Another approach has been to measure 'physiological reactions and feedback' from the peripheral nervous system (James, 1890). For this approach, skin conductance is typically used to distinguish emotions using the dimensional display of arousal and valence (Purves et al., 2008). The skin conductance response is an indicator of electrodermal activity derived from electrodes which are positioned on the surface of the hands or feet. For example, during emotional arousal evoked in a public speech, the sweat glands activity commonly increases the electrical conductance of the surface of the skin. The activity of the eccrine sweat gland is mediated by the sympathetic nerve system. Skin conductance is therefore good at measuring the sympathetic emotional response to arousing conditions, as well as identifying the arousal levels related to specific states of emotion. One of the phases of the skin conductance response can be assessed as anxiety or contextual fear, illustrating the spontaneous fluctuations in the baseline level. The skin conductance response is used in "lie detector" tests due to the reason that the fear and anxiety are connected to high arousal states. Skin conductance is also used to measure the arousal responses evoked by a stimulus unconsciously. An example is that patients who have an inability to recognize faces often still

respond to pictures of family members by showing skin conductance responses (Purves et al., 2008).

The most developed use of physiological measures of arousal has been the work of Picard and colleagues. For example, Picard and Liu suggest that measuring “stress” based on skin conductance and heart rate could be used to trigger a more empathetic human-computer dialogue when the user would most appreciate it (Picard & Liu, 2007).

Measures such as skin conductance can provide physiological reactions pointing to the most central parts of emotion in terms of arousal or valence. However, these measures are focused on an individual’s state of emotion which is unlikely to be associated with the thesis topic concerning family relations and their feelings in a social context using communication technology in specific situations. It is assumed that such the feelings will be far more complex and subtle than a particular state of ‘arousal or valence’.

The study of facial expressions of people experiencing emotion has been particularly dominant in experimental psychology. This work started with the study of the role of the different facial muscles associated with facial expressions. Duchene used electrical stimulation to elicit the contraction of particular facial muscles and took photos of the various facial expressions (Duchenne de Boulogne 1862/1990). The Swedish psychologist Carl-Herman Hjortsjo (1969) proposed a coding system illustrating the facial muscles relevant to different expressions as detailed anatomic knowledge. Later Ekman and others took this further, developing objective methods for measuring facial affect (Niedenthal et al., 2006).

The Facial Action Coding System, FACS was designed to measure all visible facial movement. FACS is an anatomy-based system for coding 44 facial action units associated with particular facial muscles (Ekman et al., 1980). Each action unit has the intensity of change coded on a five-point scale and the timing of each action can also be recorded. To validate the FACT, Ekman, Friesen, and Ancoli (1980) had participants watch pleasant or unpleasant video films. After each film was viewed, the participants’ self-reports about the emotional intensity were measured and their recorded facial reactions were coded with FACS. The results showed that those participants who showed the particular facial action units in response to pleasant films reported feeling more happiness, and those who showed negative facial action units in response to the unpleasant films reported feeling more fear, surprise, pain, or disgust than those who did not display these specific facial expressions. The specific facial action units scored was also positively correlated with self-reported intensity of positive and negative emotional feelings (Ekman et al., 1980). FACS coding has been widely applied to measure the facial movements in spontaneous video clips and posed facial expression of emotion. Using FACS Ekman indentifies six discrete basic emotions: anger, sadness, happiness, fear, disgust, and surprise.

Another approach to studying facial expression was measurement by observer judgments (Buck & Mill, 1974). Participants (acting as “senders”) viewed four types of coloured slides while their facial expressions were recorded with a hidden camera. The participants were asked to score the intensity of pleasantness of each slide. Other participants (acting as “observers”) watched the ‘senders’ recorded facial expressions and then identified which type of slide was being viewed and assessed the pleasantness of the other’s emotional expression. The findings showed that the observer-participants identified the slide category viewed by sender-participants at better than chance levels. The observer-participants’ pleasantness scores were positively correlated with the sender-participants’ self-reported pleasantness responses to the slide. The study suggested that observers could recognize the aspects of emotional states responded from just the facial expressions of “senders”.

To summarise, the basic states of emotions people experience can be precisely expressed on their faces. Moreover, such facial expressions can also be readable to others. The studies on facial expression are typically dealing with basic emotions (happiness, sadness, disgust, anger, fear, surprise) or specific emotional state (e.g., pleasant or unpleasant) and yield single emotional expressions. However, these studies were carried out in laboratories. If families experience complex and subtle feelings in response to various stimuli in their real lives, their facial expressions might be hard to gather, particularly in unpleasant situations. Moreover, in the view of emotion in social communication and relation, facial expressions might not always be reliable in real situations because the emotional states expressed could be controlled or motivated by social and cultural norms, others’ emotional states expressed or simply the emotion expresser’s intentions.

According to this “social communication” view, facial expressions are social signals which have evolved to communicate the emotion expresser’s motives in a specific social situation (Fridlund, 1992). Facial expressions can imply the expresser’s intent and what the expresser wants others to do. For example, a smile might signal agreement or affiliation, a sad face might request help or comfort, a happy face might show a person’s success, and an angry face might be related to being harmed. In line with this view, Ekman presented ‘display rules’ stating that emotions can be expressed depending on the social situation and cultural demands (Ekman & Friesen, 1969). It means that facial expressions can display an emotion without a corresponding feeling. It is also exemplified in the ‘Duchenne smile’. Duchenne demonstrated that particular facial muscles, called the orbicularis oculi, can be activated spontaneously only by subjective emotional experience. A forced or voluntary smile does not activate this muscle group, therefore appearing strained and unnatural (Ekman & Davidson, 1990). Therefore, recognition of facial expression cannot be demonstrated to be perfectly “accurate” in cultural situations. Ekman (1992) also stated that it is still unknown whether facial activity is a *necessary* part of any emotional experience.

To summarise, in the context of this thesis, the measures of emotion used by the

psychologists (Buck & Mill, 1974; Ekman et al., 1980; Brandstatter, 1983; Picard & Liu, 2007; Purves et al., 2008) would seem to be overly simplistic. Physiological measures only distinguish a state of ‘arousal or valence’. Facial expression can be shaped and changed under different circumstances and with different kinds of people. Self-report questionnaires on emotions do not seem to capture the subtleties of social communication.

Emotions experienced by people keep changing in response to various events in particular situations in the real world. Therefore, measuring emotions using facial expression, self-report questionnaires, or physiological responses are inappropriate for understanding the complex subjective feelings experienced by families living at a distance in real situations. However, the social communicational view on emotion might be more associated with the aim of this thesis in terms of collecting real data and interpreting the meaning of subjective feelings and will be returned to in Section 1.2.3 Emotion and social relations.

1.2.2 Communication media and emotion

As mentioned in the previous section, the social communication view of emotion could be more related to this thesis considering the subjective feelings experienced in a specific social situation. In this section, the benefits and roles of communication media will be examined in emotional contexts.

Whittaker and O’Conaill (1997) had a prediction about the benefits of video in mediated communication. It is because video shows visible behaviours and thus provides nonverbal information that is missing from the audio-only communication. To claim the effects, Whittaker and O’Conaill reviewed a number of studies. Firstly, it was indicated that there was the role of facial expression in video communication in terms of coordinating content. Facial expression gives listener feedback, such as concurrent head nods implying understanding or agreement with what the speaker said (Birdwhistell, 1970). In addition, the listener’s facial expressions show ‘interest, puzzlement, or disbelief’ about what listeners are being told (Ekman & Friesen, 1975). Therefore, facial expression in communication contains a rich source of affective information allowing the listener to imply the speaker’s current states and to react to what is being said; that can be considered to be similar to the “social communication” view of emotion.

It is interesting that some studies found that face-to-face interaction is no better than speech-only communication for cognitive problem-solving tasks such as jointly constructing a mechanical object where one gives instructions and the other has the physical components (Chapanis, 1975). Objective measures of conversation process including ‘pausing’, ‘overlapping speech’, and ‘interruption management’ in negotiation tasks also showed little difference in the process between the video-with-audio information and the audio-only communication (Sellen,

1995). However, for a design task, video-with-audio link groups in face-to-face communication created higher quality designs than audio-only groups. The former group also spent less time in stating and clarifying issues than the latter group (Olson et al., 1995). Besides, through analysing subjective data on turn-taking obtained from questionnaires involving participant's impressions of the effect of video-with-audio conversational process (Sellen, 1995), video-with-audio communication was thought of as better than audio-only media in respect of supporting interrupt conversations; guide conversations in natural ways; give more opportunities to listen selectively to specific speakers; allow one to determine whether one is being attended to; and to assist one in keeping track of the conversation of others (Whittaker & O'Conaill, 1997).

To sum up, in objective conversational tasks, having a video-with-audio channel made no significant difference in problem-solving compared to an audio-only channel. However, video-with-audio communication was perceived to affect some aspects of conversational manners, such as coordinating creative ideas, supporting interrupt or guide conversations in more natural ways.

More relevant to the topic of this thesis, Whittaker and O'Conaill (1997) cite strong evidence for the claim that video supports conveying 'social cues' and 'affective information'. Video-with-audio changes the effect and character of communication issues (e.g., negotiation, bargaining, and conflict resolution) requiring access to affect or emotional factors. Because video-with-audio conversations are 'more personalised', 'less argumentative', 'more polite', and 'broader in focus' than audio-only channel, people concentrate more on the others' motives when visual information is shown to them (Short et al., 1976; Reid, 1977; Williams, 1977). Whittaker and O'Conaill claimed that these findings were regarded as 'affective cues' in two ways. Firstly, video-with-audio allows people to infer others' affective or emotional state by providing visual information such as facial expressions, posture, and gesture. Secondly, such visual information provided by video-with-audio communication gives subjective benefits. People feel certain that video-with-audio and face-to-face interaction are better than audio-only for issues requiring affect, such as getting to know others. Besides, groups having conversation using a video-with-audio channel show a tendency to like each other more (Shor et al., 1976; Reid, 1977; Williams, 1977).

The evidence of the benefits of video mediated communication providing 'social cues' and 'affective information' can be considered as important for the thesis, when examining which type of communication media would fit the needs of the target families living at a distance who might have complex feelings regarding their relationships.

A further line of evidence regarding the role of seeing someone's face comes from studies of how Autism spectrum conditions might be associated with a deficit in being able to recognise emotions in others. Autism spectrum conditions (ASC) are characterised by difficulties in social interactions and communication alongside specifically limited interests and a strong preference for

repetitive and same behaviors. Individuals with ASC showed developmental delays in the ability to recognise and discriminate emotion from facial expressions, intonation, and body gestures. On the basis of this observation, Baron-Cohen and colleagues developed Lego Therapy (Owens et al., 2008), Mind Reading (Baron-Cohen et al., 2004), and Transportation (Golan et al., 2010), all of which were for assisting children in learning emotion comprehension.

These interventions have demonstrable effectiveness. For example, the transporters *DVD*, a series of children's animation (Golan et al., 2010) was designed to improve emotion recognition in children with ACS aged from three to eight. The Transporters involved eight toy vehicles moving according to rule-based motion, expressing basic emotions in social interactions including being happy, sad, angry, afraid, and surprised. The Transporters contains fifteen 5-minute episodes. In the study, 20 child participants watched the transporters everyday for four weeks. The participants were examined on two assessments (vocabulary, emotion recognition) before and after the intervention. Two test groups of children (one group with ASC, n=18 and, the other group typically developing, n=18) were matched to the intervention group. The analysis showed that the intervention group improved significantly on the tests and the improvement was greater than the other two groups. The study concluded that the Transporters significantly help comprehension of emotion in children with ASC.

As explained above, Whittaker and O'Conaill (1997) reviewed many studies to search for the benefits of video-with-audio mediated communication compared to an audio-only channel. Derks and his researchers (Derks et al., 2008) reviewed a number of studies to determine whether communication of emotion is more difficult in computer-mediated communication (CMC) than in a face-to-face situation. CMC contains a variety of electronic message systems (e.g., text based chat). The review here focused on examining the emotional content and quality of interactions and was restricted to text-based CMC because it was still the most common mode of communication and the difference with face-to-face communication was presumed to be largest. The review concluded "there is no indication that text-based CMC is a less emotional or less personally involving medium than face-to-face. On the contrary, emotional communication online and offline is surprisingly similar, and if differences are found they show more frequent and explicit emotion communication in low information text-based CMC than in face-to-face" (Derks et al., 2008, p.766).

Riordan and Kreuz asked people their reasons for choosing between face-to-face, asynchronous email, or synchronous instant message channels to convey emotional information (Riordan & Kreuz, 2010). A survey was conducted asking 124 participants to respond to a series of questions involving their use of CMC, and their preference for and desirability of email, instant message, or face-to-face in emotional contexts. The results showed that the most common reason for choosing face-to-face over CMC channels was the availability to use more 'nonverbal cues' whereas the reason for choosing CMC channels over face-to-face was to protect or defend oneself

from the message recipient. Face-to-face communication was considered more effective, more personal, more comfortable, and less permanent than CMC channels. However, the reasons for choosing one communication medium over another are subtle and complex and not simply a matter of cost or information richness.

To summarise, Whittaker and O’Conaill’s (1997) view provides evidence for the value of video mediated communication as opposed to audio-only in emotional communication contexts, with the supplied visual information playing a role as ‘affective cues’ in social situations. Some studies by Golan and others (2010) showed that with the limited data obtained from people with ASC how media can be generalised to enhance emotion recognition. In these cases, visual media, such as Mind reading and the Transporters can be considered as ‘educational’ or ‘assistive’ technology providing socio-emotional situation, rather than direct person-to-person communication media.

However, Derks’ (2008) review shows that people are very creative in their use of communication technology, even something as “information poor” as text data can be used for emotional expression. Unfortunately, in Derks’ (2008) review and Riordan’s (2010) study, video mediated communication in terms of emotional context was excluded for their research purposes, and therefore it is still unknown whether text-based communication media is more beneficial than video-with-audio mediated communication media. However, it seems reasonable to assess that visual information provided by a video-with-audio channel would be powerful for conveying complex and subtle subjective emotional context.

1.2.3 Social relations and emotion

This section will address the social constructionist view of emotion first and then describe some studies using the approach to examine gender and cultural differences in the emotional support of relationships.

This approach has its origin in the social sciences and other academic disciplines such as anthropology, sociology, philosophy, and psychology. The main purpose here is to understand human states or conditions of mind associated with social situations in the context of that they live in culture. These social “constructionists” tended not to consider biological responses or physiological reactions related to emotions. For example, Averill defines emotion as “a transitory social role that includes an individual’s appraisal of the situation” (Averill, 1980a; Averill, 1980b).

From this point, measuring a single emotional state as discussed before (in Section 1.2.1 Measuring emotion) is unlikely to be helpful to understand the socio-cultural situation. Niedenthal and colleagues mentioned that the constructionists’ view on emotion is based in attitudes that

reflect the practices, norms, and values of the culture in which the individual was raised (Niedenthal et al., 2006). Consistent with this view, emotion and culture have an interactive relationship over time in communicative situations. Emotion is also changed depending on the culture being developed. Culture affects how an individual's emotion is responded to, expressed, controlled, and understood by others and the emotion also affects the meanings of cultural development (Shweder, 1994; Shweder, 2002; Mesquita, 2003). Therefore, individuals interpret their social situations, functions of their relationships, and the meaning of their lives, and they make beliefs represented in cultural practices where their emotions are experienced and expressed as characteristics.

To take one example of this approach, Burleson's empirical study (Burleson, 2003) focused on investigating gender and cultural differences in the emotional support of relationships. Many concepts of emotional support emerged including expressions of care, concern, love, interest, and empathy, particularly when being stressed or upset. Other forms of emotional support are regarded as expressions of encouragement, appraisal, reassurance, and respect (Cutrona & Russell, 1990). Emotional support was considered as the most significant part of a human being, such as sense of selves, aspirations, hopes, fears, and deepest feelings, and also considered as communicative activities. In this view, the study of emotions can support understanding "the nature of emotional experiences, the circumstances that provoke various emotions and the factors that lead to change in emotional states" (Burleson, 2003, p.3).

Burleson's study used the Communication Functions Questionnaire (CFQ). This focuses on communication and emotion as skills, i.e., activities rather than just experiences. The original CFQ was developed by Burleson and Samter (1990) and assessed two types of skill. The first considered four affective communication skills: comforting, conflict management, ego support, and behavioural regulation. The second groups of skills were "interaction or instrumental" skills: conversing, informing, persuading, and narrative skills. A few years later, "expressiveness and listening" skills were included in the affective communication category. Using the CFQ they were able to demonstrate that affective skills were significantly more valued in romantic partners than in friends and the interactional/instrumental skills were seen as only slightly important. Regarding gender differences, both males and females found that the affectively oriented expressive skills of the partners were more valued than the interactional/instrumental skills, although women's talk was thought of as "intimacy and connectedness" being created and maintained (Maltz & Borker, 1982) whereas men's talk was considered as a "mechanism for getting things done" (Wood, 1993).

Ethnic and national differences in communication skill were also assessed in terms of close relationships (Samter & Burleson, 1998). The three groups of "African American, Asian American, and European American" students carried out the CFQ with respect to same-sex friendships. The results showed that in all these cultures, expressive skills were more important than interactional

and instrumental skills for friendships. However, the African American group of students gave lower values to most skills than either the group of Asian Americans or European Americans. Especially, the ratings of 'expressive skills' placed by the African Americans were lower than any other skills and the African American women gave lower marks on the 'expressive skills' than the African American men. Based on these findings, it was suggested that models of friendship in talking about feelings and selves may apply to mainly European Americans, less to Asian Americans, and far less to African Americans.

These studies can be considered as demonstrating the value of understanding emotionally supportive skills of communication and beliefs concerning the qualities of helpful messages that were needed in supportive situations. As mentioned before, the purpose here is to understand human states or conditions of mind associated with social situations in a cultural context. Families will experience their own subjective complex and subtle feelings when one or more members are living at a long distance in regard to communication. However, they might need to control and shape their real deep feelings due to their present social situations, their desirable relationships, and their cultural practices and norms. Through the Burleson's studies, it can be presumed that such families need emotional support including specific communicative skills such as expressiveness of care, concern, and love.

1.2.4 Studies of long distance relationships (LDRs)

This section describes two groups of studies of long distance relationships (LDRs). The first characterise the nature of the problems faced by people in long distance relationships. The other group is of ethnographic studies looking at how transnational mobility affects both high-status and low-income workers and disrupts conventional assumptions of the family relationships and social communication. In each case, the concepts used that may be relevant to the current study are brought out.

Merolla (2010) proposed a model of how partners maintain their relationships as they cycle in and out of physical co-presence. Several applications of the model were discussed in diverse kinds of long-distance relationship, including dating, commuter, military, and transnational. Particularly, Sigman's (1991) relational continuity was thought of as significant for explaining the importance of relational communication occurring beyond face-to-face communication in terms of relational continuity constructional units (RCCUs). Firstly, 'Prospective' RCCUs defined "the meaning and duration of the impending separation and of the likely return" (Sigman, 1991, p.112). Four potential functions of prospective units signal "a separation is about to occur, establish a time frame for return, define the separation and what it means for relationships, and foster expectations for the nature of the reunion (Merolla, 2010, p.171). Merolla gave examples of prospective units

including farewells (e.g., “See you again soon”); agenda establishments (e.g., “What will you do while I am away?”); and material objects (e.g., a ring). Secondly, ‘Introspective’ RCCUs were used to build continuity and functioned as reminders of the ongoing relationship. Giddens (1984) described introspective units as the “stretching of social relations across time and space” (p.35). Gilbertson and his colleagues (1998) adopted a further approach to introspective RCCUs including partners’ mediated communication, such as phone call or computer-mediated-communication. Lastly, ‘Retrospective’ RCCUs were presented as “when persons jointly involved in some relationship reencounter each other after some period of absence, giving opportunities to sustain that relationship and its history” (Sigman, 1991, p.118). Examples of the units were greetings, nonverbal displays, simple conversations, and events such as “homecomings” helping to catch up on experiences occurring during living at a distance.

Maguire and Kinney’s (2010) study was an in-depth understanding of the situations where long-distance relationships were distressing for female undergraduate college students (n=119, average age: 19.84 and the average length of relationship: 16.82). The study focused on examining the links between communication strategies and relational satisfaction in both high and low distress levels. The results indicated that communicative coping strategies were found to be of different value depending on the stressor and whether the participants were in low or high distress. The stressors were categorized as internal and external. Examples of internal stressors were: being apart in itself, travel expenses for reunion and phone bills. External stressors included experiencing frustration from communication difficulties (Guldner, 2004), interpersonal or relational differences (Culder, 2004; Sahlstein, 2004), inequity in the relationship (Stafford, 2004) and relational uncertainty or doubts about the relationship. They conclude that the perceived amount of joint problem solving was a key predictor of satisfaction among participants in low distress LDRs, while the perceived amount of openness was the most significant predictor of satisfaction among the participants in high distress LDRs.

DiTommaso and Spinner (1995) examined Weiss’s (1973) typology of social and emotional loneliness. The aim of the study was to evaluate Weiss’ suggested connections among relational needs, social and emotional loneliness, and mental health. Two hundred and forty one university students replied to a measure of social and emotional loneliness using the social provisions scale and several indications of mental health. The results showed that social and emotional loneliness were distinct experiences. There was inconsistency in the research regarding how distance may affect the relational satisfaction. Aylor (2003), Ficara and Mongeau (2000) argued that geographic separation assumed a challenge for relationship partners to try to sustain their long-distance relationships. Stafford (2005), however, claimed that LDRs were not always problematic due to the various types of LDRs existing, just some of which were distressed. Similarly, while Van Horn and his colleagues (1997) showed that participants in proximal dating relationships (PDRs) were more

satisfied than those in LDRs, Stafford and Merolla (2007) found that people in LDRs reported higher-quality communication and were more in love. Furthermore, Guldner and Swensen's (1995) study showed that there was no significant difference between LDRs and proximal relationships when examining the links between time spent together and relationship quality.

To summarise, these studies are clearly relevant to the practical problem set in this thesis. The mechanisms used to maintain LDRs described by Merolla (2010) need to be supported by technology. The stressors identified by Maguire and Kinney (2010) are also practically relevant. The studies that compare proximal and long distance relationships demonstrate that there is a problem to solve. The next group of studies to be reviewed here show how transnational mobility disrupts conventional family relationships and social communication and how mobile phones can help.

Thompson (2009) analysed how foreign workers in Singapore maintained their cultural practices and social networks through interaction and exchange, focusing on domestic and construction workers from the Philippines, Indonesia, Thailand and Bangladesh. Thompson (2009) found that the mobile phones played the cultural, social and communicative role in the lives of these workers. Local construction workers use mobile phones to reestablish transnational identities. These domestic and construction workers have significant structural constraints on their mobility, living patterns and daily activities (Thompson & Zhang, 2009). The working conditions were not good. They worked long hours and most have little choice where to live. Their poor ability to use language (English or Chinese) also restricted their interactions with people around them. Under these conditions, mobile phones played a crucial role in building and maintaining a sense of community and connection to family members and friends overseas. In such cases, migrant workers showed a detailed knowledge of the diverse telephone options available. However the desire to use phones to communicate with others could sometimes overwhelm their 'self-control' and lead to significantly high phone bills. Female domestic workers expressed a greater desire to talk or text by mobile phone than male construction workers. Having their own mobile phone was necessary also among professionals, so called 'foreign talent'. Compared to foreign workers, often trying to reduce their communications costs and employ a various complex strategies to maximize their communicative opportunities, professionals are most likely to get a single SIM card from a single company and sometimes use a house phone for international calling. They also email for communicating with family members, friends or others overseas. The most important factor in their choices was convenience, saving time, rather than money.

These papers give some examples of the emotions experienced. One domestic worker said, that when she wrote and received letters about once a month in the early 1990s, she would always worry and feel that she did not know what was going on at home in the Philippines. Another domestic worker had a boyfriend in the Philippines. She sent and received about five text messages

from him daily. On occasions such as birthdays and Christmas, she called and sent text messages more often than at other times. Another 'occasion' for intensive communication was in quarrels with her boyfriend. As she put it, when they quarrel via SMS or talking, it is because some misunderstanding has come up and it is important to settle the problem rather than let it linger. When they are not quarrelling, they mainly communicate about mundane, daily life, just to stay in touch; 'How are you?', 'How is your day?', 'What are you doing?', or with love or inspirational messages.

Horst (2006) also focused on the dynamics of the communication, this time in Jamaican transnational people with an emphasis on how family members and partners express and communicate love by appropriation of the features of mobile phones. It was found that the mobile phone was particularly important in communication between relatives, partners and families living abroad. For example, parents living in the Cayman Islands, USA, Canada, England and elsewhere could more directly contact their young children living with relatives in Jamaica, and their children could also begin to ring their parents using mobile phones. Many teenagers waited with great anticipation for the weekly phone call from their father or mother. In such cases, their lunch money could be saved just to call their parents and hear their voices. Both parents and children stated that increased and regular communication facilitated more involvement in children's academic and emotional growth. One 14-year-old schoolgirl talked about how she called her mother for encouragement before her examinations. Another 16-year-old schoolgirl noted that, while she lived close to her financially supportive father, she felt more comfortable asking her mother living in the Cayman Islands for money for 'girls stuff'. A 17-year-old young man attending Orange Valley's comprehensive high school found the phone to be critical in negotiating his alienated relationship with his father away from the watchful eye of his mother's family. The mobile phone network was also used for transactions between several family members. For example, when one family's mother experienced a stroke, her children, who were caring for her in Jamaica, called the brother living in the States to tell him about the stroke and he then sent the money they needed for her medication. Relationships between couples, such as husbands and wives were also changed when mobile phones became available. One informant described how before she had access to this technology worried constantly about her husband while he was away, wondering if he was safe, well fed, and still thinking about her and their children. Since having a mobile phone they now speak every three to four weeks while he is away and that makes her worry less about his health and safety. Another couple made impromptu calls which the husband said felt almost romantic, affirming their relationship and putting his mind at ease about her potential infidelity while they were apart. In contrast in some cases, the mobile phone began to feel like a form of surveillance rather than enhanced communication. Family living abroad felt pressure and even burdened and used caller ID to identify the various family members and friends who they might not wish to

receive calls from.

Thomson's study (2009) similarly suggested that new communication technologies, such as mobile phones were more than simply a means of communication. Instead, these communication technologies were increasingly used to link migrants and homelands in ways that were deeply meaningful to the people at both ends. The availability and possession of mobile phones had in many ways broken down the distance between Jamaicans at home and abroad due to their ability to create 'a sense of involvement' in each other's daily lives. It has also enabled Jamaicans at 'home' to communicate 'care and concern' for their friends and family members in foreign parts. However, it has also created mixed feelings on the part of many Jamaican transnationals who were perceived as having more mobility than their Jamaican bound counterparts.

Wilding (2006) also focused on explaining how people maintain their social network across distance with information and communication technologies (ICTs). Similar to Thomson (2009) and Horst (2006), this was a large qualitative study of transnational families. Interviews were carried out at their homes in Australia, Ireland, Italy, the Netherlands, Iran, Singapore and New Zealand. The use of ICTs was particularly important for some transnational families in constructing or imagining a 'connected relationship', and enabling them to pass over their physical and geographical separation by time and space. The fact of communicating was as important as its content. For example, email often comprised of 'meaningless jokes, small comments on sporting events, or a statement about the weather' (Wilding, 2006, p. 132) where 'the moment of exchange itself', helped reinforce a sense of the relationship between sender and receiver. Licoppe and Smoreda (2005) represented this as 'filling in absence by a sort of incantation'. ICTs aided in generating a strong sense of shared space and time that might overlook the realities of geographic distance and international time zones. The apparent elimination of time constraints was particularly important. One of the commonly cited problems with telephone conversation was the difference in time zones, for then only certain times of the day were appropriate for contacting family members living at a far distance. Email overcame this problem by enabling communications to be sent at any time of day, with the recipient able to respond whenever he or she likes. Regarding this, the different time zones engendered 'amusing temporal contradictions'. One migrant said, 'we saw the baby in its mother's arms before it was even born' (Wilding, 2006, p133). In some cases, the gap between imagined proximity and physical separation resulted in new opportunities for conflict. For example, one migrant talked of "how her sense of being 'part of the family' thanks to frequent emails resulted in her giving advice to her sister on a very sensitive issue. Her sister responded negatively to what she perceived as poor advice and subsequently refused to communicate by email, telephone or letter" (Wilding, 2006, pp.133-134). Imagined proximity was destroyed quickly and sometimes painfully for those migrants whose parents became disabled in some way that prevented them from using the full range of communication modes. For example, one man told of "how he

had exchanged letters and telephone calls with his mother for years until she began to show symptoms of dementia. At that point, he perceived telephone calls and even letters as pointless (Wilding, 2006, p134)”.

Wilding’s (2006) concluded that physical distances and the capacity to overcome them were perceived differently by different social actors at different moments in time, depending on where they were located and which social relationships they wished to emphasize or suppress. This finding supported recent studies that focused more specifically on the types of communicative acts or behaviours with different communication technologies. For example, letters and postcards could create particular imaginative worlds, where both the sender and receiver engaged in an idealization of the other and of their relationship (Milne, 2003). Research on the telephone illustrated the ways in which males and females differ in their shapes of conversation. Wilding (2006) suggested that the key advantage of email was to provide ‘a sense of transcending time and space’, contributing to a perception of intimate connectedness.

To summarise, the studies reviewed in this section have described the mechanisms used to maintain LDRs also the stresses and effects of living through a LDR. The detailed large sample ethnographies of the LDRs experienced by transnationals (Thomson, 2009; Horst, 2006; Wilding, 2006) have added to this understanding. What emerges is a complex picture of problems and alternatives but also a strong feeling that this is an area where the people involved feel strong emotions that can often be influenced by the communication technologies that are available.

1.2.5 Romero’s Affective Benefits and Costs of Communication questionnaire

This section is devoted to one paper (Romero et al., 2007). This paper skillfully combines ethnography and psychometric analysis to generate a conceptual structure which has been the main point of comparison with the results generated in this thesis. These authors start from a position that in the design of communication technology should take careful consideration of privacy, affective factors and the social communicative context.

Romero and his colleagues developed the Affective Benefits and Costs of Communication questionnaire (ABC-Q) for evaluating the affective qualities of the ASTRA system. The qualitative data obtained from a field study showed that technology mediated communication causes benefits and also costs. A number of the benefits associated with the concept of connectedness were “feeling in touch with someone, being aware of what they are doing or of their general well-being.” On the other hand, costs were also perceived using this communication, such as “loss of privacy, unfulfilled expectations, or the creation of new obligation” (Romero et al., 2007, p. 303). Another of their concepts was that of feeling connected, defined as a general ‘sense of being in touch with one’s family and friends’. This is similar to ‘affective awareness’ (Liechti & Ichikawa 2000) and

‘social presence’ (Short et al., 1976).

The ABC-Q was developed to measure the affective benefits and costs of communication using an awareness system or any other type of communication medium in the social and emotional communicative context. The design of the questionnaire was based on the results of a user study of an awareness system alongside some qualitative research on the meaning of keeping in touch for families who were geographically separated. The first version of the questionnaire was created containing 58 items each of which had 7-point Likert scales. For developing the complete ABC questionnaire, a preliminary study was conducted involving 20 participants for selecting the 58 items. The list of the items was limited to 36 resulting in a satisfactory Cronbach’s alpha of 0.86. The full content of the questionnaire development was discussed in the study by van Baris and his researchers (2004). Table 1.1 details the factors that were identified. These neatly capture most of the concerns and values noted in the papers described in Section 1.2.4.

Table 1.1 Items of the Affective Benefits and Costs of Communication questionnaire

Items of ABC-Q	Description
Obligation	Social obligations felt or created as a result of the communication activity
Expectation	Raised expectations or unmet expectations for communication
Threats to privacy	The extent of which communication threatens one’s privacy
Thinking about	Thinking about each other and knowing one is thought about
Need to be informed	Knowledge of other people’s activities
Staying in touch	The feeling of being connected
Sharing experiences	How much one feels other people are involved in his/her life, sharing experiences
Recognition	The extent to which each other’s feelings are understood
Group attraction	The feeling of being part of a group

1.2.6 Conclusion

We have reviewed work on measuring emotion as studied by psychologists, the effects of communication media in emotional contexts, and the constructionist view of emotion.

Measuring emotions as done by psychologists (Buck & Mill 1974; Ekman et al., 1980;

Brandstatter, 1983; Picard & Liu, 2007; Purves et al., 2008) would seem to be too simplistic. Physiological measures just distinguish a state of ‘arousal or valence’. Facial expression is controlled and shaped under what circumstances and with what kinds of people are involved. The emotion self-report questionnaire is unlikely to show the subtleties of social communication. These all are insufficiently rich for understanding the complex and subtle subjective feelings experienced by families living at a distance in communicative situations.

Whittaker and O’Conaill’s view (1997) provides evidence for the benefits of video-with-audio mediated communication as opposed to audio-only, in emotional communication contexts. The video-with-audio channel supplies visual information, playing a role as ‘social cues’ and ‘affective factors’ in communicative situations. Studies by Golan and others (2010) demonstrated how viewing ‘facial expression’ on media assists people with ASC to enhance emotion recognition. According to Derks’ review (2008), individuals are very creative in expressing their emotion in the use of communication technology, even in something such as text-based media. The reasons for choosing one communication medium over another are still complex and not simply a matter of cost or information richness. However, it seems reasonable to conclude that the visual information provided by video and audio channel would be powerful for conveying complex and subtle subjective emotional context.

The constructionist view of emotion was considered as a transitory social role interpreted by individual’s appraisal of the situation, relationships with others, and the meanings of lives. The various emotional experiences can also be provoked and changed in different communicative situations and circumstances. Burlison’s (2003) studies demonstrated the value of understanding emotionally supportive skills of communication such as comforting, expressiveness and listening skills and there was no significant difference on helpful supportive communication between the groups of genders, ethnicities and nationalities.

Studies of transnational workers and people in long distance relationships provide an understanding of the problems and alternatives of families who are geographically separated as well as some of the strong emotions that they experience. The ABC-Q provides a useful structure for thinking about these problems and opportunities.

The purpose of this thesis is to understand human states or conditions of mind associated with social situations in the context of that they live in culture. The emotions experienced by people are controlled and shaped interactively in response to various events in their real situation. The constructionist view of emotion is appropriate to the thesis work as it considers: (i) social relationships and social context, and (ii) emotional communication as a skill in communicative situations. In this thesis, emotion is considered as complex and subtle subjective feelings experienced by families in a particular situation. The situation and the complex feelings they have

will influence their relationships in unexpected ways. Sections 1.2.4 and 1.2.5 show that communication technology can help families feel something positive in such situations. In Section 1.3, we will review technologies which propose to do this.

1.3 Technology for emotional communication

In Section 1.2.2, we discussed the value of communication media in terms of providing ‘social cues’ and ‘affective information’. This section is a partial literature review considering a number of communication applications proposed for ‘affective communication’. It primarily focuses on a variety of aspects of social networking and domestic technology.

With the progress of computing technology, the purpose of systems and interactions has changed. Traditional computing appliances were developed for an explicit purpose, for the tasks accomplished within the system. Users approached the system intentionally and followed appropriate activities with attention. Recent interaction systems, however, need less attention and intention of use. Systems can recognise user behaviour in the environment with low salience and intrusion. Ambient technology, calm interfaces, tacit and implicit interactions have an emphasis on natural forms of input and non-intrusive output of the system. Dix (2002) defined incidental interaction as where actions performed for some other purpose, or unconscious signs, are interpreted in order to influence, improve, or facilitate the actors’ future interaction or day-to-day life. In the dark, corridor lights turn on and stay on when there is movement. Hotel entrances open wide when a customer is coming. These are examples of an incidental input to a system.

On the basis of this concept, the literature relevant to the topic of affective communication can be categorised into two approaches. One is relying on intentional communications and the other is on incidental communication appliances. The studies can also be arranged on an axis of the complexity of output represented in the communication. Inventions can be categorised using these two input and output representations as dimensions (see Figure 1.15).

1.3.1 Devices with intentional input

In the perspective of intentional communication, many studies have been carried out in relation to affective experience for family members or couples in different places. Lumitouch (Chang et al., 2001), Lover’s Cups (Chung et al., 2006), Necklace (Go et al., 2000) and The White Stone (Tollmar et al., 2000) are examples of this intentional interaction. Also, the ASTRA system (Romero et al., 2007), PersonCards (Lindley et al., 2009), Collage (Vetere et al., 2009), Piece of Family’ prototype (Stappers et al., 2009), HomeNote (Sellen et al., 2006), and Gustbowl (Keller et al., 2004) are examples of intentional systems.

The LumiTouch system consists of a pair of interactive picture frames (see Figure 1.1). It was introduced as a semi-ambient display with a subtle real-time communication link. When one user touches his or her picture frame, the other picture frame lights up. When a user picks up the frame and squeezes it, the feedback display area illuminates to show that the picture frame has been squeezed. The display varies depending on the squeeze attributes alongside colour mixtures and light patterns of intensity. The system was intended to allow users to develop an abstract form of emotional language.

Lover's Cups, presented by Chung and his researchers, shows another way of implicit interaction (see Figure 1.2). In this system, the act of drinking is used as an input of remote communication with the support of computer interfaces, to enhance drinking with someone they care about in a different place. Through the physical illumination or vibration of the cups, people can feel more connected and might be motivated to drink. This study implies that communication in daily life should not be confined to media forms such as audio or video channel, but could also be extended to more sensual, tactile or other subtle tangible actions.



Figure 1.1 LumiTouch: telepresence picture frame - lights up (left) and is squeezed (right)



Figure 1.2 Lover's cup: tangible, bi-directional interactions

'Necklace (Go et al., 2000)' and 'The White Stone' (Tollmar et al., 2000) were also proposed for a "one bit message" like 'I am thinking of you' (see Figure 1.3). These devices contained temperature sensors. If one holds one's necklace or the stone for a while, the other's object warms up.

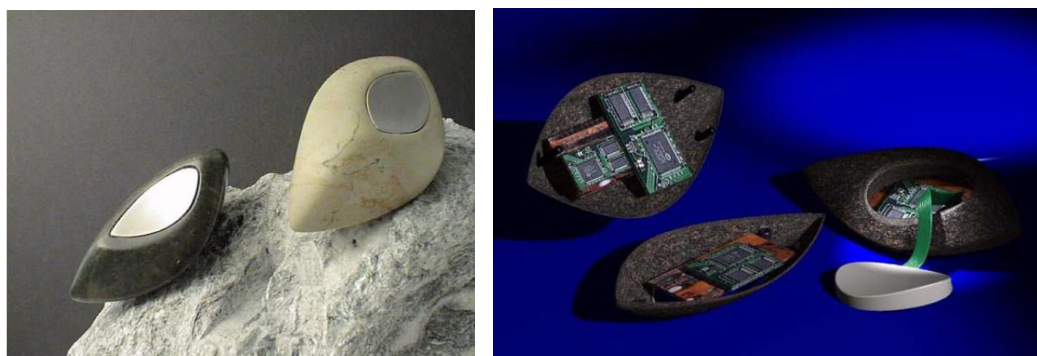


Figure 1.3 The White Stone: making sense of presence by feeling temperature between two people.

The representative forms of LumiTouch, Lover's Cups, Necklace, and The White Stone can be described as indirect, arbitrary, and obscure types of communication output (see Figure 1.15).

The ASTRA system (Romero et al., 2007) was developed for a whole family (See Figure 1.4). ASTRA provides a context for conversation with several picture messages displayed on a home screen device. Photos with hand written messages are sent to this display from a mobile phone. This study was considered as a concept design for social connectedness that allows for many emotional factors with regard to family members' communication. The ASTRA system was measured using the Affective Benefits and Costs of communication questionnaire (ABC-Q) and the factors included 'obligations', 'expectations', 'thinking about', 'sharing experiences', and 'staying in touch'. This will be described in detail in Section 1.2.5.



Figure 1.4 ASTRA: picture-based communication system.

PersonCards (Lindley et al., 2009) is specifically designed for older adults to keep in touch with people who are important to them, based on the exploration of their attitudes to communication technology. It allows for lightweight pictures and handwritten messages to be sent to a frame and displayed within the older person's home (see Figure 1.5). It provides for reflection and for the dedication of time and effort in communication, focusing on a direct connection between older person and the loved one (e.g., a son and his parents) by providing some context for the conversation.



Figure 1.5 PersonCards

PersonCards allows for lightweight pictures and handwritten messages to be sent to a frame and displayed within the older person's home. It focuses on a direct connection between grandparents and grandchildren by providing some context for the conversation. Collage is a similar concept (Vetere et al., 2009) for connecting grandparents and grandchildren. This was proposed as a photos-shared display game for intergenerational interaction play (see Figure 1.6). Photographs and text messages created by mobile phone were sent to the touch screens situated in the two homes: the grandparents and grandchildren. The photos shown on each screen can be used as items to be manipulated by touching for synchronous play.

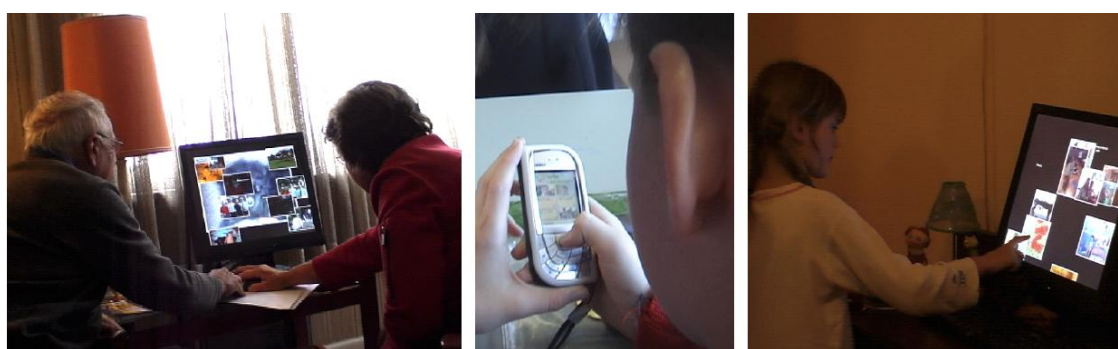


Figure 1.6 The Collage uses: photographs and text messages to a touch screen display.

The Collage differs from the ASTRA system by allowing play with the photos being collocated, by synchronously interacting on touch screens, rather than the sending of photos being used as a common ground for communication.

The ‘Piece of Family’ prototype (Stappers et al., 2009) was another intentional input device. It was developed as an augmented book with a built-in scanner for the elderly in order to send messages to the ‘Family Weblog’. The information could be displayed on the elder’s TV screen.

Another study, called HomeNote was developed for the whole family with the emphasis on exploring the unique affordances and potential value of person-to-place home communication (see Figure 1.7). The design solution was concerned with the support of not only remote situated messaging, but also local scribble. The main distinctive is the deepening of the understanding of home communication and its relationship to the affordances of different kinds of communicational artifacts. Seven types of messaging including ‘calls for action’, ‘awareness & reassurance’, and ‘social touch’ were distinguished in their analysis of usage by participants. In spite of the diversity in the types of messages, the representative form of this communication is very direct and obvious, with the exception of a few forms of scribble shown as abstract (see Figure 1.15).

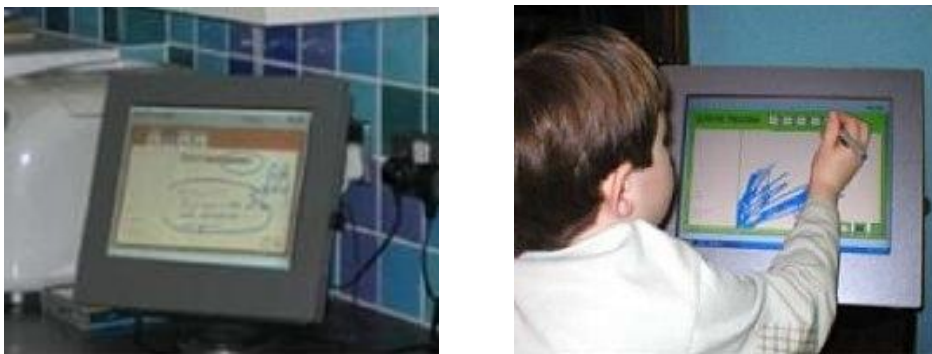


Figure 1.7 HomeNote displayed in a kitchen area (left) and a boy scribbles on the screen.

Gustbowl (Keller et al., 2004) was developed for the specific connection between mothers and absent sons, presented as a pair of bowls for remote family members (see Figure 1.8). Each bowl enables small objects to be placed on it, and shared as visual images to the other’s bowl through a camera built underneath. The objects shown to the other’s bowl were regarded as stimulus for conversation with the sudden strong expression of emotion as serendipity.



Figure 1.8 A pair of Gustbowl prototypes (left) and a number of pictures captured by the Gustbowl (right).

The systems described above, such as ASTRA, PersonCards, the Collage, Piece of family, and the Gustbowl also present very direct and obvious forms of message to the other members of the family, as compared with the LumiTouch, Lover's Cups, and the White Stone systems which represent indirect and arbitrary forms of information. LumiTouch, Lover's Cups, and the White Stone system provide visible and tangible forms of information to be used for communication as nonverbal social cues.

As mentioned before, ASTRA, PerconCards, and Collage are also considered as a kind of picture-based communication system with hand-written messages using mobile phone. In addition, Piece of family and Gustbowl used small pieces of papers or objects as visual information for the receiver to see. Whereas ASTRA and Collage are regarded as awareness systems in order to understand the day-to-day life of other family members, PersonCards and Piece of family are more focused on reflection for thinking about missing grandchildren. These systems are thought of as intentional interaction providing direct, obvious, and concrete visual information (see Figure 1.15).

1.3.2 Devices with incidental input

The second approach discussed here investigates the incidental input of communication appliances. As addressed before in the introduction of Section 3.1, an example of incidental input is that a fridge lights up as its door opens. The User does not consider such input to the system, but the light helps to find food in there.

Tsunagari-kan communication (Miyajima et al., 2005) was developed to enable users to exchange situational cues continuously and interactively through a network (see Figure 1.9). This terminal serves the exchange of data on users' presence and motion cues as an input occurring in connection with the system. In other words, the presence and motion cues are used as an incidental input data to the system without any explicit action from the user. The output device uses lights and

movement of optical fibres at the top of the terminal. The transmitted information is detected by two infrared sensors and an ultrasonic sensor. This allows the receiver to feel, think and interpret the presence of the sender in a subjective way.

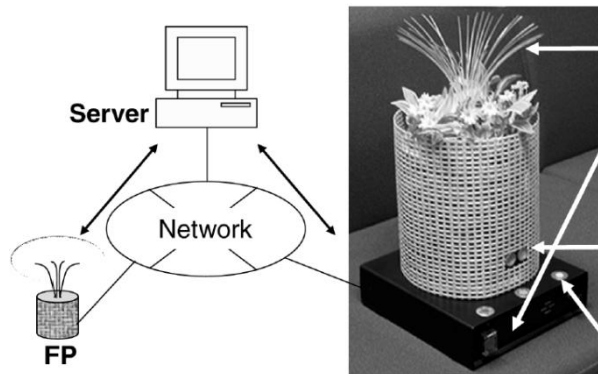


Figure 1.9 Tsunagari-kan communication system

In addition to this, touch signs are detected by three touch sensors, and the receiving terminal makes a sound as an output of the system. This is intended to exchange simple signs between a pair of terminals to be linked by the user's explicit actions which can be thought of as an additional intentional input to the system (see Figure 1.15).

AmbientROOM, proposed by Ishii and Ullmer (1997), aimed to make users aware of indications of digital information using peripheral sense. Even though it is hard to find communication elements here, AmbientROOM can be included as an example, having very incidental input and arbitrary output of communication system, like the Tsunagari-kan system (see Figure 1.15).

VideoProbe (Conversy et al., 2003) was developed as an asynchronous communication device providing random moments as snap photos of daily life. No controls were provided, the snap shot was taken whenever a person posed for three seconds in front of the camera to the remote family members (see Figure 1.10). The VideoProbe was designed using qualitative methods for gathering information of an in-depth understanding of how remote families communicate in real situations focused on what are their particular daily contexts, their relationships, and their specific needs for communication. Then the potential design ideas were explored and generated aiming at the effective ways to interact with the families, comprising children and grandparents, with careful concern about their privacy. The crucial factor of designing the VideoProbe was extremely easy to use. As noted before, when an individual stops moving the body, the VideoProbe takes pictures automatically. This single function encouraged every member of the participant families to actively take part in the field study. The experiment concluded that a series of photographs brought the

families ‘feeling of being together’, and ‘sharing the events of daily life’. The VideoProbe can be thought of as an incidental input system conveying direct and concrete visual information, supplying social cues and affective factors in communicative daily contexts (see Figure 1.15).



Figure 1.10 The VideoProbe

‘The Sound Window’ (Oleksik et al., 2008) was a virtual window presented on a PC screen to receive and send various outdoor sounds into the house (see Figure 1.11). It is a concept of communication design and provides a feeling of background presence between remote family homes. Although it is a concept phase of design, the Sound Window can be classified as an incidental input device providing indirect, arbitrary, and obscure output of information (see Figure 1.15).

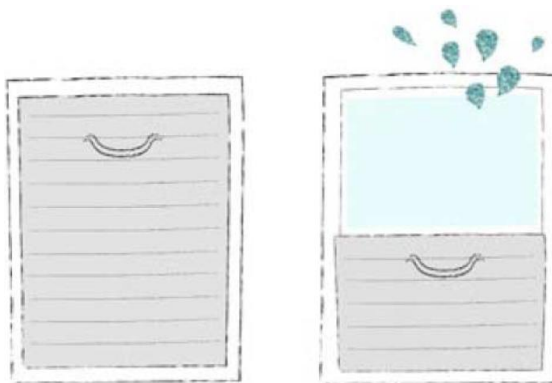


Figure 1.11 The Sound Window

The Family Window (Judge et al., 2010) was developed to support distance-separated families to increase feelings of connectedness. The Family Window provides availabilities and opportunities for sharing daily life using a web camera connected to a Tablet PC (see Figure 1.12). This domestic, video only media space is always-on and links supplying the feature of handwritten messaging on the background of the video, and the ‘time shift mode’ to be recorded and sent to the

receiver's Family Window, in case users were unable to see each other due to the different time zones or busy work schedules. Due to privacy concerns, the system allows users to obscure the sender's window to various degrees. As opposed to the Sound Window, the system provides very direct, concrete, and obvious visual information sharing of daily episodes and gives opportunities for serendipitous awareness information. The Family Window can be regarded mainly as an incidental input device because it is always-on with rich visual information, although the system contains intentional communicative features such as personalised handwritten messages, time shift recording, and blurring the sender's video (see Figure 1.15).

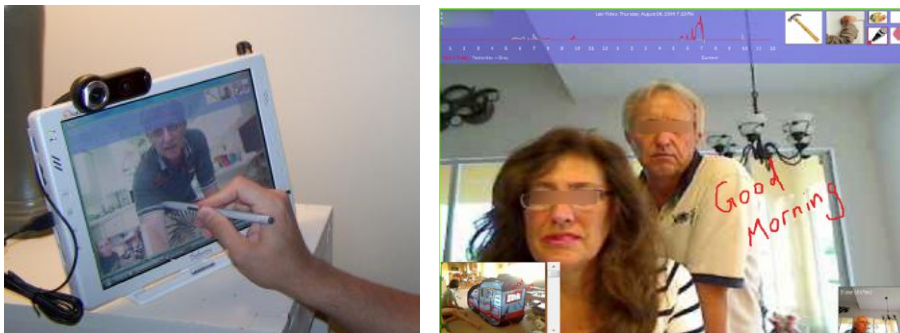


Figure 1.12 The Family Window

The characteristics of something between the incidental and intentional could be explained with MarkerClock (Riche & Mackay, 2007) and Whereabouts Clock (Sellen et al., 2006). MarkerClock aimed at supporting reciprocal care behaviours amongst seniors and was particularly designed to illustrate the needs of social connectedness by enhancing a clock into a communication appliance (See Figure 1.13). The communicative contexts are represented around the clock as concentric coloured spirals, each illustrating a different senior user. This appliance supports active communication by using symbols, and passive communication by sharing activity values. Passive communication is a trace of motion captured by a camera that does not require explicit user actions. The symbols available for active communication are displayed on the side of the clock, and users are expected to build their own meaning and extend the available vocabulary using combinations of symbols.

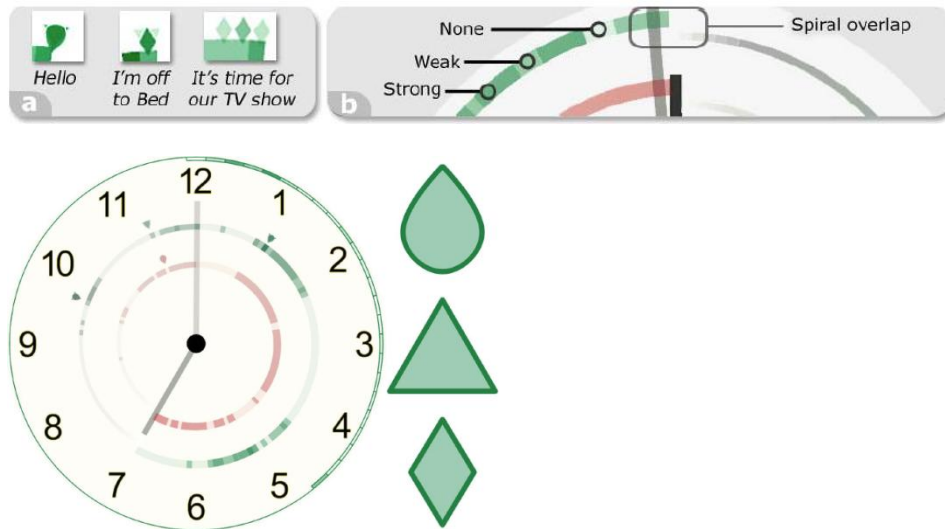


Figure 1.13 Examples of a) user's codes, b) user's motion trace (above) and MarkerClock showing two connected users (below)

Whereabouts Clock supports family co-ordination and the more emotional aspects of family life (see Figure 1.14). Family members' current locations are displayed through mobile phones as one of four categories ('Home', 'Work', 'School', 'Out'), and text messages are available to be sent to the clock. Limiting the level of information to location on the clock provides a degree of privacy that was intended to focus on sharing rather than intrusion. Automatic location technology provides incidental information to the clock but users are allowed to send text messages from their mobile phone to the clock at home when more precise information might be needed. They are also allowed to control their particular locations as one of the four available labels intentionally by using their mobile phone to register. For example, one of the participants in this study assigned both her boyfriend's house and her own family house as 'Home'. Another participant, the retired father, regularly used his mobile phone to register himself as either at 'Work' or 'Home' depending on what he was doing at his home.



Figure 1.14 Whereabouts Clock: family member's location; home, school, work, out

The Whereabouts Clock can, therefore, be thought of as having both incidental and intentional features of input information. The visual information of the location and the text messages on the clock appear to be very direct and obvious. However, this device was used in a more arbitrary way of representing since the location information is limited to just four zones. The information could be changed and viewed for other family members by the user's option in exceptional cases. Therefore, the clock is considered as an activity of a situation, not the exact location of the user. This could be positioned somewhere between the direct and the obscure output of the communication appliance.

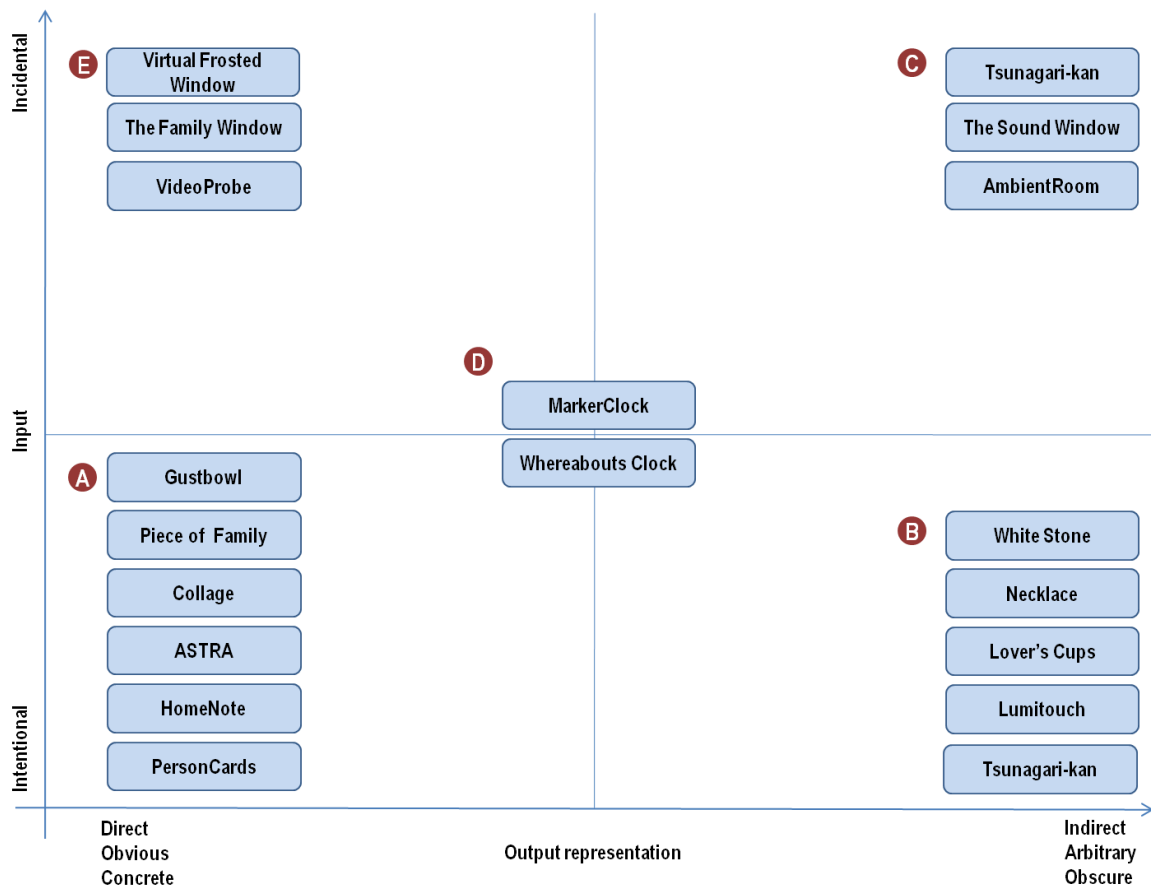


Figure 1.15 Dimension of communication representation

Figure 1.15 represents the position of code of the designs of communication technology discussed on the two dimensions, input (intentional or incidental) and output (direct or indirect) of devices.

While a large number of designs have been proposed, few communication designs have been used for any length of time. Design of communication technology may need to focus on particular needs for a particular target group in a particular situation.

1.3.3 Conclusion

Many aspects of affective communication devices have been reviewed. A number of 'intentional' affective communication appliances provide 'visual information' as 'social cues' and 'affective factors' including tangible forms such as shapes, lights, colours, and even temperature, and concrete information such as photographs, personalised text messages and items with meaning.

Some way of bridging the gap between the intentional and incidental inputs to communication systems might be a relevant design goal. However, intentional technology can be

thought of as more appropriate for the designing of technology to connect families in a particular situation than incidental input of communication technology. It could be presumed that the particular target group of people in this thesis might need more positive and direct information rather than arbitrary and indirect communicative contexts because they may have complex and subtle feelings day-to-day in regard to communication and separation. In other words, by contrast with abstract forms, an intentional input system conveying concrete and precise information may be more important in some ways of communication in order to minimize the possibility of misunderstanding and to enable everyone to interpret in a common way. Consistent with this idea, Romero and his colleagues also suggested that “abstract information (e.g., symbolic icons or text labels) regarding the availability, status or activities of their family would not be sufficient for them to create a feeling of connectedness.” (Romero et al., 2007, p.301).

Another reason for a preference for intentional input systems is because of privacy as an issue of concern when communicating with members of families living at a distance. Incidental technology is likely to be regarded as a monitoring system and viewed as overly privacy-invasive and intrusive between members of families. For example, in the study of Digital Family Portraits (Mynatt et al., 2001) providing an awareness system of senior adults’ daily activities, privacy was a critical issue. Mynatt and her colleagues conducted interviews with participant families to identify common ground for sharing and receiving significant information. It was decided that the information would be used in the forms of ‘reciprocal displays’ and to provide seniors with a copy of the portrait just like it appears to their family members.

As mentioned in Section 1.2, consistent with the constructionist view, ‘emotion’ in the thesis context is thought of as ‘subjective complex and subtle feelings’ the target group of families will experience in their specific social relationships. These affective factors in Table 1.1 will be significantly useful for the designing of technology and also for assessing the system to be developed in the thesis work. In addition, an intentional input system of affective communication appliance is considered regarding privacy and obligation and so on. However, it is still unclear about the real value of these technologies discussed in Section 1.3.1, particularly from the point of view of three-generation families in a specific situation. There are still questions about what kinds of affective factors involving communication technology can support the target families’ relationships and what they really need in their daily lives to be considered.

1.4 Structure of thesis

An appropriate method is needed to understand the complex, dynamic, and subtle deep feelings experienced by families with regard to communication and separation. Qualitative research methods have been selected as the appropriate method for doing this in the real situation of three-

generation families living at a distance. For this, a probe study will involve members of three-generation families talking about their experiences of separation and communication using “emotional probes”. Six participants from these families living in the UK and three living in South Korea are recruited and interviews are conducted. Through the analysis of the data using grounded theory analysis, codes will be illustrated with the relevant quotes in Chapter 2.

For inspiring more direct design ideas for communication devices, an additional analysis will be carried out to identify themes for design in Chapter 3. Two design sessions are conducted for generating ideas to illustrate and clarify the needs of the families and six design themes emerging with the quotes will be viewed as a rich way of expressing possible requirements for design. The themes, ‘Sending love’ and ‘Reflection’ will inspire the device of sending asynchronous media gifts based on - TimelyPresent.

Chapter 4 describes the design of TimelyPresent, a very simple to use device with which families can create gifts with special meaning to stimulate conversation and to act as long lasting keepsakes for reflection. The Archos9 is selected as the platform, resembling an electronic photo album and providing touch interaction. The key features of this design are the metaphor of a present delivered after a time delay so that the present arrives at the same time of day that it was created.

Chapter 5 explains a field study of TimelyPresent aiming at understanding the problems and opportunities provided by the participants trying out TimelyPresent and telling us about their experiences using it. Four participant families are recruited and eight participants are interviewed after the first and second months of using TimelyPresent. In each interview, open questions are asked about how they felt about making and receiving presents and changes in the relationship with remote family. Logs recording the traffic of use of TimelyPresent and the contents of presents created by the participants will be also analysed.

Chapter 6 concludes with a description of the contribution of the thesis. These are: (i) a novel demonstration of how asynchronous communication can be used to connect family; (ii) pointers as to where various methods may most effectively be used in design.

CHAPTER TWO. PROBE STUDY

2.1 Introduction

As was seen in Chapter 1, Section 3, many communication devices have been proposed to connect absent loved ones. Yet we still know little about the real value of this technology, especially from the point of view of the three-generational family. To do this we needed to find an appropriate method to understand deep feelings and real dialogue.

Chapter 1, Section 2 reviewed quantitative methods used to measure emotion. It was concluded that these methods were insufficient to understand the subtle and complex emotion involved in families living at a distance in a specific situation with regard to communication and relationship. In this thesis, we will adopt a qualitative approach. The method being considered here is to systematically identify themes that emerge from data with regard to family members' emotional needs and the practical constraints of communication technology. The aim is to formulate hypotheses inductively, based on natural and rich data, in order to inform design. It uses qualitative data from non-intrusive and non-directive interview techniques. Interviewees are not led by any specific communication technology or any intentions for designing. The next section (2.2) reviews methods for eliciting design ideas as qualitative data. Section 2.3 then reviews methods for analysing qualitative data involving grounded theory analysis with three main types of coding technique including content analysis. The Probe study method, "emotional probes" combined with interviews adopted here is described in Section 2.4. Emotional probes are formulated to trigger complex, dynamic, and subtle deep feelings experienced by families with regard to communication and separation. Section 2.5 describes three steps of analysis adopted on the qualitative data derived from the Probe study using grounded theory analysis. Emerging codes and themes are also illustrated with relevant quotes. Section 2.6 discusses the overlap between the affective factors (Romero et al., 2007) and the codes in this study, the effectiveness of the Probe method, and the positioning of the coding method used here.

2.2 Review of methods for eliciting qualitative data in a design setting

Gaver and his colleagues proposed the "Cultural Probes" (Gaver et al., 1999; Gaver et al., 2003; Gaver et al., 2004) with the idea of a design-led approach to empathetic understanding of user context with engagement (Carroll, 2000) and it was developed for gaining more insights in subjective and playful ways. It was stated that "probes are collections of evocative tasks meant to elicit inspirational responses from people - not so much comprehensive information about them,

but fragmentary clues about their lives and thoughts.” (Gaver et al., 2004, p.53).

This approach was created for the research into new technologies taken from the traditional ways of artists or designers rather than the science-engineering based approaches (Gaver et al., 1999). It was thus not focused on ‘accurate analyses’ or ‘carefully controlled methodologies’, but rather aimed at discovering aesthetic and cultural implications of design with more informal interpretation and chance observations, in order to provide opportunities for broadening new spaces for designing technology with new playful and social forms. Therefore the data derived from the probes was considered as inspirational information in order to stimulate designers’ imaginations rather than for analysing and defining a set of problems to be solved (Gaver et al., 1999).

As cited above, the key characteristics of the probes are subjective and playful forms of techniques to trigger hidden feelings or thoughts experienced by people in their social culture and to interpret them as design ideas for further development. The data from the participants with a set of tasks is likely to provide multiple possible interpretations, and the way of interpreting them is also not precisely or systematically understood due to the open nature of the process. Any interpretation of the data gained in this way could be considered as thus somehow uncertain and ambiguous. Although ambiguity could be regarded as problematic, unclear or frustrating, it could also be thought of as intriguing, exploratory and delightful. Gaver and his colleagues (Gaver et al., 2003) argued that accepting such ambiguity provides a number of advantages for designing. Firstly, it helps designers become involved with users with issues without any concern about the limit of the responses of the users. It is because a number of possible meanings could be contained within the issues. Moreover, it enables the designers to express their point of view through finding their own interpretations based on the different socio-cultural background of the users. Lastly, ambiguity can widen the technical limitations by supplying the foundations for interpretations of users to leverage them.

As an example of the use of cultural probes consider the project, Projected Realities (Gaver et al., 1999; Gaver, 2002). This was designed to enhance the presence of the elders living in a large Dutch housing estate, the Bijlmer. The sites were viewed as dangerous and unpleasant areas to live but Gaver and his colleagues found some attractions in the complex physical and cultural environment. In order to familiarise themselves with the district and get inspiring ideas from the elders for designing a system, the cultural probes were used containing postcards, maps, camera, photo album, and media diary (see Figure 2.1 and Figure 2.2). The postcards had images on the front and questions on the back, e.g., “Please tell us a piece of advice or insight that has been important to you”, “Tell us about your favorite device”. These questions were provided concerning the elders’ views of their lives, environments, and technology. The maps also contained inquiry asking about their environment, such as “Where have you been in the world?”, and where “They would go to meet people”. The disposable camera was also included with a list of requested

pictures including “Your home”, “The first person you see today”, and “Something desirable”. The photo albums requested the seniors to tell their story using some of the pictures involving the past, their families, present lives, or anything meaningful to them. Finally, the media diary was used for the elders to record their television and radio use such as what they watched, with whom, and when. An important element of this process is that the elders took the probes away with them so that they could think about them for an extended period and reflect on their responses.



Figure 2.1 A postcard: what is your favorite device (left two), Photo album (right)



Figure 2.2 Camera (left), A map: if Peccioli were New York (centre), A returned map showing zones of safety and fear in the Bijlmer

Through an understanding of the returned probe materials, three different sites on the estate were selected and design scenarios were created (Gaver et al., 1999; Gaver & Hooker 2001) and then the visible elements of the completed system, Sloganbenches and Imagebank (see Figure 2.3) were developed (Gaver et al., 2003). The awareness information systems were designed to allow the elders to spread and share their opinions within and also to the outskirts of the place. The Sloganbenches were situated in local walkways and functioned as public furniture with containing ‘electronically controlled fabric scrolls’ built into the backs which showed handwritten slogans scribbled by the elders in the area. The Imagebank was designed to place near a traffic signal close to the area that consisted of five monitors built into a wood-veneer casing. The Imagebank showed parts of images obtained by the elders to represent their lives. The clips of images were connected through a wireless network therefore the elders’ attitudes towards their lives represented by the slogans on local Sloganbenches could be summed up by the images displaying on an individual Imagebank (Gaver et al., 2003).

Gaver and his colleagues explained that Projected Realities used the cultural probes with ambiguity in a number of ways. The slogans with images were presented with little context therefore the interpretation of the attitudes the elders reflected towards their lives was not clearly understood by viewers. The mapping between slogans and images was unlikely to be easily recognised, and even sometimes contradictory images were placed side by side on the Imagebank. Furthermore, the Imagebank resembled an extended television set that could be considered unusual. The Sloganbenches also made an uncomfortable tension between sitting and viewing because the position of sitting on the bench is likely to conceal the slogan. However, the elders made a balance between the familiar and the strange while encountering the unusual features of the objects for a week trial, and the Sloganbenches and the Imagebank (see Figure 2.3) appeared to be attracted by the ambiguity to engage with the system (Gaver et al., 2003).



Figure 2.3 Sloganbench (left) and Imagebank (right)

Although it is difficult to evaluate the results of Gaver’s probes due to the reflection of

many possible meanings of influence and constraint, Gaver and his colleagues (Gaver et al., 1999; Gaver et al., 2004) report that the Probes provided the researchers with feelings for people, mixed observable facts with emotion responded, that inspired design ideas for technological possibilities, and provided unexpected new insights into the lives without any specific expectation.

Another example of cultural probes was used for the development of a system that allows the reconnection of a mother and son who live apart (Keller et al., 2004). Keller and his colleagues applied cultural probes as a communication tool with a group of parent-participants for obtaining insights into their needs of emotional communicative context in their daily life at home. Keller's cultural probe contents were small diaries, postcards with assignments, markers, pens, and a photo camera (see Figure 2.4), that were similar to Gaver's cultural probes.

However, in Keller's study, the participants were invited to a design session and given the probe packages and completed the assignments in the probes using some of the materials. This process was considered as leading up to structuring the in-depth group discussions. The participants expressed their daily experience of life and their needs in the context of emotional communication in their home environment with their sons in group discussions. In the group session, the researchers and the parents focused on the need to reconnect the parent-son relationship and the first years of sons being away from home were thought of as remarkable, as being independent for sons and a feeling of the home being empty for their parents.



Figure 2.4 (a) A cultural probe contents and (b) a group design session with the parents.

They concluded that relations between the parent and son should be developed gradually into a form of 'friendship' as equals without controlling their lives. The participants agreed that an existing but new communication device could help sons convey their emotional feelings to their parents. Also one of the emotionally rich, reassuring moments was considered as giving an impact to the development of a system. One of the questions involved in the cultural probes was about

‘what the mothers missed most’. The answer was the everyday moment when their sons would come home and say, “Mom, I’m home!” One of the participants said, “They didn’t know how valuable it was until it was gone”. The anecdote led the researchers to a specific design idea with a very simple but meaningful interaction between mother and son. Using these probes, Keller and his colleagues developed a pair of interaction systems, *Gustbowl* for leveraging the friendship-based relationship between mother and son without the feeling of obligation. More details can be seen in Chapter 1, Section 1.3.1 (see Figure 1.7).

While Gaver and his colleagues visited the older participants and explained their probe packages individually for improving the environment, Keller’s use of cultural probes was for understanding the users’ needs of emotional communicative context between mother and son in general. Gaver and his colleagues said that the probe responses were not analysed, but used for researchers to learn about the elders living in the community and their attitudes towards life in an ambiguous way. However, Keller and his colleagues used the cultural probe for in-depth discussions with the participants in order to find and clarify their needs of emotional communication and inspire more clear ideas for designing the system.

Another example of cultural probes was used for designing forms of contemporary digital jewellery. Wallace’s probes (Wright et al., 2008) were designed with the focus on personal significance such as histories, biographies, and life experiences, in order to derive insightful and inspirational ideas from people. Wallace drew an individual into conversation directly with a set of tangible object stimuli. The set of probes included a set of photos, a book of fairy tales, prizes, personal treasure, and a three-dimensional model of a house with a message, and self-tree (see Figures 2.5 and 2.6). For example, the 1st and 2nd prizes accompanied questions or messages such as, “Please tell me what you would like to receive 1st prize for” which was intended to trigger the proud moment of the participants, a past achievement, or a current goal yet to be achieved as an element of self-esteem and self-worth. The personal treasure was for asking a participant to make indentations of shapes or forms of their personal treasure. Wallace used this for obtaining an impression or trace of an object within her jewellery practice. The wooden model of a house was to ask the participant to tell about what home means to him/her. The self tree was for telling about people who have made her who she is, which was designed to find the self-identity and the close or strong relationship. They all were designed for offering opportunities to intrigue, action, reflection, and imagination in order to answer questions, tell stories, and even create images on aspects of significance for participants (Wright et al., 2008). There were no right or wrong answers and the participants were free to respond to any of the probe materials that felt right for them. There was also either partial completion or even no response at all to some of the probes. Wallace then met the participants to collect the completed probes and to talk through all the meanings and stories that people shared with her.



Figure 2.5 Prizes (left), personal treasure (centre), house model (right)

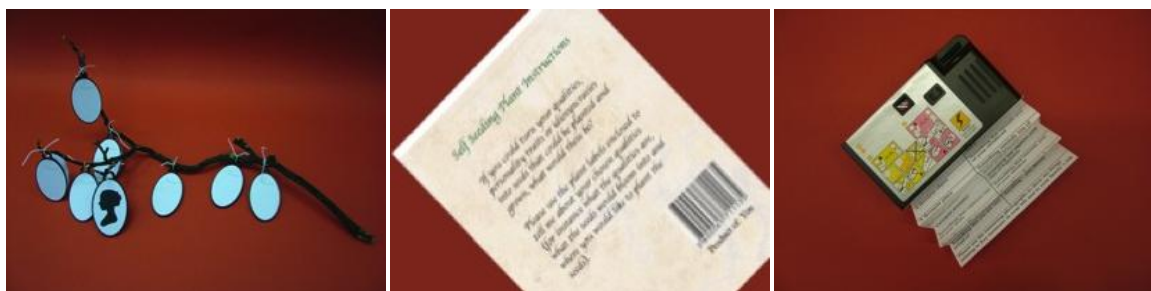


Figure 2.6 Self tree (left), fairy tale (centre), camera (right)

Using the concept of digital jewellery, Wallace’s work was aimed at producing an intimate and sensual object that was engaged in a ‘body-centric’, wearable, and art/craft form of outcomes and combined with a personally unique relationship with its specific meanings. Wallace used the materials generated by her participants in two ways. First, she used the photos, drawings and so on as resources for design such as size, shape, pattern and colour. Second, she took them to engender reflections and recounting with the individual, which was further data for the detailed design of the piece of object and interaction scope (Wright et al., 2008; Olivier & Wallace, 2009).

Using these probes, Wallace analysed the data derived from the participants using a qualitative method (Charmaz, 2006) and designed a conceptual digital jewellery piece, called Blossom (see Figure 2.7). The Blossom was created particularly for a participant in Wallace’s research, named Ana (fictional name). Olivier explained about the Blossom that “it is a piece that is worn cupped in the hand, allowing the form to sit between your fingers. It is not a piece made to be worn as accessory, as denoted by the purposeful manner in which the piece is worn; it is a piece to wear when you have the time to reflect and contemplate the experiences, meanings and human relationships it reflects” (Olivier & Wallace, 2009, p.211). Blossom was made of wood, glass, silver and vintage postage stamps.

The form and digital potential function of the Blossom is considered as Ana’s (in the UK)

special and strong relationship with her grandmother in Cyprus. Ana's family is Greek-Cypriot but she is a British citizen, who is connected with Cyprus, her members of family, the landscape, and the culture. Although her grandmother died, Ana still felt her love of flowers in Cyprus and ability to grow them using this piece of art. Wallace designed the Blossom with the symbolic words Ana repeatedly mentioned in the interview (Olivier & Wallace, 2009).



Figure 2.7 Blossom, Jayne Wallace

Compared to the previous two examples of using cultural probes, Wallace's probes emphasised understanding more specific and unique personal significance for designing a contemporary piece of art work. Gaver and his colleagues' approaches emphasised gathering data from people for providing opportunities to discover new forms of pleasures. In both cases the interpretation of the data was unsystematic. Gaver and his colleagues focused on discovering ideas from people leaving an unseen gap between the data obtained from people and the system developed by designers or researchers. This might be thought of as creative design work and the gap could be explained by a 'creative leap' that will be described at the start of Chapter 3, however there is room for something more systematic, and in this thesis we will use techniques for the analysis of qualitative data from the social sciences to at least partially fill this gap.

Table 2.1 below describes the summary of the series of features of the various probe methods reviewed above. First of all, the most significant feature of the probe method is 'creative and attractive stimuli'. All the three evocative probe tasks by Gaver and his colleagues, Keller and his colleagues, and Wallace were used for gaining insights from people in a subjective and playful way. In this study, attractive emotional probes are used for eliciting deep feelings experienced by families living at a distance.

Second feature of the probe method considers that participants take probe activities away and reflect on them for an extended period. Gaver and his colleagues posted the probe packages to their participants and left them for a period of time for them to think deeply and then respond in their probe activities. While Keller and his colleagues invited their participants to their laboratory

and asked them to complete their given probe assignments, Wallace gave participants her probe activities in person (face to face) and explained about each probe activity in detail and then the participants took their probes away. In the case of the ‘personhood’ project, the participants kept their probes for two weeks for the reflection on the probes. In this Probe study, there are two home visits with the participants. At the end of the first interview, a box of ‘things to do’ is left with the participant as a stimulus for telling us about their stories in the second interview. The family keeps their probes for about a week.

Thirdly, only Keller and his colleagues asked their participants at the design session to have an in-depth group discussion about their needs of emotional communication in their daily home contexts. In this probe study, there is no design session with our participants.

Fourth feature of the probe method involves the use of probe responses, e.g., the photos taken, as a resource to inform design. Gaver and his colleagues used the returned probe materials from the elder participants in order to inform design, such as the specific three sites and visual elements derived from their participants for using and deploying the system designed. As described before, Wallace used the probe responses, such as physical shapes, patterns or materials, to inform design of the piece of artwork. In this study, the probe responses were not used to inform design. Examination of the elements of the probe responses was not found to be useful (see Discussion, Section 2.6.2). However, it is clear that that the probe activities were critical in eliciting the stories they told us, that is, the interview data that is the basis of the GTA.

Interview data used to inform design is the fifth feature of the probe method. Keller and his colleagues had an in-depth discussion with the participants and the specific stories guided the researchers to a specific design idea with a simple but meaningful interaction system. Wallace had an interview with participants and the stories they told her were used for detailed design of the piece and the interaction space. Similar to Wallace’s stories, the families in this study told us about their feelings as interview data are used to inform the design of technology to connect three generational families.

None of the above studies systematically analysed what the participants said. In this study we used grounded theory analysis (GTA) to do so. GTA is reviewed in the next section (Section 2.3).

In this Probe Study, a box of ‘things to do’ was left with participants at the end of the first interview as a stimulus for conversation with people in the second interview (see Section 2.4 Probe study method). The stories they told us were then transcribed and subjected to grounded theory analysis that will be described in Section 2.5. The next section (Section 2.3) will review methods for analysing qualitative data.

Table 2.1 Summary of the features of the various probe methods reviewed above.

Features of probe method	Gaver	Keller	Wallace	This study
Creative and attractive stimuli	√	√	√	√
Participants take probes away and reflect	√	.	√	√
Participants use probes in design session	.	√	.	.
Probe response (e.g., the photos taken) used to inform design	√	.	√	.
Interview data used to inform design	.	√	√	√
Systematic analysis of qualitative data	.	.	.	√

2.3 Review of methods for analysing qualitative data

Section 2.2 reviewed methods for eliciting qualitative data associated with feelings experienced by people, for use in a design setting. The methodology of cultural probes was developed from the traditional ways of artists or designers, so that the approach is aiming at discovering aesthetic and cultural implications of design with more informal interpretation of data obtained from people (Gaver et al., 1999). In this thesis, the analysis of the qualitative data obtained in this way will be analysed systematically using social scientific methods for interpreting qualitative data.

For analysing qualitative data, content analysis is commonly used in social science for evaluating human communication media such as books, films, newspaper articles, and advertisements (e.g., Mayring, 2004). Ole Holsti (1969) defined content analysis as “any technique for making inferences by objectively and systematically identifying specified characteristics of messages”. Content analysis is thus a type of quantitative approach of coding large amounts of textual information in order to identify the properties, patterns and trends in data sets (e.g., the frequencies of most used topics). The approach is comparative analysis but the sections of textual information are categorised and placed by initial codes emerging or given topics. When the analysis is completed, the number of sections of text is counted in a statistical and objective way. To do this the researcher has to have a pre-conceptual framework for analysing the data. Coding data by topic is unlikely to be completely clear, so that the findings may be controversial. The method gives quantitative results that can be compared to other results of categories. In order to examine the

general tendency of data, content analysis can be helpful and may be applied to both quantitative and qualitative research depending on the characteristics of the data (Mayring, 2004).

Memoing has been suggested as another analysis technique for qualitative data (Glaser & Strauss, 1967; Charmaz, 2006). Memos represent the written forms of an individual's abstract thinking about data, outcomes of analysing, such as conceptual labels. Memoing helps the process of conceptualising incidents, refining them and keeping track of ideas in generating theory. It also assists to increase the level of abstraction of the initial codes with the data. While proceeding with initial coding (see Section 2.5.2), memoing was used as an effective tool to stop and write emerging ideas while examining the data to be broken down into units of meaning or incidents. In Section 2.5.4, memoing was particularly helpful for sorting or grouping numerous sections of text, arranging and comparing similarities and differences in detail, and developing the codes into categories early in the axial coding process.

As a main method for analysing qualitative data, grounded theory (GT) was proposed for this study. GT was developed by two sociologists Barney Glaser and Anselm Strauss (Strauss & Corbin, 1990; Charmaz, 2006; Corbin & Strauss, 2008). It is a systematic qualitative research methodology emphasising the generation of 'theory' from qualitative data gathered during the research. This continuous comparative approach is inductively derived from the study of the phenomenon, aiming for not "truth" but to conceptualise what's going on by using rich empirical data.

One of the most distinctive rules in GT is that the researcher does not have to have hypotheses in advance. Compared to many other scientific disciplines, even those using qualitative data, hypotheses are prohibited in GT. This rule of method challenges the traditional model of study, where the researcher has a theoretical framework in mind, and only then applies the model to the studied phenomenon. Instead, GT gives researchers the freedom to explore and generate new ideas and concepts explaining human behavior (Glaser & Strauss, 1967). That is, the researchers may start into the research area where they want to understand and find out about particular interesting parts from the data, however, the researchers do not know precisely which particular issues they expect to occur. Rather, GT guides the researchers by providing a process for generating a conceptual level of understanding of some topic in a data-driven manner. It is for formulating the theory and therefore produces potential hypotheses for further study (Glaser & Strauss, 1967).

In GT, the element of analysis is the incident or the unit of meaning (Glaser & Strauss, 1967). There are commonly several hundred incidents analysed in a GT study and each participant generally reports many incidents. When comparing many incidents in a certain area as being 'saturated', the emerging concepts and their relationships can be regarded as being real probability statements. GT can be presented as a "well-codified" set of propositions or as an "ever-developing"

theoretical discussion, using conceptual categories and their properties, illustrating the reality of social interaction and its structural context (Glaser & Strauss, 1967).

The approach starts from the data gathered, e.g., interview transcripts, and interesting points are marked using a series of codes, obtained from the rich text data. The codes are then clustered into corresponding concepts at a higher level of abstraction in order to make them feasible. From these concepts, with following data, categories are composed that are the principle for the generation of a “theory”. Coding stands for the procedures where “data are broken down, conceptualised, and put back together in new ways” (Strauss & Corbin, 1990, p.57). Analysis in GT, according to Strauss and Corbin, is composed of three major types of coding: (a) open coding, (b) axial coding, and (c) selective coding.

(a) Open coding involves ‘identifying concepts’ in the process of breaking down the empirical rich data, examining, comparing, and connecting the resembling concepts together into categories. Conceptual labels, concepts associated with similar categories alongside with identifying the dimensions (domains) and properties (attributes) of the categories are a significant part of this stage of analysis (Strauss & Corbin 1990; Adams et al., 2008).

(b) Axial coding relates the data back together in new ways by making connections between a category and its subcategories. This coding identifies high-level phenomena involving key concepts and events, alongside with conditions. It is regarded as building a substantial and close texture of relationships around the axis of a category (Strauss & Corbin, 1990; Charmaz, 2006).

(c) Selective coding is the process of selecting the core category, regarded as the central phenomenon that is systematically related to all other categories that are integrated. This whole iterative process often needs further refinement for filling the gaps between some categories to be defined at a higher level. This coding analysis is validated by constant comparisons with the raw data to confirm or prove conclusions (Strauss & Corbin, 1990; Adams et al., 2008).

As opposed to Strauss and Corbin (1990), Glaser (Glaser & Strauss, 1967) has outlined a more wholistic and flexible method of GT. Glaser claims “all is data” to be able to be analysed in GT, comprising not only interview or observational data but also surveys or statistical analyses or literature data from science or media. Glaser emphasises the creativity of the individual researcher within a frame of stages, while Strauss is more interested in validation criteria and a systematic approach. However, we will adopt Strauss and Corbin’s coding methods. This is because the aim of analysing qualitative data is to understand the deep feelings experienced by families in a systematic and rigorous way and to generate “theories” of emotions with complexities and subtleties from the whole perspective of three-generation families. The results of the analysis will be described in Section 2.5. The next section will explain about the Probe study method, involving four emotional

probes and interviews conducted with eight participants.

In Chapter 5, transcripts derived from the field study of TimelyPresent were analysed. Analysis of these data was less open ended than that of the data collected in the emotional probe study. For this reason Thematic Analysis (Braun & Clarke, 2006) was used. One of the benefits of thematic analysis is its “flexibility”. Braun and Clarke (2006) argued that compared to other qualitative methods, that are “tied to”, or “stemming from”, a specific theoretical or epistemological position, thematic analysis is essentially independent of theory and epistemology. Thematic analysis is, therefore, more applicable in Chapter 5. The process followed will be described in Section 5.3.3.

2.4 Probe study method

A probe study was conducted where members of three-generational families, where at least one person is geographically separated from the others, talk about their emotional experiences. Two interviews were conducted with participants in their own homes, separated by more than a week. This section will describe two interview techniques to be designed with emotional probes and carried out with eight participants. Section 2.5 discusses the analysis of these interviews.

2.4.1 Ethical approval

Ethical approval for the probe study was obtained from the University of York, Department of Psychology Ethics Committee based on the consent form prepared for the participants (see Appendix 1). This made clear that the interviews would be recorded and that if they felt that no longer wish to take part at any time after signing the form, they could just say so and we would stop and destroy any data collected. The small gift referred to in Appendix 1 was a £10 Marks and Spencer voucher.

Interviews were audio recorded and anonymised at the point of transcription English names were used as pseudonyms even when the participant was Korean but the gender of the participant was preserved. All the information was stored securely. All the names given in this thesis are fictional.

2.4.2 Procedure

2.4.2.1 Interview 1

The procedure for the first interview is set out in Figure 2.8. Participants were first asked about their day-to-day contact with their family. A family map was drawn identifying family members and how they typically communicate. This technique is a natural way of gathering data with open-ended questions, for example, ‘I just want to listen to the story of your family and how

you communicate with each other. If you don't mind, I will write your name on the centre of this paper. Is that ok?'. Each family member was then added to this diagram (see Figure 2.9 for example).

Next, to sensitise them to the types of technology we are interested in, they were shown pictures of four prototype communication devices (Lover's Cups (Chung et al., 2006), LumiTouch (Chang et al., 2001), HomeNote (Sellen et al., 2006), and Whereabout Clock (Sellen et al., 2006)) (see Figure 2.10 and Figure 2.11). Pogo, an early mobile device, was also introduced as a wishing prototype (see Figure 2.12). The participant was asked, 'What do you wish this communication device could be? How do you think it would be working?' Finally, the probes were introduced and left with them.

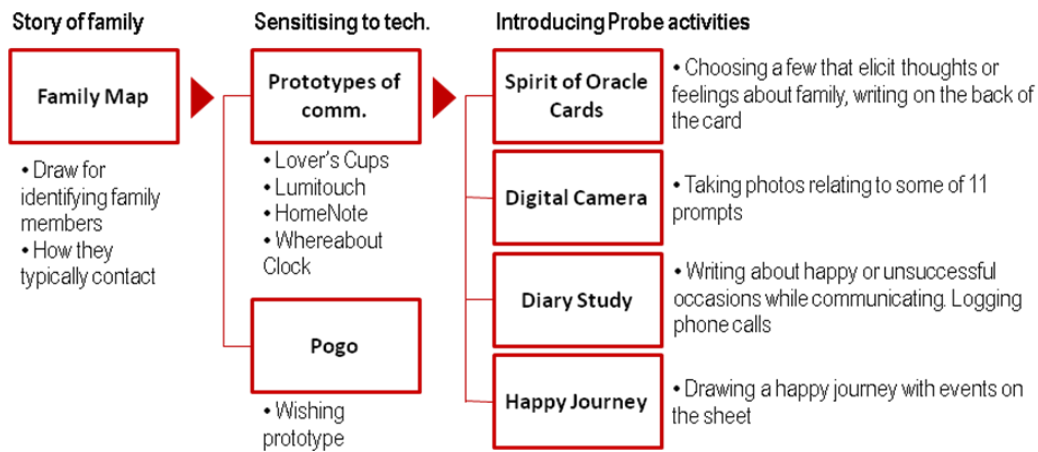


Figure 2.8 First interview procedure including probe activities.

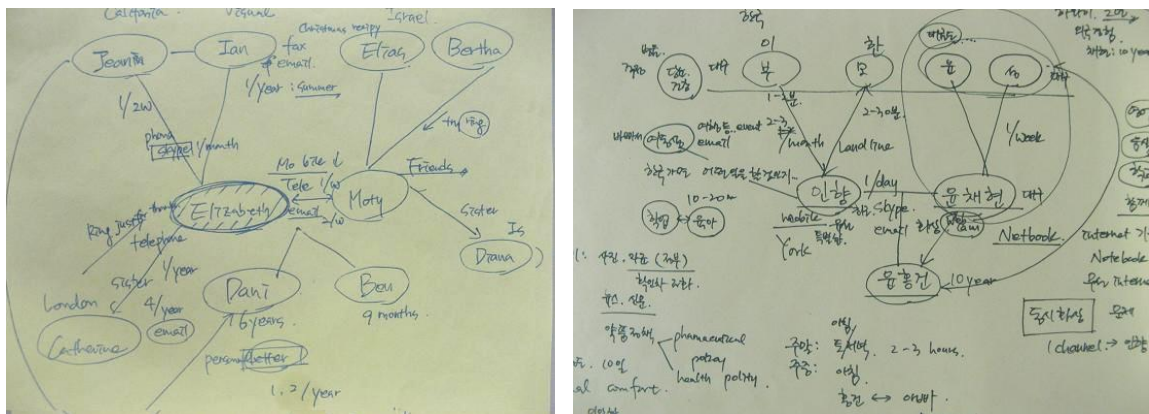


Figure 2.9 Family map: a. English map, b Korean map



Figure 2.10 Prototype communication devices for sensitising to technology: a. Lover's Cups, b. LumiTouch, c. HomeNote



Figure 2.11 Prototype communication devices for sensitising to technology: d. Whereabouts Clock

2.4.2.2 Interview 2

More than one week after the first, the second interview was conducted. The probe responses were the stimulus for conversation. Participants were asked to talk about what they had done with the probes, focusing on how and why, rather than what and who, in order to get more emotional context. Some probe activities were carried out during the second interview.

The interview was designed to be natural and non-intrusive. If any signs of distress in the participants were recognised, the conversation was steered to another topic. All participants signed a consent form (see Appendix 1: Information for Participants and Consent Form) stating that they understood that the conversation was recorded and that they could stop at any time and ask to have the recording destroyed. No participant did this. Care was taken to ensure that the participants were not upset at the end of the interview. Interviews were audio recorded and transcribed. Transcriptions were made anonymous as the first step in coding and analysis.

2.4.3 The Probes: Box of ‘things to do’

The probes were presented to the participant in an attractive "box of things to do" (see Figure 2.12a and Figure 2.12b) participants could choose to carry out one or more of the activities. These emotional prompts were four types of activities, each with instructions (see Figure 2.12c).

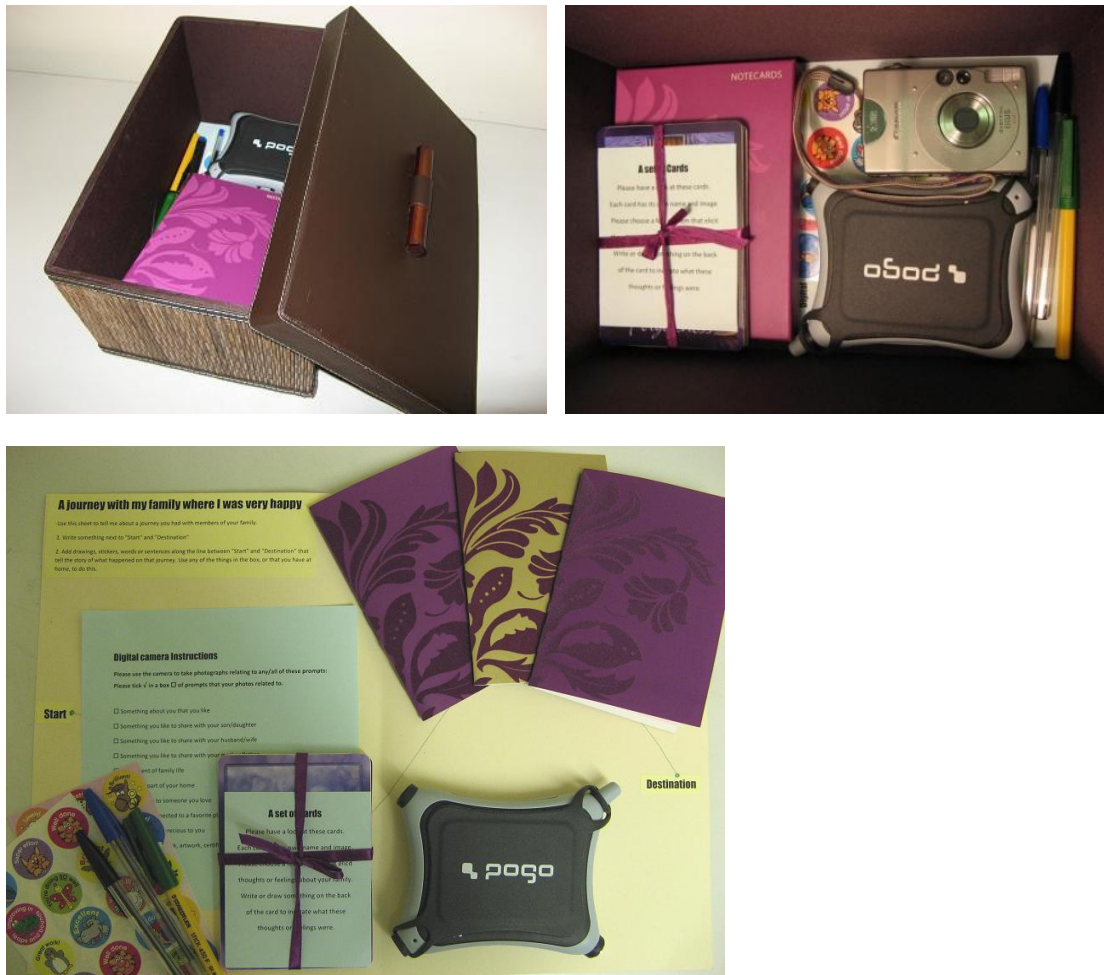


Figure 2.12 a. Probes box, b. Things to do in the box, c. Things to do

2.4.3.1 Spirit of oracle cards with an invitation

These cards were intended for emotional reflection as stimulus. Each card has its own name and image on the front such as ‘emotions’, ‘intention’, ‘regret,’ ‘angel over me’, ‘blessings’, ‘faith’, ‘remembrance’, ‘speak your truth’, ‘soul mate’, ‘honesty’, etc (see Figure 2.12a). Participants were asked to choose a few of them that elicit thoughts or feelings about their family, and write or draw on the back of the card. Examples of the responses to the cards from participants written down on the back can be seen in Figure 2.13b.



Figure 2.13 a. Cards with instruction, b. Responses to the cards from participants

2.4.3.2 Digital camera

Participants were asked to take photos relating to any/all of 11 prompts listed on the instruction sheet (see Figure 2.14). These were: something about you that you like, something you like to share with your son/daughter, something you like to share with your husband/wife, something you like to share with your mother/father, an element of family life, a favorite part of your home, a connection to someone you love, something connected to a favorite place, objects that are precious to you, children’s homework, artwork, certificates that they really want to show off, and symbols of affection (see Figure 2.14). Some of the photo probe responses are of ‘iPod to listen to specific American radio programs together (Figure 2.15a)’, ‘the name and drawing scribbled by son (Figure 2.15b)’, ‘children’s story book to read for son at bed time (Figure 2.16a)’, and ‘son’s shouts at friends in football game (Figure 2.16b)’.

Digital camera Instructions

Please use the camera to take photographs relating to any/all of these prompts:
Please tick ✓ in a box of prompts that your photos related to.

- Something about you that you like
- Something you like to share with your son/daughter
- Something you like to share with your husband/wife
- Something you like to share with your mother/father
- An element of family life
- A favorite part of your home
- A connection to someone you love
- Something connected to a favorite place
- Objects that are precious to you
- Children's homework, artwork, certificates that they really want to show off.
- Symbols of affection

Figure 2.14 Digital camera instructions



Figure 2.15a. Something to share with your husband, b. A connection to someone you love



Figure 2.16 a. Something to share with your son, b. Something to share with your husband

2.4.3.3 Diaries

Two diary cards were provided to write about special occasions of communication, for pleasant or unsuccessful ones, with the date, time, contact person, and the types of communication (see Figure 2.17a and Figure 2.17b). A third card was designed for a log of telephone calls with the instruction of ‘Please list as many as possible the telephone calls you have with members of your family between the two visits’. The common topics were intended to indicate daily context (see Figure 2.18a). Examples of the responses of telephone calls (English and Korean) can be seen in Figure 2.18b.

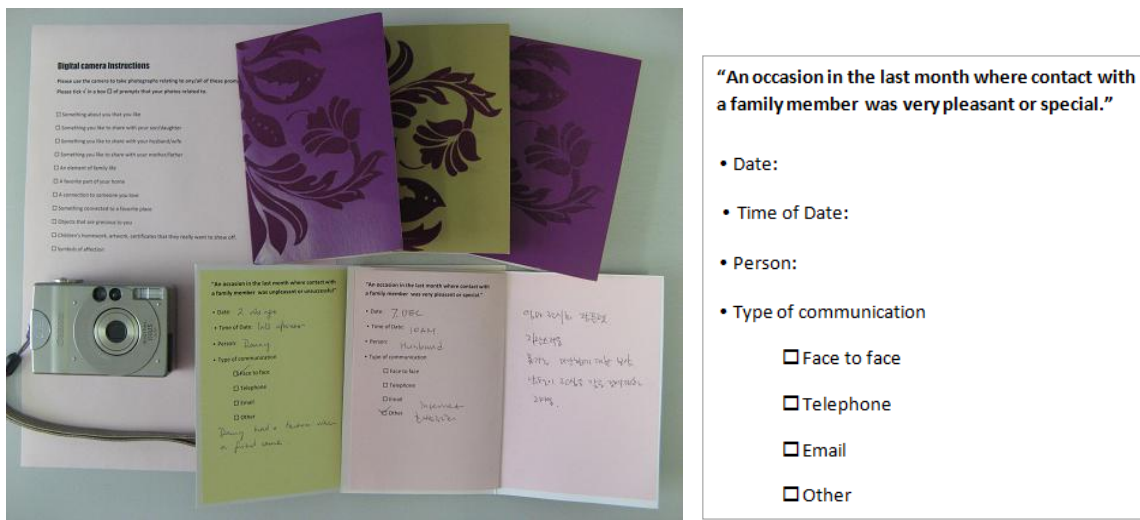


Figure 2.17 a. Digital camera with instructions/Diaries, b. Instruction of diary: pleasant occasion

Please list as many as possible the telephone calls you have with members of your family between the two visits.

Day	Time of Day	Who rang who	Topic

Please list as many as possible the telephone calls you have with members of your family between the two visits.			
Day	Time of Day	Who rang who	Topic
8.12	12 noon	Mum	To see if I was feeling ok to apologise
8.12	10pm	Donna USA Dona's sister	Wanting to know my parents address for Xmas cards and general catch up
9.12	9pm	Mum	Wanting Donna's address for Xmas card (~ USA) (am)
11.12	8pm	Mum	Re Donna's address again - don't know - need to ring her
13.12	2pm	Mum	Re Donna - still not got address.
13.12	2.30pm	Donna + me	Donna to ask for address (not in)
14.12	5pm	Mum	Re Donna address - not visit yet!! Mum changed plans again
15.12	7.0pm	I → Mum	re Xmas etc and Niala's birthday
17.12	10am	Mum	changing plans re visiting!!

일주일 동안 가족 구성원과의 전화 내용을 가능한 한 많이 기록하십시오. Please list as many as possible the telephone calls you have with members of your family between the two visits.			
날짜/Day	시간/Time of Day	누가 누구에게 Who rang who	주제/Topic
2009년 12월 8일	12시	Mum → Me	안녕하세요? 잘 지내세요?
12월 9일	10시	Mum → Donna	위해서라. 잘 지내세요.
12월 10일	10시	Mum → Donna	같은 거예요. 어디서 잘 지내세요?
12월 11일	8시	Mum → Donna	사서 보내주세요.
12월 13일	2시	Mum → Donna	사서 보내주세요. 어디서 잘 지내세요?
12월 14일	5시	Mum → Donna	안녕하세요. 잘 지내세요?
12월 15일	7시	I → Mum	안녕하세요. 잘 지내세요?
12월 17일	10시	Mum → Me	안녕하세요. 잘 지내세요?

Figure 2.18 a. Log of telephone calls form (above), b. Responses of telephone calls - English and Korean (below)

2.4.3.4 Journey with my family where I was very happy

A3 sized paper was offered for describing a happy journey participants had with their family members. The instructions say ‘Write something next to “Start” and “Destination”. Add drawing, stickers, words or sentences along the given line between “Start” and “Destination” that tell the story of what happened on that journey. Use any of the things in the box, or that you have at home, to do this’. More than two events were expected to be described along the line on a journey in order to get as much data as possible (see Figure 2.19).

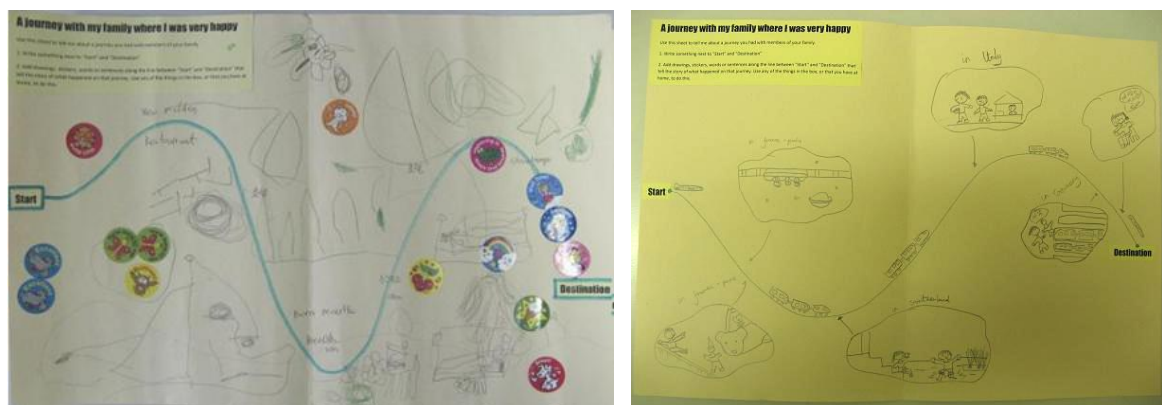


Figure 2.19 a. Journey probe response (left), b. Journey probe response (right)

2.4.4 The informants

The informants are listed in Table 2.2. They were recruited by personal contacts and also via Societies for South Koreans at the University of York and the University of Sheffield. They were all members of three-generational families, where at least one person is geographically

separated from the others. Six participants in the UK and three in South Korea were recruited. The data were gathered between the 5th of December, 2008 and the 4th of January, 2009.

2.4.4.1 Informants in the UK

Two British mothers were the first to participate in the Probe study. One was concerned about her parents who had recently moved to California for their business. The other talked about the members of her husband's family settled in the USA. One Korean father, studying for a PhD and living with his family in the UK, participated in the interviews. One mother, looking after their children and supporting her husband, living with her family in the UK, was also interviewed. These two participants had elderly parents in South Korea. Another mother, studying for a PhD and looking after her son in the UK, was interviewed. Her main concern was her husband living in South Korea. Her 10 year old son also participated, talking about his own emotional experience of communicating with his father.

2.4.4.2 Informants in South Korea

One grandmother, living in South Korea with her husband, was interviewed, talking about her only daughter who was living in the UK with her family. Two mothers of children also took part in this study, talking about their experiences, connecting to their husbands working in different countries. One had two children and was a housewife, whereas the other was a working mother with a 9 month old boy. Equipment failure meant that there was no recording of the first interview for participant 9, Lucy (see Table 2.2).

Table 2.2 Informants, all names in this thesis are pseudonyms to ensure anonymity.

	Interview			Probes						Interview duration	
	Infor mants	Who	Who is at a distance	Cards	Photos	Happy occasions	Unpleasant occasions	Phone calls	Journey	Int.1	Int.2
1	Anne	Mother of 2 in UK	Parents in USA	3	Yes	Yes 2	Yes 1	Yes 3	·	72min	14min
2	Betty	Mother of 1 in UK	Husband's family in USA	4	Yes*	Yes 2*	Yes 2*	Yes 10	·	45min	86min
3	Tom	Father of 2 in UK	Parents in Korea	3 in 2 nd R*	Yes*	Yes 1*	Yes 1*	Yes**	Yes*	40min	64min
4	Linda	Mother of 2 in UK	Parents in Korea	5	Yes	Yes 2	Yes 1	Yes 8	Yes	75min	94min
5	Emma	Mother of 1 in UK	Husband in Korea	5	Yes	Yes 2	·	Yes 9	·	84min	82min
6	Sam	Son in UK	Father in Korea	·	·	·	·	·	Yes	25min	17min
7	Jane	GM in SK	Daughter in England	5	Yes*	Yes 2	Yes 1	Yes 7	Yes	68min	59min
8	Helen	Mother of 1 in SK	Husband in Baghdad	3 in 2 nd R*	Yes**	Yes 1	Yes 1	Yes 14	Yes	78min	86min
9	Lucy	Mother of 2 in SK	Husband in Bangladesh	4	Yes	Yes 2	Yes 2	Yes 5	Yes	·	34min

R: interview record file / *delivery second interview / **delivery 1 week later after second interview

2.5 Results of GTA of Probe study transcripts

2.5.1 Overview of coding analysis

The work of transcription and translation into English, in the case of the interviews conducted in Korean, was carried out by the author. With approximately eight hours of recorded conversation for Interview 2 (nine files) and seven hours for Interview 1 (eight files), 134 pages of transcript were generated (see table 2.1, last two columns “Interview times”). The English conversation files were transcribed in full. Korean files were transcribed in Korean and then translated into English. Small sections (less than 10% in total) of the recordings were not transcribed as they were not concerned with the probes, family relationships or communication. For example, two mothers were busy calming their babies down, another mother had to pick up the phone and have a conversation with her friend, another who was a friend of mine was arranging to see me after interview. This accounted for less than 10% of the recordings.

Pseudonyms were used throughout this thesis. Transcripts were anonymised at the time of transcription. English names were used as pseudonyms even when the participant was Korean but the gender of the participant was preserved (see Table 2.2, second column “Informants”).

Preliminary open coding was carried out to break down the raw data and to examine and compare sections of text without a preconceived framework or hypothesis. Following the procedure suggested by Strauss and Corbin (1990), the text was segmented into “incidents”. Open coding was performed on these sections of text which were then translated into English for presentation in this thesis. Finally axial coding was used to relate together the low level codes. The results of this process are described in the sections below. These findings will be the sources for design ideas and requirements that will be addressed in Chapter 3.

2.5.2 Results of Step 1: Open coding

In Step 1, the sections of text marked with the first level codes were examined for subtle meanings. The total number of Step 1 codes was 118 from the 281 sections of text. Similar codes were grouped and summed up to see which code is more addressed than others.

Codes used with more than three sections of text are shown in Table 2.3. The most frequently assigned codes were ‘obligation’ (20), ‘doing things together’ (19), ‘object with meaning’ (19) ‘seeing each other’ (17), and ‘specific uses for specific media’ (17). Other codes were ‘talking to men’ (15), ‘pride’ (14), ‘no time’ (14), ‘reassuring’ (14), and ‘loneliness’ (13). The codes used with more than three sections of text were listed in order of frequency in Table 2.3. Each code in this table is listed with one example text section as a reference number. Appendix 2 shows a full list of open codes and the text references. Appendix 3 gives all 281 text sections and the open codes

associated with them. The number of codes used with only one or two text section(s) was 64, for example, ‘being connected’, and ‘changed relationship’.

Table 2.3 Codes used with more than 3 sections of text

Open code	Insta nces	Text Ref.	Open code	Insta nces	Text Ref.
1 obligation	20	B18	28 image with meaning	5	B145
2 doing things together	19	B76	29 phone	5	B10
3 object with meaning	19	B128	30 who sees what	5	B62
4 seeing each other	17	B4	31 writing	5	B213
5 specific uses for specific media	17	B61	32 all my love	4	B148
6 no time	15	B22	33 cards	4	B69
7 talking to men	15	B17	34 conflict	4	B34
8 pride	14	B67	35 cost	4	B188
9 reassuring	14	B16	36 drawing	4	B217
10 loneliness	13	B57	37 kissing + hugging	4	B141
11 phone hard for children	11	B14	38 maintaining identity	4	B154
12 Skype	11	B58	39 trauma	4	B39
13 using webcam	11	B59	40 adapt	3	B127
14 looking to the future	9	B174	41 being a stranger	3	B92
15 unconditional love	9	B113	42 eating	3	B108
16 eating together	7	B89	43 expressing emotion	3	B91
17 keeping a record	7	B3	44 freedom	3	B97
18 reunion	7	B84	45 from the bottom of my heart	3	B7
19 children’s laughter	6	B147	46 missing grandchildren	3	B137
20 email	6	B193	47 reducing contact	3	B19
21 just the two of us	6	B142	48 repetition	3	B64
22 social network utility	6	B194	49 sense of presence	3	B57
23 special event	6	B90	50 sorry	3	B34
24 talking to children/infants	6	B45	51 talking together	3	B53
25 Cyworld	5	B251	52 voice	3	B55
26 drawback of digital camera	5	B245	53 Whereabouts Clock	3	B25
27 easy to share picture	5	B197	54 yearning	3	B36

The results of Step 1: Open coding can be considered as a resource for a designer. A designer could use the codes recorded in Appendix 2 to access all the text sections relevant to a particular relational theme such as “obligation”, or emotional needs such as “loneliness”, or all the text sections that refer to a particular technology such as “email”. However, there is still a lot of work for the designer to do integrating the ideas in these text sections and understanding the emotional subtleties in the data. Our aim in Chapter 3 is to use the data here to identify

opportunities for technological intervention via new services or inventions. Step 3, Selective coding is our attempt to draw out some of these subtler themes in a way that will make them accessible to designers and to form the input for Chapter 3.

2.5.3 Results of Step 2: Axial coding

The results of Step 2 can be thought of as the summative result of the GTA analysis. For this reason all 37 axial codes are described in detail here.

Each included one or more data quotes. The axial codes were refined iteratively. Some of the codes had many associated quotes. Others had just a few. The associated quotes for all 37 axial codes can be found in Appendix 4. The 37 axial codes are illustrated in categories below with just one or two quotes. One hundred and eighteen sections of text are included in this analysis.

A few of the open codes that emerged from the previous step were used as axial codes at Step 2, such as, 'specific uses for specific media', 'using webcam' and 'talking to men'. Most were formed by merging and integrating open codes from Step 1.

2.5.3.1 Category 1: Happy & Fun

This section illustrates seven axial codes for Category 1: Happy & Fun. Table 2.4 shows how each of the axial codes in this category was connected to the open code(s) from the previous step in association with the reference number of sections of text. Each axial code was formed with one to three open codes.

Table 2.4 The links between axial codes open codes and interview text extract reference number for Category 1 Happy and Fun.

Axial code [number]	Open codes (texts)
Sharing the moment: a special event related to infants/children, with pride [A1]	Sharing (B1), special event (B90), pride (B67)
Sharing the moment: Kid's laughter with happiness [A2]	Sharing (B1), children's laughter (B147), voice (B55)
Fun with doing things together [A3]	Doing things together (B76)
Feeling happy from the bottom of your heart [A4]	From the bottom of your heart (B7)
Just the two of us: being together especially at reunion [A5]	Just the two of us (B142), reunion (B84), being together (B159)
Seeing each other with easy to share photos [A6]	Seeing each other (B4), easy to share picture (B197)
Showing the sense of being in play for kids [A7]	Sense of presence (B57), sense of being in play (B224)

Sharing the moment: a special event related to infants/children, with pride [A1]

“I was pleased to see when the baby [20months] said some new words. One day, the baby sitter told me that Benjamin understood the meaning of 'the same'. She asked him who was prettier between her two daughters. Benjamin said 'the same'. In the night, I asked Benjamin who was prettier between me and other girl on the photo. I was expecting to hear from the word 'same', but he said, 'mummy'. I was so happy and excited that I rang my husband [in Baghdad] and told him this story. He was so surprised and happy.” [Helen Int.2, Diary] T1

Sharing the moment: Kid's laughter with happiness [A2]

“This picture is of Harry playing football with his friends. I want to show this picture to my husband, hopefully with Harry's shouts at his friends. [Emma, Int.2, Photos] T3

“My husband said he wants to hear the children's laughter every day.” [Lucy Int.2, Diary] T4

Fun with doing things together [A3]

“She was famous for her good written work. When I taught her to write, I put every bit of paper where she wrote or drew on onto the wall. Every space was covered with her papers like a white board full of texts. When she put some written work on the wall, then I put my paper reply next to hers. Sometimes her father joined to put his own work as well. It was really fun for everyone. When my friends came to see the papers on the wall, they were all enjoying reading them and laughing. It was a kind of joke, paper puzzle, or a riddle. There was an arrow on a paper for me to follow for the next paper. We had played to write like that since she was young.” [Jane, Int.2] T6

Feeling happy from the bottom of your heart [A4]

“I found a letter in my husband's books and stuff accidentally. I could feel his very deep and sincere feelings about me and children by the letter. I think he was embarrassed to give the letter to me so didn't give it to me and forgot. But when I read it again I feel very happy to see his own heart.” [Helen Int.1] T8

Just the two of us: being together especially at reunion [A5]

“This is the photo of a pair of mugs I took [photo probe]. Even though my husband came here in Korea, there was little time just for us as a husband and a wife because he was always with his children. I really want to have a cup of coffee and have a chat with my husband face to face.” [Lucy Int.2, photos] T11

Seeing each other with easy to share photos [A6]

“For communicating with my daughter, can it [Pogo probe] be a video telephone to see her? I think I can talk to her while seeing her. I hope to carry this in my handbag and to show my friends some photos of my granddaughter on it.” [Jane, Int.1] T14

Showing the sense of being in play for children [A7]

“In my case, Simon [2.5 years old] wants to see the movie on the whole family in the swimming pool. He can play the video in the camera by himself and he puts the camera next to his head on the pillow and watches it so many times until he falls asleep every night. He wants to go swimming with his sisters but he is too young for that. But, he has learnt the image of swimming pool watching the video. He loves it so much.” [Helen' friend Int.1] T18

2.5.3.2 Category 2: Reassurance & Obligation

This section illustrates six axial codes for Category 2: Reassurance & Obligation. Table 2.5 shows how each of the axial codes in this category was connected to the open code(s) from the previous step in association with the reference number of sections of text. Each axial code was formed with two to three open codes.

Table 2.5 The links between axial codes open codes and interview text extract reference number for Category 2 Reassurance & Obligation.

Axial code [number]	Open codes (texts)
Sense of presence as reassurance by seeing each other [A8]	Sense of presence (B57), seeing each other (B4)
Reassurance with regard to intergenerational obligations [A9]	Reassuring (B16), intergenerational concern (B118), obligation (B114)
Reassurance and obligation being at a distance with concern [A10]	Reassuring (B16), obligation (B114)
Reassurance, equal opportunity for expression [A11]	Reassuring (B16), equal opportunity to communicate (B18)
Reminding of the importance of family: by object with meaning [A12]	Forgetful (B230), object with meaning (B128)
Reassurance and instructions with nagging [A13]	Reassuring (B16), nagging (B111)

Sense of presence as reassurance by seeing each other [A8]

“I was very worried about Benjamin. He couldn't have enough time to get to know his father. So I showed him his father's photo almost every day. The problem was Benjamin thought every man in a photo was his father. When my husband came here with us, he was shocked at the problem. We were all in an elevator and my husband was holding Benjamin with his arms. He asked where daddy was and Benjamin pointed at the picture on the wall with his finger and said ‘Daddy, daddy...’” [Helen Int.1] T20

Reassurance with regard to intergenerational obligations [A9]

“My mum rang me [from Korea] about her bad dream. She was worried about everything about our daily life [here in England]. She asked if anyone is not well or my husband was away on business. I told her that children had caught a bad cold, but they are now ok.” [Hannah, Int.2, Diary] T21

“I feel sorry for my parents when my children refuse to talk with their grandparents on the phone, even though I threaten them” [Tom, Int.1] T22

Reassurance and obligation being at a distance with concern [A10]

“My father is suffering from diabetes, so I ask him to see if he takes medicines, drinks alcohol, or goes to surgery. He listens to me only, so I need to ring and ask him.” [Emma, Int 2. Diary] T29

“I ring my parents more often as a kind of obligation because they are very old now. I think I have to at least ring them more. I didn't ring them so often in Korea.” [Tom, Int.1] T30

Reassurance, equal opportunity for expression [A11]

“On Sundays, the son in law, James rings me and says hello with some chat and then passes the phone to my daughter Laura to talk with me. They ring James's family, too. In that case, Laura rings them first and then passes the phone to James. They made a rule like that as equal. Giving a present, making a phone call and everything should be equal between them. I like it.” [Jane, Int.1.] T31

Reminding of the importance of family: by object with meaning [A12]

“This name on the wallet was written by Harry. When I think of the family, Harry could be the flower and the core of the family. His name has a special meaning, given by his grandparents so I took a photo of the name [photo probe], rather than my son, Harry.” [Emma, Int.2] T32

Reassurance and instructions with nagging [A13]

“I tell my husband about Harry's school things and ask him to stop Harry buying expensive cards, to persuade him to take a shower more often and something like that.” [Emma, Int.2, Diary] T33

2.5.3.3 Category 3: Comfort & Yearning

This section illustrates eight axial codes for Category 3: Comfort & Yearning. Table 2.6 shows how each of the axial codes in this category was connected to the open code(s) from the previous step in association with the reference number of sections of text. Each axial code was formed with one to three open codes.

Table 2.6 The links between axial codes open codes and interview text extract reference number for Category 3 Comfort & Yearning.

Axial code [number]	Open codes (texts)
Keeping a record to feel comfort from the media [A14]	Keeping a record (B3), satisfying (B5)
Comfort and consolation from yearning by seeing each other [A15]	Yearning (B36), seeing each other (B4)
Comfort and consolation from yearning by an object with meaning [A16]	Object with meaning (B128)
Talking to men/father/grandfather [A17]	Talking to men (B17), talking together (B53)
Unconditional love for grandchildren [A18]	Unconditional love (B113), missing grandchildren (B137)
Direct channel between grandparents and grandchildren [A19]	Grandparenthood (B88), missing grandchildren (B137), equal opportunity to communicate (B18)
Sharing emotions [A20]	Sharing (B1), expressing emotion (B91)
No news is good news [A21]	Freedom (B97)

Keeping a record to feel comfort from the media [A14]

"If only with a kind of conversation with someone, it disappears afterwards. ... I keep answer machine messages. ... I saved it for a year ... when I felt lonely, I just pressed the button. I can hear people say hi, Betty, it's me ... It's truly nice. I used to keep. I've got a friend in Australia, she's left me an answering message and I just used to keep it. I just want her voice." [Betty Int.1] T34

Comfort and consolation from yearning by seeing each other [A15]

"My husband seems quite relieved from missing us since using the webcam. He doesn't want to be alone on Saturday nights. It is too long for him to be alone. I feel to be at the same space by seeing him on the computer while he leaves Skype on and watches TV or wanders around. I feel free from restraint." [Emma, Int.1] T36

Comfort and consolation from yearning by an object with meaning [A16]

"The watch could be the one, my wife bought me when I went on a business to the USA for the first time. I didn't wear it. I didn't need it because it's quite expensive and the mobile phone told me the time in Korea. But here I am wearing it most of the time, even at night. It is very practical to see the time. It reminds me of my wife." [Tom, Int.2, Photos] T39

Talking to men/father/grandfather [A17]

"When my husband came here, I needed to talk about all things over the night. I had to talk. But my husband was just happy to see me and Benjamin and that's all. I said he didn't need to come if he just wanted to see me, and not to talk. Well, we are just compromising for us all. We are trying to do the best for each other." [Helen Int.1] T44

Unconditional love for grandchildren [A18]

"The relationship between the grandparents and the grandchildren is very simple. Unconditional givers and unconditional takers. ... Sometimes they ring me several times a week. When my children are busy eating, talking with friends, or preparing to go out, not being able to talk, they ring on the very next day to hear their grandchildren's voice." [Hannah, Int.1] T50

Direct channel between grandparents and grandchildren [A19]

"Occasionally, they [her parents] write a letter to William [6 years]. ... They do write hand written letters. William's, my parents say, doing hand written letters. ... William writes a letter to them, and then they write a letter to him. I think they do that maybe, once a month, or something like that, or once every two month." [Anne, Int. 1] T55

Sharing emotions [A20]

"This one is 'Can you feel me?' [cards probe]. I wish Tim [her husband] and I could feel each other's emotion more. We are very different people. Tim has very different knowing, thinking, the way we communicate and we often ... he often understands what I mean. We just express ourselves in very different ways. So at least there are some misunderstandings. And often we don't have much time with each other. So that will also make it harder. It is easy misinterpreting." [Anne Int.2, Cards] T57

No news is good news [A21]

“I think ‘honesty’ is best for the relationship. Sometimes my husband doesn't want to say something. He didn't want me to worry about that. But I feel there is something wrong, and feel very stressed. So I hope he tells me about everything.” [Helen Int.2, Cards] T58

2.5.3.4 Category 4: Identity & Hope

This section illustrates seven axial codes for Category 4: Identity & Hope. Table 2.7 shows how each of the axial codes in this category was connected to the open code(s) from the previous step in association with the reference number of sections of text. Each axial code was formed with two to three open codes.

Table 2.7 The links between axial codes open codes and interview text extract reference number for Category 4 Identity & Hope.

Axial code [number]	Open codes (texts)
Parents are wishing all their love for children [A22]	All my love (B148), good mother (B168), good father (B85)
Establishing and maintaining identity: the balance between one's own identity and sacrifice as a mother [A23]	Maintaining identity (B154), balance between identity and sacrifice (B265)
Establishing and maintaining identity: being a good model of parents to kids [A24]	Maintaining identity (B154), good model to children (B267)
Establishing and maintaining identity: being a good father to kids [A25]	Maintaining identity (B154), good father (B85)
Establishing and maintaining identity: the presence of daddy [A26]	Maintaining identity (B154), presence of father (B154)
Establishing and maintaining identity: Looking back, seeing the presence [A27]	Maintaining identity (B154), looking back (B229), looking to the future (B174)
General progressive reduction of contact [A28]	Reducing contact (B19), changed relationship (B259)

Parents are wishing all their love for children [A22]

“We [grandmother and her husband] have always said to my daughter that do what she wants, do what she likes, and do with the way of what she thinks. I tried to give her every opportunity but also her own responsibility. I believe she lives her life very well with happiness.” [Jane Int.1] T60

Establishing and maintaining identity: the balance between one's own identity and sacrifice as a mother [A23]

“I don't want to see the woman crying on the card, 'Regret' [cards probe]. It seems too much sacrifice as a mother to me. That could be a burden on the family. If I give too much to my children, then I could wish to take that much from them, because I am a human. Since I became a mother, I have thought of that. I don't want to be forced to sacrifice myself for them.” [Hannah Int.2] T62

Establishing and maintaining identity: being a good model of parents to children [A24]

“I think it is very important to show children the good relationship between me and my husband with harmonious, reliable and hopeful way.” [Hannah, Int.2, Cards] T65

Establishing and maintaining identity: being a good father to children [A25]

“...my husband was so proud of himself to push the buggy. He felt like a good father of his son and a good husband of me. He said to me that he was very very happy.” [Helen Int 2, happy journey] T66

Establishing and maintaining identity: the presence of father [A26]

“When my husband came here, Benjamin [9 months old] felt very upset about being with his father. He is still a baby. So I show the photo of my husband and tell Benjamin he is your father, say hello and kiss him. Even though there is a kind of side effect, I am still telling him who daddy is and encouraging him to say hello and something like that. I think it is very important to tell him the presence of his daddy.” [Helen Int.1] T67

Establishing and maintaining identity: Looking back, seeing the present [A27]

“There is one picture upstairs. It is African embroidery. I like that one. I like it. ... It's like a mother and her child. ... Sometimes I just feel like walking away from it all. But sometimes I was quite happy to look at it in the little room. Sometimes I forget what I've got. ... When I was younger, like when I moved a house as a student, everything was put in a trunk. Then I reopen the trunk and I saw, "Oh!" I feel really surprised. I've completely forgotten that. ... something happens in my brain, I was completely different. I've never done it. I've never been to Hong Kong. I've never worked in Chile, never travelled the world. I completely forget. It's really weird, and annoying, but it happens.” [Betty Int.2, Photos] T63

General progressive reduction of contact [A28]

“I used to ...when things go badly, I want to ring my mother and get some more support, you know. So I tend to ring her, you know. But, I don't ring her that much than at that time, but I used to, we used to have a long conversation when she's not with it, with usually some problem. I wanted her... you know, advice from her, really, sometimes advice, sometimes more support.” [Anne Int.1] T71

2.5.3.5 Category 5: Trauma & Upset

This section illustrates five axial codes for Category 5: Trauma & Upset. Table 2.8 shows how each of the axial codes in this category was connected to the open code(s) from the previous step in association with the reference number of sections of text. Each axial code was formed with two to three open codes.

Table 2.8 The links between axial codes, open codes and interview text extract reference number for Category 5 Trauma & Upset.

Axial code [number]	Open codes (texts)
Frustration and eagerness of talking with children/infants [A29]	Frustration (B83), phone hard for children (B14), talking to children/infants (B45)
From frustration and loneliness to adaptation [A30]	Frustration (B83), loneliness (B57), adapt (B127)
Little room and little time to give comfort each other [A31]	No time (B22), relaxing together (B96)
No time to deal with photos [A32]	No time (B22), drawback of digital camera (B245), easy to share picture (B197)
Arguing and reconciling [A33]	Conflict (B34), reconciliation (B34)

Frustration and eagerness of talking with children/infants [A29]

“One day Benjamin was busy saying 'daddy, daddy, daddy...' on the phone when he was so excited to hear from his father. But after that Benjamin was just listening to his father, not talking to him. So my husband was trying to ask to say 'daddy' once more in very many ways, but ... yes, he is eager to hear his son's voice.” [Helen Int.1] T74

From frustration and loneliness to adaptation [A30]

“It was really hard for me not to be able to talk with my husband face to face. He was so generous to listen to me all the time but since he's gone, I couldn't control my pent-up feelings and frustration. So when he came here first I said to him that I was so serious. I exaggerated my worry about being separated or something like that. He was shocked and said if so he would stop working there. I said 'I didn't mean it but just try to do something more'. Since then he tried to ring me more often so I just tried to adapt myself to this circumstances.” [Helen Int.1] T75

Little room and little time to give comfort each other [A31]

“One day, my husband looked a bit depressed with some stress. His tone with the voice was so low. I asked what happened and he said the work was not easy, under his control. I just wanted to give a gentle hug to him but it was impossible. Even though I was talking on the phone, there was a limit of time and the way of expressing my feeling. He was talking on the way home but I was in my office. It's very inconvenient to talk. I wanted to say that I was thinking of him very much but sometimes it's not easy.” [Helen Int.2, Diary] T77

No time to deal with photos [A32]

“When I was studying in Australia, my husband often put some photos of Benjamin on the Cyworld for me to look at. But now I couldn't do that. I feel very annoying. I know it is not so difficult to do that but I am always busy working and looking after Benjamin. I don't want to spend the time for putting the photos or something like that.” [Helen, Int.1] T81

Arguing and reconciling [A33]

“I [in South Korea] was cross with Laura [daughter in the UK] the other day. Maybe it was the first time I had a bad conversation with my daughter. She didn't answer my phone several times and I became worried more. So I had to keep ringing more often but she still didn't answer me. One day, unexpectedly, she picked up the phone and said to me 'Why?' with a very annoying voice. I was heartbreaking to hear her tone rather than her excuse. So I said that I would not ring her any more. ... Laura rang me soon after the bad conversion, and asked me "Are you upset?". She said Hanna [her daughter, 10 months old] was crying and hard to be settled down for a while so she's got upset and exhausted. Laura said sorry for letting me annoyed. I had to say sorry for that.” [Jane, Int.1] T86

2.5.3.6 Category 6: Technology & Media

This section illustrates four axial codes for Category 6: Technology & Media. Table 2.9 shows how each of the axial codes in this category was connected to the open code(s) from the previous step in association with the reference number of sections of text. Each axial code was formed with one to six open codes.

Table 2.9 The links between axial codes open codes and interview text extract reference number for Category 6 Technology & Media.

Axial code [number]	Open codes (texts)
Specific uses for specific media [A34]	Skype (B58), Skype distracting (B201), phone (B10), cards (B69), letter (B63), mobile phone (B23)
Media depending on cost [A35]	Cost (188)
Using a webcam [A36]	Using webcam (B59)
Who sees what: level of privacy using media [A37]	Who sees what (B62), Whereabouts clock (B25)

Specific uses for specific media [A34]

“I used to emailing and using blog in Korea. But email is usually used for specific information. When some information cannot be delivered by telephone, we use email for that, such as passport numbers, or important documents. [Tom, Int.1] T91

“I just leave Skype on for about 10 to 20 minutes on weekdays. It's free. The camera is still on. Even though we don't talk, we can see everything... We usually leave Skype on for about 2 to 3 hours on Saturdays.” [Emma, Int.1] T93

Media depending on cost [A35]

“I contact with my husband everyday using Skype with webcam. He bought a Netbook just for the network communication with about £250. He uses it every day. [Emma, Int.1] T104

“Skype can be used when computer is on with network, but LG myphone can be used with network. It doesn't need computer. It is easy to use and very cheap with just about 1 pound a month and free for the same system users.” [Tom, Int.1] T105

Using a webcam [A36]

“Since using Skype, I don't feel too difficult to communicate with my family. I was so interested and curious about seeing each other through the webcam when we started to install that several days ago. I think I feel more comfortable psychologically when seeing each other, rather than just talking.” [Emma, Int.1] T107

Who sees what: level of privacy using media [A37]

“It is sometimes not easy to do that [using Cyworld] and the photos are not for the family only. My friends can see some of them and I need to decide whether some photos are acceptable for the public or something like that.” [Hannah Int.1] T113

“My daughter could like to use WhereAbouts Clock to ring me on where I am often. But I don't need it. Men do not want to be violated their privacy.” [Tom Int.1] T115

The 37 axial codes illustrate some of the deep feelings of our participants. The design opportunities that they suggest will be discussed in Chapter 3. The discussion below considers the method we used, how it compares with other GTA, and where it was most and least effective.

2.6 Discussion

2.6.1 Summary of results from open and axial coding

Chapter 2 describes a method to inform the design requirements of communication technologies that allows people with family members living abroad to feel more connected. A probe study was conducted with nine participants. They were all members of three-generational families, where at least one person is geographically separated from the others. They talked about their subjective complex and subtle emotional experiences. In the first interview, a box of ‘things to do’ was left with the participants as a stimulus for conversation in the second interview. The emotional probes included: Spirit of Oracle cards with an invitation; a digital camera with instructions; diaries to note times when communication was pleasant or unpleasant; journey with my family where I was happy.

With 17 interview record files with 134 pages of transcript generated, the emotional experiences they told us were analysed using Grounded Theory Analysis (GTA): open coding and axial coding. In content analysis, 281 sections of text were identified for sensitising issues from data relevant to three prefixes of codes: “emotion”, “relationship”, and “technology”. Through

quantitative analysis of sections of text, 66 sections of text were associated with all the three prefixes. These resulted in more emergent codes in step 2. At step 2: open coding, 118 codes emerged from the sections of text examined at the previous step. The most frequently used codes emerged were “obligation (20)”, “specific uses for specific media (20)”, “doing things together (19)”, and “object with meaning (19)”. The number of codes used more than three times was 51 of the total in open coding. At step 3: axial coding, 37 codes in 6 groups were formed by clustering the open codes. These are regarded as the summative outcomes of the GTA in the probe study.

As addressed before in Chapter 1, Section 1.2.5, Romero and his colleagues developed a questionnaire, the ABC-Q to describe the affective benefits and costs of communication using awareness systems (Romero et al., 2007). This questionnaire was used to identify nine factors (see Table 1.1). The meaning of Romero et al.'s factors would seem to overlap with the open codes that emerged from Step 1 in this thesis work. They are obligation, expectation, privacy, thinking about, need to be informed, staying in touch, sharing experiences, recognition, and group attraction.

Romero and his colleagues define the affective factor, ‘obligation’ (see Table 1.1) as “social obligations felt or created as a result of the communication activity” e.g. I feel obliged to contact the other (Romero et al., 2007, p.302). This has a strong parallel in our analysis of the Probe study where the most frequently used code was “obligation (20)”. Many of our quotes illustrated how members of families could feel strongly obliged regarding communication with other members of family living at a distance.

Privacy is another of Romero and his colleagues' factors. This can be seen as “the extent of which communication threatens one’s privacy” (see Table 1.1). The code of ‘who sees what (5)’ is a concern with regard to ‘privacy’ that came up in the discussions of the ‘Whereabouts Clock’ (see T114) which was not welcomed by the family as it was considered as a monitoring system. T114 is an example quote for who sees what saying,

“Do you have to.... do their information [about one of paper probe, WhereAbouts clock] get put their ... involuntarily or do you have to put in? I mean, someone might not want their own way to know when they... (Ben screaming). You don't want to be tracked by something. Maybe a prisoner with a tag or something like that.” [Anne Int.1].

The participants in the probe study also mentioned that they were concerned about who sees what when they communicated using a webcam, e.g.,

“If we [her family in the UK] can see them [her parents in SK] through the web camera and they can see us, they must be very happy and my children can be curious and excited. But I feel a bit reluctant to do that. I think I need to clean my house and make my children smart for that, but it's difficult to keep the place clean with two children. I could feel a bit nervous and irritated.” [Hannah, Int.1, T111].

Romero and his colleagues' factor ‘expectation’ may be related to the codes ‘seeing each other (17)’, and ‘special event (6)’. ‘Seeing each other’ may involve supporting opportunities for serendipitous awareness. An example quote for this code is,

“I just leave Skype on for about 10 to 20 minutes on weekdays... The camera is still on. Even though we don't talk, we can see everything... We usually leave Skype on for about 2 to 3 hours on Saturdays.” [Emma, Int.1, T101].

The code, ‘special event’ may consider unexpected surprising effects, e.g. a wife in T1 says, “I was pleased to see when the baby [20months] said some new words. One day, the baby sitter told me that Benjamin understood the meaning of 'the same'. She asked him who was prettier between her two daughters. Benjamin said 'the same'. In the night, I asked Benjamin who was prettier between me and other girl on the photo. I was expecting to hear from the word 'same', but he said, 'mummy'. I was so happy and excited that I rang my husband and told him this story. He was so surprised and happy.” [Helen, Int.2, Diary]

The factor, ‘need to be informed’ was defined by Romero and his colleagues (Romero et al., 2007) as “knowledge of other people’s activities.” It can be associated with the codes ‘doing things together (19)’, ‘seeing each other (17)’, and ‘reassuring (14)’. Many of the quotes showed how family members could feel fun, happy or reassured by doing things together, seeing each other, or by being informed of other family members doing things. An example quote for ‘doing things together’ is,

“This is the photo of the Geneva Lake. It was so pretty. I wish I were living in this place. I hope to bring my family and parents here to lodge in a camp having a peaceful relaxing time for us all together.” [Emma, Int.2, Photos].

T16 is an example quote from ‘seeing each other’ illustrating,

“I [boy in the UK] was happy to see dad [in Korea] while talking using a webcam. It is better than just talking with him.” [Sam, Int.1].

With the code, ‘reassuring’, a mother in T20 is concerned about the way of reassuring her baby on the presence of his father, saying,

“I was very worried about Benjamin [20months]. He couldn't have enough time to get to know his father. So I showed him his father's photo almost every day. The problem was Benjamin thought every man in a photo was his father. When my husband came here with us, he was shocked at the problem. We were all in an elevator and my husband was holding Benjamin with his arms. He asked where daddy was and Benjamin pointed at the picture on the wall with his finger and said 'Daddy, daddy'. [Helen Int.1].

The factor ‘staying in touch’ meaning “feeling of being connected” could be considered as ‘specific uses for specific media (20)’ and ‘Skype (11)’. The families in this study use specific media selectively depending on their specific needs in a situation. An example quote for the code, ‘specific uses for specific media’ is,

“I [father in the UK] used to emailing and using blog in Korea. But email is usually used for specific information. When some information cannot be delivered by telephone, we use email for that, such as passport numbers, or important documents.” [Tom, Int.1, T91].

Many quotes for the code, ‘Skype’ illustrate that Skype supports the feeling of connectedness or psychological comfort. A wife in T107 says,

“Since using Skype, I don't feel too difficult to communicate with my family. I was so interested and curious about seeing each other through the webcam when we started to

install that several days ago. I think I feel more comfortable psychologically when seeing each other, rather than just talking.” [Emma, Int.1, T107].

‘Sharing experiences’ is another factor defined as “how much one feels other people are involved in his/her life” (Romero et al., 2007, p.303). This could be explained with the codes of ‘seeing each other (17)’, ‘pride (14)’, ‘keeping a record (7)’, and ‘easy to share picture (5)’. An example quote for ‘seeing each other’ is, *“My husband seems quite relieved from missing us since using the webcam.*

He doesn't want to be alone on Saturday nights. It is too long for him to be alone. I feel to be at the same space by seeing him on the computer while he leaves Skype on and watches TV or wanders around. I feel free from restraint.” [Emma, Int.1, T36].

The families in the Probe study showed that they were happy to share the feeling of pride on their infants or children’s daily activities. A mother in T2 says,

“It was Joshua's first day of preschool. My husband asked me how he was there on the phone, so we had a long conversation about that. The very happy conversation was talking with my husband on Joshua's preschool experience. He was worried and anxious about his son's days at school. But luckily he settled down very quickly because his sister was watching him all the time.” [Hannah Int.2, Diary].

The code of ‘keeping a record’ considers how media records may be savoured. An example quote for this is,

“She [daughter in the UK] likes to write a card so I've [mother in Korea] got lots and lots of cards from her. But she was cross not to get a card from me. I don't want to do that because once I wrote one and the next time when I read it again, it was too dull, so I couldn't sent it to her. It was unfair that we [Jane and her husband] really love to get her cards but we do not send them to her. It is far more convenient for me to ring her but she seems to like to have a card from me. So symbols of affection could be the hundreds of cards from my daughter. [Jane, Int.2, B70]. T3 is an example quote from ‘easy to share picture’, saying, “This picture is of Harry playing football with his friends. I want to show this picture to my husband, hopefully with Harry's shouts at his friends.” [Emma, Int.2, Photos].

The factor of ‘recognition’ was explained as the extent to which each other’s feelings are understood and it could relate to the codes, ‘talking to men (15)’ and ‘phone hard for children (11)’. An example quote from the ‘talking to men’ illustrates,

“I [wife in Korea] think honesty is best for the relationship. Sometimes my husband [in Baghdad] doesn't want to say something. He didn't want me to worry about that. But I feel there is something wrong, and feel very stressed. So I hope he says to me about everything.” [Helen Int 2, Cards, T58].

T22 is an example quote from the ‘phone hard for children’ saying,

“When my children refuse to talk with their grandparents [in Korea] on the phone even though I [father in the UK] threaten them, I feel sorry to my parents.” [Tom, Int.1]

The factor of ‘group attraction’ was that the feeling of being part of a group may be associated with ‘sense of presence (3)’. The code ‘sense of presence’ may involve the fact that young children are engaged with media for fun. An example quote from this code is,

“Simon [2.5 years old] wants to see the movie on the whole family in the swimming pool. He can play the video in the camera by himself and he puts the camera next to his head on the pillow and watches it so many times until he falls asleep every night. He wants to go swimming with his sisters but he is too young for that. But, he has learnt the image of swimming pool watching the video. He loves it so much.” [Helen’ friend, Int.1, T18]

To summarise, there are many parallels between our codes emerging from GTA and the factors discovered by Romero and his colleagues (Romero et al., 2007) using a statistical psychometric approach. Although some factors are less easy to find closely related quotes for than others, these parallels coming from such different research approaches but considering a very similar research domain lend validity to the conclusions of both studies.

2.6.2 Effectiveness of the probe method

General information about family member’s relationships and how they typically communicate with each other was gathered from the first interview. More complex and subtle emotional stories were told at the second interview. The content analysis showed that emotional probe activities were very effective for triggering the participants’ subjective deep feelings and sensitising to technological preferences and constraints.

Drawing the ‘Family map’ (see Figure 2.9) was a natural, subtle and effective way of identifying every member of the family and the general information about their communication technology, for example, what types of technology were usually used, how often and when they contacted members of the family, and how much time they spent on it. As the participant was talking about each member of the family, the author was naming and drawing a diagram, like a family tree. The participant could see if there is someone missing in the family map. Some participants tried to fill the A4 page fully. Thus, they wanted to add more members of the family, such as aunts, uncles, nephews, or nieces. Others were excited to tell about their new technology set up and how to use it. One participant seemed a bit uncomfortable talking about one of the members of her family. She, thus, just simply mentioned about it and there was an uncomfortable pause for a few seconds. The moment was steered to other topic by the author. The relationships of family members were therefore naturally revealed while drawing the map.

After drawing the family tree, four types of communication devices (Lover’s Cups (Chung, Lee et al., 2006), LumiTouch (Chang et al., 2001), HomeNote (Sellen et al., 2006), and Whereabouts Clock (Sellen et al., 2006)) were presented to the participants (see Figures 2.10 and 2.11). All participants were interested to listen about each prototype communication device. Some participants were curious about them and questioned on how to use them in detail. However, only ‘HomeNote’ was likely to be acceptable to three generational families, particularly for the connection between grandparents and grandchildren with the use of the scribbling function.

‘Lover’s Cups’ and ‘LumiTouch’ were likely to be more attractive to young couples rather than to busy parents with young children. The ‘Whereabouts Clock’ was unlikely to be welcome to any participant in the study. They seemed to be concerned about the level of privacy, which was addressed in the previous chapter (Chapter 1, Section 1.2.5). ‘Pogo’ was suggested for use as a ‘digital photo album’ or a ‘portable video phone’.

In the second interview, not all the probes were found to have been used by all the participants (see Table 2.2 Informants). ‘Spirit Oracle cards’ (see Figure 2.12) was the most popular with the participants. Three participants responded to five cards, two participants answered to four cards and three participants to three cards. Participant 3, Tom had difficulty carrying out the card probe at first, but he could find three cards eventually through the help of explanation with examples by the researcher. He seemed to need enough time to retrieve the past memories of members of the family, such as the first day of his honeymoon and the experience of bathing his new born baby. Diaries (happy or unpleasant occasions, log of phone calls) were also very effective (see Figure 2.16). The researcher asked how they used the diaries in detail and their feelings were uncovered. The digital camera provided in the box had some problems for participant 2, the son of whom deleted the photos taken accidentally. In this case, the author asked what kind of photos had been taken and why the photos were taken in detail. Even though the photos were not taken appropriately, all the conversation about the situation was recorded and analysed. The participant actually asked the author to take the photos again so she did. Participants usually took from five to ten photos according to the 11 prompts (see Figure 2.13).

While some participants were happy to draw ‘A journey with my family’ (see Figure 2.18) with their children and explained about each event on the journey, two participants showed difficulties with carrying out the final activity. The dates of the interview with the UK participants were the middle of December, before the Christmas holiday. They had a busy schedule with many school activities and the weather was too cold. Participant 2 had the second interview for just 14 minutes because the baby was not well and crying too much. It should have been considered that the interview dates needed to be appropriate for participants to have enough time to carry out the probe activities. Participant 5, grandmother, seemed to enjoy doing the all activities with much effort and time spent (see Table 2.2).

As a reminder, the author rang the participants between the two interviews to say hello and ask them how they were doing on their ‘things to do’. When they complained about too much work, then the author tried to calm them down and reassured them that the activities were totally dependent on the participants’ choices, trying to reduce the feeling of stress on them. The author also tried to help the participants to do some unfinished activities at the second interview in a friendly and comfortable situation.

Our intention was that the main data for this study would be the transcripts of what the participants said in the second interview, however, one could also consider the results of the activities as data. The Spirit Oracle cards and the photos gathered from the participants were two-dimensional graphic image data. However, the cards probe and the photos probe were carried out using a variety of approaches by each participant. Some participants were reading the name of the card first and had a look at the image carefully to see if they could elicit thoughts or feelings about the family. Others simply looked through the images on the cards, without reading the names of them and chose some because of the colour (e.g. red, blue), shape (e.g. a rainbow, trees, birds), or an atmospheric image (e.g. mysterious, comfortable), which were used as reminders of past memories or future wishes of members of the families. Although some photos were taken in a similar way such as ‘the whole family photos’ as ‘objects that are precious to you’ and ‘dining tables’ as ‘a favorite part of your home’, it was hard to make specific trends or patterns from the visual image data.

2.6.3 Positioning the coding method used here in Grounded Theory Analysis

The aim of the interviews was to find out ‘how people communicate with each other within their family members’ and ‘how they feel about distant relationships’. Stories about complex and subtle affective feelings should be elicited from participants in a very careful, un-intrusive, open-ended way in the probe study. The approach to analyse the data in GTA seemed hard to start with a lot of transcripts. As first, every section of text seemed to be significant and soon stifled the author with overwhelming data. It was easy to lose track of what one was doing in the phase of continuous comparative analysis, especially when considering complicated emotional aspects from data. The results of GTA in the probe study are considered as an integrated set of conceptual codes that emerged from empirical data through the two steps of the coding process. These could be regarded as hypotheses for finding the design requirements of technology to connect three-generational families at a distance.

Glaser and Strauss suggested four criteria for the verification of a GTA: fit, workability, relevance, and modifiability (Glaser & Strauss 1967; Strauss & Corbin, 1990)¹.

The notion of “fit” is that theory must be closely applicable to and illustrated by the data in the studied area. The axial codes in the probe study emerged through continuous comparative analysis of codes, the relationships between them, and the sections of texts iteratively. These were systematically, thoroughly, tightly woven codes driven by the diverse data. It is argued here that they represent good “fit” to the data.

¹ ‘understanding’ was mentioned by ‘relevance’, and ‘control’ was explained as ‘modifiability’.

Since codes also correspond closely to the real phenomena, they must also make sense and be comprehensible both to those studying and to those practicing in that area. This criterion is “relevance” in GT. In the probe study, interviews were considered with sensitive care taken and a non-intrusive approach. Emotional probe activities as stimulus for conversation triggered deep feelings and reflective thoughts about families. Thus the stories the participants told us about the emotional experiences are real dialogues and we would argue that the findings in the study are “relevant” to the reality in the contexts of communication and separation of families.

“Workability” means that codes must be meaningfully connected with the incidents and be able to explain how problems are being solved. The findings in the study are very explanatory and appeal to many people, with two design sessions discussed (see in Chapter 3) and three presentations given to the HCI group members in the department of Computer Science, to the staff and research students in the department of Psychology at the University of York, and to the participants and the panelists in the doctoral colloquium session in the international conference, IASDR 2009. We believe that the probe study satisfies the criterion of “workability”.

“Modifiability” is a criterion that theory should be abstract enough to be applicable to various contexts associated with that phenomenon. The axial codes and their associated quotes (see Section 2.5.3) can explain the problems of communication, how they feel, and what technical constraints are in the contexts. The findings will be used as sources for design requirements and ideas of technology in Chapter 3. This will be our demonstration of the results being “modifiable”.

The idea of “theoretical saturation” is another criterion in GTA. Saturation means that as more data is added to the set of transcripts, codes repeat themselves and new codes are less likely to emerge. In other words, as she sees similar instances over and over again the researcher becomes empirically confident that a category is saturated, with the basis on the widest possible range of data on that category.

The experience of conducting interviews with participants was different as the study progressed. At first, each participant’s emotional experiences with members of the family seemed different and diverse. The first few participants’ stories were very interesting to the author. It was tempting to make notes after each interview finished. However, this type of memoing did not help very much for analysing in GT. There was a conflict while analysing between the notes and other data. The researcher found that she just made her own codes forcedly by the previous notes rather than conceptualising the data as it was. Later the researcher could feel that some parts of stories they told us were similar to those of previous participants, particularly when talking about their comments on present communication technology.

At Step 1, while examining the text sections iteratively, the first level of codes emerged and could be compared to themselves. While analysing at Step 2, the researcher could feel that 37 axial

codes with the relevant 118 quotes, grouped into six categories were good enough to explain about the emotional aspects of people's stories in the context of distant relationship and communication within the family. Therefore, we argue that the data analysed in the probe study were "saturated" enough for the research of designing technology to connect family.

2.7 Conclusion

Chapter 2 described the Probe study method to inform the design of communication technologies that allows people with family members living abroad to feel more connected. The Probe study was conducted with nine participants. They were all members of three-generation families, where at least one person is geographically separated from the others, talking about their subjective complex and subtle emotional experiences. Creative and attractive emotional probes were used as a stimulus for conversation. The 134 pages of transcript data elicited from the Probe study were analysed using two steps of coding methods (open coding, and axial coding) in a systematic and rigorous way. At Step 1: Open coding, 118 codes emerged from the sections of text analysed. At Step 2: Axial coding, the 37 codes in six categories emerged by forming and clustering with the previous codes, following 118 relevant quotes, considered as the summative outcomes of the GTA in the probe study. In other words, the results of GTA in the probe study are considered as an integrated set of conceptual codes that emerged from empirical data through the two steps of the coding process. These could be regarded as hypotheses for finding the design requirements of communication technology to connect three-generation families at a distance that will be described in Chapter 3.

As described before in Section 2.6.1, it was found that there were many parallels between the codes emerging from GTA and the factors discovered by Romero and his colleagues (Romero et al., 2007) using a statistical psychometric approach. These parallels contributed validity to the conclusions of both studies. As discussed in the previous section, it was argued that the Probe study was verified on the four criteria: fit, workability, relevance, and modifiability (Glaser & Strauss, 1967; Strauss & Corbin, 1990).

Therefore, the method combining "emotional probes" and interviews was considered to be successful in eliciting rich data for understanding the emotional needs of communication, and also practical constraints of technology, such as daily context, cost, and time differences. Some participants took these activities as therapeutic treatment as they could evoke and explain explicitly their experience of retrospective, present, and future dialogue. Others wanted to keep some of probe activities for themselves as symbols of the importance of the family. The summative results of coding, the emerging axial codes and related sections of text in the Probe study will be turned into requirements for the design of communication devices that will be described in Chapter 3.

CHAPTER THREE. IDEAS FOR INVENTIONS

3.1 Introduction

The results of GTA of the probe study data seen in Chapter 2, Section 2.5.3 provide an integrated set of conceptual codes and related quotes. They are used here as hypotheses for finding design requirements for communication technology to connect three-generation families at a distance.

In this chapter, ideas and requirements for designing inventions of communication devices are considered. The ideas are generated from the findings of the third step of analysing the data elicited from the Probe study in Chapter 2. While the analysis in Chapter 2 shows much about the various complex and subtle emotions experienced by the families separated by a large distance and time difference, it does not directly inspire design ideas for communication technologies. An additional analysis is, therefore, carried out to identify themes for design. The approach is conducted based on understanding the themes within the quotes (the summative findings in the analysis in Chapter 2), again aiming at thinking of problematic situations of communicating with family members and generating possible ideas and requirements for the design of technology in an intuitive or imaginative way. In order to get wider insights at this stage, two design sessions were conducted with Mark Blythe, in the Department of Computer Science in the University of York and with Patrick Olivier, Jayne Wallace and James Thomas at Culture Lab. in the University of Newcastle. The first section reviews literature on design thinking and the idea of the creative leap in design.

3.2 Literature Review: Design thinking and the creative leap

Design thinking is an approach for finding and solving problems. It is a thoughtful desire to change the world using a combination of aesthetics, ethics, and reason (Nelson & Stolterman 2003). It requires imagination and reason, a combination of convergent and divergent thought, and creativity. It also requires multiple lines of thought and the exploration of many alternatives, keeps several alternatives open at the same time, and is comfortable with ambiguity.

Donald Schon (1983) suggested that design thinking should be considered as a conversation. Schon explained that designers juggle variables, reconcile conflicting values, and steer around constraints. There is no unique right answer. Design involves a conversation between members of the team that takes the form of reciprocal reflection-in-action, knowing-in-action, combining critical thinking and tacit knowledge in the context of the design situation. Designers sometimes

cannot verbalise how this is done. However the knowledge can only be revealed in the way designers carry out tasks and approach problems. They are characteristically unable to make it verbally explicit, so that their knowledge is somehow ‘unspoken’ but being able to be ‘seen’ or ‘felt’. This conversation makes the design thinking and process rigorous. Design thinking might be thought of as positive critical conversation. For example, a critical conversation has the potential for helping, and being able to move further assisting the members to achieve their goal together, referred to as ‘convergence of meaning’.

An idea of ‘creative leap’ (Cross, 1997) is considered as a novel concept emerges as a potential design solution. It was widely regarded as a characteristic feature central to the design process. As Cross mentioned, it is, however, not a sudden shift, but a bridging concept between problem and solution, which synthesises and resolves a variety of goals and constraints. This model of the design process was addressed in order to identify creative leap by members of the team. It contains five stages: (1) explore the problem and write a performance specification; (2) generate a range of concepts; (3) evaluate and select the most promising concept; (4) develop the concept into a detailed design; (5) communicate the final proposed design. In this case, the creative leap occurred between ‘selecting the most promising concept (stage 3)’ and ‘developing the concept into a detailed design (stage 4)’.

Hegeman (2008) also argued that the most critical and fundamental aspect of the design process is ‘the recurrent leap’ between the details of design specifications and the whole form and the interactive system of design. The way of creative thinking by designers is continuously jumping back and forth between the level of abstract ideas and the constraints of reality for design. Another characteristic of the design process is that design spaces with problems or needs have no perfect solutions to be found, so that there is a kind of dilemma with potential alternative solutions to be chosen. Löwgren and Stolterman mentioned that “a dilemma can only be resolved by a creative leap, by transcending the limitations of the present” (Lowgren & Stolterman, 2004, p.17).

Table 3.1 summarises a number of design techniques. Brainstorming and mind mapping have been used as ‘free association thinking’ in order to help creative thinking. Descriptive models for creative design have also been developed by Cross (1997; 2006), which is based on the four procedures of ‘combination’, ‘mutation’, ‘analogy’ and ‘first principles’ proposed by Rosenman and Gero (1993) and ‘emergence’ proposed by Gero (1994).

Table 3.1 Design thinking and techniques. Techniques from three to seven explained by Cross in 1997

no	Techniques	Explanations	
1	Brainstorming	Group techniques to generate a large number of ideas for the solution of a problem. Ideas jumping another idea	Abstract or ideal concept
2	Mind mapping	Associating words with visual representation with hierarchical or tree branch. More systematic than brainstorming	
3	Combination	Combining features from existing designs into a new combination or configuration, Likely to know how far to pursue novel combinations	Prototyping with visual material
4	Mutation	Modifying the form of some particular feature(s) of an existing design.	
5	Analogy	Long been regarded and suggested as a basis for creative design	
6	First principles	The theoretical position that designing proceeds by identifying requirements, or desired functions, and arguing from these to appropriate forms or structures.	
7	Emergence	The process by which new, previously unrecognized properties are perceived as lying within an existing design.	

In this study, the creative leap needs to occur between the themes with the group of quotes that emerged at the final step of the analysis of the Probe Study (see in Chapter 2) and this phase of generating ideas for inventions of communication devices alongside with clarifying the needs of the families. This is because, while the analysis addressed in Chapter 2 illustrated much about the complex and subtle emotions experienced by the families separated by large distance and time difference, it does not directly inspire design ideas for communication devices. Two design sessions were carried out for this and these will be described in the following section.

3.3 Method: The design sessions

The previous two steps of analysing the empirical rich data in the Probe study were used to select key sections of transcript in order to understand subjective complex and subtle emotions experienced by families with regard to separation and communication (see Chapter 2, Section 2.5.3). In this section, another analysis will be conducted for exploring and clarifying the needs of

families and generating design ideas for inventions. The data for this analysis was the outcome data of the previous analysis (see Chapter 2). Nine sets of quotes (transcribed talk) that provide potential requirements for design were generated by the supervisor Andrew Monk and the author using the design technique, 'brainstorming'. This is a building of ideas by a process of mapping association.

For doing this, each of the axial codes (118 quotes) was cut out and displayed on a wall using 'Blu-Tack'. At first, codes with the quotes more related to 'technology' were put on the left side and themes with the quotes more concerned with 'relationship' were shown on the right side on the wall. Codes (with the quotes) thought of as positive were placed on the upper part and others considered as negative were put on the lower part of the wall (see Figure 3.1).

Secondly, the codes and the quotes were examined again in order to see if there are some relationships between them. The themes related to quotes were grouped and displayed again and then ideas were generated from the quotes. Thirdly, the ideas were written down on notes, and then attached to the associated space (see Figure 3.1). At this brainstorming session (preliminary design session), nine sets of quotes within the themes (ideas) emerged including finding time to do things together, home media space (with video and audio, video only, audio only), the presence for small children with common activities, and multimedia recorder for sharing.

The first design session was conducted to have an in-depth discussion with Mark Blythe (Department of Computer Science, University of York) on the 17th of June, 2009. The aim of the design session was to generate design ideas to illustrate and clarify the needs of the families as expressed in the sections of text on the wall (see Figure 3.1). These ideas should be physical inventions for connecting families at a distance. However, they did not need to be practically realisable or to entirely fulfill the requirements implied by the sections of text. They were called 'nearly-do-it inventions'. This approach is similar in purpose to the Chindogu 'unuseful objects' (Blythe & Monk, 2002). Where there were existing products, prototypes, or concept designs which could also partially satisfy the desires expressed in some of the collection of quotes, they were also discussed. The sections of texts were re-grouped on the wall and a yellow sticky note attached naming the invention to record these ideas (see Figure 3.1).

The second design session was held in a more conventional way with Patrick Olivier, Jayne Wallace, and James Thomas at Culture Lab. in the University of Newcastle on the 29th of June in 2009. These discussions were recorded and transcribed for identifying new ideas.

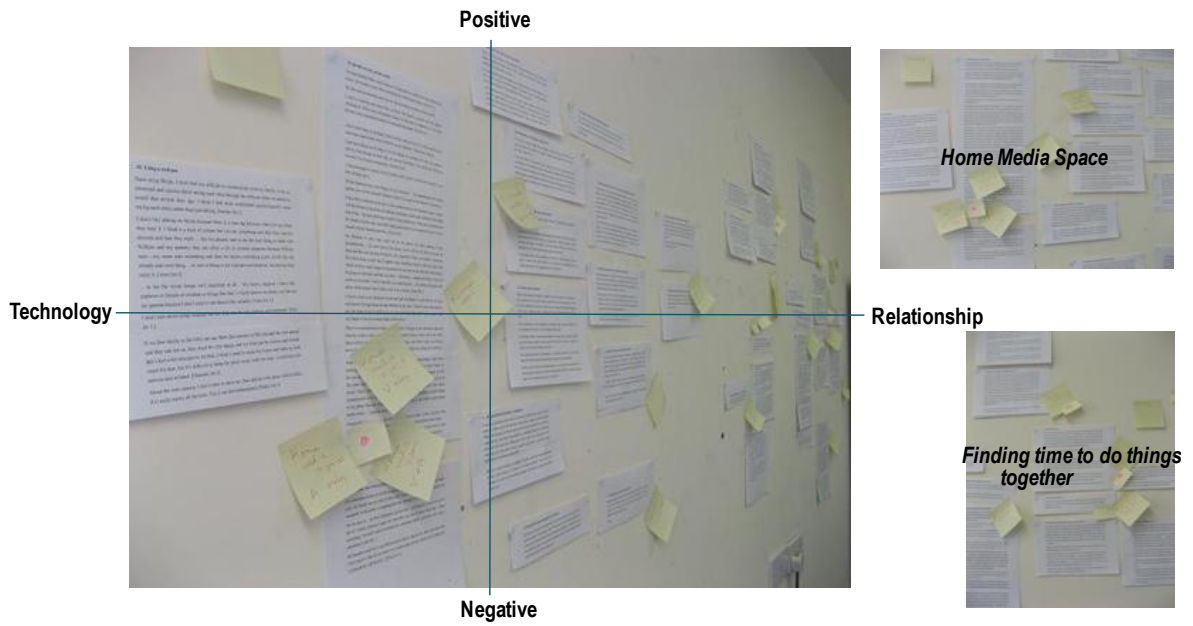


Figure 3.1 Ideas generated through brainstorming

3.4 Results: Design ideas and concepts illustrating them

In this section, the combination of a small group of quotes derived from family members with some needs of emotional communicative context that can be inferred from those quotes, was found to be a powerful and rich way of expressing possible requirements for design. Table 3.2 summarises these results as six design themes, which were explored and generated through the analysis of the two design sessions with several iterations of examining the sections of text relevant to the codes (see Chapter 2, Section 2.5.3). Each requirement was derived from the sections of text. ‘Sending love’ and ‘Reflection’ would be the themes that inspire the idea of sending asynchronous media gifts which will be described at the end of this chapter.

Table 3.2 Design themes and quotes ('T' number*) that specify the requirements of the families.

Design themes	Requirements / positive	Requirements / negative
Finding time	Low effort: T78, T72, T70 Synchronising: T79 Emotional: T77, T57	No video: T111, T112 Not tracking: T114, T115
Sending love	Common ground for conversation: T44, T46, T29, T48 Lasting gift: T39, T8, T10, T35 Easy to share: T117, T113	
Presence for small children	Synchronous: T67 Engaging for both: T67, T20, T23 Co-creation /play: T6, T7, T97, T109	
Reflection	Sound: T4, T34 Object with meaning evocative: T3, T39, T63, T40, T32 Something you wear: T39 Young children too: T17, T18	
Reassurance	Trust: T27, T58	Obligation: T29, T30, T21
Saying sorry	Conflict: T86, T87	

*'T' numbers' quotes can be found in the sections for each design theme and also in Appendix 4.

3.4.1 Finding time

People with family members living abroad are conceived to have little room and little time to give comfort to each other. They feel happy when they can do something together (synchronous) or share the moment of special events or activities relating to their children or infants. They, however, live their busy lives with children. T78 shows 'very little time to talk' with husband. In the case of a mother working and having a baby, communication is likely to be short and simple, such as the idea of 'not to say too much' in T72. Therefore, the requirement of this context is that technology should support individuals to find time to talk with 'low effort', like 'just ring to find out which there are..., T70'.

"When you have two young children, you have very little time with your husband. So we don't have much time to talk." [Anne Int.2, Cards] T78

"The topic of the conversation on the phone is usually to see if how I am and how they are. I am quite talkative as a friend but these days I try not to say too much, because they are busy with a baby." [Jane Int.1] T72

“I rang my mum daily when she was in Oxford almost daily when we worked together. Also we don't work together now but I used to have to ring her about lots of her business but now though....we just ring to find out which there are ...now... ” [Anne Int.1] T70

The international time difference is also a significant problem for communicating with each other on common topics of daily life. T79 gives the requirement of ‘synchronising’ with communication between a busy mother of two children in the UK and the older parents in California.

“It's not the question of money, it's about the time. Everything is free and everyone is ready to talk, so, the main problem is the time.... I think they [her parents in California] are 8 hours earlier than us. When I want to talk to them, it has to be after 5 o'clock in the afternoon, but that's just I start supper and bedtime for us... so my mother's obstacle is for 8.30 or 9 but by that time I am already in bed, putting my children in bed. ” [Anne Int.1] T79

Because of the time difference, another problem for emotional communication arose. Even though the married couple has time to talk, the situations did not allow them to give comfort to each other synchronously. In T77, the wife wanted to give a gentle hug to her husband who seemed depressed. She was, however, talking on the phone in her office in Korea but her husband was on his way home from work in Baghdad. In this context, technology should help the couple who must be able ‘to express the emotions’.

“One day, my husband looked depressed with some stress. His tone with the voice was so low. I asked what happened and he said the work was not easy, under his control. I just wanted to give a gentle hug to him but it was impossible. Even though I was talking on the phone, there was a limit of time and the way of expressing my feeling. He was talking on the way home but I was in my office. It's very inconvenient to talk. I wanted to say that I was thinking of him very much but it's not easy.” [Helen Int.2, Diary] T77

In the case of the couple living together with children, T57 shows the wife wishes to ‘feel each other’s emotion more’.

“This one is ‘Can you feel me?’ [cards probe]. I wish Tim [her husband] and I could feel each other's emotion more. We are very different people. Tim has very different knowing, thinking, the way we communicate and we often ... he often understands what I mean. We just express ourselves in very different ways. So at least there are some misunderstandings. And often we don't have much time with each other. So that will also make it harder. It is easy misinterpreting.” [Anne Int.2, Cards] T57

T111 and T112 show a feeling of some reluctance in revealing messy places. Another requirement is that technology should not always be a video type of communication. It is because ‘it's difficult to keep the place clean with two children, T111’, and ‘It is really messy all the time, T112’.

“If we [her family in the UK] can see them [her parents in SK] through the web camera and they can see us, they must be very happy and my children can be curious and excited. But I feel a bit reluctant to do that. I think I need to clean my house and make my children smart for that, but it's difficult to keep the place clean with two children. I could feel a bit nervous and irritated.” [Hannah, Int.1] T111

“About the web camera, I don't want to show my face and my own place with my baby. It is really messy all the time. Yes, I can feel embarrassed.” [Helen, Int.1] T112

In T114 and T115, adults are concerned about the level of privacy of ‘being tracked’. Parents might need a type of tracking device for their children for security reasons. Children can, however, be curious to see the WhereAbouts Clock working. The requirement of design is that technology is ‘not tracking’.

“Do you have to.... do their information [about one of paper probe, WhereAbouts clock] get put their ... involuntarily or do you have to put in? I mean, someone might not want their own way to know when they... (Ben screaming). You don't want to be tracked by something. Maybe a prisoner with a tag or something like that.” [Anne Int.1] T114

“My daughter could like to use WhereAbouts Clock to ring me on where I am often. But I don't need it. Men do not want to be violated their privacy.” [Tom, Int.1] T115

Illustrative Design concepts associated with Finding time

The design theme of “finding time” and the related sections of text showed what families really need, involving the requirements of communicating with low effort, communicating synchronously, and emotional value for designing technology (see Table 3.2). Negative factors of technology were also to be considered, such as ‘no video’ all the time and ‘not tracking’ (see Table 3.2). Based on the findings, ideas associated with the theme “finding time” were suggested and taken into consideration for potential value of communication technology (see Table 3.3).

The first idea for ‘finding time’ considered existing commercial devices such as ‘clocks’ and ‘schedulers’. They could provide support for remote family members to find an appropriate time to talk. Commercial desktop and smart phone applications can provide more than one clock to be displayed on the same screen. One could show the present time for those members living in one time zone and the other could display the local time for the loved ones living in a different time zone. Google World Time Server Clock is one of the examples. The graphic signals the time of day at a remote location could facilitate synchronisation of communication with very low effort. Emotional value also might be gained by using it, even though it does not provide signal availability.

Another type of commercial device are ‘schedulers’ to be shared by members of the family. O2 Joggler is one of the examples which facilitate synchronising communication. However, it needs high effort to use it and the user could feel it is like work, rather than socialising with members of the family.

Table 3.3 Ideas associated with the theme, “Finding time” and the match to requirements and potential value

Ideas		Source	Potential value
<i>Clocks</i>	Commercial desktop and smart phone apps	Many e.g., Google World Time Server Clock	Facilitate synchronisation. Low effort. Could gain emotional value. Does not signal availability.
<i>Schedulers (shared)</i>	Commercial desktop and smart phone apps	Many for work, e.g., ... Some for home e.g., O2 Joggler	Facilitate synchronisation. High effort, could feel like work.
	SPARCS future calendar events feature	Experimental system (Brush et al., 2008)	Facilitate synchronization. High effort, could feel like work.
<i>Location monitors</i>	WhereAbouts Clock	Experimental system (Sellen et al., 2006)	Monitoring aspect not liked by our participants, does not signal availability
<i>Movement detectors</i>	Tsunagari-kan planter display	Experimental system (Miyajima et al., 2005)	Low effort. Could gain emotional value, but too implicit
<i>One bit “I thought of you”</i>	‘Secret-touch’	Experimental system (Vetere et al., 2005)	Facilitate synchronisation. Low effort. Could gain emotional value. Tactile interaction
	‘Lovers cups’	Experimental system (Chung et al., 2006)	Facilitate synchronisation. Low effort. Could gain emotional value. Tangible interaction
	‘Feather’	Experimental system (Strong & Gaver 1996)	Facilitate synchronisation. Low effort. Could gain emotional value. Tangible interaction
<i>Media gifts</i>	SPARCS recent photos feature	Experimental system (Brush et al., 2008)	Could gain emotional value
	ASTRA awareness system	Experimental system (Romero et al., 2007)	Could gain emotional value
<i>Media space (always on comms)</i>	Portholes	Experimental system (Lee et al., 1997)	Facilitate synchronisation. Low effort. Gain emotional value but not home environment
	The Family Window	Experimental system (Judge et al., 2010)	Facilitate synchronisation. Low effort. Gain emotional value.
	Video link in infrequently visited places	Design session with Mark	Facilitate synchronisation. Low effort. Gain emotional value.
	Sound window	Concept design (Oleksik et al., 2008)	Facilitate synchronisation. Low effort. Could gain emotional value, but too implicit

SPARCS (Brush et al., 2008) was an experimental system providing recent experiences and future calendar events features for extended family members to feel connectedness. The mechanism of the system allows members of family to give suggestions and get feedback on the information posted. However, SPARCS still needs high ‘effort’ to use in an ‘asynchronous’ way of communication, even though it helps to gain ‘emotional’ value for that.

Another idea, the Whereabouts Clock (Sellen et al., 2006), was thought of as location monitors, which could help find time to talk. Whereabouts Clock provides one of the four locations of work, school, home, and other place shown on the clock by using the user’s mobile phone. Although it needs low effort to communicate, gaining a level of emotional value, the monitoring aspect of the system was not liked by our participants (see Chapter 1, Section 1.3.2; Figure 1.14).

Tsunagari-kan planter display (Miyajima et al., 2005) was considered as one of ‘movement detectors’ proposed for sensing of connectedness between remote family members. ‘FamilyPlanter’ was gently rotating when the other party was recognized by the movement in the home. The system needs low effort and could gain emotional value. However, the output of the system is likely to be too arbitrary, which could be irrelevant for those who are very busy working parents with young children (see Chapter 1, Section 3.2; Figure 1.9).

One bit of “I thought of you” was also regarded as ‘brief automated signal as synchroniser’ for expressing emotions, particularly for busy absent couples. The output of the signal is shown by a range of forms, for example, subtle vibration like ‘Secret-touch’ (Vetere et al., 2005), light up with illuminating colour such as ‘Lover’s Cups’ (Chung et al., 2006) (for more detail see Chapter 1, Section 1.3.1; Figure 1.2). Another experimental system, ‘Feather’ was developed for supporting emotional relations (Strong & Gaver, 1996). The Feather describes if a travelling partner closes a picture frame box, then a linked device placed in the home responds, and a feather in a clear glass cone floats around within the cone (see Figure 3.2).

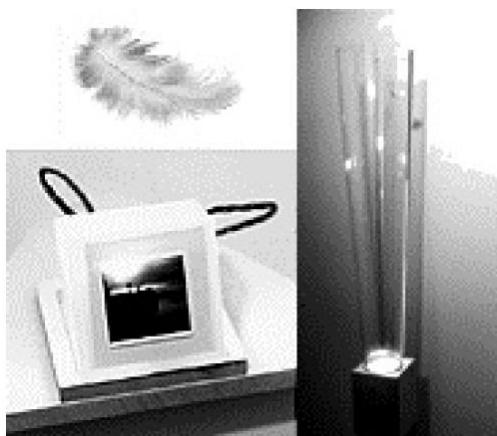


Figure 3.2 Picture frame box (left) and a feather in a glass cone (right).

These three systems described above could help ‘finding time’ to talk and meet the requirements with ‘low effort’, ‘synchronising’, and ‘emotional’, such as ‘FamilyPlanter’ (Miyajima et al., 2005) described above. This idea of ‘one bit - I thought of you’ might be more welcomed by couples, rather than busy parents with children. However, the simple ‘one-bit’ message could have more impact of lingering and evocation such as in the example quote, T77 (see Section 3.4.1), and this idea could also be related to the theme, ‘Sending love’ to be described in Section 3.4.2.

SPARCS (Brush et al., 2008) also provides a recent photos feature, which was considered as a form of ‘Media gifts’ in this study, which came from a previous study suggesting that the way teenagers use text messages may usefully be considered as gift-giving (Taylor & Harper, 2002). It is because members of a family could feel informed and surprised to share new photos with meanings. In comparison with ‘FamilyPlanter’ (Miyajima et al., 2005), SPARCS supports rich, explicit and concrete information to be transmitted to receiver. ASTRA (Romero et al., 2007) also supplies recent photos with hand written message to a home screen device through a mobile phone for triggering conversation and gaining emotional value (Romero et al., 2007). These photo systems might help the receiver to find time to talk by recognizing the time and the context of new photos to be displayed on the device (see Chapter 1, Section 1.3.1; Figure 1.4). These systems are described in detail in the following section (Section 3.4.2 Sending love).

Regarding an audio and video link which is always on in ‘media space’ (Bly et al., 1993), NYNEX Portholes (Lee et al., 1997) was thought of for ‘finding time’ to talk. The Portholes were intended to link short physical distances in the working environment, allowing increased ease of coordinating activities and also socialising between colleagues. The notion of ‘media space’ was brought into the domestic environment with the system Family Window (Judge et al., 2010). The Family Window was aimed at supporting families to feel more connected over distance by providing availability awareness and opportunities for sharing daily activities. The system supports video only without audio due to concern on the level of privacy (for more details see Chapter 1, Section 1.3.2; Figure 1.12).

With regard to the level of privacy, the positioning of the camera is crucial to be considered. Mark Blythe suggested an idea of ‘open video link together’ in infrequently visited places or only when passing a space like a flight of stairs in home. It might support a lower level of peripheral awareness of family members. However, it could be a very natural way of approaching awareness with ‘low effort’ and serendipitous opportunities of ‘synchronous’ communication.

Compared to the Family Window (Judge et al., 2010), providing a video channel only, the Sound Window (Oleksik et al., 2008) is supporting an audio channel only (see Figure 1.10). The

Sound Window is proposed as a concept phase, allowing people to receive and send domestic sound information from remote locations (see Chapter 1, Section 1.3.2). The arbitrary ‘soundscape’ (Oleksik et al., 2008) could be amplified by opening the virtual window on a remote computer screen, offering a feeling of background presence. If the Sound window could be implemented and deployed for field trials, it could facilitate synchronisation with low effort and emotional value.

3.4.2 Sending love

The design theme of ‘Sending love’ was inspired by some of the quotes related to ‘Parents are wishing all their love for children [22]’, ‘Sharing emotions [20]’, and ‘Talking to men/father/grandfather [17]’ which emerged in the axial coding in Chapter 2 (see Section 2.5.3.3 and Section 2.5.3.4). It seems that all members of the family need to communicate with each other more in order to understand and share their emotional needs and support. Some men are, however, unlikely to talk to members of the family. This could be simply because of the nature of personality to a certain extent, such as ‘a man of few words, T48’.

“When my husband came here [in Korea from Baghdad], I needed to talk about all things over the night. I had to talk. But my husband was just happy to see me and Benjamin and that's all. I said he didn't need to come if he just wanted to see me, and not to talk. Well, we are just compromising for us all. We are trying to do the best for each other.” [Helen Int.1] T44

“My husband doesn't enjoy talking with me. He says a very simple answer. I say five things, and then he says just one.” [Emma, Int.2, Diary] T46

“My father doesn't talk so much, just for 1 minute or so. He is suffering from diabetes so we just talk about the hospital, the medicines and something like that.” [Emma, Int.1.] T29

“My brother didn't tell the parents about his honeymoon and other things about the wedding. He is a man of few words. So I needed to tell them about his schedule.” [Hannah, Int.2, Diary] T48

Consistent with the theme, talking to men/father/grandfather, Romero and his colleagues (Romero et al., 2007) explained that many individuals, especially males, are likely to have a level of difficulty regarding engaging in a purely social nature of communication, although these are the most valuable within the family.

“Utility-oriented topics of conversation are sometimes needed and appreciated as an excuse for engaging in emotionally gratifying communication.” (Romero et al., 2007) p.303

T39 and T10 show how ‘object or letter with meaning’ evokes the feelings of family members. These were regarded as ‘lasting token of love with value’. The very traditional communicational message, a letter, could be the most valuable medium because it enables the showing of the bottom of the sender’s heart with effort and the receiver feels this with strong

impression. T10 shows very deep emotion by text message as ‘gift-giving’ (Taylor & Harper, 2002). Another case shows how to co-create the media as a ‘special present’ for a wedding in T35.

“The watch could be the one, my wife bought me when I went on a business to the USA for the first time. I didn't wear it. I didn't need it because it's quite expensive and the mobile phone told me the time in Korea. But here I am wearing it most of the time, even at night. It is very practical to see the time. It reminds me of my wife.” [Tom, Int.2, Photos] T39

“I found a letter in my husband's books and stuff accidentally. I could feel his very deep and sincere feelings about me and children by the letter. I think he was embarrassed to give the letter to me so didn't give it to me and forgot. But when I read it again I feel very happy to see his own heart.” [Helen Int.1] T8

“They don't think the telephone is the best. Even if you are talking with someone, it's not always the best way. I know when Mike rang me the other day to see about ... see how I was and tell me he loves me. And I sent him a short text of ‘thank you for your love’, then he sent a text back of ‘I will always love you’. It was really nice.” [Betty Int.1] T10

“Nowadays, I get email once or twice a day but before the marriage, Laura [daughter in the UK] emailed me very often. So my husband printed them out with photos to make a book, which would be her special present for the marriage. We have enjoyed seeing these emails, letters and photos.” [Jane Int.1] T35

Therefore, the requirement of this situation is ‘to see something to talk about’. Technology should be a vehicle for ‘common ground for conversation’ in the emotional context. However, it should also be ‘easy to share media’, since everyone is ‘always busy and bothering to send a photo using computer, T117’, and ‘not easy to do social network utility’ while being concerned about ‘who sees what’, T113.

“I am always busy and bothering to send a photo using computer. If this [Pogo probe] could be a digital album to store lots of photos, I would take photos of Benjamin whenever possible and then send them to my husband. I will tell him that ‘While you were there, I was thinking of you like these photos with my feelings’.” [Helen Int.2] T117

“It is sometimes not easy to do that [using Cyworld, like Facebook] and the photos are not for the family only. My friends can see some of them and I need to decide whether some photos are acceptable for the public or something like that.” [Hannah, Int.1] T113

Illustrative Design concepts associated with Sending love

The design theme of “sending love” and the associated quotes required ‘common ground for conversation’, especially for men to be engaged in social communications with members of the family. ‘Lasting gift’ was also considered as a requirement for designing technology which conveys a meaningful message for lingering with personal effort. Another factor for designing technology should be ‘easy to share’ media (see Table 3.2). Ideas associated with “sending love” were suggested with a simple description of how they match the requirements (see Table 3.4).

Table 3.4 Ideas associated with the theme, “Sending love” and the match to requirements and potential value

	Ideas	Source	Potential value
Media gifts	Asynchronous sending of media clips	Design session	Could be a lasting gift. Easy to use. Common ground for conversation
	ASTRA awareness system	Experimental system (Romero et al., 2007)	Photo as a lasting gift. Easy to use. Common ground for conversation
	The videoProbe	Experimental system (Conversy et al., 2003)	Series of still photo as a lasting gift. Easy to use. Common ground for conversation
	Digital photo album, c.f. Flickr	Design session	Series of still photo as a lasting gift. Easy to use. Common ground for conversation
	MessyBoard	Experimental system (Brush et al., 2008)	Could be a lasting gift. Easy to use. Common ground for conversation
	Teleportation	Design session with Patrick	Could be a lasting gift. Easy to use. Common ground for conversation.
	ScanBoard	Experimental system (Hindus et al., 2001)	Could be a lasting gift. Easy to use. Common ground for conversation
	Piece of Family	Experimental system (Stappers et al., 2009)	Could be a lasting gift. Easy to use. Common ground for conversation
Media space (always on comms)	Everyday utterances	Design session with Jayne	Easy to use. Could be common ground for conversation.
	Sound snap shots	Design session	Easy to use. Could be common ground for conversation.
	Sonic Gem	Concept design (Oleksik et al., 2008)	Shared music as a lasting gift. Easy to use. Gain common ground for conversation
	MissU	Experimental system (Lottridge et al., 2009)	Facilitate lasting gift. Easy to use. Gain common ground for conversation
One bit “I thought of you”	Paired objects-device	Design session	Could be a lasting gift. Easy to share.
	Necklace	Concept design (Go et al., 2000)	Could be a lasting gift. Easy to share.
	The White Stone	Experimental system (Tollmar et al., 2000)	Could be a lasting gift. Easy to share.
	The Hug wearable	Experimental system (Vetere et al., 2005)	Could be a lasting gift. Easy to share.
	The hug pillow	Experimental system (Gemperle et al., 2003)	Could be a lasting gift. Easy to share.
	Hug avatar, c.f. MSN, NateOn	Design session	Could be a lasting gift. Easy to share.

Under the theme of ‘sending love’ to absent loved ones, many ideas and the associated studies could be illustrated under three categories composed of ‘media gifts’, ‘media space’, and ‘one bit - I thought of you’. At first, eight ideas and experimental systems are described as a form of ‘media gifts’ including three design ideas generated in the design sessions and five experimental systems proposed.

With regard to the form of ‘media gifts’, ‘asynchronous sending of media clips’ timed to arrive at an appropriate time was suggested for the theme, ‘sending love’ in the design session by the author. This idea is for distant family members living in a far different time zone to be able to feel the illusion of living in the same time zone. This media clip could be intended to be synchronised to the receiver’s daily activities, such as ‘meal time’, ‘getting up’, or ‘going to bed’ with a simple but meaningful message. The participants separated from their husbands in the probe study mentioned that ‘eating together’ is very important but they just had breakfast or dinner just with their children for long time. They took a photo of the ‘dining table’ with a hope of ‘eating together’ as a whole family (see Section 3.5.1). This idea was also inspired by the study, ‘Sharing the empty moments (Lottridge et al., 2009)’ describing that the timing of thinking about a missing absent loved one was often when waking up, or going to bed. Family members in the context of living at a distance might send media clips in an asynchronous way due to the significant time difference. However, it would be feasible to develop this idea with technology. It will be developed as a form of scenario and illustrated in Section 3.5.1.

Technology based on this idea should meet the requirements of ‘common ground for conversation’ and ‘easy to share’ it between members of the family. It could be used as a ‘lasting gift’ if the message is meaningful. As described before in Section 3.3.1, an awareness system, ASTRA (Romero et al., 2007) could be an example for this idea, supporting a context for conversation with picture messages displayed on a home device through a mobile phone (see Chapter 1, Section 1.3.1; Figure 1.4). The VideoProbe (Conversy et al., 2003) was developed to provide random moments of snap photos with only a three second-pause in front of the screen to the remote family member. More details can be seen in Chapter 1, Section 1.3.1 (see Figure 1.10). These examples could meet the requirements of ‘common ground for conversation’, ‘lasting gift’, and ‘easy to share’.

‘Digital photo album’ was also proposed as the form of ‘media gifts’ during one of the design sessions. This is focused on the photos being automatically and randomly organised as groups and sent to distant family by technology. For example, MessyBoard (Brush et al., 2008) was a shared digital bulletin board system supplying a free-form layout on a web-browser using notes, photos, or even drawings. The MessyBoard could be included as supporting a form of ‘media gifts’.

In the second design session conducted in Culture Lab, an idea of ‘Teleportation’ was

suggested by Patrick. Patrick explained that the Teleportation could be designed as a device that simultaneously scans then shreds a drawing or letter to be printed at the receiving device. The drawing or letter could be kept at the receiver's end only, like the traditional way of posting. This idea will be partly adopted in the design of TimelyPresent that will be addressed in Chapter 4.

In comparison to the Teleportation, the experimental systems, 'ScanBoard' (Hindus et al., 2001) and 'Piece of Family' could be considered here. ScanBoard enabled physical pieces of paper to be put through the slot, digitized and shown to the selected virtual board. A set of thumbnail images could be shown on the screen and zoomed up to full size by touching them. 'Piece of Family' (Stappers et al., 2009) is likely to be a partial working prototype as an augmented book with a built-in scanner. It was developed particularly for the elderly to send messages to the 'Family Weblog' of adults and children. In addition to this, the Family Weblog information could be displayed on the TV screen of the elderly (see Figure 3.3). However, the two systems addressed are distinct from the idea of Teleportation allowing only one single form of paper to be sent to the receiver.



Figure 3.3 The working prototype consisting of a notebook with a scanner in its cover, and a small extension to the television's remote control.

Under the notion of 'media gifts', the ideas and the experimental systems described before could be associated with the theme 'sending love, supporting 'common ground for conversation' for distant members of family and the media sent to receiver could be shared with ease and thought of as a long 'lasting gift'.

In regard to the second form of 'media space' representing always on communication systems, the following two ideas generated from the design sessions, one design concept and an experimental system proposed are illustrated. 'Everyday utterances' was suggested by Jayne Wallace in the second design session. Everyday utterances could be recorded and transmitted by technology, such as "I am off now". These days most people are all busy every day with working,

studying, or socialising with others. In such a busy life, Everyday utterances could be missed easily so might be valued. This idea was also inspired by Keller’s study (Keller et al., 2004) for reconnecting between mothers and sons living in different places. On the focus group interview, the most missed moment for mothers was their sons saying “Mom, I’m home!” More details can be seen in Chapter 1, Section 1.3.1 and in Chapter 2, Section 2.2 (see Figure 1.8).

‘Sound snap shots recording children’s laughter’ could be a similar idea to the previous one. The ‘Everyday utterances’ could be thought of as a more explicit voice message, whereas ‘Sound snap shots’ might be more implicit, abstract, background sounds. In the probe study, sound such as ‘kid’s laughter’ could evoke happy moments of all members of the family. This crucial design element should be considered with the time difference.

The concept design, Sonic Gem (Oleksik et al., 2008) was discussed as an example of the two design ideas (see Figure 3.4). The precious stone like a gem could represent a recording of valuable domestic sound. The gem contains a wireless memory chip inside, interacting with a recording and playback device. The recorded gem can be played back while being moved past a sensor in the sonic gem bowl. It is a tangible form of sound. If the sonic gem can be transmitted to a remote family member, it would fit the idea of ‘everyday utterances’.



Figure 3.4 Sonic gem bowl

An experimental system, MissU (Lottridge et al., 2009) was developed for remote couples to share their explicit music playlist and exchange ambient background sounds (see Figure 3.5). Some of the design elements were a ‘continuous’ link providing time for reflection or experiencing ‘being with’ the other, and ‘easy access’ and ‘direct manipulation’ similar to the requirements of ‘sending love’. MissU also supports common ground for conversation.



Figure 3.5 The prototype of MissU

The last group for ‘sending love’ to the loved ones contains two ideas, two experimental systems and a concept design proposed under the form of ‘one bit of message’. Just one bit of message could sometimes be necessary for sending love. ‘Paired objects-device’ suggests one to connect both partners for a day, such as pair of earrings. Many ideas have been presented for this. Examples are ‘Necklace (Go et al., 2000)’ and ‘The White Stone (Tollmar et al., 2000)’. The Necklace has a temperature sensor so if one holds their necklace for a while the other’s necklace warms up. The White Stone (see Figure 1.3) was carried in a pocket. This could be initiated by pressure and a heat sensor, transmitting signals to the other stones to play a sound, which could be compared to Sonic Gem (Oleksik et al., 2008) described before. These ‘paired objects-devices’ could meet the requirements of ‘lasting gift’ and ‘easy to share’ with ‘one-bit message’. However, they might not support common ground for conversation.

‘Wearable device to feel like ‘hug’ or sending ‘hug’ avatar in a media space’ could also be considered in this category of ‘One bit’ message. ‘The hug over a distance (Vetere et al., 2005)’ was presented for allowing a tactile interaction with the feeling of a hug by the partner’s jacket. This device is likely to suit the couple in T77, but might not fit for a busy family with children. Another concept, ‘The Hug (Gemperle et al., 2003)’ was presented as a pair of soft, cushion-like objects providing the feeling of a hug with communication through a wireless network with a pressure sensor, light indicators, and a microphone with speaker (see Figure 3.6).

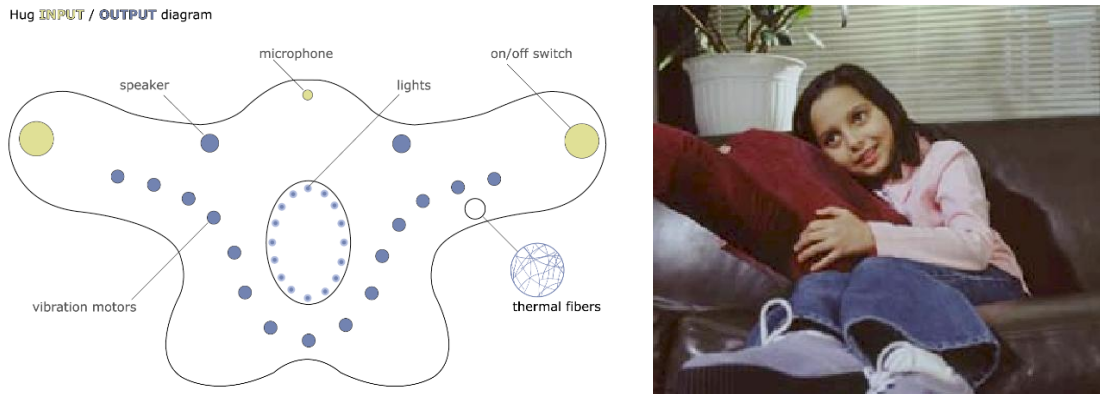


Figure 3.6 The Hug

Some of the participants mentioned ‘avatars in a media space’ such as MSN or NateOn, used for expressing emotional feelings with playful animated media clips. This idea could be developed in a more personal or co-creative way as a service on smart phones. These hug ideas are all ‘easy to share’ and might be provide ‘common ground for conversation’.

3.4.3 Presence for small children with common activities

Small children are not good at talking on the phone and soon lose interest. Yet absent parents are keen to keep in touch. In T67 and T20, a mother has a child with an absent father. She is worried about her son because father and son cannot have enough time to get to know each other. The father is eager to hear the son’s voice but the nine month old son is just listening to the father without saying anything. In this case, the presence of the father could be encouraged through common activities. Some technology should make play and engage both child and father.

“When my husband came here, Benjamin [9 months old] felt very upset about being with his father. He is still a baby. So I show the photo of my husband and tell Benjamin he is your daddy, say hello and kiss him. Even though there is a kind of side effect, I am still telling him who daddy is and encouraging him to say hello and something like that. I think it is very important to tell him the presence of his daddy.” [Helen Int.1] T67

“I was very worried about Benjamin. He couldn't have enough time to get to know his father. So I showed him his father's photo almost every day. The problem was Benjamin thought every man in a photo was his father. When my husband came here with us, he was shocked at the problem. We were all in an elevator and my husband was holding Benjamin with his arms. He asked where daddy was and Benjamin pointed at the picture on the wall with his finger and said 'Daddy, daddy’”. [Helen Int.1] T20

“... especially, my father always tells me to show their [the grand parents'] pictures to my children as often as possible, not to forget them. He always asks me to do so to make sure his grandchildren remember him, until when the whole family will meet at the airport.” [Hannah, Int.1] T23

Mothers show pictures of the husband or grandparent to teach the child who they are but this is not effective. What is needed is some way of facilitating meaningful interaction between the child and the absent family member.

Common activities can engage a child whereas simple conversation does not. This could be explained more by Vangelist who concluded in his research that, “People who are happy with their relationships not only spend more time together, they engage in activities that make their time together particularly rewarding.” (Vangelisti, 2002, p.660).

The engagement with a child is achieved by common activities such as writing observed the following two example quotes in T6 and T7. Technology should be synchronous and support ‘co-creation’ to play.

“She was famous for her good written work. When I taught her to write, I put every bit of paper where she wrote or drew on onto the wall. Every space was covered with her papers like a white board full of texts. When she put some written work on the wall, then I put my paper reply next to hers. Sometimes her father joined to put his own work as well. It was really fun for everyone. When my friends came to see the papers on the wall, they were all enjoying reading them and laughing. It was a kind of joke, paper puzzle, or a riddle. There was an arrow on a paper for me to follow for the next paper. We had played to write like that since she was young.” [Jane, Int.2] T6

“I’ve got her all diaries since she was a second year student in the primary school. She had been famous for writing a diary in the neighbourhood. Her stories of the diary are really funny but I just showed the cover of the diary to my friends. I liked to talk about my daughter’s diary with them.” [Jane, Int.1] T7

Audio and video links enable a feeling of being together across time and space. For children’s common activities, Skype could be a good example of media space especially for connecting children and remote grandparents.

“He [William 6 years old] won’t do on the phone. He hates talking to them [grandparents].... he won’t talk on the phone, but he will do on Skype as he can see them and they can see him. It must be very important to him or he thinks it’s more fun. The whole thing is more fun. It appears that something which is a bit fun. I don’t think which involves visual image of my parents and real time so he wants the whole thing to be going on real time and they are there... their faces... images are terrible. They look awful on the screen. I don’t want they are supplying that. ... He prefers it [Skype] to the phone which doesn’t find it funny at all in my medium.” [Anne, Int.1] T97

“I don’t like talking on Skype because there is a time lag between what you say when they hear it. I think it’s a kind of system but you say something and then they wait for seconds and then they reply ... but we already start to say the next thing so often with William and my parents, they are often a bit at crossed purposes because William says....my mum asks something and then he replies something quite slowly but she already asks next thing... so sort of thing is not a proper conversation, but anyway they enjoy it.” [Anne Int.1] T109

Illustrative Design concepts associated with Presence for small children

The design theme of “Presence for small children” and the related quotes showed that three

requirements emerged for designing technology. For small children, common activities should be interacted in a ‘synchronous’ way. This approach could be also ‘engaging for both’ a child and absent parent/grandparent with a meaningful interaction. Some ways of interaction can be regarded as the form of ‘co-creation/play’ (see Table 3.2). Ideas for “presence for small children” were suggested with a simple description of how they match the requirements (see Table 3.5).

Table 3.5 Ideas associated with the theme, “Presence for small children” and the match to requirements and potential value

Ideas	Source	Potential value
<i>Media gifts</i>		
Video snap shots for children	Design session	Voice evocative. Could engage both
Children’s electronic diary to be shared	Design session	Could engage both. Co-creation/play
HomeNote	Experimental system (Sellen et al., 2006)	Could engage both. Co-creation/play
Wayve	Experimental system (Lindley et al., 2010)	Could engage both. Co-creation/play
The Collage	Experimental system (Vetere et al., 2009)	Could engage both. Co-creation/play
<i>Media space (always on comms)</i>		
Gustbowl	Experimental system (Keller et al., 2004)	Could engage both. Co-creation/play
Games to play on Skype	Design session	Could engage both. Co-creation/play

The idea of ‘Video snap shots for children’ was suggested to evoke a feeling of the presence of remote family members and to stimulate conversation. A number of commercial digital cameras and Smartphones provide a function for recording video snap shots. However, many feel uneasy to share these with remote family members. Technology should make it easy to share. The Video snap shots could have value, engaging both children and the absent parents/grandparents, by allowing co-creation or co-play if the activity could be relayed.

Another idea ‘Children’s electronic diary to be shared’ was also proposed for the ‘presence for small children’. This idea could be ‘engaging both’ and absent parents and also support ‘co-creation/co-play’. If a child and the absent parent could both engage in this activity, they could feel connected and happy to share moments with meanings. The situated message device, HomeNote (Sellen et al., 2006) could be an example and applied to this. HomeNote enables the users to

receive and display text messages sent via mobile phones. It also supports local scribbling using the tablet's stylus input (see Figure 1.7). The drawback was that the device could receive or draw messages only, and was not able to send them out. Among the four prototypes of communication introduced in the first interview in the Probe Study (see Chapter 2, Section 2.4.2.1 Interview 1), only HomeNote got positive comments from the participants due to the function of 'scribbling' on the screen.

Wayve (Lindley et al., 2010) was a new situated lightweight messaging device using pictures and scribble, particularly inspired by HomeNote. Wayve supported a closed network for a family with a flexible nature of communication, including a creative approach to messaging, commenting on mundane aspects of daily life, simple games to be played by both child and remote parent/grandparent (see Figure 3.7). The Wayve is thought of as being valued for 'presence for small children' with 'synchronous', engaging for both', and 'co-creation/play' and it is regarded as being difficult to improve on.

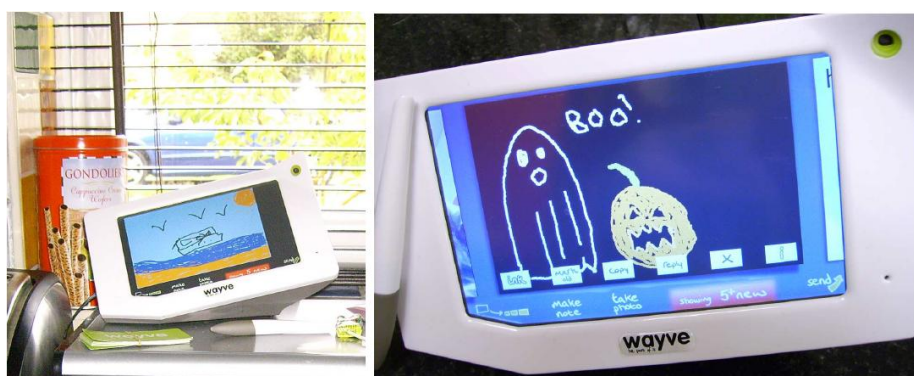


Figure 3.7 Wayve in a participant's kitchen and close up

The Collage (Vetere et al., 2009) was developed from insights about the connection between grandparents and grandchildren as a shared-photos display game for intergenerational interaction play (see Figure 1.6). The Collage differs from ASTRA (Romero et al., 2007), explained before in Section 3.3.1, by allowing the user to play with the photos collocated by interacting on the touch screen rather than by just sending photos for common ground for conversation (see Figure 1.4). The Collage could meet all the requirements of 'synchronous', 'engaging both' children and remote grandparents, and especially 'co-play' for 'presence for small children'. However, the Wayve allows people to engage in creative and playful activities in various ways such as messaging with 'playful embellishments', 'poking fun', or 'displaying wit', playing competitive games, and scribbling using it (Lindley et al., 2010).

As a form of media space, another experimental system, Gustbowl (Keller et al., 2004)

could be considered as a good example for ‘presence for small children’ (see Figure 1.8). The Gustbowl was presented as a pair of bowls for remote family members to share each other’s small objects, put on as visual images through a camera underneath. The objects shown to the other’s bowl were regarded as stimulus for conversation with the sudden strong expression of emotion as serendipity. Gustbowl could facilitate ‘engaging for both’ children and remote parents with activities ‘synchronous’, and ‘co-creation/co-play’. The Gustbowl was considered to be difficult to improve on.

It is found that if the open video could be linked together within a certain period of time, it seems to be ideal for all family members to see each other by using Skype with a webcam. The idea of ‘Games to play on Skype, or on the telephone’ could be considered for the design space. This idea was further developed as a simple form of scenario, Skype phone with stylised view, which is described in Chapter 3, Section 3.5.3.

3.4.4 Reflection for comfort

Some cases see more value in audio only media spaces. ‘Sound’ or ‘voice’, especially ‘children’s laughter’ is evocative of feeling happy and comfortable from yearning for loved ones.

“My husband said he wants to hear the children's laughter every day.” [Lucy Int.2, Diary probe] T4

“If only with a kind of conversation with someone, it disappears afterwards. ... I keep answer machine messages. ... I saved it for a year ... when I felt lonely, I just pressed the button. I can hear people say hi, Betty, it's me ... It's truly nice. I used to keep. I've got a friend in Australia, she's left me an answering message and I just used to keep it. I just want her voice.” [Betty Int.1] T34

“One day Benjamin [9 months old] was busy saying 'daddy, daddy, daddy...' on the phone when he was so excited to hear from his father. But after that Benjamin was just listening to his father, not talking to him. So my husband was trying to ask to say 'daddy' once more in very many ways, but ... yes, he is eager to hear his son's voice.” [Helen Int.1] T74

Regarding the theme of ‘reflection for comfort’, children can do the same as adults. This case is not ‘sound’ only, but a simple video clip shown repetitively to a child, giving a sense of being in play with the absent family member.

“If I can try to make a simple film of Benjamin and his father and show the film very often to Benjamin, he would be very happy to see his father playing with him with joy in the video.” [Helen Int.1] T17

“In my case, Simon [2.5 years old] wants to see the movie on the whole family in the swimming pool. He can play the video in the camera by himself and he puts the camera next to his head on the pillow and watches it so many times until he falls asleep every night. He wants to go swimming with his sisters but he is too young for that. But, he has learnt the image of swimming pool watching the video. He loves it so much.” [Helen’ friend Int.1] T18

T 63 shows how objects with special meanings can support people to establish and maintain identity.

“There is one picture upstairs. It is African embroidery. I like that one. I like it. ... It's like a mother and her child. ... Sometimes I just feel like walking away from it all. But sometimes I was quite happy to look at it in the little room. Sometimes I forget what I've got. ... When I was younger, like when I moved a house as a student, everything was put in a trunk. Then I reopen the trunk and I saw, "Oh!" I feel really surprised. I've completely forgotten that. ... something happens in my brain, I was completely different. I've never done it. I've never been to Hong Kong. I've never worked in Chile, never travelled the world. I completely forget. It's really weird, and annoying, but it happens.” [Betty Int.2, Photos] T63

“This picture [photo probe] is of Harry playing football with his friends. I want to show this picture to my husband, hopefully with Harry's shouts at his friends.” [Emma, Int. 2. Photos] T3

T39, T40 and T32 show feelings of comfort and consolation from yearning through an object with meaning. Particularly, ‘something to wear or to take’ such as ‘watch, T39, or pen, T40’ could evoke a memory about the absent loved ones. This may be consistent with one of Stafford’s cultural assumptions for long distance relationships, saying “shared meanings and understanding are necessary for close relationships”. (Stafford, 2005, p.14).

“The watch could be the one, my wife bought me when I went on a business to the USA for the first time. I didn't wear it. I didn't need it because it's quite expensive and the mobile phone told me the time in Korea. But here I am wearing it most of the time, even at night. It is very practical to see the time. It reminds me of my wife.” [Tom, Int.2, Photos] T39

“I like the pen ... from Korea. We like that. I used to having it with a camera on the table. ... it was nice... I took it everywhere.” [Betty, Int.2, Photos] T118

“This shoe rack reminds me of my husband who came here and made it for us [her and her son].” [Emma, Int. 2. Photos] T40

“This name on the wallet was written by Harry. When I think of the family, Harry could be the flower and the core of the family. His name has a special meaning, given by his grandparents so I took a photo of the name [photo probe], rather than my son, Harry.” [Emma, Int.2.] T32

Illustrative Design concepts associated with Reflection for comfort

The theme of “Reflection” for comfort and the related quotes gave the requirements of ‘sound’ evocative, ‘object with meaning’, and ‘something to wear’. People are likely to keep and store a number of media, such as voice messages, video clips, or pictures with meaning and whenever they are needed the media could be played or used for users to feel comfort. Reflection for comfort was conceived not only by adults but ‘young children too’ (see Table 3.2). ‘Reflection for comfort’ was accounted for self-reflection for establishing and maintaining identity, inner-thoughts about members of the family, or simply engraving a sense of play. Ideas for “reflection for

comfort” were represented with their match to the requirements (see Table 3.6).

Table 3.6 Ideas associated with the theme, “Reflection” and the match to requirements and potential value

Ideas	Source	Potential value
<i>Media gifts</i>		
Sonic Gem bowl	Concept design (Oleksik et al., 2008)	Voice evocative. Could engage for both
Picture mail with sound	Design session with Andrew	Voice evocative.
Text messages into voice mails	Design session	Voice evocative
<i>One bit “I thought of you”</i>		
Paired-object device	Design session	Object with meaning, something to wear
LumiTouch	Experimental system (Chang et al., 2001)	Object with meaning

The idea of ‘everyday utterances recorded and transmitted’ was already mentioned in the section of ‘sending love’ with the possibility of ‘common ground for conversation’, ‘lasting gift’, ‘easy to share’ (for more details see Section 3.4.2). This idea could also be used here with ‘reflection for comfort’. Simple utterances could be evocative and give strong impact especially between remote family members or friends. It might be more valued if each utterance could be stored. ‘Young children’ might do such reflection when they are missing their absent parents. If an object with meaning could be designed ‘to wear’ for the ‘everyday utterances’ system, it could be ideal for the requirement of ‘object with meaning evocative’.

As noted, ‘The Sonic Gem (Oleksik et al., 2008)’ was exemplified in the section of ‘sending love’. The Sonic Gem could meet all the requirements of ‘sound’, ‘object with meaning evocative’, ‘something to wear’, and ‘young children too’. However, the Sonic Gem was not a prototype, just the concept phase of an idea (see Figure 3.4). The Gem could be perceived as a toy or gadget children would lose easily. The Gem could be developed further as an experimental system, and redesigned in the form of a bracelet or pendant.

The idea of ‘Paired objects-device’ suggested in the section on ‘sending love’, was also represented here for ‘reflection for comfort’. This could connect both partners for a day, such as, a pair of rings or necklaces. This idea could meet the requirements of ‘object with meaning evocative’, ‘something to wear’, and ‘young children too’, but ‘sound’ should be accounted for.

The previous idea inspired another one, ‘paired objects-device for situated at home’ for ‘reflection for comfort’, such as photo frames. ‘LumiTouch (Chang et al., 2001)’ could be a good

example for this (see Figure 1.1). This device was already mentioned as an example of ‘brief automated signal as synchroniser’ for ‘finding time’ to talk. LumiTouch meets the requirement of ‘object with meaning’ by providing subtle light by tangible interaction. Lumitouch could be developed further for ‘voice message’ with a photo, such as the idea of Andrew’s ‘photo with sound’.

‘Text messages by adults transformed into voice mails’ was proposed for ‘reflection for comfort’ which was originally inspired by one of the units of the MATCH (Mobilising Advanced Technologies for Care at Home) project, ‘speech synthesis’ (Georgila et al., 2010). It could be considered and applied for the link between children and their absent parents. For example, the voice mails created from absent parents’ text messages could be sent to the kid at an appropriate time, such as good morning messages or simple bed time stories. This idea is an asymmetric method of communication for the connection between absent parent and child, busy parent and grandparent, or grandchild and grandparent. ‘Text message into voice mail’ could meet the requirements of ‘sound’ and ‘young children too’. This idea could be possible for further development. It will be described as one of the scenarios created in Section 3.5.1.

3.4.5 Reassurance

Many quotes request some way of “monitoring” someone else for “reassurance”. However, people are less willing to be monitored. This context requires a sense of ‘trust’ between each other within the family members, just like ‘everything is fine’.

“My mother always told me what a wonderful time they're having in California, so when she was made appointed, telling me, every time she rang me, how they both loved California... Technically, she was... every single time she phoned me, she would say, we've both had such a fantastic, marvellous time. My thought, that's a bit of vicious by thought, what probably means that she is over defensive, you know, when people transform things very much, it is dealt to mean the opposite is true... She wouldn't tell me there is no problem. She always tells me a good story only. She tells me everything's going well... I think she's reassured me, probably things about ... I am upset about...” [Anne, Int. 1] T27

"I think ‘honesty’ is best for the relationship. Sometimes my husband doesn't want to say something. He didn't want me to worry about that. But I feel there is something wrong, and feel very stressed. So I hope he tells me about everything." [Helen Int.2, Cards] T58

An English idiom says out of sight, out of mind. It means when we can no longer see them, we forget about them. However, in some cases, out of sight with long distance gives a feeling of ‘obligation’ to contact more as a ritual for courtesy’s sake, especially with health concerns for elderly parents.

“My father is suffering from diabetes, so I ask him to see if he takes medicines, drinks alcohol, or goes to surgery. He listens to me only, so I need to ring and ask him.” [Emma, Int.2, Diary] T29

“I ring my parents more often as a kind of obligation because they are very old now. I think I have to at least ring them more. I didn't ring them so often when I was in Korea.”
[Tom Int.1] T30

“My mum rang me [from Korea] about her bad dream. She was worried about everything about our daily life [here in England]. She asked if anyone is not well or my husband was away on business. I told her that children had caught a bad cold, but now they are now ok.”
[Hannah, Int.2, Diary] T21

Illustrative Design concepts associated with Reassurance

The theme of “reassurance” and the related quotes gave the requirements of ‘trust’, and lessening the sense of ‘obligation’ (see Table 3.2). Ideas for “reassurance” were represented with their match to the requirements (see Table 3.7).

Table 3.7 Ideas associated with the theme, “Reassurance” and the match to requirements and potential value

Ideas	Source	Potential Value
Prompting systems: Family monitor service		
Social network displays	Experimental system (Morris 2005)	Self motivation, Caregivers’ peace of mind, low effort
Digital family portrait	Experimental system (Rowan and Mynatt 2005)	Caregivers’ peace of mind, low effort
CareNet	Experimental system (Consolvo et al., 2004)	Caregivers’ peace of mind, low effort
Marker Clock	Experimental system (Riche & Mackay 2007)	Synchronous, low effort, emotional value
Intentional Presence Lamp	Experimental system (Hindus et al., 2001)	
Virtual Frosted Window	Experimental system in Responsive Home (Andrew)	

Prompting systems for a family monitoring service might help for reassurance that everything is fine. Social Network Displays (Morris, 2005) was developed for fostering a self-awareness of health and empowerment of social connectedness, through visualizing an egocentric model and suggestive mirroring of social behaviour. Figure 3.8 shows the conceptual model of social network such as a solar system, displayed and constantly updated using sensor and self-reported data. As can be seen, the elder is placed at the centre as the sun, and his/her friends and

family members are represented as kinds of planets surrounding by the sun. The movement of planets inwards demonstrates greater interaction with the elder. The preliminary observations from the field study showed that Social Network Displays was thought of as an intervention for the elders to feel motivated to try to maintain social ties. However, it is typically a self-monitoring system, not for interacting with others and may be regarded as an inappropriate approach for family members living separated at a far distance. The elders might want to demonstrate more meaningful actions, such as preparing food or initiating a telephone call.

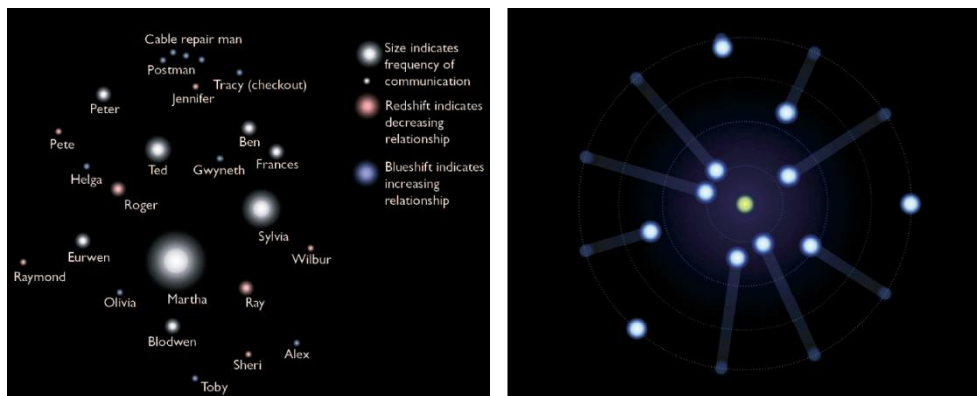


Figure 3.8 Conceptual models of social interaction, solar (left) and the representations of social activity (right)

‘Digital Family Portrait’ (Rowan & Mynatt, 2005) was developed to serve as ‘peace of mind’ to distant family members using the awareness of the elder’s well-being with the respect of privacy. This system used an augmented photo frame representing the ‘qualitative’ view of information of day-to-day activities. Digital Family Portrait served the connection between grandparent and grandchild who give each other daily glances and visual inspection with levels of an abstract form. However, the way of gathering and measuring the information by the participants might not be consistent and reliable for other members of the family because of the complexity of evaluating the categories with ranks. Digital Family Portrait could lessen the sense of ‘obligation’, but could not meet the requirements of ‘trust’ although forms of ‘reciprocal displays’ are provided. More details can be seen in Chapter 1, Section 1.3.3.

‘CareNet System’ (Consolvo et al., 2004) was developed as an interactive digital picture frame, which was inspired by the Digital Family Portrait project. The system was more focused on the target group who were the local members of an elder’s care network, responsible for providing the elder’s day-to-day care. CareNet could not meet the requirement of ‘Trust’. This system is likely to monitor in an explicit way with much detailed information, which might not consider the level of privacy of the elder. While the CareNet system was regarded as serving a more attractive

visualisation of the information on the frame, it is unlikely to consider the level of privacy which may be a critical issue.

‘Marker Clock’ (Riche & Mackay, 2007) was developed for the elder maintaining social connectedness by the exchanging of situational cues continuously and interactively. It offers to share implicit and explicit information about each other’s day-to-day routines, and particular events could be shared and represented around the clock as concentric coloured spirals (see Figure 1.13). More details can be seen in Chapter 1, Section 1.3.2. Marker Clock facilitates ‘synchronisation’ of communication with ‘low effort’, and users might gain ‘emotional value’. It can be developed further for the members of a family living at a distance with regard to the theme ‘Finding time’ to talk.

Other examples of awareness systems are two prototypes of Intentional Presence Lamp (Hindus et al., 2001) providing family members with an indication of a remote member’s presence. Curtain IPL showed tiny shapes of flower and lemon, represented by each user, floating around on the display if the user explicitly activated the device (see Figure 3.9). Lampshade IPL allowed users to represent their availability for communication, and served as a collaborative decoration by showing the upper part for a remote user and the lower part for a local one on the lampshade. Intentional Presence Lamp could fulfill the requirement of ‘trust’ and lessen the sense of ‘obligation’. The system could also be thought of in terms of the idea, ‘family monitor service’ in the section of ‘Finding time’.



Figure 3.9 The Curtain intentional presence device (left) and Intentional Presence Lamp (right)

Privacy is always an issue of concern when studying awareness monitoring systems. Although a great deal of personal information could be collected by technological sensors, it should be considered how this information is to be displayed to maintain privacy while providing enough data to make meaningful messages. Common ground for sharing and receiving information, how to interpret the contextual information, and how to represent it could be the key issues for the

designing of awareness systems. As described before in Chapter 1, Sections 1.2.5 and 1.3.3, in order to design communication technology, a careful balance should be taken between privacy and autonomy with regard to the various and sensitive affective factors in a social communicative context.

3.4.6 Saying sorry

T86 and T87 show cases of arguing and reconciling by telephone conversation. In these cases, design concepts should be considered to aid the understanding of each other's mixed feelings more.

“I [in South Korea] was cross with Laura [daughter in the UK] the other day. Maybe it was the first time I had a bad conversation with my daughter. She didn't answer my phone several times and I became worried more. So I had to keep ringing more often but she still didn't answer me. One day, unexpectedly, she picked up the phone and said to me 'Why?' with a very annoying voice. I was heartbreaking to hear her tone rather than her excuse. So I said that I would not ring her any more. ... Laura rang me soon after the bad conversion, and asked me "Are you upset?". She said Hanna [her daughter, 10 months old] was crying and hard to be settled down for a while so she's got upset and exhausted. Laura said sorry for letting me annoyed. I had to say sorry for that.” [Jane, Int.1] T86

“The day before that my birthday, wedding anniversary party which they attended, the house was very messy due to two weeks of illness for me and Nina, 6 year old. They had called round to the home before the party at restaurant. Mum mentioned the state of the house and gave me a pep talk re cleaning, tidying and keeping on top of things etc. I felt very petrified and insulted re how the house would work by Christmas and their coming to stay. She said, "Oh, they won't look like by the Christmas." They give me some credit. You know, I will make it right for Christmas. Piss me off!!! I don't want to speak to her again. I felt much wound up after the call and irritated. Even rest of the week, we didn't eat. Without feeling quite low anyway, I didn't want to hear it. The day after the party I was exhausted. I didn't want to have the party. I was so low. If I could have cancelled it, I would cancel it. I already rearranged it once and I didn't want to have the party. So I was very upset and unmotivated.

... Mum rang to see if I was ok. I hadn't spoken to her since the first of December, after the bad conversation. We normally speak on Mondays, Thursdays and weekends. She asked if she had made upset me, and apologized and offered to help to clean and tidy the house when she comes here next week. She blamed father. Actually, father was really difficult. ... Even though it was quite special, maybe I felt better, but still stressed. I should have but it was beginning for me. It wasn't very special. It was beginning for me to feel a bit better. I still didn't feel great but felt glad that she apologized and she recognized that she had upset me and she took responsibility for that. She's never apologized. She recognized that the conversation had been really bad timing.” [Betty Int.2, Diary] T87

Illustrative Design concepts associated with Saying sorry

The three sections of text described above said that the relationship between the members of a family will not always be good.

Table 3.8 Ideas of “Saying sorry” and the match to requirements

Ideas	Match to requirements	Use in thesis
Conflict management: minimal conversation, inter-passivity, unreliable spy (by Mark)	No concept was proposed	
Sorry button with graphic or glowing signals as an excuse to express feeling sorry. Supply some examples of good excuses	ASTRA mentioned about ‘good excuses’ for conversation	

It was quite difficult to think of solutions for this kind of problem and there is little research about mediated communication in the context of family conflict. However, Romero et al. (2007) found that ‘utility-oriented topics’ for starting conversation are effective for those who are concerned about initiating before engaging in social communication. Even minimal conversation is valued and appreciated.

3.4.7 Combining ideas

These ideas sketched above are not mutually exclusive. Some ideas can be generated as combinations of two or three categories, e.g., sending love and reassurance. The aim of the themes and ideas was not to generate a clear distinction of categories, but rather to outline the types of themes from the ideas at the design sessions and later find related literature and comparisons with the requirements. A variety of combinations are presented below as design scenarios

3.5 Ideas for designing

So far, the needs of emotional communication for family members have been expressed in detail as real dialogues (sections of text) and their possible requirements for designing communication devices. The six design themes and the requirements along with the relevant sections of text were considered as powerful ways of illustrating their subtle but strong needs for feeling connected in communicative situations (see Table 3.2). Through carrying out an examination of the ideas generated in the two design sessions and examining further literature associated with the theme with the quotes, the theme of ‘Sending love’ inspired the idea of sending asynchronous media gifts (see Table 3.4). The potential value of this idea was supporting long lasting for reflection, easy to use, and common ground for conversation.

Three groups of design scenarios were created. They considered the privacy concern for all

members of the family and focused on expressing emotion with ease and fun. In these scenarios, members of the three-generation family will be presented as personas: father, Tom studying in the UK, mother, Helen working in South Korea, 4 year old son, Joshua going to a nursery, living with his mother in South Korea, grandfather, James and grandmother, Emma living in a different city from Helen, South Korea.

3.5.1 Group 1 (G1): Asynchronous sending of media gifts timed to arrive at an appropriate time

G1-Scenario A: ‘Time for breakfast together’ or ‘time for dinner together’

This scenario illustrates how an absent father in the UK sends an asynchronous video message to his family in Korea. This message created at a certain time in the UK will arrive at the same time of day in Korean time as a synchroniser, providing 30 seconds of short video clip.

When Tom (father) sits down at the dining table at 8.30am in the UK, he presses an icon on the mobile phone to take a video clip of the breakfast, ‘jam toast with an orange juice’. He says ‘Have a nice meal’ with a smile. He puts it on a stand to support the mobile phone recording video while Tom is having breakfast. 25 seconds later, the phone makes a sound signal to stop recording very soon. Tom tries to finish his message with ‘good bye’ and waves his hand at the mobile. After 30 seconds the recording stops automatically. This media clip is sent to a server which will be transmitted to his wife, Helen’s mobile phone, when she is ready for breakfast with her son, Joshua.

When Helen is ready to have breakfast, she sits at the table with Joshua in the dining room. It is 7am in South Korea. Helen can see her mobile phone on the table showing an icon (visual / audio signal) indicating the breakfast message from Tom. Helen just touches the icon or shakes the mobile, then the video message plays for Helen and Joshua. Joshua is happy to see the picture of his father having breakfast with a smiley face. After 30 seconds the video playing stops automatically.

After watching the video, Joshua asks Helen to make a breakfast message for his father. Helen presses the icon for recording a video of Joshua having the meal with her. Joshua says ‘Thanks for the message, daddy. I am having green vegetables for breakfast now. You will be happy to see that. Have a nice day’. 30 seconds later, the mobile phone signals a gentle sound and then stops the recording. Helen puts the phone on the table and has breakfast with Joshua.

At dinner, Tom goes to a restaurant with his colleagues at 7pm in the UK. When the dinner is served, Tom brings his mobile phone and presses the icon to record a video of the meal. Tom says ‘Today’s meal is roast beef with potatoes. Emm... your mouth must be watering...’ The video shows Tom and his colleagues having dinner together and saying hello to Helen and Joshua. The

video clip will be sent to Helen's mobile phone when she and Joshua are ready for dinner.

This scenario was inspired by common ground for conversation required by the theme, sending love (see Section 3.3.2). It is strongly related to the code in the open coding, 'eating together' (see Table 2.3 in Chapter 2). Many quotes showed that the families separated from their husbands in the Probe study told us that having a meal together is very important. An example quote from 'eating together' illustrates, *"I think it is very important to have dinner together at a dining table. Meanwhile we share with each member's daily activities, work, or study. We couldn't have the time for that but once we settle down in Bangladesh I will do that as the most important part of our family life."* [Lucy Int.2, photos]. Another example quote says, *"I really want to have dinner together as a whole family at this table. While eating, I want to share the daily things and even very trivial things with my husband and my son."* [Helen, Int.2, photos]. This scenario can also provide for men in particular, who are not good at talking for common ground for conversation with their family members. An example quote from 'talking to men' (see Table 2.23 in Chapter 2) illustrates, *"I [a wife in Korea] think honesty is best for the relationship. Sometimes my husband [in Baghdad] doesn't want to say something. He didn't want me to worry about that. But I feel there is something wrong, and feel very stressed. So I hope he says to me about everything."* [Helen Int.2, Cards].

G1-Scenario B: Teddy's Night, night message

This scenario illustrates that Joshua (four year old boy in Korea) is playing with his teddy, showing his father saying a good night message from the UK. This is similar to the previous scenario where the asynchronous sending of a message acts as a synchroniser.

Joshua has a special teddy bear with a speaker, a recorder, and a screen on its belly like a Teletubby. When he is in bed, pressing a hand of teddy, it shows a video message on the screen saying 'night, night, my dear son' in Tom's voice, recorded by Tom last night when he was in his bed with his mobile phone.

When the teddy stops the video, Joshua presses the other hand of the teddy and shows his face wearing his pyjamas saying 'night, night, Dad.'

One day Joshua listens to a simple story book read by Tom through the teddy bear.

Before Joshua's birthday, Tom records himself singing a happy birthday song for Joshua. When Joshua wakes up and presses the teddy's hand, the teddy sings the song in Tom's voice.

This scenario was inspired by the theme, 'sending love' and it was associated with 'parents are wishing all their love for children [22]', and 'sharing emotions [21]' (see Section 3.3.2). This scenario is also related to the codes 'talking to children' and 'repetition' (see Table 2.3 in Chapter

2). An example from ‘talking to children’ is *“I want to spend even a short time with my son. I really want to read a book with my son before going to sleep.”* [Helen Int.]. The following quote is from ‘repetition’ illustrating, *“Try to make a simple film of Benjamin and his father and show the film very often to Benjamin. I think Benjamin will be very happy to see his father playing with him with joy in the video.”* [Helen, Int.1].

G1-Scenario C: Voice message of ‘I’m off now’, ‘I’m home now’.

This scenario shows how Joshua makes a simple voice message at the entrance of his home to his father in the UK using a system. It allows Joshua to say simple words every day which are recorded and transmitted. His father, Tom has the same system as a pair to use in the UK. The ‘ASAP’ message is a function for a sender to send a message directly and for a receiver to get it as soon as possible.

Every morning, Joshua says ‘Dad! I’m off now, to go to a nursery. Bye!’ at the entrance of an apartment around 8am in Korea. This simple voice message was recorded by his waving at the photo of his father, Tom. The voice recorder is built behind the photo, which is connected to the server.

On the way to the office, Tom hears a signal for voice mail. He sees if there is Joshua’s voice message, presses it and hears his voice mail. He feels comfortable and reassured that Joshua is ok.

Tom just wants to give a message back to Joshua right now. Tom rings him. But Joshua does not answer the phone, so Tom makes his own good morning voice message. The voice message is sent to the server and 15 hours later it will get to the photo frame at the entrance of Joshua’s home. In this case, there are two options. If Tom wants Joshua to get the voice message when he is ready to go to nursery, he chooses the ‘15-hour message’ icon. If Tom wants Joshua to get the message as soon as possible, he chooses the ‘ASAP’ message icon.

When Joshua comes back home, he sees the photo frame is flickering with a red LED. He sees a message has arrived and is ready to play. Joshua waves his hand for 3 seconds in front of the photo frame and then the message starts to play. Once it finishes, the frame does not flicker, it has a steady green LED indicating that it is ready to record Joshua’s message.

When Joshua waves at the green LED, then it is flickering for recording a voice message. If there is no noise for 10 seconds then the recording stops automatically.

This scenario was inspired by the ideas of ‘everyday utterances’ and ‘sound snap shots’ generated in the second design session with Jayne (see Table 3.4) involving the theme, sending love. This scenario can support common ground for conversation and use it with ease. It is strongly

related to the theme, 'Sharing the moment: Kid's laughter with happiness' [2] which emerged in the axial coding described in Chapter 2. An example quote says, *"My husband said he wants to hear the children's laughter every day."* [Lucy, Int.2, telephone log]. This scenario could also be connected to the theme of Reassurance with regard to intergenerational obligations [9] (see Chapter 2, Section 5.4.2) and T21 was an example for that saying, *"My mum rang me [from Korea] about her bad dream. She was worried about everything about our daily life [here in England]. She asked if anyone is not well or my husband was away on business. I told her that children had caught a bad cold, but they are now ok."* [Hannah, Int.2, Diary]. It may also be associated with the code, 'Talking to children' (see Table 2.3 in Chapter2) and one example for the code is, *"One day Benjamin was busy saying 'daddy, daddy, daddy...' on the phone when he was so excited to hear from his father. But after that Benjamin was just listening to his father, not talking to him. So my husband was trying to ask to say 'daddy' once more in many ways, but ... yes, he is eager to hear from his son's voice."* [Helen, Int.1].

3.5.2 Group 2 (G2): Asynchronous sending of media gifts timed at a specific time

G2-Scenario A: 'Time for sending gifts to loved one'

The following two scenarios illustrate how Tom sends a picture with a message to his son, Joshua, using a Teddy, and to his wife, Helen, using her mobile phone.

When Tom is working in his office around 4pm, one of his colleagues, Garry wants to go to a café to have a cup of tea with Tom. Garry orders a cup of tea and carrot cake. Tom orders a cup of latté with chocolate cake. When they sit down at the table, Tom presses the icon on his mobile phone and takes a photo of the cakes with a handwritten message of 'Joshua, I will buy a big one for you.' This message will be sent to Joshua's teddy bear when he wakes up and activates it by pressing the hand of the teddy.

When Tom is on a train going to a conference, he sees beautiful scenery of a beach. Tom brings out his mobile phone and takes a picture of it and writes a message saying 'Think about this summer holiday'. It will be sent to Helen's mobile phone at 10.00 pm when she always checks her messages.

These two cases described above were inspired by 'common ground for conversation', particularly for men to be engaged in social communication with family members. An example quote from the code, 'talking to men' (see Table 2.3 in Chapter 2) illustrates, a wife saying *"I think honesty is best for the relationship. Sometimes my husband doesn't want to say something. He didn't want me to worry about that. But I feel there is something wrong, and feel very stressed. So I hope he says to me about everything."* [Helen Int.2, Cards]. The first scenario was also strongly

associated with the codes, 'eating together' and 'object with meaning' (see Table 2.3 in Chapter 2). An example quote is, "*This is the picture of muffins Harry baked for me. I couldn't have enough time to be with my son in Korea but now I am happy to have this kind of experience with my son here. I wanted to show this to my husband. If he came here, he would be happy to eat together. It reminds me of my husband.*" [Emma, Int.2, Photos]. The second scenario could refer to the codes, 'image with meaning', 'reunion', and 'doing things together', illustrating, "*This is the photo of the Geneva lake. It was so pretty. I wish I were living in this place. I hope to bring my family and parents here to lodge in a camp having a peaceful relaxing time for us all together.*" [Emma, Int.2, Photos].

G2-Scenario B: Special meal for grandfather, James' birthday

This scenario shows how Tom creates a special message for his father, James. The message is, however, sent to his wife, Helen's mobile phone. Helen shows the message when she visits James. Therefore, the whole family shares the message together.

Tom feels a bit sorry not to be able to attend his father's birthday party tomorrow. He makes a simple video message of a glass of wine, he already bought yesterday, saying 'Happy birthday, James. I will drink this for you'. This message will be sent to Helen's mobile phone as an 'event icon'.

Joshua and Helen go to the grandparents' to congratulate grandfather, James' on his birthday. The grandmother, Emma prepares a special food for James. The whole family members, except Tom, gather and have the birthday party for James. At the party table, Helen shows the video message created by Tom in the UK to James. James is very pleased to see it. Helen presses the event icon on the phone for recording a video of James happy and all the other family members chatting together. This video takes 90 seconds. Another member of the family already starts recording with a video camera. But Helen just wants to make a short one for Tom to watch it shortly, thinking that event timing is important. It will be sent to Tom's mobile phone when he wakes up.

Tom wakes up and sees that the phone signals a special message from Helen. He touches the 'event' icon and the message plays with the meal time with members of the family. He phones his father, James, having a conversation with him about the event.

Similar to the previous scenario, this scenario was inspired by 'common ground for conversation' and 'lasting gift' (see Table 3.4) and also related to the code 'talking to men' (see Table 2.3 in Chapter 2). It was strongly associated with the codes of 'eating together' and 'reunion' (see Table 2.3 in Chapter 2). An example quote from the codes says, "*There was a big party for*

my husband's birthday. Many relatives came and congratulated. We all had a nice chat over lunch. I was so happy to introduce my daughter's family including a lovely granddaughter." [Jane, Int.2, Diary].

3.5.3 Group 3 (G3): Something for engaging grandchildren with fun

G3-Scenario A: A connection between grandparents and grandchildren - Chess Game

This scenario illustrates how to play a chess game with grandparents and grandchildren.

There is a kind of chess game on the smart phone. Two-four [two to four?] members of the family can play the game together.

Once one member of the family moves one step, the other is allowed to move one step. Once moving, then the user can make a simple message for the other members playing, like commenting on the game strategy, or simply a 'hello' message.

If one did not move, the other cannot move.

Other types of game, such as 'raising an apple tree', or 'cooking' can be applicable for this.

This scenario was inspired by the design theme Presence for small children requiring 'engaging the both' and 'co-creation with fun' (see Table 3.2). It was strongly related to the theme emerged in the axial coding 'Fun with doing things together [3]' (see Chapter 2, Section 5.4.1). An example quote for the theme illustrates, "*She was famous for her good written work. When I taught her to write, I put every bit of paper where she wrote or drew on onto the wall. Every space was covered with her papers like a white board full of texts. When she put some written work on the wall, then I put my paper reply next to hers. Sometimes her father joined to put his own work as well. It was really fun for everyone. When my friends came to see the papers on the wall, they were all enjoying reading them and laughing. It was a kind of joke, paper puzzle, or a riddle. There was an arrow on a paper for me to follow for the next paper. We had played to write like that since she was young.*" [Jane, Int.2] T6.

G3-Scenario B: Skype phone with stylised view

While talking through Skype with a webcam, the user can choose from graphic tools for the user's screen view to wear. For example, hat, glasses, earrings, moustache, beard, scarf, neck-tie (used as foreground image), or curtain, trees, lakes, the top of Alps, or on the moon (used as a background image), etc. If the user wearing a hat is moving on the screen, the hat follows the movement in a slight dangling. If the tree is chosen as a background, the tree can be shown with the leaves being moved by a breeze.

One can make their own dressed image on its own, or use their own photos as a background image while using the webcam.

Similar to the previous scenario, this was inspired by the design theme Presence for small children requiring ‘engaging the both’ and ‘co-creation with fun’ (see Table 3.2). A good example quote for this scenario was from the theme in the axial coding ‘Fun with doing things together [3]’ (see Chapter 2, Section 2.5.4.1) saying, *“If we [her family in the UK] can see them [her parents in SK] through the web camera and they can see us, they must be very happy and my children can be curious and excited. But I feel a bit reluctant to do that. I think I need to clean my house and make my children smart for that, but it's difficult to keep the place clean with two children. I could feel a bit nervous and irritated.”* [Hannah, Int.1].

3.6 Discussion

While the results of analyzing the qualitative data derived from the Probe study said much about complex and subtle emotions experienced by the families living at a far distance and time difference (see Chapter 2), it did not straightforwardly inspire design ideas for communication devices. An additional analysis was, therefore, carried out to identify themes for design in Chapter 3. Based on the analysis, the idea of ‘sending asynchronous media gifts’ was inspired and three groups of design scenarios were created. This section describes the link between the design scenarios and theories of emotion from psychological research described in Chapter 1.

The studies of long distance relationships (LDRs) discussed in Chapter 1 (Section 1.2.4) were clearly relevant to the practical problem set in this thesis. The mechanisms used to maintain LDRs mentioned by Merolla (2010) need to be supported by technology. The stressors identified by Maguire and Kinney (2010) were also practically relevant to understand people’s emotional needs for communication and are mirrored in the motivation for the design ideas described in Section 3.4. Examples of stressor were ‘frustration from communication difficulties’ (Guldner, 2004), ‘interpersonal or relational differences’ (Culder, 2004; Sahlstein, 2004), ‘inequity in the relationship’ (Stafford, 2004), and ‘relational uncertainty or doubts about the relationship’.

The same is true of the results from ethnographic studies on transnationals (Thomson, 2009; Horse, 2006; Wilding, 2006). For example, family members living across continents might always worry and feel that they do not know what is going on at their home overseas and sometimes struggle to find the way of settling down after unexpected quarrels happened due to misunderstanding each other (Thompson, 2009). In addition, they worry about the absent loved ones’ health and safety but also sometimes feel pressure and even burdened by the obligation to communicate with each other in social situations (Horst, 2006). These problems can be seen to be associated with the motivation for the design ideas: Finding time, Reassurance and Saying sorry

(see Table 3.2).

The three groups of scenarios inspired by the theme, Sending love (see Section 3.5) are emotionally supportive of communicative skills such as comforting, listening, and expressiveness of care, concern, and love (Burlison, 2003). The first group of scenarios are focused on providing asynchronous sending of media gifts timed to arrive at an appropriate time. These scenarios can help in constructing or imagining a connected relationship (Wilding, 2006) and in creating a sense of involvement in each other's daily lives (Thomson, 2009). Second group of scenarios with 'specific time and meaning' can support in generating a strong sense of shared space and time that might overlook the realities of geographic distance and international time zones (Wilding, 2006).

3.7 Conclusion

A process has been proposed in this chapter, by which the qualitative data derived from the Probe study (see Chapter 2) can inspire the design of communication devices. It was found that the combination of a group of quotes told us by family members with some associated nearly-do-it inventions was a powerful and rich way of expressing needs of emotional context in communication and possible requirements for design. This approach of understanding the real needs and generating the relevant ideas may not be radically novel. However, we do not believe that it has been described explicitly in this way before. It chimes with Schon's (Schon, 1983) notion of design as a conversation and 'reflection in action', also Cross's (Cross 1997; Cross 2006) notion of a 'creative leap' between problem and solution (see Section 3.2). Schon and Cross both emphasized the importance of critical positive thinking in the design process (see Section 3.2).

Through generating ideas for 'nearly-do-it' inventions iteratively on the two design sessions (see Section 3.3) alongside examining the relevant communication systems proposed in the literature review, many design ideas and concepts were generated and also found to be parallel to other systems (see Section 3.4). In this chapter, the six design themes and their requirements, along with the relevant sections of text, were illustrated in their subtle but strong needs of affective feelings of connectedness. The significant value of this approach is that the such the needs of communication by three-generation families where one or more members are separated by large distances and thus big time differences were envisaged in detail as the form of their real dialogues (sections of text) and their possible requirements for designing communication technology.

At a subsequent meeting between people at Culture Lab who would be building the prototype and the author and her supervisor, it was decided to design and implement a device inspired by Group 1 scenarios as asynchronous media gifts arrived at an appropriate time (see Section 3.5.1). The sections of text associated with the themes, Sending love, Presence for small

children, and Reflection for comfort were to be used as the specifications of the needs of the families regarding these devices. As noted before, the potential value of this idea was supporting: long lasting material for reflection; an easy to use interface, and common ground for conversation. The idea of ‘media gifts for children’ can also be valued because it is voice evocative and engaging the children and absent parent/grandparent. Support for the hypothesis that family members living at a far distance might want to show their affection through the creative act of choosing and creating a media gift, will be described in detail in Chapter 4. Such media gifts could also attain value as demonstrations of daily routine. The next chapter describes the design of devices sending asynchronous media gifts timed at an appropriate time, named TimelyPresent.

CHAPTER FOUR. TimelyPresent

Chapter 4 describes the development of TimelyPresent by Andrew Monk, Gavin Wood (computer programmer, Culture lab at the University of Newcastle), and the thesis author through over 3 months' iterative, intensive designing. In depth discussions and frequent feedback were made and given through telephone conferencing, email, and face to face. Chapter 4 is structured as follows: the basic design concept of TimelyPresent is described in Section 4.1, and why the name TimelyPresent was chosen is explained in Section 4.2. The next section (Section 4.3) illustrates form factors, selecting the Archos 9 as a platform for TimelyPresent to be designed and run. In addition, controlling the time of delivery for presents is considered in the following section. Section 4.5 describes the first screen with metaphors containing always-on, family photo, clocks, and presents deleted from sender's TimelyPresent after sending. Key functions for using TimelyPresent are illustrated in Section 4.6 including opening a new present, making a present, looking again at presents, and exiting from TimelyPresent. Technical details are then described containing compression and recording length of video file, a central server side, and unboxing and start up of TimelyPresent. Section 4.8 explains initial design as the form of storyboard introduced and how screen shots, visual design elements, and the connectivity were changed to the final version of storyboard of TimelyPresent. The following section describes the results of user testing and the design details changed including the method of cooperative evaluation conducted with three potential users and also comments given by two advisors. Finally, potential values of using TimelyPresent to sender and to receiver are discussed here.

4.1 The basic design concept

The design scenarios of 'Time for breakfast' and 'Night night message' developed in Chapter 3 in Section 3.5.1 lead to the basic idea of 'media gifts delivered at an appropriate time'. It was considered as a type of mobile device that could allow members of a family, where at least one person is living in a far different time zone, to feel more connected using simple video messages as a form of 'gift'. The idea came directly from the codes and themes identified in Chapters 2 and 3. The relevant are described next in this section.

'Sending love' to the members of the distant family and 'Reflection for comfort' from yearning, emerged from the previous study (see Chapter 2 and Chapter 3). It might be true that all members of a family need to communicate with each other more to understand and share their emotions for the maintenance of a better relationship and family solidarity (Stafford, 2005). However, a busy mother with young children and a busy working father may be struggling to 'find time' to talk to each other (see Chapter 3.3.1) and this may make it harder 'to express emotions' to or 'to feel the emotions' of the absent loved ones who are living at a significant distance apart thus

in a far different time zone. In such cases, an ‘object or letter with meaning’ could have an important role in evoking feelings of being a member of a family through a ‘long lasting token of affection’ (see Chapter 3.3.2). ‘Objects with special meanings’ could also support the feeling of comfort and consolation from yearning the absent loved ones (see Chapter 3.3.4).

In terms of the technology to be used, audio media, such as ‘sound’, ‘voice’, and particularly ‘children’s laughter’ were valued for families living at a distance to support feelings of happiness and comfort. Small children are not good at talking on the phone and soon lose interest. Yet absent parents are keen to keep in touch. (see Chapter 3.3.3). Simple video clips were, therefore, more attractive to children to evoke happy moments, giving a sense of play and helping a sense of presence of the absent family member (see Chapter 3.3.4).

We hypothesised that family members in such situations might want to show their affection through the creative act of choosing and creating the gift (Taylor & Harper, 2002). The basic concept of ‘media gifts delivered at an appropriate time’ could support such families. ‘Media gifts’ could be created with a special meaning involved in facets of daily routine and these gifts could be a topic to stimulate conversation and long lasting keepsakes for reflection for comfort. Playful simple video messages could also encourage engagement between both children and an absent parent or grandparents. This device can thus be thought of as supporting ‘Media gifts delivered at an appropriate time to enhance and supplement the other ways people already communicate, such as by using Skype telephone and email’.

4.2 Why “TimelyPresent”

The section describes why the name TimelyPresent was chosen and what features were considered in the detailed design of TimelyPresent.

One question was whether to use the term ‘gift’ or ‘present’. The two words are used in general with physical objects without expectation of return or compensation. In Korean culture, a ‘gift’ is more formal and more valuable than a present. The former is likely to be used on a special occasion such as national holidays. A ‘present’ is, on the other hand, likely to be more informal to be given and taken by close friends or members of a family. The term, ‘present’ also has a meaning of the ‘time’, associated with the events perceived directly, often called ‘now’. It is related to the design concept of ‘the delivery at an appropriate time’. Therefore, we decided to call the system, ‘media gifts delivered at an appropriate time’, ‘TimelyPresent’.

Timing is crucial when communicating between members of a family (Romero et al., 2007). It was also found that the participants in the Probe study in Chapter 2 showed that they felt happy when they shared moments that were associated with the children’s special events or activities. Two

example quotes illustrate this point,

“I was pleased to see when the baby [20months] said some new words. One day, the baby sitter told me that Benjamin understood the meaning of 'the same'. She asked him who was prettier between her two daughters. Benjamin said 'the same'. In the night, I asked Benjamin who was prettier between me and other girl on the photo. I was expecting to hear from the word 'same', but he said, 'mummy'. I was so happy and excited that I rang my husband [in Baghdad] and told him this story. He was so surprised and happy.” [Helen Int.2, Diary] T1.

"It was Joshua's first day of preschool. My husband asked me how he was there on the phone, so we had a long conversation about that. The very happy conversation was talking with my husband on Joshua's preschool experience. He was worried and anxious about his son's days at school. But luckily he settled down very quickly because his sister was watching him all the time." [Hannah Int.2, Diary] T2.

It is, however, unlikely to be easy to coordinate communication because of the international time difference. This is not only because of limits on the times of the day they are able to talk synchronously, but also because talking at different times of day does not support common ground for conversation. T77 is an example quote for this saying,

“One day, my husband looked a bit depressed with some stress. His tone with the voice was so low. I asked what happened and he said the work was not easy, under his control. I just wanted to give a gentle hug to him but it was impossible. Even though I was talking on the phone, there was a limit of time and the way of expressing my feeling. He was talking on the way home but I was in my office. It's very inconvenient to talk. I wanted to say that I was thinking of him very much but sometimes it's not easy.” [Helen Int.2, Diary].

Tolmie and his colleagues (2002) also addressed the importance of daily routines with expectation, meaning of the action, and context of time of the day (Tolmie et al., 2002). If members of a family already knew the daily routine of the absent loved ones, it might be easy to find time to communicate, to expect what daily activities were done in the context of time of day, and to understand more about the loved one's life. TimelyPresent could provide this sort of knowledge by displaying the message at the same local time as it was created.

TimelyPresent is a video messaging system for the asynchronous sending of media gifts timed to arrive at an appropriate time. Each family was allowed to use two TimelyPresents as a pair, for example, parents with children in the UK and grandparents in South Korea. The present made on a sender's TimelyPresent at the local time will arrive at a receiver's TimelyPresent at the same time of day that the sender sends it, so a present made at 12 noon UK time arrives in South Korea at 12 noon the next day. In this way a pair of TimelyPresents could help users to experience the illusion of living in the same time zone.

The design had to be simple in operation so it could be used by young children and older adults who may have little experience with electronic devices. As mentioned in Section 4.1, video messages could be more appropriate than talking on the phone for both children and absent parents engaging in play. Such video-with-audio media were also considered as a possible awareness

system because of the rich and unfiltered information conveyed through the images and sounds (Bly et al., 1993) and the visual information can be effective and valued in the emotional context of communication. This is also supported by Whittaker and O’Conaill siting strong evidence for the claim that video supports conveying ‘social cues’ and ‘affective information’ (Whittaker & O’Conaill, 1997) (see Chapter 1, Section 1.2.2). TimelyPresent could support long distance relationships by enhancing the feeling of co-presence, understanding daily activities of absent family members, and also providing opportunities for serendipitous communication.

4.3 Form factors, selecting the Archos 9

This section describes the selection of a platform for designing and running TimelyPresent. The intention was to find a device which does not look like a computer or a mobile phone.

At first, a device called Chumby was considered as a platform for TimelyPresent. Chumby looks like a kind of digital alarm clock with friendly features, an attractive and simplistic interface, and touch interaction (see Figure 4.1). Chumby has a screen resolution of 320×240 , which is less than the iPhone having a 480×320 resolution. However, the screen is clear, bright and good enough for designing a graphic interface.

It could be always-on, which is an important factor in the design of TimelyPresent. Chumby, however, does not have the code libraries of a Windows system, making it hard to program.



Figure 4.1 Picture of Chumby

As an alternative the Archos 9 was chosen as it uses Microsoft Windows 7 with WiFi network. The Archos 9 has a screen resolution of 1024×600 , a touch screen, HD video and high quality audio from a built-in web camera. It has a lithium polymer battery and is able to run for 5 hours, so that it can easily be carried around when making presents. The size of Archos is 25.6

cm×13.8 cm×1.7 cm with 0.8 kg weight. The larger screen size in comparison with the Chumby was an advantage as one could make the screen buttons larger for older adults. The Archos has pure lines with simplicity and looks like a digital photo frame (see Figure 4.2).



Figure 4.2 Picture of Archos 9

4.4 Controlling the time of delivery

Three options for timing the delivery of presents were considered. This section will explain why 'same local time' was chosen.

In alternative A (see Table 4.1) the sender sets the time of day for a present to be delivered separately for each message sent. This is very flexible and gives the sender full control. It could be useful for celebrating special events, such as a birthday or anniversary. However, it is less simple in operation.

Table 4.1 Design space for time setting

	Control	How to set up	Positive	Negative
A	User states time/day (e.g. 18.00pm/2 nd of June)	On TimelyPresent On creation	Flexible to send presents	Setup every time Less simple
B	User agree event (e.g. dinner, good morning message)	On website On setup	Less flexible Simple Setup once	Obligation Daily thing
C	Same local time System	On website On setup	Flexible Simple	Long time to be waited

Alternative B allows the users to synchronise through daily events such as having dinner or saying good morning. The sender and receiver would agree such an event and set it on the device once. This alternative is less flexible but simpler than A. It is, however, unlikely to be welcome to those who have very busy, dynamic or irregular daily lives. Alternative B might also set up an obligation to send daily presents. Once the present is delivered, the receiver could feel obliged to respond to it, so that it becomes regarded as a way of monitoring each other's daily activities.

Alternative C in Table 4.1 was the protocol chosen. A present made and sent at the sender's local time of day arrives at the same time of day in the receiver's local time zone. This is flexible and simple in operation as it requires no settings from the users. It does have the potential negative effect of making the receiver wait for a long time to receive a present. For example, a present created on the sender's TimelyPresent in the UK will be delivered to the receiver's TimelyPresent 15 hours later. A present created in Korea will be delivered to the receiver's TimelyPresent in the UK 9 hours later. Our hypothesis was that this might in time be seen to make the presents more valuable by reinforcing the present metaphor.

4.5 The first screen with metaphors

The detailed design described below was the result of three months of iterative design from initial interaction designs (see Section 4.7.1 Screen layouts with connectivity). Discussions and critical feedback were carried out by email, telephone conversations, and face to face meetings.

The main screen (see Figure 4.3) displays the title banner, 'TimelyPresent', on the top, left corner of the screen along with the small message 'allowing family members to feel more connected'. The banner is shown on each screen. It is also a button that allows the user to go back

to the first screen by touching it.



Figure 4.3 Main screen of TimelyPresent

4.5.1 Present metaphor

The value of a gift as an emotional token or social cue is prevailing in the quotes associated with Sending love (see T32 and T8 in Chapter 3, Section 3.4.2). The design challenge was to make special what is essentially just multimedia. The present metaphor, a closed or open package, was intended to do this for the receiver. When a new present arrived there was a single chime sound and the Open button then flashed until the button was touched to display the present in a new screen. The present icon, used as the third button on the left side of the screen and throughout using TimelyPresent, portrayed a wrapped package that could be opened or closed. The images in the buttons for Make, Look again and Open were designed by Guy Schofield at Culture Lab., Newcastle University. Key functions in TimelyPresent will be described in detail in Section 4.6.

As can be seen in Figure 4.3, three buttons are placed on the left side of the screen and mimic the function of a web page navigation bar. They are: 'Make', 'Look again', and 'Open'. Next to the name of the button, a picture of a closed present, an opened present and a shiny closed present is placed. The Korean name of the buttons is also shown alongside the one in English. Having a Korean translation was felt to be important, particularly for grandparents who might feel uncomfortable when reading words in English.

4.5.2 Always-on

It is intended that TimelyPresent should be always on in the background. This feature was inspired by the ASTRA system (Romero et al., 2007). TimelyPresent encourages users to leave it

on by displaying two working clocks with the time at each location over a background of a picture of the family members (see Figure 4.3 above). Having TimelyPresent always on means that the receiver could see when a new present arrives at the same time of day that the sender sends it, encouraging the receiver to feel they are living in the same time zone as the sender.

A screen saver was designed in order to protect the screen of Archos 9. The first screen dances in a wave slowly when no action is taken for more than 10 minutes. This will be described in detail in Section 4.10.

4.5.3 Family photo

It was thought that the family photo with clocks could reinforce and clarify the concept of presents delayed in order to feel that they are living in the same time zone. The idea of displaying a photo of one's family was inspired by participants in the Probe study (see in Chapter 2) taking a photo of 'all members of the family' which was regarded as one of the objects that were precious to them. The following are examples of quotes,

"The photo of the whole family is my precious object, because it wasn't easy to be taken." [Lucy Int.2, photos], and "I want to take photos of my whole family with my parents. However, it wasn't easy to do that. It would be very difficult for us to meet my brother's and sister's families including my parents." [Helen, Int.2, photos].

Lucy, a mother emphasised her children's pictures illustrates, "...*other precious things are my children's photo albums. They show their whole upbringing since they were born.*" [Lucy Int.2, photos].

Consistent with this, Khalid and Dix found that photographs of absent family members were regarded as 'a symbol for family cohesion and progress' (Khalid & Dix, 2010, p. 220). It is presumed that the family photo(s) shown on the main screen of TimelyPresent along with presents to be received and saved could be considered as a visual and video information for long lasting keepsake and also have a role "as a self-contained institution, the relationship within the family, the unity and a bond of nurturance" (Hirsch, 1981, p.139).

Four families participated in the field study of TimelyPresent and each family used a pair of TimelyPresents (see Chapter 5). For using their TimelyPresents each participant family was asked to provide photo(s) of the family and the name of their pair of TimelyPresents so that the researchers could identify which TimelyPresent belongs to whom. For example, "Andrew-Gavin(UK)" for the TimelyPresent to be used in the UK and "Gavin-Andrew(SK)" for the TimelyPresent to be used in South Korea, which were indicated and displayed with a small font size on the top right corner on the screen of TimelyPresent (see Figure 4.4 below). With those, a pair of TimelyPresents was configured for the participant family using them.



Figure 4.4 An example of the name of TimelyPresent displayed on the top-right corner of the screen

At first, two pictures of the family were displayed on the main screen, such as one picture of the family living in South Korea shown on the right and the other living in the UK shown on the left screen (see Figure 4.4). Some participants asked if they could use one picture of the family as a whole (see Figure 4.5 on the left) and this was implemented as an option to be displayed on the main screen of TimelyPresent. This can be also found in the results of the user testing in the Appendix 7.

4.5.4 Clocks

Two working clocks show the two local times. The time difference between the two countries is usually nine hours or eight hours during summer time. Korean time is nine hours ahead in the case of usual season. The pictures of the sun and the moon next to the clock show day time and night time. The switching times are 7am and 7pm. It was intended that the two clocks designed could be thought of as symbols of the presence of absent family members. Regarding this, one of participants in the field study told us that the clocks made him think of remote family in Korea (see Chapter 5).

4.5.5 Present deleted from sender's TP after sending

TimelyPresent automatically deletes a video file after it has been sent. In other words, the sender cannot keep the present which had been created and sent. This idea reinforces the similarity with sending a real present. A gift is transference of goods you cannot both give someone an object and

at the same time keep it for oneself. It was thought that this could make for more personal significance and uniqueness.

4.6 Key functions

This section describes the four main functions for using TimelyPresent, involving opening a newly received present, making a present to send, looking again at presents that were previously viewed, and exiting from using TimelyPresent.

4.6.1 Opening a new present

As described before in Section 4.5.1, the present metaphor, a closed or open package, was intended to make receiver feel that a media clip is special with meaning. When a new present arrived a single chime sound played and the Open button then flashed until the button was touched to demonstrate the present in a new screen. The present icon, used as the third button on the left side of the screen and throughout using TimelyPresent, portrayed a wrapped package that could be opened or closed. Once the present was displayed, it became an opened present which could be looked at again by the Look again button being touched (see Figure 4.5). This will be addressed in detail in Section 4.6.3.



Figure 4.5 Opening a present

4.6.2 Making a present

For the sender, three features of the design were included to make the present special: the present metaphor, the delay, and the absence of the present once it was sent. The sender created a present by touching the Make button displayed on all screens. This displayed another screen which is controlled from the TimelyPresent rather like a video camera. It started off in pause mode so that

the sender had an opportunity to rehearse what they were going to create. When they were ready the sender could touch the record button placed on the bottom part of the screen to make a present up to 90 seconds long. The red dot flickering next to the Stop button indicates that recording is in progress. When the recording stops by touching the Stop button, a picture of a closed present appears on a new screen (see Figure 4.6).

Touching the Stop button allowed the present to be previewed. It gives an opportunity for the sender to see if the content of the present is satisfactory before sending it. For simplicity, it was decided not to provide editing facilities but the sender could delete the message at this point by touching the Erase button and record another. Alternatively, they could touch the send button on which a sent screen was displayed stating when the present would be delivered, that is, at the same local time in the remote location. For example, when the Send button is touched, the present is being sent with a message of 'Sending present'. A few seconds later, another screen comes on stating that, for example, 'Sent! Your present will be delivered at 16:30 UK local time' (see Figure 4.6). As noted before, it explains that the present created on the sender's TimelyPresent at the local time in the UK will arrive at the receiver's TimelyPresent at the same time of day that the sender sends it. A present made in the UK at noon will be delivered to Korea 15 hours later at noon Korean time. A present created in Korea will be delivered to the UK nine hours later.

This time delay, and the fact that the present was no longer available to the sender were intended to encourage them to treat the present as something that should be special. They may be considered as being more like a handwritten and posted letter or card than a multi-media message. In this respect one can contrast this deliberate asynchronous mode of communication with the automatic synchronous communication evident in the VideoProbe (Conversy et al., 2003) and the Family Window (Judge et al., 2010) (see Chapter 1, Section 1.3.2; Figures 1.10 and 1.12). As described in Chapter 1, the VideoProbe provided random moments as snap photos of daily life and the Family Window was an always-on home video only media space. These devices were regarded as incidental interaction systems. Due to the international time difference and privacy concerns, it was thought that intentional devices were more appropriate for the design of technology for families living at a distance. The level of privacy should also be considered as mentioned in Chapter 1, Section 1.3.3. Incidental interaction could lead to unintentional violations of privacy.

The absence of the sent message on the sender's TimelyPresent was also intended to reinforce the present metaphor. As noted in Section 4.5.5, no one can give someone a present and simultaneously keep it for oneself.



Figure 4.6 Making a present

The initial design interactions showed that there was a list of recorded presents on the screen 5 (see Section 4.10.1 Screen layouts with connectivity). On the screen, the sender was allowed to make several presents and select one of them to be sent. However, during iterative design, it was decided that just a single present should be made and sent, as this would be simpler and easier in operation. The intention was that sometimes ‘less is more’.

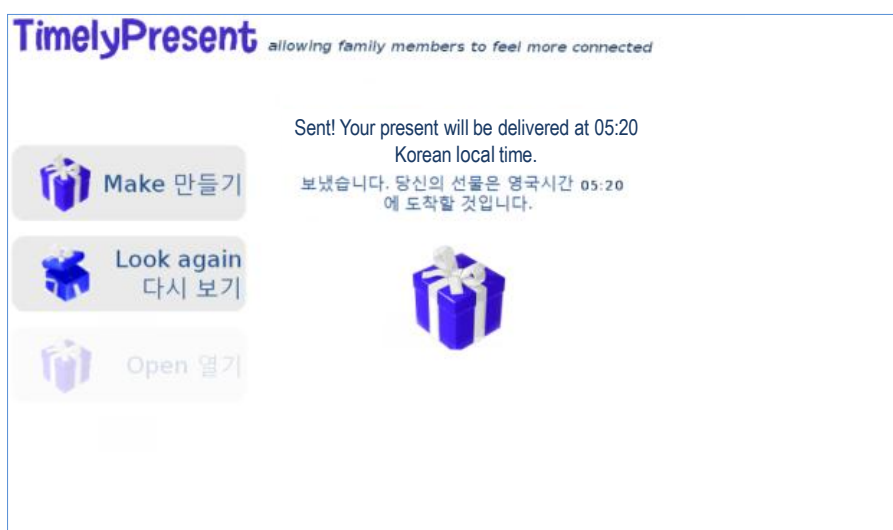


Figure 4.7 Sending a present

A present sent indicates that the present is uploaded to the server. It will be kept for several hours and then be delivered if the time condition is satisfied. This will be described in more detail in Section 4.7.2 Server side.

4.6.3 Looking again

Presents previously opened and looked at by the receiver were moved into the Look Again screen where the icons representing the series of presents were opened packages. The value of saved objects when reflecting on one's absent loved ones appears widely in the probe study transcripts. One interesting example came from a mother who had kept and repeatedly reviewed some answer phone messages from absent friends (see Chapter 2, Section 2.5.4.3 in T34). Once one of the opened presents is touched, it is automatically played. The series of opened presents can be slid back and forth for navigating by touching one of the two arrow buttons placed between the opened presents (see Figure 4.8). Any single present can be deleted once it is displayed on the screen (see the second screen of Figure 4.6).

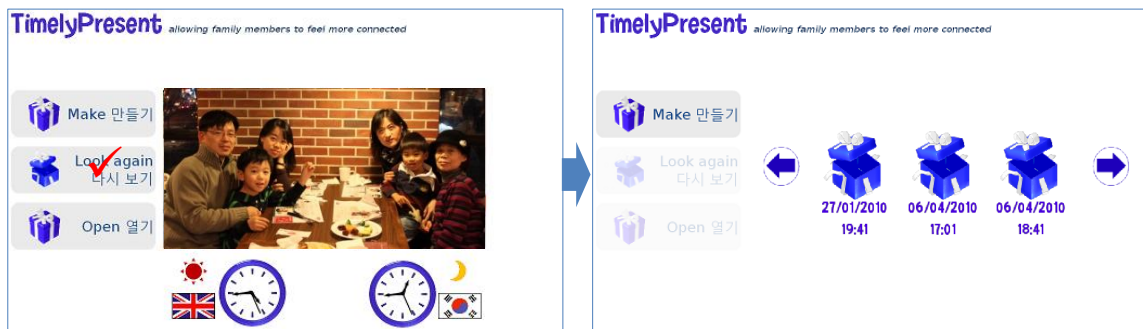


Figure 4.8 Looking again at presents

It had been discussed earlier during the initial designing, that the form of icons for the opened presents could be designed and presented as thumbnails (see Figure 4.16). This was because when numerous opened presents were arranged on the Look again screen, it could be confusing for a receiver to navigate and see which present was just displayed or which present was the most recent one by touching one of the two arrow buttons. In addition, it was not possible to tell if certain presents were considered as more valued or preferred to be displayed again compared to the others. This is due to the identical form of opened presents, labelling only the time and date they were created. Another idea for arranging the icons of opened presents, could be arranging them in three rows displayed on the screen in order to see and find a certain present to be looked at with ease. Unfortunately, these two ideas were not applied in the final stage of design because of the complexity and the tight schedule of the project. It was anticipated that some of the participant

families trying out TimelyPresent would mention such design elements and they did so (see Chapter 5).

4.6.4 Exiting from TimelyPresent

An Exit button was not intended to be designed for using TimelyPresent at first. At the initial iterative designing, the author tested the TimelyPresent using the lowest version installed, running, and developed on a personal laptop. As described before, one of the design factors as a metaphor to be considered was that TimelyPresent is to be running always-on (see Section 4.5.2). There is, thus, no need to ever switch off TimelyPresent. Only when TimelyPresent should be turned off, pressing the ‘Esc’ key was the way to go out. However, since the platform of TimelyPresent, Archos 9 was chosen, it was hard to use the ‘Esc’ key which is a virtual keyboard appearing when a certain button on the left part of the device is pressed (see Appendix 5). The Exit button was, therefore, designed mainly for the demonstration of presents and the maintenance of using TimelyPresent. When touching on the top, right corner of the main screen which was blank space, the reference name of TimelyPresent appears on the top right corner and the Exit button also appears on the bottom, left part of the screen (see Figure 4.9). If touching the Exit button, TimelyPresent stops.



Figure 4.9 Switching off TimelyPresent

The demo presents were created by the author in order to introduce TimelyPresent to the users who would be conducting user testing, and eventually to the participant families who would be carrying out the field study of TimelyPresent. One of demo presents in English says, ‘Welcome to the world of TimelyPresent. TimelyPresent is designed to allow family members to feel more connected by making and giving a present to the loved one. I hope you enjoy using TimelyPresent and be happy with your family’. Some were also created in Korean (see Figure 4.10 Scenes of demo presents of TimelyPresent).

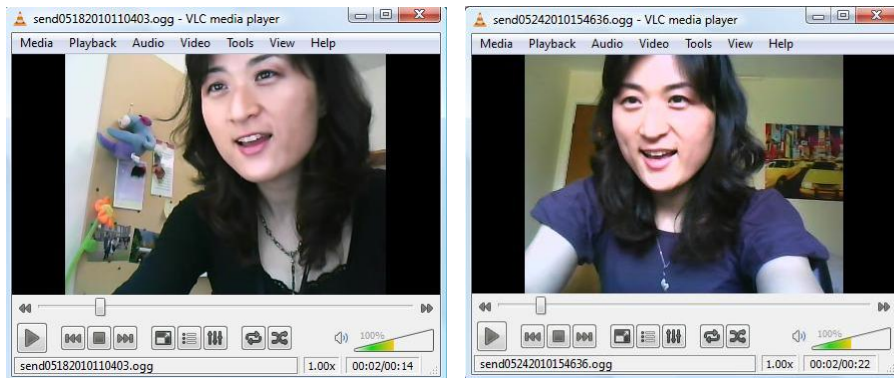


Figure 4.10 Scenes of demo presents of TimelyPresent.

4.7 Technical detail

This section describing technical details of using TimelyPresent contains three sub sections. The first two involve compression and recording length of a present message, and a central server side where presents are uploaded, delayed and downloaded. The third part explains how to stand up and how to turn on the device, Archos 9, how to connect the internet, and how to start up TimelyPresent.

4.7.1 Compression and recording length

A present created on the sender's TimelyPresent is sent to a server in the form of a video file. A present arrives at the receiver's TimelyPresent to indicate that a video file is downloaded from the server. In order to minimize the size of the video file, the theora codec was used for compressing video files using TimelyPresent. The codec helps users upload or download the video files to and from the hidden central server as smoothly and quickly as possible. More details can be found in Section 4.7.2.

The duration of recording reads from 0 to 90 seconds long. At first the maximum duration was 30 seconds but this seemed too short to make a present on occasions. The size of recorded present could also affect the ability to be uploaded to and downloaded from the server. After a discussion of the technical considerations, it was decided that the time of recording would have a finite time of up to 90 seconds.

A 'red dot' is flickering while the present is recording up to 80 seconds, and it is flickering faster for the last 10 seconds as a warning signal. When it reaches 90 seconds, the recording stops automatically. The time of recording length can be shown as a set number of seconds as the present is recording.

4.7.2 Server side

As noted before in the previous sub section, TimelyPresent requires a central server behind the scenes. When a present is sent or uploaded this means that the present has reached the server. It is then subject to the time condition. When the time goes by and reaches the same local time of day in the receiver's time zone, the present can be downloaded from the server and be delivered, and arrives at the receiver's TimelyPresent.

The process of 'sending' a present on TimelyPresent requires some time, depending on the size of present. On the screen of the sender, the present sits for a while because it is taking the raw 'avi' file which has been recorded from the camera, and it is converting this to the new compressed 'ogg' format. This squashes the 150 Mbytes for a recording to a much smaller sized 1.5 Mbytes. This could be compared to 'wrapping the present' in terms of the sender's perception. At this time, the present is not uploaded to the server yet but the screen shows 'a present is sending' as a message during the conversion time.

4.7.3 Unboxing and start up

There are a few steps to be taken for starting up the Archos. Archos provides a 'leg stand' and a 'stylus pen' hidden on the back of the device. The 'leg stand' could be pulled out and extended using fingers in order to stand the Archos up (see Figure 4.11).



Figure 4.11 Archos providing a leg stand and a stylus pen hidden

The supplied power cable is connected to the Archos power connector on the bottom left part of the device and to a wall outlet. Once it is connected, the battery starts charging and the

second indicator as a blue light comes on (see Figure 4.12).

A separate USB camera is then connected to the USB port on the left centre part of the device (see Figure 4.11). Finally, turn the Archos on by pressing and holding the Power button for about 3 seconds. When the power is connected, the top indicator comes on with a blue light.

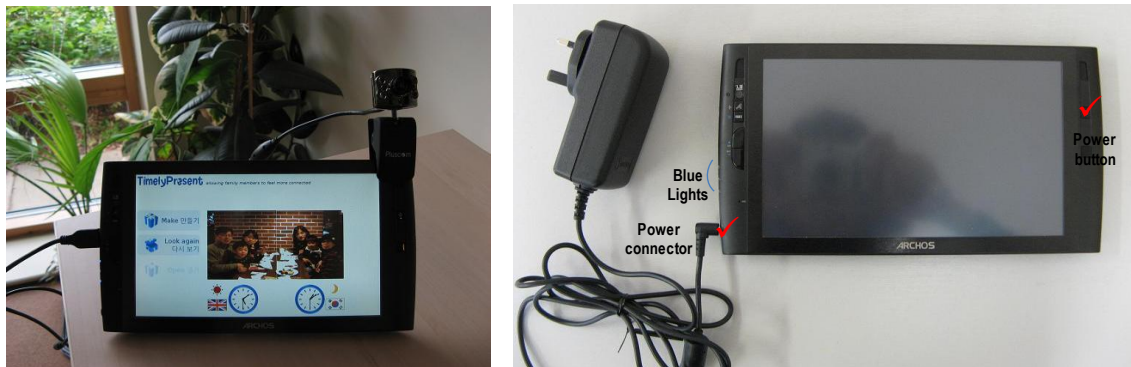


Figure 4.12 TimelyPresent run on the Archos with an extended camera and the power supplier

Archos is running on a wireless network. For connecting to the internet, the short-cut icon, ‘Network connection’ is provided on the screen (see Figure 4.13 left). If the icon is touched twice quickly, then a window appears containing another icon, called ‘Wireless network connection’ that needs two touches on it. All the WiFi networks, then, detected by Archos are shown on another window (see Figure 4.13 right). The users need to select their own WiFi and touch the ‘Connect’ button. If the security key is needed, a virtual keyboard should be used for typing it (see Appendix 5).

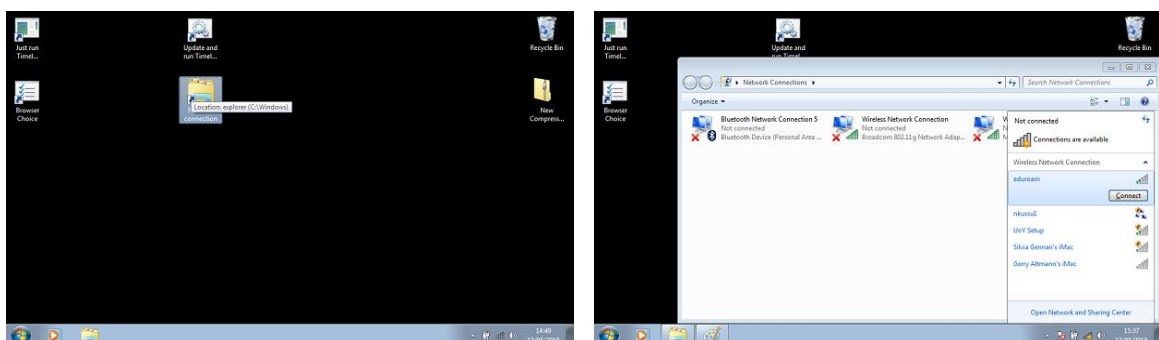


Figure 4.13 Screen shots showing ‘Connecting to the internet’ using the short-cut icon, ‘Network connection’

Once the internet is connected, TimelyPresent is ready to be run by touching the icon

‘TimelyPresent’ twice, which is provided on the screen of the Archos (For more details see the user instructional manuals in Appendix 5 and Appendix 6).

4.8 Initial storyboard and how the design evolved

This section describes the initial design storyboard containing the connectivity and the basic functions of each screen, which was created and illustrated by Gavin Wood on 17th March, 2010 (See Figure 4.14), based on the meeting with Andrew Monk, Gavin Wood, and the author.

The initial design took the form of a storyboard (see Figure 4.14). At this stage we were designing for the Chumby which has a much smaller screen than the Archos 9, 320×240 instead of 1024×600. Nine screens were included as the essential structure of interaction with TimelyPresent. The first screen contained the photo(s) of family with meaning including the start button. The second screen was intended to clearly differentiate between ‘Play a present’ and ‘Record a present’. It was the first choice seen by the user in the flow of the user interface. With the increase in screen size for the Archos 9, and to simplify the design these two screens were combined into one screen including family photo(s) and three key functions: Make, Look again, and Open a present. The words of the icons, ‘Play a present’ and ‘Record a present’ were changed into ‘Open’ and ‘Make’ alongside the pictures of the closed package in order to sensitise and reinforce the present metaphor (Section 4.5.1; Figure 4.1).

The third screen showed a list of presents received and waiting to be played. On this screen, some presents were shown as having been previously looked at and others were shown as new presents. The two different types of presents would be shown as an icon illustrated as an opened or a closed present. The function of ‘Play a present’ was divided into two functions: Opening a new present and Looking again at presents that were previously opened and looked at (Section 4.6.1 and Section 4.6.3). In the final design, new presents would be indicated on the first screen and only presents previously looked at would be listed on the screen.

The fourth screen viewed the present being played in a full screen. A flashing ‘play icon’ would clearly indicate that it is playing. Once the present has reached the end, it could be replayed using the Play again button placed on the bottom part of the screen. These screens remained essentially unchanged in the final design.

Next, the fifth screen displayed a list of presents created. The idea is that the presents recorded would remain as a form of list on the screen until they are either sent or deleted. If a present is sent it slowly fades out indicating that it is being uploaded to the server. This screen was intended to allow senders to choose one of four functions concerning (i) making a new present, (ii) playing a present for reviewing, (iii) deleting an unsatisfactory present, and (iv) sending the present.

Four icons placed at the right side of the screen would perform distinctive actions. At this stage, the action of touching a present was thought of as selecting it from the list of presents created and saved, not playing it automatically. In the final design, this was felt to be too complicated. As noted before in Section 4.6.2, it was decided not to provide editing features, but the sender could delete the present at this point by touching the Erase button and make another. Otherwise, the present could be sent by touching the Send button (see Figure 4.6 and Figure 4.18). There was, thus, no list of presents created at this point except one if it is not sent or deleted.

The sixth screen displayed that the present message was ready to be created, by touching the New button shown on the fifth screen. This screen would show the current view framed by the camera. Touching the Record button would initiate recording a message and the duration of the current recording would be viewed. The Stop button shown on the seventh screen would end the recording and return to the recorded present screen, the fifth screen. The present message created could be previewed by touching the Play button as can be seen on the fifth screen. Once the present has reached the end, the Look again button appears, allowing the present to be viewed again (see the eighth screen in Figure 4.14). In the final design, the sixth and seventh screens remained unchanged except that a present message could be created by touching the Make button shown at the main screen. However, once the present has reached the end by touching the Stop button, the picture of a single present appears on the next screen allowing the user to preview, to send, or to delete it (see Figure 4.18).

The ninth screen would allow the sender to control the variables of the time of delivery before sending the present created. In the final design, it simply shows the local time at which the message was created. As described in Section 4.4, it was decided to set the time of delivery as 'same local time' (see Table 4.1) for simple operation and to reduce the feeling of obligation in the final design.

As can be seen, there was a Back button on every screen for going back to the previous screen in the initial design storyboard (see Figure 4.14). For example, if users view a present, as can be seen at the fourth screen, and want to record a present, the Back button should be touched twice. However, in the final stage, the banner, TimelyPresent, would be shown placed at the top left corner at every screen with the function of going back to the main screen by one touch (see Figure 4.18) which is simpler for operation than interacting with the initial design.

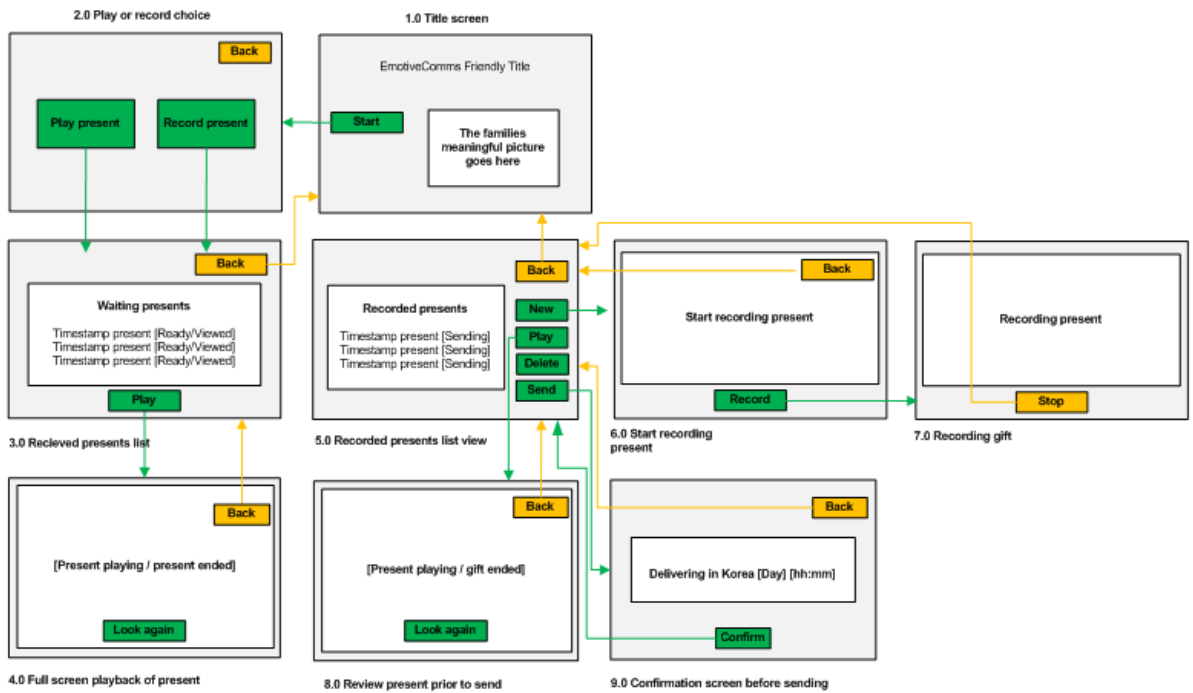


Figure 4.14 Initial screen layouts with the connectivity

Examples of the first screen and the second screen of the initial storyboard described above (see Figure 4.14), are illustrated below (see Figure 4.15). The first screen seen at the left of Figure 4.15 displayed a family photo including two clocks, intended to show the local times of the UK and South Korea. The arrow icon placed at the top right corner on the screen was also depicted as the Start button. The right side of Figure 4.15 shows two pictures of closed presents alongside the icons for Playing gift or Recording gift. The name of ‘gift’ as a video message was used at the initial design stage.

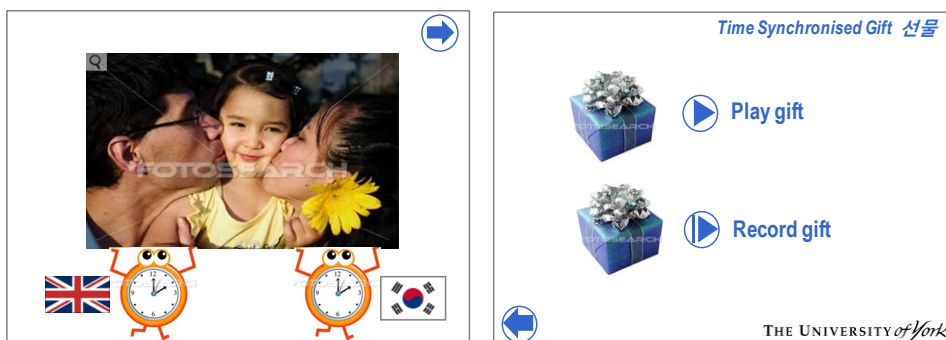


Figure 4.15 Initial screen designs on new present, opened present

The screen seen at the left of Figure 4.16 below was illustrated following the third screen of

the initial storyboard (see Figure 4.14). The pictures of closed and opened packages depicted were considered as implying two categories of messages: the new messages arrived but not opened yet, and the messages previously opened and looked at. These ideas were adopted and further developed as the visual forms of present messages in the final design (see Figure 4.3 and see Figure 4.8).

In addition, showing presents in the form of thumbnails was considered and illustrated (see Figure 4.16). This is very desirable but was not possible due to the tight schedule of the project, designing TimelyPresent. Interestingly in Chapter 5, participants told us they would have liked thumbnails while conducting the field study of TimleyPresent.

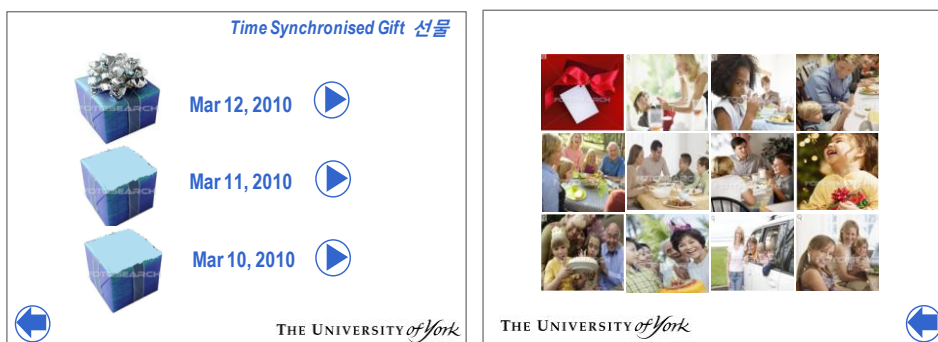


Figure 4.16 Storyboard designs on new present, opened present, thumbnail present

The example screens as can be seen below (see Figure 4.17) how a video clip is played on full screen according to the fourth screen in the initial storyboard described before (see Figure 4.14). In the left screen, a small red dot flickering indicates the video file is being played and on the right screen when the present has reached the end, the Play again button and the Next button depicted. However, on the final version of TimelyPresent running on the Archos 9, the Play again and the Next buttons were not needed. The picture of a present was used as an icon for playing by touching it and the way of going back to the main screen was by touching the banner, TimelyPresent as noted at the start of Section 4.5, thus simplifying the design.

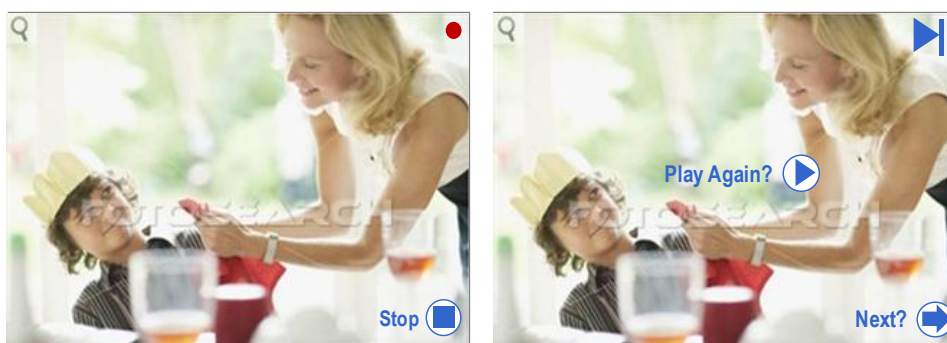


Figure 4.17 Storyboard designs on new present, opened present, thumbnail present

The final storyboard and connectivity diagram (see Figure 4.18) illustrates the resulting design changes, consisting of nine screens. In summary, through the iterative design and development of TimelyPresent over about three months, the initial first screen and the second screen in the storyboard (see Figure 4.14) were simplified into the one shown in Figure 4.18. Also, the main screen combines a family photo, three function buttons, and two working clocks for the UK and South Korea (see Section 4.5 for details). The second screen, Open a present, shows the state of a newly arrived video message which can be opened and played by touching the Open button shown on the main screen. Once the new video present is played, it is automatically transferred to Received presents list and can be viewed by touching the Look again button thereafter.

The main screen can also access the third screen showing the list of opened presents by touching the Look again button. If one of the presents is touched, it is played on the second screen.

The fourth screen showed the state of a video message ready to be created. Senders can see the video picture moving on the window screen using a camera. Touching the Start Recording button placed at the bottom allows senders to go to the fifth screen. The fifth screen displayed the state of the video message being recorded. By touching the Stop button at this point, the video message was created in the form of a closed present displayed on the sixth screen. Touching the present allows senders to preview it, as can be seen at the seventh screen. The eighth screen showed the present was being sent by touching the Send button on the sixth screen. The last, ninth screen, displayed the statement of the time of delivery of the video message sent (see Figure 4.18).

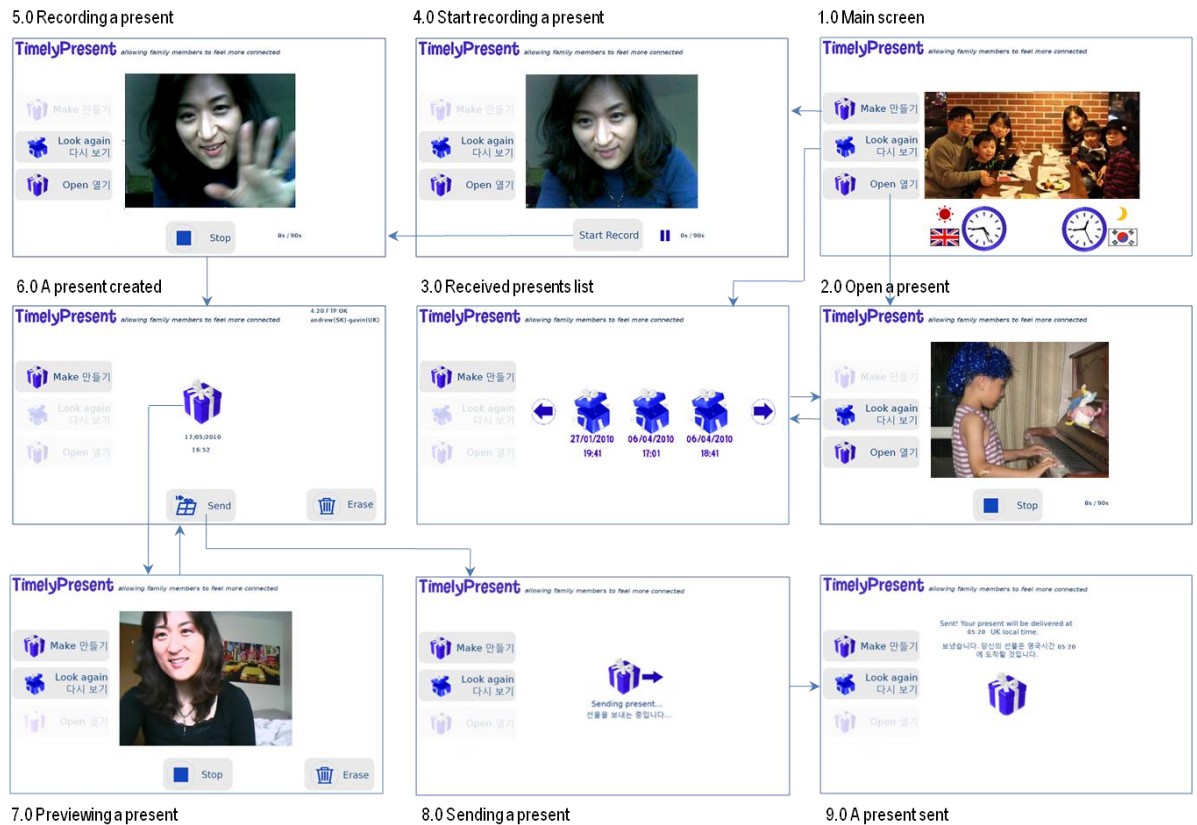


Figure 4.18 Final connectivity diagram: storyboards of interaction with TimelyPresent

4.9 User testing and how it changed the design

The design decisions detailed above were further refined by user testing. The method, called ‘Cooperative Evaluation’, was used (Monk et al., 1993). Cooperative Evaluation was carried out to get the user’s own perspective on the system designed, and to achieve common ground between user, designer, and system developer in order to improve the specifications of the system, TimelyPresent. In addition, two advisors were asked to give comments on the main screen in order to polish the design layout for giving visual impressions of TimelyPresent. After the first user testing was carried out and the results were adopted for improving the design of TimelyPresent, two instructional manuals were produced. Using these instructional manuals, the second level of user testing was conducted.

4.9.1 Method

The first step was to recruit users who were typical of the eventual users of the system, TimelyPresent. Table 4.2 below describes participants for user testing or for commenting. Five participants were recruited: three participants for user testing and two advisors for commenting on

the first screen. English names were used as pseudonyms.

Table 4.2 Participants for user testing and commenting

Participants	Way of cooperative evaluation	Who	Place	Date
Christine	First user testing	Mother of 3 children, Lecturer in East Asian Studies, the University of Sheffield.	User's home in Sheffield	8, May, 2010
Nancy	First user testing	Mother of 1 boy, Lecturer in the dept. of Psychology, Sheffield Hallam University	User's home in Sheffield	9, May, 2010
Lucy	Second user testing	Grandmother of 3 grandchildren, retired a few years ago	The author's home in York	18, May, 2010
Joshua	Discussion on screen layout	Single, Lead UX designer at Realtime World in Dundee	Comments given through email and MSN	12, May, 2010
Rio	Discussion on screen layout	Father of 2 boys, Prof. School of Mechanical Engineering, Sungkyunkwan University, South Korea	Comments given through email	12, May, 2010

Christine is Korean British, a mother of three children living in the UK. She is married to a British man. She used to telephoning to her parents in South Korea once a week and visiting them once a year. Nancy is British, a mother of one boy living in the UK. Her husband is Japanese, so the family is used to contacting other members of the family in Japan. The author visited Christine and Nancy for conducting the first user testing on TimelyPresent. The testing with Christine took more than an hour and the testing with Nancy took about 45 minutes. The author made notes in detail on each task listed on the paper while conducting the user testing.

On the basis of the comments given by the two participants, some design elements of TimelyPresent were modified and improved. Joshua and Rio were then contacted as advisors by the author. They both have a design background and were simply asked to comment on the main screen layout of TimelyPresent. Considering their comments, the final step of redesigning was carried out and the detailed graphic design was also modified and further improved. Two instruction manuals were then produced and the second user testing was conducted with them. The first manual explains how to start up TimelyPresent and the second manual explains how to perform three tasks

using TimelyPresent (see the user instructional manuals in Appendix 5 and Appendix 6 and also see Section 4.7.3).

Lucy, a grandmother of three grandchildren living in York, was invited to the author's home and participated in conducting the second user testing of TimelyPresent with the two instructional manuals on 18th May 2010 (see Table 4.4). It was intended that at least one of these participants was not familiar with this technology. Three users were recruited by personal contact. Before conducting the user testing, photos of the user's family were obtained and displayed on the main screen of TimelyPresent in order to make the user feel like a real user of the system. A number of demo presents were also created. Displaying these presents was the first task given for the user to perform.

An introductory session was prepared to make sure that the user felt comfortable before doing the tasks to be given. The author started to explain about the testing with three points: what TimelyPresent is, why the author is here with the user, and how the user can help her, as follows:

“TimelyPresent allows you to make and send a present for your loved one. It is designed for feeling more connected. Why I am here with you is to improve TimelyPresent together because it is not perfectly designed yet. It is only an initial stage of working interaction prototype. You will try out TimelyPresent while telling me what you are thinking. It would be great if you give me comments as many as possible that will help design TimelyPresent better.”

Nine tasks were prepared for the user to perform using TimelyPresent (see Table 4.3). The author started up the TimelyPresent and tried to keep the user talking on any issue drawn while performing the tasks given. The author kept asking ‘what are you trying to do?’, ‘what are you looking for?’, or ‘what were you expecting to happen?’ This approach is called, ‘think aloud’.

Table 4.3 Tasks for user to perform in Cooperative Evaluation

Tasks	Question/Instruction
T1. Ask about first experience of first screen.	As you can see, this is the first screen of TP. It is a touch screen so you can touch any part of the screen. What can you see and what do you feel about it?
T2. View new present	Pretend that your husband sent a present for you, which has arrived now. Can you see the new present?
T3. Make a present (short)	Now you can make a present for your husband. Try to make a present.
T4. Review the present	Try to see if it is good or not.
T5. Send a present	You have made a present. Now try to send it to your husband.
T6. Make another present (long)	Try to make another big (long) present which can be up to 90 seconds.
T7. View old present	Pretend to have some old presents you have already opened before. Try to view old presents.
T8. Delete one of the old presents.	Try to delete one of the presents
T9. Go back to the first screen.	Try to go back to the first screen

After the tasks had been performed by the user, a simple de-briefing session was held. The author told them that, ‘You have completed all things successfully’ in Korean with Christine and in English with Nancy and Lucy. The debriefing questions were then given to them (see Table 4.4). The results of user testing using cooperative evaluation are described in the following Section 4.9.2. More details of the results can be seen in the Appendix 8 and Appendix 9.

Table 4.4 De-briefing questions

De-briefing questions on TimelyPresent
What more would you like to do with TimelyPresent?
What do you think was the best thing about TimelyPresent?
What do you think was the worst thing about TimelyPresent?
What was the most difficult part in operation?
What do you think most needs changing?

4.9.2 Results of user testing

Many comments were given and some unexpected behaviours were shown during the user testing. All the details of the two levels of user testing including the results of de-briefing sessions can be found in Appendix 8 and Appendix 9.

After a discussion about the comments given and unexpected behaviours shown while the user testing on 11th May, some changes were made to the design of TimelyPresent. These are described below with examples of the comments and/or unexpected behaviour that suggested them.

1. A detachable USB camera was added as an alternative to the built-in camera. More than one user mentioned the restrictions imposed by the built in camera, stating that it was not satisfactory for making presents. An example for this is, “The position of the camera should be changed. The camera for the front is not fun. It seems too artificial and not natural. There should be another camera being able to show where children play in an easy and flexible way.” [Christine, U1].
2. On the first screen, design elements were rearranged in a simpler way and consideration given to the fonts and colours used. Regarding the first expression on the main screen, a few quotes illustrated, “*It seems too complicated. Picture and the things on the screen should be arranged in a simple way. They look so amateurish....*” [Christine, U1]. “*It seems not professional.*” [Nancy , U1]. “*It is so crude and not attractive to play with, and the pictures are not immediate to catch the meaning.*” [Rio, C].
3. The clocks were given second hands. There was also an option for one instead of two pictures. Some relevant quotes are given saying. “*Are the clocks really working?*” [Christine, U1]. “*I didn’t know the clocks are working. If second hand is provided, it can show the clock*

working? What about digital clock?” [Nancy, U1]. With regard to the pictures of family, the two following quotes explain that what one or two photo(s) of family can mean. *“Why two photos? They don’t need to be separated. Why don’t you put a very big one picture of the family? They will go back to Korea at last.”* [Christine, U1]. *“The family photo apart looks like a family divorced.”* [Rio, C].

4. Icons that were buttons were made larger and labels added (imperative words, ‘Make’, ‘Look again’, ‘Open’, in English and Korean). Icons were also resized to a standard size. This was in response to the following user comments. A number of illustrating quotes follow, *“The icons are difficult to understand what they are for.”* [Christine, U1]. *“Three icons should become smaller with a few words to show clear meanings.”* [Nancy, U1]. *“Box button colour is identical to the clock colour so it is confusing. Highlight the buttons and remove any boxes to avoid confusion. Too busy on the left half. Give more space around the buttons.”* [Rio, C]. *“The fonts should be changed first.”* [Joshua].

5. The time for activating the screen saver mode was elongated from 5 minutes to 10 minutes. The time of ‘no activity’ before going back to the main screen was also increased from 1 minute to 2 minutes. While Christine was thinking of how to make a present, the screen suddenly went back to the main screen because it had timed out through inactivity. Christine looked shocked, stared at it and asked the author, *“What happened?”*

6. A clearer explanation of what TimelyPresent was doing when a message was sent was provided. An extra screen designed shows a reassuring message for senders with what time the present will arrive. Although a present is sent, it was changed so that the reassuring message screen still remains and does not go back to the main screen automatically. If users want to do another task, such as making another present, they need to go to the main screen. For this, the banner button should be touched. This can be explained by the following comment given at the user testing with Nancy. After Nancy pressed the ‘send button’, she saw the following screen for a while (about 10 seconds) and it suddenly went back to the main screen. Nancy looked a bit shocked and asked the author if the present was gone or not. Nancy said, *“Why not saying any message such as ‘it’s gone’?”*

7. Finally, the arrangement of presents on the ‘Look again’ screen was changed so that the most recent was first in the list. The relevant comment says, *“Old presents should be displayed in a different way. New ones should be left and old ones should go right.”* [Christine, U1].

After these changes had been made it was judged that TimelyPresent was ready for the field study.

4.10 Discussion and conclusions

This chapter (Chapter 4) has described the design of TimelyPresent that was inspired by the codes identified in analysing qualitative data derived from the Probe study carried out in Chapter 2. As noted in Chapter 3, it was found that the combination of a group of quotes from family members with some associated nearly-do-it inventions was a powerful and rich way of expressing possible requirements for the design of technology. The targeted users aimed in this thesis are three-generation families where one or more members are separated by large distances and thus awkward time differences. The intention of designing TimelyPresent was not to replace the technology these families already use for communication, such as Skype and email, but rather to supplement and enhance the value they get from them.

This chapter illustrated the design of TimelyPresent allowing the family members living at a far distance to feel more connected to each other through sending and receiving playful video messages using it. TimelyPresent is a simple to use device, developed to support showing affection, evoking the feelings of happiness and comfort, or encouraging engagement between children and an absent parent or grandparents. Presents they received could also be long lasting keepsakes for reflection and common ground for conversation.

The concept of TimelyPresent was described as an asynchronous media gift delivered at an appropriate time as a synchronizer. The Archos 9 was selected as the platform for using TimelyPresent, running Microsoft Windows 7 with 1024×600 resolution touch screen and WiFi connection to a home network. It was set up to resemble a digital photo frame and intended to be always on in order to avoid usability problems with set-up or switching it on and off. Three options for controlling the time of delivery of presents were discussed. The specifications for designing TimelyPresent were outlined concerning the main screen with metaphors including present metaphor, family photos, and clocks, and the key functions for using TimelyPresent including Opening a present, Making a present, Looking again, and Exiting from TimelyPresent. In addition, technical details were delineated, involving the initial screen layouts with connectivity, compression and recording length of a present, server side, alongside with the method and results of user testing of TimelyPresent.

This section concludes this chapter (Chapter 4) by discussing the potential value of TimelyPresent to the sender and the receiver respectively. The sections follow the potential value (i) to the sender including encouraging engagement, the act of giving as reciprocity, and implying the worthiness of effort for increasing the level of happiness, (ii) to the receiver concerning long lasting keepsakes for reflection and a sense of shared culture, treasured memories, and (iii) to both parties on lessening the feeling of obligation. This framework of potential values is discussed with regard to previous literatures particularly those reviewed in Chapter 1.

4.10.1 Potential value to sender

One of the most potential values to the sender using TimelyPresent is considered as encouraging engagement between children and an absent parent or grandparents by sending a video message. The act of sending and receiving a present can be regarded as mediating playful activity.

The good relationships between grandparents and grandchildren could benefit the contented state of being happy and healthy of both parties. Grandchildren may be happy to get the emotional support and guidance offered by mature companionship, whereas grandparents can receive a sense of meaning as members of the family and the feeling of pride of a carer or mentor (King & Elder 1997), or story-teller, play mate (Vetere et al., 2009). However, opportunities to enjoy the relationships must be hard in the case of families living at a far distance.

Grandparents are increasingly concerned about the difficulties of maintaining the relationship and contact with their grandchildren (Vetere et al., 2009). This concern is also considered as one of the codes, ‘unconditional love’ involving numerous quotes, emerged from the Probe study (see Chapter 2, Section 2.5.3; Table 2.3). An example quote showed a grandfather’s worry with yearning and missing his grandchildren. Hannah, a mother says,

“... Especially, my father always tells me to show their [the grand parents'] pictures to children as often as possible, not to forget them. He always asks me to do so to make sure his grandchildren remember him, until when the whole family will meet at the airport.” [Hannah, Int.1].

Children also benefit from developing strong ties with their grandparents at a young age (Blau, 1984) and healthy grandparents have a positive effect on familial interaction and relationships (Griff, 1999). “For young children, especially pre-schoolers, naturally occurring interaction can best be explored through playful activity. Play is common between grandparents and children and is crucial to building their relationship.” (Vetere et al., 2009, p.166).

It is believed that if the sender is a young child who is around 5 years old, he or she could make a present in a playful way because TimelyPresent was designed to be very simple in operation. Young children might find their own way of creating presents with the hope of using the detachable USB camera. It is also presumed that older adults can send a video present. If communication technology is designed with the focus on being extremely easy to use, it enables every member of the family, involving grandparents and young children who actively participate (Conversy et al., 2003) (see Chapter 1, Section 1.3.2; Figure 1.9).

This value of being able to respond by creating and sending a present is considered as essential. Consistent with this, Lindley and her colleagues conducted three focus groups with older adults from 55 to 81 years of age, aimed at understanding how the participants kept in touch with people who are important to them and how new technologies might be designed for them (Lindley

et al., 2009). It presented that older adults regarded “the act of keeping in touch as being worthy of time and dedication, but also as being something that needs to be carefully managed within the context of daily life” (Lindley et al., 2009, p.1693). One of the values expressed by the participants was “the importance of reciprocity” which emerged from the qualitative data and an example quote noted that

“Nearly all of these things are based on the fact you’re going to have either a mobile phone with a camera, or you have got a digital camera which you know how to use [...] a lot of people don’t have that [...] you’re always going to be just a receiver, you’re never going to be the giver, so it’s got more ramifications than just sitting looking, ‘Ooh that’s nice’ [...] because you want to give back again” (Lindley et al., 2009, p.1699).

In line with this, Seligman found that the act of giving makes people feel happy and provides a more enduring form of happiness that takes longer to habituate to than the act of receiving (Seligman, 2004). It is because happiness is highly habitual so that something that can firstly give feelings of happiness might rapidly come to produce a neutral state of feeling although receiving and gaining things has the potential to make people feel good. Similar to the notion of gift-giving (Taylor & Harper, 2002), the act of giving does not mean only physical objects. Seligman has found that even small expressions of thanks to people daily can have an influence on the level of happiness. TimelyPresent allows senders to express even simple and short utterances such as thanks and to make the thanks givers feel happy as the receiver feels so.

TimelyPresent allows the sender to maximize the opportunities to create and send a present at an appropriate time of day. The sender does not need to consider the time difference and see the availability to communicate with the loved ones. It also allows the sender to manage the amount of time and the content of presents to be created due to the function of previewing the present created and making another with ease. It is presumed that the sender will be happy to make a better present using the 'preview' feature while thinking with fondness of the receiver when they get it. This could lead the sender to make presents special due to the absence of sent messages on the sender's TimelyPresent. As noted before, this was intended to reinforce the present metaphor for the sender (see Section 4.5.5). One cannot give someone a present and concurrently keep it for oneself. This design factor and the time delay as an illusive synchroniser are intended to encourage the sender to treat the present as something that should be unique and special and considered, more like a handwritten and posted letter or card than a multi-media message. Consistent with this, Romero and his colleagues found that, “effort invested by the sender of a message is valued by the receiver, but only when it is meaningful with respect to the communication message.” (Romero et al., 2007, p.301), see also Section 1.2.5. The process effort, noted by Romero and his colleagues, for example, to start up a computer, connect to a service provider and send an e-mail message cannot be regarded as valued compared to the effort taken to go to a shop for choosing a postcard to correspond to the receiver's personal appreciation. We believe that TimelyPresent can support the

personally targeted effort to be taken by the sender and also thought of as such by the receiver who could feel happy.

4.10.2 Potential value to receiver

One of the most valuable factors of TimelyPresent is considered to be the key function of the Look again on the receiver's TimelyPresent. As noted in Section 4.6.3, presents previously opened and looked at by the receiver were moved into the Look Again screen where the icons representing the presents were opened packages. The value of saved objects when reflecting on one's absent loved ones appears widely in the probe study transcripts. The Look again feature allows the receiver to have time for reflection from yearning by seeing the presents using just a few touches on the screen. Presents could be long lasting keepsake and considered as 'the extended nature of experience' (Khalid & Dix, 2010).

The video presents made in the home environment could be oriented towards lifestyle, aspirations, and emotions (Tolmie et al., 2002). Understanding the other's daily routines is important and valuable with regard to expectation, meaning in the action, and the context of time of the day (Tolmie et al., 2002). Using TimelyPresent, the receiver could understand more about the remote loved ones by looking at the contents of presents involving episodic daily activities with real images and good quality of sound provided by the key characteristic of Archos 9. It is presumed that the contents of presents could involve saying hello with a smile, playing, new shoes, or flower pots. It might make the receiver feel a similar emotion to that of the sender and feel more connected, particularly when the present arrives at an appropriate time such as relaxed time at home from busy work or bed time.

Khalid and Dix mentioned about Urry's (1990) 'tourist gaze' explaining "how people who are far away from their homeland will see ordinary things as extraordinary" (Khalid & Dix, 2010, p.220). From the view of the receiver, for example grandparents in South Korea, contents of presents will be extraordinary and special because the presents are created in the UK. The receiver might see their grandchildren's book in English, special events such as a Christmas party or Easter eggs, or hear someone talking in English in the background. Receivers could feel 'a sense of shared culture' (Khalid & Dix, 2010) and a sense of culture to be shared, rather than the geometric notions of distance and space.

The meanings of the contents of presents can also change over time. For example, although a present created by the sender could be a very ordinary daily aspect of life, the present could be valued by the sender. It is presumed that such a present could become retrospectively more meaningful and valued to the sender and receiver when the whole family reunite and see it together. If the content of a present involves a young child's daily life, it would be more special than parents'

or grandparents' life because children, especially babies grow quickly. As time goes by, contents of presents will be considered as 'treasured memories' (Khalid & Dix, 2010) especially to grandparents.

4.10.3 Potential value to sender and receiver

The design of TimelyPresent has been very much shaped by the approach of designing an awareness system (Romero, Markopoulos et al. 2007) and their description of the ASTRA system, and also their characterisation of the benefits and costs of communication (see Section 1.2.5). All the nine affective benefits and costs (Romero, Markopoulos et al. 2007) described in Chapter 1, Section 1.2.5 (also see Table 1.1) were observed in our data and very much shaped the design of TimelyPresent (also see Chapter 2, Section 2.6.1). For example, when deciding on how to engineer the arrival of a present we rejected our original idea of synchronising on some daily activities such as a meal-time as it might create new social obligations (see Chapter 2, Section 2.6.1). The value of gift-giving among families was also an important motivation for using the present metaphor. Giving someone a present should not be considered as part of a direct exchange which cannot be direct or exactly equivalent, the form is important. As Zizek remarks "If, upon receiving a gift, I immediately return it to the givers, this direct circulation would amount to an extremely aggressive gesture" (Zizek 2007).

4.10.4 Conclusion

Designing TimelyPresent for more than three months was a multidisciplinary approach integrated with the focus on user centred design involving design thinking with the notion of creative leap, and understanding deep feelings experienced by three-generation families as a whole perspective. Especially, user testing with cooperative evaluation was successful for understanding potential users' comments on using the initial prototype of TimelyPresent. We believe that TimelyPresent could help such casual interactions over the coffee table or living room which might be related to real emotional experience in a relaxed and playful way, also with the support of sharing non-verbal gestures such as hugs, smiles, shrugs and particularly the child's laughter. We also hope that this creative way of expressing emotions using TimelyPresent could be a fundamental feature of social relationships for three-generation families at a distance.

Based on these findings, TimelyPresent was considered ready for the field study. The aim is to understand the problems and opportunities provided by participants trying out TimelyPresent and telling us about the participants' experiences using it. Chapter 5 will describe how participant families were recruited and TimelyPresents deployed, what types of data were collected, the

methods for analysing them and the findings. These results could also help to improve the design of TimelyPresent.

CHAPTER FIVE. FIELD STUDY of TimelyPresent

As described in Chapter 4, TimelyPresent is a very simple to use device with which families can create gifts with special meaning to stimulate conversation and to act as long lasting keepsakes for reflection. The key feature of this design is the metaphor of a present delivered after a time delay so that it arrives at the same time of day as it was created. This chapter (Chapter 5) describes the results of trials of TimelyPresent by participants over a period of more than two months. The participants were interviewed after one month and two months of using TimelyPresent. Log data were also collected while they were using the TimelyPresents. In addition, the contents of presents created by the participants were collected and analysed.

5.1 Introduction

5.1.1 Goals of field study

The aim of the field study of TimelyPresent is to understand the problems and opportunities provided by the participant families trying out TimelyPresent, and to allow them to tell us about their experiences using it. It is focused on understanding how people feel using TimelyPresent and why they use it. These results will also help improve the design of TimelyPresent.

These goals will be achieved by analysing the qualitative data derived from interviews and the contents of presents created by the participants. We had not expected to analyse the contents of presents created by the participants. During the interviews it became apparent that participants were very willing to show the interviewer the content of presents and it was decided to ask all the families if, just the interviewer, could view present contents. An email was sent around and all the families but one agreed.

5.2 Method

Four participant families were recruited via personal contacts who are members of families (grandchildren, their parents and grandparents) where at least one person is geographically separated from the others living abroad in different time zones. Each family was allowed to use two TimelyPresents as a pair, for example, parents with children in the UK and grandparents in South Korea. Each pair sends and receives a simple video message to each other between the two countries, the UK and South Korea. Four pairs of TimelyPresents were deployed and tried out for more than two months. Eight participants were interviewed after the first and second months of using TimelyPresent. In each interview, open questions were asked about how they felt about making and receiving presents, and changes in the relationship with their remote family.

Transcripts of 15 interview files were analysed using thematic analysis. One participant could not have the second interview due to his tight business schedule. Logs recording the traffic of use of TimelyPresent were also examined alongside 133 presents created by the participants (details for the participants are given in Table 5.1).

5.2.1 Ethical approval

As in the probe study, interviews were audio recorded and anonymised at the point of transcription. English names were used as pseudonyms even when the participant was Korean but the gender of the participant was preserved. All the information was stored securely.

Ethical approval for the field study of TimelyPresent was obtained from the University of York, Department of Psychology ethics committee based on the two consent forms prepared for the participants. The first consent form was for using TimelyPresent for two months for free and made it clear that only the traffic of using TimelyPresent would be looked at, and not the contents of the presents they created. Written permission for this was obtained (see Appendix 10). The second asked them for permission to record them talking about the experience of using TimelyPresent. (see Appendix 11). Participants were informed they were free talk about issues on trying out of the TimelyPresent and that they were not expected to provide any information that they did not wish to. It was made clear that if they felt that no longer wish to take part at any time after signing the form, they could just say so and we would stop and destroy any data collected. The email used to get permission for viewing the content of presents is given in Appendix 13. Every family gave their permission to do so except Eddie's father. The presents that he created were not viewed.

During the first interview, the mother of the Eddie-Dad family (see Table 5.2) indicated that one of her sons, Mark (aged 12), would also like to be interviewed. This request was granted using the audio recorded permission of Mark himself and the request by his mother who was present in an adjacent room during both interviews.

5.2.2 Procedure

5.2.2.1.1 Recruiting participants

Participants for trying out TimelyPresent were recruited entirely via personal contact. It took more than five months to recruit the four participant families.

Perhaps because of the novelty of the idea, recruitment for this trial was not easy. Although the trial study of TimelyPresent and the need for participants were advertised on the websites of the Korean societies of York, Sheffield, and London, no one responded. Recruiting families living at a

distance was presumably necessary by personal contact because it could be sensitive to ask such the families to take part in the study.

First of all, it was very hard to find families who are living separated. It was also hard to find families with children aged around five years. They were unlikely to attend social groups, such as Korean societies of universities or going to churches. Therefore, it was hard to know the personal information about such families separated at a far distance. Asking when and how long they would stay in the UK should be considered first to ensure that they could try out TimelyPresent for at least for two months. Many were staying in the UK temporarily for study.

Secondly, fathers living in Korea were often unwilling to participate in the field study, although the mothers living with children in the UK were interested and happy to agree to take part. The author asked them to contact their husbands to see if they would be happy to take part and then let her know. Mothers did not contact the author after their husbands disagreed to do so on the phone. Furthermore, they did not answer phone calls or reply to emails either. The fathers' unwillingness could be because of worries about privacy.

Thirdly, using a new technological device was not always welcome to everyone, particularly grandparents who have at least internet access and are able to use a computer, for example, using email at their homes.

In the end we recruited four families. They are described in the next section and Table 5.1.

5.2.2.2 Deployment of TimelyPresent

Two TimelyPresents as a pair were loaned to users and delivered one to the family member abroad and one to the family member in the UK. Four TimelyPresents were deployed in the UK by the author visiting the participants and helping them to install them, along with the two instruction manuals (see Appendix 5 and Appendix 6) and the consent form (see Appendix 10). The four other TimelyPresents were deployed to the participants in South Korea by posting them including the manuals and consent form. The first manual explains how to turn on Archos, how to connect the internet, and how to start up TimelyPresent (see Chapter 4, Section 7.3). The second manual illustrates three tasks to perform using TimelyPresent concerning Making, Looking again, and Opening presents (see Chapter 4, Section 4.6). The author had to track the post in detail from the Department of Psychology in the University of York, UK to the participants' homes, South Korea. One parcel containing a TimelyPresent was unfortunately held for a few weeks under customs inspection at the airport in South Korea. When the author was informed about the problem, she contacted the participant several times to make sure it was understood that the study would be only for academic research and any charge would be paid by the department. Fortunately, the parcel with

the TimelyPresent arrived safely at the participant's home.

The author also occasionally telephoned all the participants to see how they were getting on with TimelyPresent with regard to the installation and maintenance. Moreover, three participants in Korea were grandparents who had little experience with electronic devices. TimelyPresent needed a wireless network to be connected and a router to be installed which was significantly complicated. Three grandparents only had a landline network, not a wireless network for using TimelyPresent. The author had to see which landline they were using at their homes and found appropriate wireless routers for them to use TimelyPresents.

The participants also needed technical support for installing the router and TimelyPresent. The author arranged friends of hers who could visit the participants to help them install the router and their TimelyPresent, which needed much time and effort. It was also considered that the grandparents might feel uncomfortable reading foreign language using TimelyPresent, although Korean words for the key functions of TimelyPresent and Korean versions of the two instruction manuals accompanied it. Therefore, the author tried to contact them at least two times a week to see if any help would be needed. It was far more difficult to connect a wireless network rather than to use TimelyPresent. More details including technical problems are described later in Section 5.3.3.4.

The intention was that each pair of TimelyPresents would be deployed for two months. As can be seen in Table 5.1 below, the date of deployment for trying out TimelyPresent ranged from 21st of May to 10th of June. The first date of connection between the pair of TimelyPresents was the date when the sender who had sent a present for the first time received the first present back from the other end. All participant families used their TimelyPresents for longer than two months. There were, however, some gaps for summer holidays or attending conferences. Interestingly, after the holidays some participants made video presents telling about their journey and sent them to the other end. More details will be described in the results from the analysis of the interview transcripts in Section 5.3.3.

It was discovered that Hannah's grandmother was not using her TimelyPresent. She just used the TimelyPresent a few times, such as on the days of installation and interview. The author discovered this by monitoring the logs and tried to contact her several times, but she did not respond to the telephone. Despite this, she welcomed the author to come and conduct an interview twice at her home. One of technical problems also happened on Eddie's TimelyPresent. The power supply of the Archos was not working after a few weeks of using it. Although a new power supply was provided, Eddie's family had to move to a different flat. Eddie's father was also extremely busy working and going on business trips to many countries so he was unlikely to use his TimelyPresent often. Therefore, Eddie-Dad family decided to carry on using their TimelyPresents for a longer period than the other participant families.

The author visited and stayed in South Korea during the period from 4th of July to 24th of September, 2010. During this period, she was able to maintain some presents and do some face-to-face interviews. More details are described in Section 5.2.1.4 (see Table 5.2).

Table 5.1 Participant families and the deployment dates

Participant (UK)	Who (UK)	Children (age)	Who is at a distance (South Korea)	Name of TimelyPresent version	Date of Deployment	Period of using TimelyPresent
Jenny	Mother of 2	Mark (12), Eddie (7)	Husband	Eddie-Dad(UK)	27/05/10	27/05 - 19/11/10
				Eddie-Dad(SK)	25/05/10	30/05 - 19/11/10
Beth	Mother of 1	Hannah (2)	Parents	Hannah-Halbie(UK)	21/05/10	21/05 - 26/09/10
				Hannah-Halbie(SK)	25/05/10	10/06 - 13/09/10
Ceci	Mother of 2	Alice (7), Joshua (5)	Parents	Alice-GP(UK)	05/06/10	05/06 - 29/09/10
				Alice-GP(SK)	07/06/10	15/07 - 16/09/10
Tony	Father of 1	Anne (4)	Parents	Anne-GP(UK)	10/06/10	10/06 - 16/10/10
				Anne-GP(SK)	09/06/10	27/06 - 10/09/10

Table 5.2 Interview summary (SK: South Korea, F: face to face interview, T: telephone interview)

Who use TP	Informants	Interview #1				Interview #2				
		Type	Date	Transcripts (pages)	Duration	Type	Date	Transcripts (pages)	Duration	
Eddie-Dad	Mother and 2 boys (UK)	Mother and Mark	T	11/07/10	7	23:46	F	29/10/10	8	72:24
	Father (SK)	Father	T	24/07/10	12	59:28		.	.	.
Alice/Joshua-GP	Mother and 2 children (UK)	Mother	T	05/08/10	7	49:52	F	26/09/10	7	27:41
	Grandparents (SK)	Grandmother	F	12/08/10	9	71:20	T	13/09/10	5	24:59
Anne-GM	Parents and 1 girl (UK)	Father (Mother in Int.2)	T	27/08/10	6	45:04	F	29/09/10	9	66:00
	Grandmother (SK)	Grandmother	F	10/08/10	6	56:17	F	16/09/10	4	50:08
Hannah-GM	Parents and 1 baby (UK)	Mother (Father in Int.2)	T	16/08/10	7	49:13	F	16/10/10	7	45:32
	Grandmother (SK)	Grandmother	F	18/08/10	8	71:59	F	10/09/10	7	63:34

5.2.2.3 Log data

Log information was derived from recording the traffic of use of TimelyPresent. Activities were automatically recorded when TimelyPresent was on or off, or when users created, viewed or sent presents to each other and more specifically, activities such as preview, upload, download, and play. The purpose of the log analysis was to understand how much if at all participants used the features of TimelyPresent. The results of the analysis will be discussed in Section 5.3.1

5.2.2.4 Interviews

Eight participants were interviewed after the first and second months of using TimelyPresent. In each interview, open questions were asked about how they felt about making and receiving presents, changes in the relationship with remote family, and the best and the worst things about TimelyPresent. More details are addressed in the following section about the interview schedule. Interviews were recorded and written permission for this was obtained (see Appendix 11). The interviewer was sensitive to any signs of distress in the participants and ensured that they were not upset at the end of the interview. Interviews were audio recorded and transcribed. As described at the first in Section 5.2.1.1, transcriptions were made anonymous as the first step in coding and analysis. Recordings and transcripts were kept securely.

Interviews were conducted face to face for about an hour or by telephone for approximately half an hour. Although face to face interviews are thought of as the most desirable method, particularly with grandparents, telephone interviews were also necessary where participants had very busy schedules, so that it was hard to make time for a face to face interview, such as Eddie's father if the author was staying in South Korea while the participant in the UK was needed to conduct an interview. Skype was used for the telephone interview and the conversation was recorded. It was sometimes hard to have a long conversation during the interview due to the poor line quality between the UK and South Korea.

A face to face interview with all members of the family was considered as the most desirable way for collecting data. This was because every member of the family enjoyed participating in the interview and telling of their own experience of using TimelyPresent. It was found that the views of the mother and father on the same present received were likely to be slightly different, which could be discussed in a natural way at the interview. The second interviews conducted with Eddie's family, Anne's family, and Hannah's family were the cases of this.

Grandparents would prefer to have a face to face interview rather than a telephone interview. They also needed some technical support on using TimelyPresent. It was found that the author, interviewer could understand more about the feelings the interviewee might have. This is because

the author could see and feel the presents the participant received and the way they expressed their feelings by hearing about their thoughts, and seeing their facial expressions, and even body gestures. A number of moving moments could be perceived during the face to face interviews. Examples are showing tears in eyes, and an unexpected response to presents, such as answering to a present. More details are illustrated in Section 5.3.3.3.

It was also felt that it would be more likely that a participant would be more comfortable expressing negative or deep feelings or giving reluctant comments in detail at a face to face interview. It was found that while Tony, Anne's father was not good at talking in the telephone interview he became engaged in telling about his own experience of using TimelyPresent in the face to face interview.

As can be seen in Table 5.2, 15 recorded interview files totaling 12 hours 27 minutes and 113 pages of transcripts were generated. There were nine face to face interviews and six telephone interviews. Although Eddie's father could not take part in the second interview because he was extremely busy with business trips all over the world, he responded to questions on using TimelyPresent via email.

The purpose of the interview was to make people tell us about the experiences they had trying out TimelyPresent. It was also more precisely to understand their subtle feelings expressed into verbal data. The first step for interviewing was getting the signature on the consent form (see Appendix 11) and starting the recorder. The interviewer explains why the author is conducting the interview. The author says, *'Why I am here with you is to improve TimelyPresent together with you because it is not perfectly designed yet. Please tell me about your own experience of trying out TimelyPresent. It would be great if you give me comments as many as possible that will help design TimelyPresent better'* (see Chapter 4, Section 4.9.1).

Questions were asked about presents in the form of an interview schedule containing four parts. The first two parts were about presents; receiving and making presents. The third part contained questions about the change in the relationship with the remote family since using TimelyPresent. The last part of the interview schedule comprised questions about the usefulness of the design of TimelyPresent.

Firstly, the receiving presents part aimed to get them to talk about at least four presents. The questions are presented in Table 5.3.

Table 5.3 Questions about presents received

-
- Q1. What was the last present you received? How do you feel?
- Q2. Did you talk about it later?
- Q3. Did you look at it more than once?
- Q4. What other presents made you happy?
- Q5. Could you choose a few and tell me about the stories?
- Q6. Could you show me?
- Q7. Did any presents make you uncomfortable?
-

After the first part of the questions was asked, the author asked permission to view the presents participants had mentioned. If they were happy to show the presents, the interviewer tried to see them together with the participants and asked how and why they felt looking at them in more detail.

The second part of the interview schedule was about making presents, for example, ‘what was the last present you made?’, and ‘what presents did you most enjoy making?’ (see Table 5.4 below). The aim here was to get them to talk about at least two presents. It was found that on the 3rd question of ‘when?, how?, and why?’ listed in Table 5.4, the participants tended to tell us about technical inconveniences rather than the contents of present that made them uncomfortable. More details are illustrated in Section 5.3.3.4.

Table 5.4 Questions about making presents

-
- Q1. What was the last present you made?
- Q2. What presents did you most enjoy making?
- Q3. When? How? Why?
- Q4. While preparing it, making it, or sending it, or when the remote family ring you about the present arrived?
- Q5. Did making any present make you uncomfortable?
-

The next part of the interview schedule contained questions that were about the change in the relationship with the remote family since using TimelyPresent. Four questions were asked, with the answer on the scale of; same, more, or less. After the answer was chosen, for example, if the participant says, ‘We think about each other more’, the author asked ‘Why and how do you think

so?’ The four questions and the answers were also used as prompts to trigger the feelings.

Table 5.5 Questions about the change in the relationship with remote family

Questions	Marking		
a. We think about each other	More	Same	Less
b. I feel involved in their lives	More	Same	Less
c. I feel obliged to contact them	More	Same	Less
d. I worry about my privacy	More	Same	Less

The final part of the interview schedule contained questions about usefulness for the further design of TimelyPresent. These are presented in Table 5.6.

Table 5.6 Questions about usefulness for the design of TimelyPresent

Q1. What do you think was the best thing about TimelyPresent?
Q2. What do you think was the worst thing about TimelyPresent?
Q3. What was the most difficult part in operation?
Q4. What could be added to TimelyPresent, such as functionality, aesthetics, or services?
Q5. What do you think most needs changing?

This interview schedule was used at the first and second interviews in an identical way with the participants. The results from the analysis of the interview transcripts are described in Section 5.3.3.

5.2.3 Informants

This section provides some more detail about the individuals in these families.

‘Eddie’s family’ was recruited first, and this was the only family where the mother and father were living at a far distance. Seven year old Eddie and twelve year old Mark are living with their mother, Jenny, in the UK. Father, David, is living in South Korea alone. Jenny is a PhD student. Jenny is also busy looking after two boys. At first the four members of the family were

living together in the UK as David was doing his PhD. After David finished his PhD, he had to go back to work again in Korea. David is very busy working and often going on business trips to America, China, or some countries in Europe. Due to his extremely busy life, David could focus on working rather than missing the other members of his family in the UK. However, when he has a little time at home he is always missing Eddie and Mark, and his wife, Jenny. David telephones and has a conversation with Jenny for about two hours daily to see if everything is fine. David knows that Eddie and Mark are not good at talking on the phone. Therefore David usually talks with Jenny only over the phone. After using TimelyPresent for about a month, the power supply broke. Although the new power supply was provided, Eddie's family moved to another flat. Therefore, the second interview with Eddie's family was the latest among all the participants.

The second participant family is 'Alice/Joshua and grandparents family'. Alice (6 year-old) and Joshua (4.5 year-old) are living with their parents, Ceci and Paul in the UK. Paul is a professional engineer and working in industry. The family moved to the UK around four years ago. Ceci is a housewife, looking after Alice and Joshua and supporting her husband, Paul. They visit Korea once a year around April, over the Easter holiday, and stay at the parents of Ceci in South Korea for about a month. The grandparents are very close to Alice and Joshua. The grandfather particularly has a very strong relationship with Alice. This is because when Ceci was busy working in Korea the grandparents looked after Alice for about four years, since she was born. Ceci explains that Joshua is likely to be jealous because of the strong connection between Alice and her grandfather. Therefore, Joshua tries to get more attention from his grandmother. Ceci telephones her parents three or four times a week. Alice and Joshua usually have a short conversation, such as saying hello to their grandparents on the phone. They do video-conferencing with their grandparents on weekends. Alice and Joshua are very friendly and bright.

The next participant family is 'Anne and grandmother family'. Anne is living with her parents in the UK. She is a four year-old, shy girl. The father, Tony, is the pastor of a church. Tony has been living here since he was a high school student. After he got married to Linda, the family settled down in the UK. Since Anne was born, the grandmother has been missing her all the time. Anne's family also visits Korea once a year. Tony telephones his parents occasionally and does video-conferencing on weekends. The grandmother has a strong relationship with Anne. Anne's mother, Linda, joined Tony who conducted a face-to-face interview with the author.

'Hannah and grandmother family' is the fourth participant family. Hannah is just 2-years old, a very active and bright girl. Hannah is living with her parents in the UK. The mother, Beth is a full time lecturer at the University. The father, James finished his PhD recently and he is now working in industry as a researcher. Beth and James have been living in the UK for more than 10 years. Since Hannah was born, the grandmother living in South Korea has been eager to see Hannah. However Beth is extremely busy looking after Hannah and also working full time.

Therefore Beth is unlikely to telephone her mother very often. They do video-conferencing once or twice a month.

5.3 Results

5.3.1 Results from analysis of logs

Logs were recorded of all activities on TimelyPresent (e.g., Appendix 12). The purpose of the log analysis was to understand how participants use the features of TimelyPresent and to find any particular behaviours that might be found interesting. It was also presumed that the results of log analysis might be linked to, at least in part, results of the analysis of the interview transcripts. This section focused on the following behaviours of participants: previewing a present, sending a present and viewing a present.

Participant families were allowed to preview presents created before sending them. During the period of the trial of TimelyPresent (see Table 5.1), some presents were previewed before sending them whereas some were not. Some presents were previewed more than once. Tables 5.7 and 5.8 show the number of presents in the UK and in South Korea, respectively. Alice/Joshua-GP family used their TimelyPresent in the most active way. Alice/Joshua family in the UK created 66 video presents and previewed 56 presents at least once before sending them. The other 10 presents were sent to Korea without previewing them. The total preview frequency was 73. On the other hand, the grandparents in South Korea created 15 presents and eight of them were previewed at least once. The total preview frequency was 12.

Anne's family in the UK was unlikely to preview presents whereas the grandmother in South Korea enjoyed previewing presents. Anne's family made 12 presents and sent 10 presents to Korea without previewing them during the trial period. Only two presents were previewed before sending them. The grandmother, however, created 27 video presents and previewed 12 presents at least once before sending them.

Hannah's family in the UK created 32 presents and 12 of them were previewed at least once. The total preview frequency was 24. There was a gradual decrease in previewing presents in Hannah's activities as time went on. This might be because they could feel confident to make presents without previewing them or due to the novelty effect wearing off as time went on. The grandmother of Hannah in South Korea just created six presents and four presents were previewed. As already noted she had some trouble operating the TimelyPresent.

Eddie's family tended not to preview presents. Particularly Eddie's father in South Korea created 18 presents and sent them all to the UK without any present being previewed. Eddie's family in the UK created 36 video presents and sent 18 presents to Korea without previewing them.

However eight presents were previewed at least once. Such behaviour was similar to Anne’s family in the UK. It could be presumed that the users, such as Eddie’s father, Anne’s father, Eddie, and Mark were men who might not be interested in previewing presents as opposed to the other members of families, such as the mother of Alice and Joshua and the grandmother of Anne who enjoyed previewing presents. More details are described in the results from the analysis of the interview transcripts in Section 5.3.3.

Table 5.7 Number of presents previewed before sending them (in the UK)

Participant families	TPs not previewed	TPs previewed at least once	Total preview frequency
Alice/Joshua-GP	10	56	73
Anne-GM	10	2	3
Hannah-GM	20	12	24
Eddie-Dad	18	8	11

GP: grandparents, GM: grandmother, Dad: father

Table 5.8 Number of presents previewed before sending them (in South Korea)

Participant families	TPs not previewed	TPs previewed at least once	Total preview frequency
Alice/Joshua-GP	7	8	12
Anne-GM	15	12	19
Hannah-GM	2	4	4
Eddie-Dad	18	0	0

Table 5.9 shows the number of presents created by the participant families that were uploaded and downloaded. ‘A present is sent’ indicates that the present is ‘uploaded’ to the server. ‘A present arrives’ means that the present is ‘downloaded’ from the server. Alice/Joshua family created and sent 47 video presents to their grandparents’ TimelyPresent in South Korea which is the highest number of presents sent among all the participant families. On the other hand, the grandparents made and sent nine presents to Alice/Joshua’s TimelyPresent in the UK.

Anne’s family created and sent 11 video presents to their grandmother’s TimelyPresent while the grandmother made and sent 20 presents. Although one present (0551) failed to be uploaded to the server due to a technical problem, Anne’s grandmother made and sent a significant number of presents (20) compared to the other grandparents such as Alice/Joshua’s grandparents (9) and Hannah’s grandmother (3).

Hannah-GM participant family seemed to find it extremely difficult to interact with each

other using TimelyPresent. Hannah’s family made and sent 26 video presents to Korea whereas Hannah’s grandmother just created and sent three presents to the UK. As can be seen in Tables 5.8 and 5.9, she created six presents in total but she just sent three presents. It can be considered that it might still be difficult for grandparents to use TimelyPresent although Anne’s grandmother and Alice/Joshua’s grandparents used their TimelyPresents without big problems.

Eddie’s family in the UK created and sent 20 video presents to father in Korea whereas father made and sent 18 presents to Eddie and Mark. In comparison to the other three participant families, the interaction between Eddie/Mark and father showed a balanced way of sending and receiving presents using TimelyPresent although the design of TimelyPresent did not intend to make users feel obliged to give and receive a present.

Table 5.9 Number of presents uploaded and downloaded

Participant families	Presents in UK		Presents in South Korea	
	Upload	Download	Upload	Download
Alice/Joshua-GP	47	9	9	47
Anne-GM	11	19*	20	11
Hannah-GM	26	3	3	26
Eddie-Dad	20	18	18	20

*1 present (0551) created by grandmother of Anne failed to be downloaded from the server.

Finally, the number of presents was considered, i.e. the number of new presents that were opened and looked at and also the number of presents that were previously opened and looked at again. As can be seen in Table 5.10 below, Alice/Joshua family just received nine video presents from their grandparents. They, however, played the nine presents over and over again 114 times. The mean plays per present (TP) was 12.67 that was the largest number among other participant families. The maximum number of plays was 33 times (see Table 5.11). On the other hand, the grandparents of Alice/Joshua played 45 presents and the total play frequency was 172 which the highest number of play frequency compared to other families. This is implied that they kept playing their video presents repeatedly as Alice and Joshua family did. The mean plays per TP was 3.82 and the number of maximum plays was 14 times during the period of two months of TimelyPresent trial (see Table 5.11).

Anne’s family played 19 video presents and the total frequency was 77 whereas the grandmother of Anne played 11 presents and she kept playing them over and over again 89 times. This can be signified that the grandmother of Anne played the presents more often (8.09) than Anne’s family did (4.05). This means that grandparents miss their grandchildren more than their

grandchildren do which relates to the code of ‘unconditional love’ which emerged from the probe study (see Table 2.3 and also see Appendix 2).

Unfortunately, Hannah’s family just received three presents so the total play frequency was 11 times whereas the grandmother of Hannah played 28 presents and the total frequency was 149 times. The grandmother played more than five times per present (see Table 5.10). Lastly, Eddie’s family played 20 presents over and over again 76 times while Eddie’s father played 15 presents repeatedly 33 times.

Table 5.10 Counts of presents played

Participant families	Presents played in UK		Presents in South Korea	
	TPs played	Total count of play	TPs played	Total count of play
Alice/Joshua-GP	9	114	45*	172
Anne-GM	19	77	11	89
Hannah-GM	3	11	28	149
Eddie-Dad	20	76	15	33

*2 tps (4354, 3636) were not played although they were downloaded.

Table 5.11 Mean and maximum counts of presents played

Participant families	Presents played in UK		Presents in South Korea	
	Mean count per TP	Max count	Mean count per TP	Max count
Alice/Joshua-GP	12.67	33	3.82	14
Anne-GM	4.05	10	8.09	12
Hannah-GM	3.66	4	5.32	14
Eddie-Dad	3.80	18	2.20	6

In summary, three behaviours of using TimelyPresent were examined: previewing a present, sending a present and viewing a present. Regarding previewing a present, it was found that Alice/Joshua family and Anne’s grandmother enjoyed previewing a present whereas Eddie’s father, Anne’s father, Eddie, and Mark were unlikely to enjoy previewing a present. It may be that men are not interested in previewing a present but of course this is a very small sample.

On the behaviour of sending a present, Alice/Joshua family also sent the highest number of presents. This could be because the mother of Alice and Joshua said that they considered TimelyPresent as a toy so that they enjoyed making and sending presents at the interviews with the

author. The mother also said that Alice and Joshua were competing when sending presents to their grandparents (for more details see Section 5.3.3.2 Playful mode of use for creator). Therefore, TimelyPresent can appeal to a family with young children who can enjoy and find their own way of creating presents in a playful way and healthy grandparents also can have a positive effect on such familial interaction and relationship with their grandchildren (Griff, 1999) (see Chapter 4, Section 4.10.1). However, as noted before, it might still be difficult for grandparents to use TimelyPresent although Anne's grandmother and Alice/Joshua's grandparents used their TimelyPresents without big problems. The problems will be described in detail in Section 5.3.3.4.

One of the most significant behaviours of using TimelyPresent is viewing a present. Alice/Joshua's grandparents and Anne's grandmother viewed the presents created by their loved ones over and over again. As described before, the total count of play by the former was 172 and the one by the latter was 149. This indicates how highly valued the presents were. As we shall see in Section 5.3.3.3 grandparents miss their absent grandchildren greatly and gain comfort from viewing the presents.

5.3.2 Results of analysis of content of presents

As described in Section 5.2.1.4, some participants showed the author their presents received from their remote families in the course of the face to face interviews. Given their willingness to do this, it was decided to email the participant families a letter asking if they were happy to give the author permission to see the complete set of presents they had sent and received (see Appendix 13). Every family gave their permission to do so except Eddie's father. Therefore, 133 presents were collected and examined.

There were three modes of camera used for creating presents. As described in Chapter 4, Section 9.2, a detachable USB camera was added as an alternative to the built-in camera. However, there were two ways of using the detachable USB camera: (i) showing an appropriate angle and position but being fixed near to the device, and (ii) tracking moving people or objects. For example, when the mother wanted to make a present that showed Hannah playing in the garden, she used the detachable USB camera which followed Hannah's movement. As can be seen in Table 5.12, Cam1 indicates the built-in camera was used, Cam2 means the USB camera was used in a fixed position, and Cam3 points out the USB camera was used in a moving and flexible way.

A hundred and thirty three video presents were examined. The largest complete set of presents examined was 56 created by Alice/Joshua-GP family. Anne-GM family made 30 presents, and similarly Hannah-GM family created 28 presents. Due to the participant refusing permission for the author to view the presents made by Eddie's father, 18 presents were examined that were created by Eddie's family in the UK only.

Table 5.12 Number of three modes of camera used for creating presents.

Participant families	No. of presents examined	Cam1 (Built-in)	Cam2 (USB-fixed)	Cam3 (USB-moving)
Alice/Joshua-GP	56	6	18	32
Anne-GM	30	7	9	14
Hannah-GM	29	4	10	15
Eddie-Dad*	18**	0	13	5
Total	133	17	50	66

*The presents created by Eddie's father were not included in the analysis due to the participant's request.

**Two presents were excluded from the analysis as they were the two created by Gavin used for the initial stage of using TimelyPresent.

As can be seen in Table 5.12 above, the rate of using the moving detachable USB camera (Cam3) was most popular, accounting for more than half of the presents in the cases of Alice/Joshua-GP family (57%) and Hannah-GM family (52%). The percentage of using Cam3 by Anne-GM family was just less than half (47%). However, Eddie-Dad family used the fixed detachable USB camera (Cam2) for 72% of presents. It is presumed that Eddie and Mark made presents in their own way using Cam2 without the mother's help. In comparison with this, the other three participant families made presents using Cam3 with the support of the parents who tended to take the role of prompter or director (see Appendix 14 for examples of the results of analysis of the content of presents).

Interestingly, the rate of using the built-in camera (Cam1) was far less than the other two camera modes in making presents in any participant family. Anne-GM family used Cam1 at the rate of 23% and Hannah-GM family used it in making 14% of presents. In the case of Alice/Joshua-GP family, the proportion of using Cam1 was 11% whereas in Eddie-Dad family's case, the built-in camera was not used at all.

In conclusion, 87% of presents created by all the participant families were made using the detachable USB camera whereas only 13% of presents were made using the built-in camera (see Table 5.12 above). This could be regarded as significant on the use of the camera in creating video messages. As noted before in Chapter 4, Section 4.1, we hypothesised that family members living at a far distance might want to demonstrate their affection through the creative act of choosing and creating a gift (Taylor & Harper, 2002). One of the results of the user testing conducted using the initial prototype of TimelyPresent (see Chapter 4, Section 4.9.2) described that the restrictions imposed by the built in camera were not satisfactory for making presents. An example for this is, "The position of the camera should be changed. The camera for the front is not fun. It seems too artificial and not natural. There should be another camera being able to show where children play in

an easy and flexible way” [Christine, U1]. This implies that people wanted to show their affection through the creative act of making a present in a playful way using the detachable camera. Therefore, future designs of TimelyPresent should include a detachable USB camera.

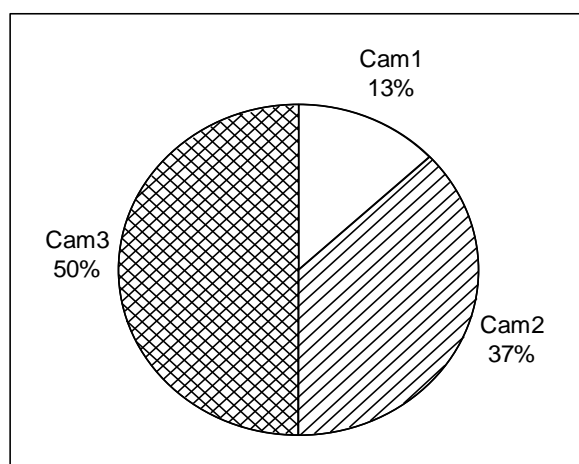


Figure 5.1 The rate of camera use by all the participant families

In addition to camera used, the function of the presents was examined. Table 5.13 shows that four modes of function associated with the presents emerged here: (i) doing things, (ii) things I’ve done, (iii) simple messages, and (iv) requests for action.

One class of video messaging was easy to recognize. It was referred to as ‘doing things’. This was the most popular use of TimelyPresent, constituting 70% of the all video messages analysed. Messages associated with doing things are mainly focused on showing visual activities with meanings and sound. Example presents show that Joshua is eating a snack on a table, Hannah is playing in the garden, and Anne is dancing to music in the living room. ‘Doing things’ mainly include non-verbal activities such as jumping up and down, dancing, putting out a tongue, pulling faces to entertain others, nodding, and waving a hand. Particularly, things such as smiling with laughter, pretending to kiss, and acting up to the camera to give something to the receiver are considered as a direct way of showing affection. Interestingly, children’s laughing or shouting, and even birds singing as background sound seem to be very contagious to feeling happy.

Some presents in this category showed that the mother or father had a role as a narrator to explain the situation, or as a prompter to keep asking the kid(s) things about what he or she is doing or what he or she has done today in detail. These helped the receiver interpret the things related to an activity, event, or in the situation in the present. For example, Hannah’s mother became a narrator in a present saying, ‘Hannah is playing in the garden. Dad went to Cambridge to see his

supervisor and it is almost lunch time...’ Another example present showed only Joshua busy eating snacks and the mother’s voice is heard as a background prompter, asking ‘What are you eating? Bananas. What did you eat before? Cherries. What day is it today? Friday...’

Where video messages were mainly short and associated with expressing, in effect, ‘I am thinking of you’ (Sellen et al., 2006), they were categorized as simple messages. These accounted for 15% of the messages examined. Simple messages involve giving the time of day, salutations, and compliments. Two examples to illustrate this are Anne saying ‘It is time to go to bed. Good night, grandpa’, and Hannah’s mother saying ‘This is Saturday today. Have a good weekend’. Although these messages are shown as relatively simple and short, the visual information conveyed social cues such as the sender’s look, hand gestures, hair, facial expression, clothes and the background situation in a present.

TimelyPresent was also used as a way of demonstrating ‘things I’ve done’, making up 8% of the total video messages. ‘Things I’ve done’ messages contain daily events which happened in the past, like a diary. It was found that children tended to show off what they have done to the remote families such as artwork, school work, or daily chores. This can be considered as one of the codes, ‘pride’, which emerged from analysing the probe study (see Chapter 2, Section 2.5.3; Table 2.3). An example is the present where Joshua showed two national flags, the UK and South Korea that seemed to be created by him and said ‘Grandpa, let’s meet with these’. Alice also said, ‘Grandpa, you should come and see these flags’. Two other examples were created by Anne saying ‘Grandma, I studied Korean with my mum today’ in a present, and by Eddie saying, ‘Dad, this is my own room. Look... I tidied it all by myself. I hope to have many books here.... Bye’.

Another class of video messages was ‘requests for action’, making up 7% of the total corpus. Although TimelyPresent is an asynchronous media, it was often used as the channel through which the receiver could be asked to take a specific action. For example, Alice asked her grandfather to make and send her a present in a present. At the interview, this made her grandparents puzzled so they rang Alice to see what kind of present she meant. The mother said the present made all the family members feel amused. It can be regarded as one of the codes which emerged from the analysis of the interview transcripts, ‘Playful mode of use for creator’ (see Section 5.3.3.2). Another example of requests for action was the Anne’s grandmother asking her son, ‘I cannot hear your voice properly. Could you try to make the volume louder?’ in the present.

Table 5.13 Functions of making presents

Participant families	Doing things (demonstration)	Simple message	Things I've done (diary)	Requests for action
Alice/Joshua-GP	55	14	2	5
Anne-GM	30	3	8	6
Hannah-GM	40	10	2	1
Eddie-Dad*	17	8	4	3
Total	142	35	16	15

These four functions are not mutually exclusive. An example of a present created by Alice showed that the mother tried to prompt Alice to say something but Alice did not answer and just smiled and laughed a lot with her body wiggling in a playful way. The mother, then, asked Alice to blow a kiss to grandpa and she pretended to do so while saying 'good night, grandpa'. A camera was tracking Alice's whole body and then zoomed in to her face to show her laughing, with big smiles. This message can be referred to as 'doing things' (Alice acting a playful way), and also as 'simple message' (good night).

In summary, sending a video message using TimelyPresent has value for helping social relationships within the families. Even though they are living at a far distance, most video messages were showed a bright and positive attitude rather than concern. In particular, the function of video messages to the loved ones involving 'doing things', 'things I've done', 'simple messages', and 'requests for action' were the kinds of messages that the participant families value. Interestingly, most messages were related to expressing very natural aspects of the daily life of the family involving 'doing things (68%)', and 'things I've done (8%)', or to demonstrating social greetings involving 'simple messages (17%)'. However, video messages sent and received between the remote families were not only for demonstrating affection from one person to others. Sometimes they request affection by sending a message back, such as 'requests for action (7%)'. These were not thought of as a strong and urgent form of request message, but more careful and thoughtful asking with hope. Even some of the messages associated with the class of 'requests for action' can be thought of as playing jokes or 'poking fun' (Lindley et al., 2010).

Based on the analysis of the content of the presents, it was found that TimelyPresent provided opportunities for the remote families to demonstrate their affection through the act of making and sending a video message in a creative and playful way involving 'doing things', 'things I've done', 'simple messages', and 'requests for action' using the detachable USB camera. The next section will describe the results from the analysis of the interview transcripts.

5.3.3 Results from the analysis of the interview transcripts

Transcripts of 15 recorded interviews totaling 12 hours 27 minutes and 113 pages were analysed (see Section 5.2.1.4 for details of interview method). Analysis of these data was less open ended than that of the data collected in the emotional probe study. Specifically, the four "potential values" identified in Section 4.10 were used as organisers in a Thematic Analysis (Braun & Clarke, 2006). They were: (i) value for both the creator and receiver of presents, (ii) value for the creator of presents, (iii) value for the receiver of presents, and (iv) technical. Where possible, we relate the codes generated here to those generated in Chapter 2 and other concepts in the related literature. These can be considered as "sensitising concepts".

The process followed was as specified by (Braun & Clarke, 2006): (a) transcription of the data (familiarisation); (b) initial coding; (c) collating codes into themes; (d) refining and defining themes in a clear structure.

5.3.3.1 Value for both the creator and receiver of presents

This section describes the value for the creator and receiver of presents using TimelyPresent involving nine codes in association with the quotes which emerged from the analysis and which are illustrated here: (1) a different concept of communication media, (2) real scenes of daily life, (3) sending and receiving a video message just like a real present, (4) simple to use, (5) including more than one person, (6) carry over into other communication media, (7) feeling closer, (8) obligation and privacy, and (9) delayed delivering.

Different concept of communication

One of the values for the sender and receiver of presents is that TimelyPresent is considered as different from other communication media, such as telephone calls or video conferencing and this was mentioned by seven people. The participant families are struggling to coordinate the time for video-chatting between Korea and the opposite part of the planet. Even though they find time for that, it is unlikely to provide natural communication for both sides. Children are not good at talking on the phone so that it is unlikely to have common ground for conversation and emotional contexts can be lacking.

TimelyPresent seems to have got around many of these problems. A father of two boys, David, said TimelyPresent brought his family closer, particularly with his second son.

David: It could be because I am in a special situation, but TPs brought my family closer, especially with my second son. To tell you more specifically, TPs made us feel something that was not possible by other communication tools such as telephone or video-chatting. My second son doesn't answer the phone at all and rarely does video-chatting.

A grandmother (GM2) said that TimelyPresent allowed her to feel very different and fresh

on viewing the video messages conveying the ways of the grandchildren playing and shouting.

GM2: ... Telephone allows us just to talk but TPs gives me other feelings such as Alice and Joshua had long hair but now they have the hair cut nicely. Even the voices of Alice and Joshua on the TPs are different from the ones on the phone. The way of Joshua playing and shouting is delivered to me here through TPs. It is exactly the same on the TPs as he was playing and shouting here at my place in this April. ... The feelings are completely different. When we saw the last present, Joshua was wearing the school uniform and saying something about the school. Meanwhile, I could see Alice far behind Joshua was doing something and also hear the voice of Cecilia and her husband talking to each other as a background. When I saw the present, I could feel very different and fresh.

A mother of two children, Cecilia, mentioned that Alice and Joshua enjoyed making video presents showing their daily activities in an easy way rather than making telephone calls to their grandparents.

C: Alice and Joshua enjoy making presents far more than talking on the phone. Therefore, they make presents more often than talk on the phone. They want to make presents. Making presents is far easier for them because they don't need to talk if they don't want to. They can simply show their daily activities they like such as playing, studying, reading a book before bed, etc. When Alice and Joshua pick up the phone, they have to concentrate on listening to and talking to their grandparents, which could not be sometimes enjoyable. Therefore, TP is far better for Alice and Joshua.

Real scenes of daily life

The video presents made in the home environment could be oriented towards lifestyle, aspirations, and emotions. Understanding the other's daily routines is also important and valuable with regard to expectation, meaning in terms of action, and the context of the time of day (Tolmie et al., 2002). As noted before in Chapter 4, the receiver could understand more about the remote families by looking at the contents of the presents involving episodic daily activities with real images and the good quality of sound provided by Archos 9 using TimelyPresent (see Chapter 4, Section 4.10.2).

In line with this, six people mentioned that TimelyPresent allowed them to create or to view real scenes of daily life of their loved ones in a very natural way. Cecilia and Beth said that they were pleased to create their children's natural looks and behaviours of their life as presents and share them with the grandparents.

Cecilia: They [presents] were just noisy and distracting. Before I sent the presents I used to review them to see if there was something wrong. Even from my point of view, they were just noise pollution. But these natural looks are not an act. They are the real pieces of daily life of Alice and Joshua. So I sent them without any decoration. H: The grandparents must be happy to see them all. Cecilia: Yes, I know that, because they already fell in blind love with Alice and Joshua.

Beth: We could show Hannah's very natural behaviours... The one was showing Hannah was playing and toddling around in the garden with a happy laugh, which was really good. When we do video-chatting, Hannah has to be in front of a computer. But I think TimelyPresent is good for capturing Hannah's natural daily aspects of life and sending

them to my parents. I remember that we made and sent a few more presents on Hannah playing in the garden. Hannah was also enjoying making the presents.

Grandmother (GM1) felt closer to her remote family by viewing the real scenes of their daily life.

GM1: ...I feel related closer to them because I can see the real scenes of their everyday life, such as having meals in the kitchen. I can watch how my son's family is living and it enables me to talk to them more about their life after viewing TimelyPresent messages. It is not possible by telephone. It is not possible by visual chatting either, due to the time difference and different daily routines. However, TimelyPresent is very useful because you can record messages immediately at any time you want.

Two other grandmothers (GM2, GM3) mentioned that they were happy to understand the loved ones' real subtle scenes of life vividly.

GM2: Since using TP, I am so glad to be able to see how Alice and Joshua are growing up right under my nose. I could understand Alice and Joshua more precisely and directly by using TP rather than telephone, such as I can say to my husband, 'Cecilia had the children' hair cut nicely recently.' When Alice and Joshua came here in Korea a few months ago, they went to a barber's and a beauty shop to have the hair cut. Now I can see their hair styles were changed by Cecilia and think Alice and Joshua are growing up very quickly. TPs shows me a very natural way of understanding them. If Beth tells me 'Joshua had the hair cut' on the phone, I simply think 'oh, Joshua could have the hair cut'. But there is no need to say about the hair, if I can see Alice and Joshua on the present. I could also think that Cecilia's skill in cutting hair is improved. [Int.2]

GM3: ...I could see their daily activities in more details such as what they are eating, what they are wearing, how they live their lives. I could simply know that Hannah caught a cold by Beth talking to me so on the phone but I could know that more precisely and vividly by TimelyPresent showing me Hannah rubbing her runny nose. ... This present is about Hannah playing at the garden. She looks so happy to wander around with laughter under the bright sunshine. ... I am really glad to see some scenes of her life very vividly.

Like a real present

One of the goals of the design of TimelyPresent was making multimedia messages like a real present. The act of giving could provide a more enduring form of happiness taking longer than the act of receiving (Seligman, 2004) (see Chapter 4, Section 4.10.1). Our participants seemed to value this.

Five people mentioned that the way of sending or receiving a video message using TimelyPresent was felt to be like the way of dealing with a real present although it is just a simple video message. Tony, Anne's father, illustrated below that TimelyPresent has exactly the concept of sending a present to the loved ones.

Tony: I feel that I am sending a real present to my mother while using TimelyPresent and I think this present would make her happy that is really enjoyable. ... TimelyPresent is not for seeing and talking to each other. TimelyPresent is just like the concept of sending a present. ... Yes, really it is ... definitely. Just like receiving a real video file present.

Lucy, Anne's mother, also described her feelings when receiving a video present as being

very excited, rejoiced and fantastic.

Lucy: Actually, the present is a simple short video file but the TimelyPresent shows the video file is made and sent as a present for me, so I feel that the file is not a simple video file, it seems to be a real present. ... Once we can see a new present arrived, we were very happy. When the present was blinking on the screen, I was very excited and rejoiced. The feeling of clicking the present and seeing the new present was extremely fantastic.

Simple to use

As described in Chapter 4, TimelyPresent was designed for simplicity of use (see Chapter 4). This was found to be another value to the creator and receiver, as mentioned by five people. A grandmother (GM2) seemed to feel confident to be able to use TimelyPresent.

GM2: Everyone can do it [TimelyPresent] easily. It is good for grandma to be able to do it. Many old people like me tend to be a bit afraid of using technology, but TimelyPresent makes me unafraid of using it.

Cecilia illustrated that using TimelyPresent is far easier for making and sending a video file than using one of social network systems, Cyworld.

Cecilia: The best thing about TP is simplicity.... TP allows Alice and Joshua to make and send presents in a simple way, which is really good.... most presents are absolutely funny. They were laughing, shouting, dancing, and teasing each other and so on. They made most of the presents by themselves just like playing with a toy. They press the 'Make' button for making a present and press the 'Stop' button for finishing recording it. They see how it looks by pressing the present icon and then send it. Yes, the TP is just a toy for Alice and Joshua.

Including more than one person

Five people mentioned that they feel happier to view a video present where more than one person is shown rather than just one. TimelyPresent allows the sender and receiver to feel the moment of being together with a special occasion or event that can be considered as 'treasured memories' (Khalid & Dix, 2010) for both. Cecilia mentions about making and sending a video present showing Joshua and Alice wearing their school uniform together on the first day at school for Joshua. Cecilia also said that the present showing grandparents being close together and expressing their affection to Alice and Joshua for the first time made all the family members feel happy, particularly Joshua who responded to it. Tony illustrates the special occasion of his brother and wife's visit to their mother and created a present showing them all.

C: The present I made was on the scene of Alice and Joshua playing at home wearing their school uniforms. It was the first day for Joshua to go to school. They went to school together and came home together. I thought my parents would be very happy to see them wearing the school uniforms on the present. ... I liked to make the present showing Alice and Joshua being together. ... I was happy to see the present showing us the grandmother and grandfather, both of them on the screen and saying they love Alice and Joshua. Particularly Joshua liked the present very much. Of course other presents made us happy. But it was the first time that we looked at the present showing both of the grandparents next to each other saying they both love Alice and Joshua. Joshua was so happy to see it that he was even nodding to it and said 'I love you' without knowing it. When I saw Joshua doing so, I was very pleased and happy.

T: I was very glad to see some presents my brother sent here. When my brother and his wife visited the mother, they saw all the presents we had sent. After that, they made and sent three or four TPs to us on saying hello to us, how cute Anne was, missing us... and they also showed that they were very excited to see the TP working and the presents we've sent from here. I opened to see those presents with my family several times. It is just good for me to see them chatting and laughing with each other on the screen. It is because I am used to seeing my parents once a week through video-chatting but it's not easy to see my brother and his wife.... It wasn't easy to see my brother and even his wife. They were also very curious about using the TP. We were glad and pleased even to hear the voice of 'Oh? Are we on the screen now?' ... well, yes, we were also very curious to see if the TP was working well. Meanwhile, we were very delighted to see the present showing three other members of the family living far away from here telling us something in turns at one time. It was great.

Carry over into other communication media

The intention of designing TimelyPresent was not to replace the technology the families use for communication, such as Skype or email, but rather to supplement and enhance the value they get from them (see Chapter 4, Section 4.10). Example quotes showed that video presents created by the sender support common ground for conversation between the sender and receiver. As illustrated below, some presents made the grandparents feel puzzled and the grandchild feel inquisitive so that they telephoned each other to talk about the issues in detail. As Vetere and his colleagues described that pre-schoolers are best to explore through playful activity (Vetere et al., 2009) (see Chapter 4, Section 4.10.1), this way of carrying over into other communication media can help build the relationship between grandparents and grandchildren in a playful way using TimelyPresent.

H: ...The children told the grandparents about the present they had sent on the phone and ...

Cecilia: Yes, the grandparents asked us some additional questions about the presents, when they could not understand what Alice or Joshua was saying to them. Or when some presents made them curious, they rang us and asked what they were doing and why they were doing so on the TPs.

H: For example...

Cecilia: ...one present made the grandfather puzzled. Right after he was listening to Alice asking him 'Why you didn't send me a present? why not?, why not?' in the present, he just rang and asked us what sort of present she wanted to get from him, such as toys, sweets, or clothes. Then Alice answered him with saying a present made by the thing, TimelyPresent. She wanted to see the face of the grandparents. ... Joshua was very curious about the red T-shirt the grandfather was wearing on one of the presents so Joshua looked at the present several times saying, 'Grandpa usually does not wear such a red T-shirt but why he is wearing it?' At last, Joshua rang the grandpa and asked why. [Laughing]

GM2: ... He [grandpa] was also laughing out at another present we received. When we made and sent a present, my husband was wearing a red T-shirt. After Joshua saw the present received, he made and sent another present on asking, 'Grandpa, why were you wearing such a red T-shirt on the present last time?'

H: You mean, Joshua was asking about the red T-shirt by TP, wasn't he?

GM2: Yes, he was. He sent another present in return but the topic was funny, why grandpa was wearing a red shirt. [Int.2]

Cecilia: One day, when Alice was missing the grandfather so she made a present showing that she was sitting on a table nicely and doing something for a while. A few days later when the grandfather asked her what she was doing on the present on the phone, she said, 'I was studying. I wanted to show you what I was studying here.'

H: I see. What a clever girl!

Cecilia: Well, the grandfather asked Alice what sort of study she was doing. The screen is not big enough so he could not see what she was doing in detail. Then Alice said to him that she was drawing on a paper and tried to show the picture to him on another present. But it was not clear enough for the grandfather to see it.

Feeling closer

The purpose of designing TimelyPresent was to allow families to feel more connected and closer. Four people said that TimelyPresent made them feel closer to each other. Eddie's father and Mark said that the presents reminded him of the moments of when they were living together.

David: ...the message showing me my sons playing and bickering with each other in front of me was very refreshing. I really liked it. ... They usually bicker on trivial things. ... I remember they were competing about whom to show me the message in the tp. I was really satisfied about the TimelyPresent that it was reminding me of the moments of when we were together.

David: ...I think I am the one that TimelyPresent was the most helpful for. Especially the relationship between me and Eddie became closer. I didn't think I was intimate with him, but through TimelyPresent we can talk to each other face to face. I didn't ask how he feels, but it was great for me to see him closely. I think TimelyPresent made us care more about each other. ... Eddie talked to me in such a manner that I am living with him together in the UK. That was the happiest.

David: I was glad to feel like when I was living together with him. I was happy to see how he is living, which was not possible on the phone. I see his face in video chatting but what I see through TimelyPresent was in a very different way. It delivers me how they play or chat loud as it is, which was excellent.

H: Did you like to see father's face or listen to his voice?

Mark: I like it all because the present made by father is the only way for me to feel him very close.

Alice and Joshua's grandmother also illustrated her feelings that it was like living very close to her grandchildren. It is because the children's ways of talking, looking, playing, or shouting are delivered just like they are.

GM2: ...I can see the new daily things about Alice's family. Of course I cannot see them all but I can see Alice is wearing a new lovely one-piece dress, and Joshua is playing the ugly teddy bear. When the moment I am seeing them, I don't feel that they are far away. When I see Alice and Joshua in here on the TPs, I feel that they seem not to be living in the UK, just living very closer to me. I really feel so even though it is not true.

GM2: I like the feeling that we seem to be living very close because I can see them as they are looking the way how they are living. Such as if Alice is wearing pyjamas, it shows me her just as she is. If Joshua is screaming and jumping, it shows me him just as he is doing so. If Alice is studying, it shows me her just as she is studying.... I think the best thing about TP is giving me such feelings.

Privacy and obligation

As noted before in Chapter 4, when deciding on how to engineer the arrival of a present, we rejected our original idea of synchronising on some daily activities such as a meal-time as it might create new social obligations. The value of gift-giving among families was also an important motivation for using the present metaphor, not be considered as part of a direct exchange or not equivalent (Zizek, 2007) (for more details see Chapter 4, Section 4.10.3). In addition, the level of privacy was carefully considered on designing TimelyPresent as an intentional interaction system (see Chapter 1, Section 1.3.3).

The results of analysing the interview transcripts showed that Anne's family and her grandmother felt a bit obliged to send a present although there was no pressure. They thought the concept of 'gift-giving' using TimelyPresent implied that reciprocal 'gift-taking' was needed for them all to feel pleased and happy together.

H: Do you feel obliged to contact them more?

Tony: A little... I feel a bit obliged to send one when I have a new present from Korea but ... not much burden I felt. ... Once I took the TP, I felt that I should make and send one. If not, my mother could feel a bit disappointed. Also if she sent a present, we thought we should send one again. If taking one, give one. Whatever kind of present we receive, we are very pleased. Therefore, we were thinking that just like we were very glad to see a new present, my mother would also feel very pleased if we send one.

GM1: I obviously think that I need to send one if Anne has sent me several. It is like I owe her one. ... It is not a big pressure but since I become so happy to receive a TP message, I think that they would feel the same if they get one too. I don't think it is a pressure. I send one, thinking that they are missing me a lot too. ... And I think they feel the same, waiting for a present I made like I am always waiting for a new present they made. When I come back home, I am wondering if a new present arrives or not. I am getting more interested in the presents.

On the other hand, Hannah's family said that the feeling of obligation disappeared soon as time went by.

Beth: At first I felt a bit obliged but such a burden disappeared as time goes by.

However, Eddie's family and Alice/Joshua family mentioned that they have never felt being obliged to send a present using TimelyPresent.

Cecilia: No, never. There is no obligation to make presents. When Alice and Joshua want to make TPs, I just turn the TP on and let them do. They can make TPs by themselves.

Beth: No, never. Only my parents see the presents so I didn't worry about that.

James: Never.

Regarding privacy, no participant families worried about it except the Hannah's grandmother who showed a little bit of worry about the privacy. It is presumed that she might not understand the closed internet using TimelyPresent, because she was observed to not feel comfortable to use her TimelyPresent in a proper way.

Delayed delivering

Three options for timing the delivery of presents were considered: (i) user states time of day, (ii) user agrees event, and (iii) the same local time (see Chapter 4, Section 4.4). The third option was chosen as the protocol. A present made and sent at the sender's local time of day arrives at the same time of day in the receiver's local time zone. This was due to the flexibility and simplicity in operation. Although it has the potential negative effect of making the receiver wait for a long time to receive a present, the hypothesis was that this might in time be seen to make the presents more valuable by reinforcing the present metaphor.

Based on the analysis of interview transcripts, four people mentioned that it was all right for the delayed delivering of presents while three people said that they preferred a direct delivery to the delayed delivery. One suggested an extra option for the sender to choose a specific time of day for the delivery, as discussed above as the first option, user states time of day.

Regarding the positive comments on the delayed delivering, Mark mentioned that he liked to be able to see the time when his father would get the video message.

Mark: I like to be able to see the time when father could get the message I sent. I could see what time father could come home and see the present and I prepared the time when I make and send one for him, which is really good. [Mark is very thoughtful of father] H: Did you make and send a present after thinking that when father would receive it? Mark: Yes, I did.

Hannah's mother said that there was no problem for waiting for a present to arrive for a few days if the device was perfectly well running so that the present would arrive successfully.

Beth: I think yes, that will be fine to me. No problem for waiting for a few days to receive a present. If there is an urgent message, we can ring or email each other. Such a present has formal context. It would be great if I receive such a present. But it is not necessary to get such a message quickly. It would not matter to take longer time, but does matter that the present would be able to be delivered successfully. ... I think it would be ok for the present delivery to be delayed if the device is perfectly well running.

Hannah's grandmother also said that she could wait for a present for a few days.

GM3: We have been living apart for more than 10 years. I don't feel any difficulty on such a big time difference. I just think that the pattern of life of Beth's family is very different from me here so the present could be delivered a few days late. I don't feel uncomfortable on this. I already know what time it is here and what time it is there in the UK. So even though a present comes late, I don't think, 'Why is it so late?' I don't feel any difficulty on the time difference and I already got used to it for a very long time.

Due to the technical problem of sleep mode (see Section 5.3.3.4), TimelyPresent could, however, not be always-on. Therefore, the time to view a video present was not the time when it arrived, but the time when the receiver could see if there was a present or not. As Jenny and David mentioned below, waiting for a present could make him feel a bit worried or disappointed. Waiting for a present felt like waiting for a letter.

Jenny: ... I think the time lag for a present to be delivered could be a good thing but also a bad thing. It is because the time to see a present is not the time when it is delivered, but the time when I can see if there is a present or not. Therefore the idea of time lag could be a fault. If a present is not delivered yet, I need to wait for that and I am a bit worried about that. Even though it arrives here, I need sometimes to see if there is a new present...

H: It could be confining that you have to wait a long while (to get a present). David: Yes, it is. Actually it is disappointing sometimes. It was frequent in the beginning but gradually getting less frequent. When I think 'is it arrived?', and if it is not, I feel disappointed. H: Did you feel like that? David: Yes, waiting for a present feels like waiting for a letter.

For the delayed delivery, Beth also gave an alternative option for the sender to choose a specific time of day to send a present as described before.

Beth: The main distinction of using TimelyPresent could be the time delivery, such as sending a present straight away or sending one at a specific time.

One of the negative comments given by Cecilia on delayed delivery should be considered here. Cecilia said that direct delivery might be better because more presents might be sent and received, and longer time of positive feelings might be lingering in her mind. As she said, a critical point could be losing the time to share the feelings with the receiver who might have the same feelings when viewing the presents the sender sent. She also wanted to see what presents arrived in Korea more precisely and how the grandparents felt about the presents through telephone conversation. These issues will be discussed in detail in Section 5.4.2.

C: Well I don't know about it exactly. But I can say that if we send a present and right after that they receive the present, they see the present and then they ring us on what it is and how they feel about it... yes, if the whole process becomes quicker, I think we could feel more enjoyable to use the TimelyPresents. There is a time gap between sending a present and receiving one. If the receiver wants to reply to the present as making another present on their own TP, it will take at least a few days. Meanwhile I think I could lose the feelings of joy, happiness, and excitement given to me while I was making presents. I want to keep the feelings for longer lingering in my mind. And when we can talk about something on the phone, we are busy talking about other issues, not about the presents sent or received. We easily forget to mention about the present... the grandfather also didn't have time to say the feeling of joy he had when he received and opened the present on the phone. And I think the real feelings created by opening and seeing new presents could not be delivered and shared with us fully on the phone because the moment when he had the feeling was already gone by. At least a few days later he could ring us and say something on the phone. However, he must be very delighted once he received a present.

5.3.3.2 Value for sender of presents

This section illustrates the value for the sender of presents, containing four codes in association with the quotes which emerged from the analysis: (1) playful mode of use for creator, (2) finding time to send presents, (3) preparation for them, and (4) the difference between children and adults in showing the manner of creating presents.

Playful mode of use for creator

One of the most important potential values to the sender using TimelyPresent is to encourage engagement between children and an absent parent or grandparents by sending a video message that can be regarded as mediating playful activity (see Chapter 4, Section 4.10.1). It was shown in the analysis of present content (see Section 5.3.2) that people tended to make presents in playful and positive ways involving good stories only. This code can be parallel with the code, 'Fun with doing things together' which emerged from the probe study (see Chapter 2, Section 2.5.4.1).

Eddie's family and Alice and Joshua family said that their children enjoyed making presents competitively.

Cecilia: Yes, of course. They enjoyed it very much. I think it is really good for Alice and Joshua to make presents competitively and to treat the TP as their precious toy. I think the younger children could not enjoy making presents because they might feel a bit difficult to use it and the older children could feel bored after using TP for a while as they get busier doing other activities. I think Alice and Joshua are appropriately aged for enjoying making presents.

In addition, five people mentioned about the playful mode of making presents. There are three ways of entertaining others. For example, Alice and Joshua's mother created presents showing the children doing things in playful ways that would make the grandparents feel amused to see.

Cecilia: It was about Alice and Joshua dancing with cheers and shouts in the living room. They were watching a WorldCup match on the TV. It would be better if the window size of the present becomes bigger. ... Yes, while I was making it I felt that my parents would be very happy to see it.

Mark or Eddie made presents in a funny or even strange way on purpose because they thought the father would like to see them.

Mark: When I try to make a present, my younger brother tends to make it funny in a strange way. I enjoy it because I think my father would like it better. And I feel happier when I make a present. It is because it is just like a way of giving a present to others. To be honest, I didn't ring my father often. But sending a message through TimelyPresent makes me talk more. I can also just send presents about the UK, the way we live here to my father.

Mark: Whenever I made a present, I feel happy. I like the way of keeping a record of the aspects of our life, which is really interesting. Yes, all I made were interesting and fun. ... because we don't say bad story, but just say good story only and send it to father. And why

I make and send a present is just for father who could more understand how we live here by seeing and listening to it.

Even Anne's grandmother showed her comic gestures or funny facial expression in presents intentionally in order to be at the same eye level with Anne's and to make her happy.

GM1: In order to try to be at the same eye level with Anne's. I had been thinking what kind of my look would make Anne happy. Then I found Anne likes to see my comic gestures or funny face expressions. I don't want to be a serious adult in front of Anne. When I made a present, I became a child like Anne and pretended to play with Anne in front of a camera. Anne really enjoyed seeing it, which also made me delighted. [Int.2]

In other cases, presents were made and sent unexpectedly that would also make the receiver feel amused.

Lucy: There was a present showing that the mother in law was chewing gum sitting on a sofa. That means she didn't know the TP was on for recording and then sent it by mistake. 90 seconds of recording was all about the noise of a TV program running and her chewing gum, and that's it. At first, we thought, 'What's that? How long do we have to wait for her proper voice?' But later we found that the present was unexpectedly made and sent to us. She even didn't know about the present when we asked. ... Actually, it was very interesting and amusing.

Tony: There were some odd presents we received. My mother might press a wrong button while she was recording a present. But it was irony. The unexpected presents arrived nicely but the presents we really wanted to see were cut. One of the presents was showing only my mother's one upper arm.

Finding time

As one of the design themes which emerged in Chapter 3, Section 3.4.1, families living separated were struggling to find time to communicate and share emotions with each other due to the time difference. The opportunity given to create and send a present at any time was also considered as one of the potential values to the sender using TimelyPresent in Chapter 4, Section 4.10.1.

Six people mentioned that the best thing about TimelyPresent is to allow people to say something whenever they would like to. Three people said that many presents were improvised because the situation was available for them to create one at any time of day.

Cecilia: I simply ask to see if Alice or Joshua would like to make a present, especially when they look bored or have some free time before or after doing something. If they want to make one, I turn the TP on and let them do whatever they want with it. They then concentrate on making presents by themselves.

GM3: I am really missing Hannah but I cannot ring them any time because of the time difference. And even when I ring them at an available time, they sometimes don't answer the phone because they are busy, feeding, bathing Hannah, playing with Hannah, putting Hannah to sleep... Whenever I want to ring them, I have to think and wonder if it is a good time to talk or not. Therefore TP is really convenient to make and send a message at any time lively. ... When I want to tell them good news but because of the time difference I have to wait for that and after that I forget, which is very regrettable. ... TP allows me to send my voice and face vividly. Even though they could not answer the phone, they could

see the presents made by me later. Beth could think and feel that I was missing her and her family, there was something to talk to them, what I was thinking about, what I was feeling, etc. Beth could imagine things about me such as she went back to her hometown, she must be tired from the long journey, how she feels now, etc. TPs could give us the opportunities to understand the right moments of the situation happening more easily. I think it would be easier to interpret each other's circumstances by using TPs.

Preparation

Two people said that TimelyPresent allowed senders to think about what to say to the receiver. TimelyPresent allows people to have a deeper and more meaningful conversation. It could be similar to text messaging where the act of creation is effortful. "As messages have to be typed, there is time to think, reflect and the possibility to read them over and change them before sending." (Derks et al., 2008, p 781).

David said that before creating a present, he began to think what to tell his sons for their lives which he had never done before.

David: ... There is a reason why I like TimelyPresent. After the TimelyPresent is ready, I began to think about what I need to tell my sons for their lives, which I've never done when I was living together with them or ringing them. Especially for Mark while Eddie is still too young. It gave me an opportunity to think about what to say for them.

As a grandmother (GM1) said, due to the limited time, she tended to forget to say something while talking on the phone or video-chatting. She wanted to send a meaningful message so she thought carefully about the contents before making it.

GM1: ... When I received a present saying something about their life, I could prepare what I want to say and send it as reply. That is really good. ... When I do video-chatting with them, I couldn't relax to say something because the time for talking is quite limited. They are busy and we are busy. So I tend to forget saying something while doing video-chatting. But TimelyPresent gives me the opportunity to think and prepare what to say and then to say it. Therefore, we can have deeper conversations with each other by using TimelyPresent. ... that is the biggest advantage of it.

Difference between children and adults

Four people said that the manner of making video presents created by adults and children/babies are different. Adults tend to think too much, to show an official or formal way of sitting upright in front of the camera, and to say good words only, which could be considered as similar to the attitude of 'preparation' described above. Children, however, show themselves just as they are in a very natural way. Messages created by adults are also likely to be shown with a sense of obligation but others made by children were shown as their pure looks which made receivers feel more delighted.

GM3: Beth and James are sending messages in order to show their good looks consciously, whereas Hannah is showing the very natural and real way of her life. It seems not so natural when adults try to send a message. Baby is showing herself just as she is. Baby is pure in heart. I think adults seem to send a message as a sense of obligation. Actually, I am absolutely happy to see whatever present I received. But it is more valued to see the

present showing the pure look of Hannah than other presents. The present is cuter than others. Of course Beth, my daughter is very important to me but I feel more love to Hannah. Hannah's present is far more delightful.

Jenny: ... My husband does not say something special happened to him. He always sounds like saying something which seems to be official or formal, in the way of sitting upright. It might be because he is an adult. Isn't it? Children are not saying in such a way. They send any present in the way of whatever they want. Some of the examples are showing playing piano, and drinking milk with milk dribbling on their faces. However, an adult is not showing such sort of thing. It seems the same way of showing in a proper position and saying good words only.

David: ... Adults think too much, although children send one if they simply want to. Adults think too much before talking.

5.3.3.3 Value for receiver of presents

This section describes the value for the receiver of presents only. Seven codes and the related quotes are illustrated here containing (1) anticipation for a new present to arrive, (2) the value of laughter, (3) mixed feelings, (4) reflection, (5) presence for young child, (6) object with meaning, and (7) answering to a present.

The value of laughter

One of the values for the receiver of presents is the value of children's laughter which was expected to occur as an important emotional cue during the field study of TimelyPresent (see Chapter 4, Section 4.10.4). Six people mentioned that children's laughter in a present made them laugh or feel happy. As also described in the previous section (Section 5.3.2), children's bright laughter is also highly contagious to others around and the laughter in a present makes receivers laugh.

GM1: First of all, all the presents made me happy. I can see how Anne is growing up, and she speaks in Korean a bit better now by looking at the presents. I also see the different aspect of Anne from between what I imagine and what I see on the presents. I like them all. ... The last present showed me that Anne was smiling and Anne was mischievous to father with laughing. Especially when I heard her happy laughter, I could think that 'Oh, Anne is very happy now'. I could be attached to the feeling of happiness. Yes, I really really love to hear Anne's such bright laughing voice. Since Anne was very young, many told her that Anne was laughing very happily, and such laughing voice made others happy. Anne's laughing voice was very bright, white and clean, and beautiful. ...[Int.2]

GM3: Oh, Hannah is kissing to me. It is very funny to see the present of Hannah. It made me laugh. ... Hannah is dancing again, jumping up and down very actively. I like best to see Hannah playing like this.

E: It was the first present we made. My younger brother wanted to show the father his way of drinking milk as a trial. But he couldn't finish drinking it within 90 seconds so he tried to do it again and it made him laugh ... it was so funny and made me laugh as well and ... yes, it made the whole family laugh... it was the most enjoyable thing.

Even children's innocent screaming in the present made receivers laugh.

[Joshua is screaming in the present.]

GM2: He is just screaming...

[Joshua is screaming again in a different present.]

GM2: Oh, my god... Joshua is terribly naughty and active...

[Alice is asking, 'Grandma, why didn't you send me a present? why not? why not?' on the present.]

[H and GM2 are both laughing at the present.]

Similar to the value of laughter, four people mentioned that children's smiles made them feel happy.

GM1: Her smile is so adorable and lovely, isn't she? Whenever I say to her, I call her my little angel like a wonder-woman, super-woman or swan. She makes me so happy and pleasant. ...You would understand me when you become grandma. I didn't know this when I was mom. I have even written a poem about her because my expressions satisfy me enough. It may sound funny but I love her that much. She is my top priority. That is because I am happy about using TP. Once I see her video, I smile that whole day with joy.

Anticipation for a new present to arrive

Six people mentioned that they have anticipation for a new present to arrive from their loved ones. This can be regarded as similar to the affective factor, 'raised expectation for communication', one of the significant items of the Affective Benefits and Costs of Communication questionnaire (Romero et al., 2007) (see Chapter 1, Section 1.2.5; Table 1.1).

Mark felt an expectation to get a present when he sent one to his father while David also illustrated that waiting for a present felt different from other communication media.

Mark: I feel the best when I see the final message saying successfully delivered, your message will arrive at a certain time. It is because several hours later father would be able to receive the present I made and sent, which made me very excited. I could also think that once father could see the present and then he could reply to that. Yes, of course I know that father is very busy so sometimes he cannot reply to that. But I could feel such an expectation to get a present from father, when I sent one. I think the rate of probability of receiving a present could increase whenever I send one.

David: ... calling them is the most convenient. However, I think TimelyPresent is not a normal concept of communication. ... It is different from calling or video-chatting. It is very different to describe, but it feels different. Yes, it does. There might be a present arrived... When I have a break from long hectic work, I sometimes have anticipation that there might be a TimelyPresent arrived. Waiting for a present feels different.

In addition to these cases, Anne's grandmother said that she was always expecting to see if a new present had arrived. Anne's father also expressed that his heart was throbbing with expectation.

Mixed feelings

Two grandmothers mentioned that they had mixed feelings on viewing presents created by their grandchildren. One grandmother (GM2) said that she felt glad to see their grandchild but also felt sorry for them and missing them. The author also found tears in the eyes of Hannah's grandmother when she said it was good to see the presents. These mixed feelings might be due to the fact that they are living separated at a far distance so that they are always missing them.

GM2: I feel very affectionate with my grandchildren. The presents are very touching and moving. ... Yes, they are all moving. I feel glad to see them but also feel sorry for them. I feel delighted but I feel missing them too. I feel pity.

H: Could you tell me why you have such mixed feelings?

GM2: Because they are living very far away from me, I cannot see them when I want to see. I have such feelings in my heart. ... TP is better to show them directly. One more different part about using TP is some mixed feelings which cannot be caught by telephone. I sometimes see what it is, or what they are thinking about only by facial expressions or peculiar gestures.

Another grandmother says:

H: How do you feel when you see these presents?

GM3: It is really good.

[It is very quiet for a while. H can see her eyes with tears. H doesn't want her cry. H tries to disturb the quiet moment so asks another thing cheerfully.]

H: You should tell me honestly. Is it really good for you?

GM3: Yes, of course it's good. Good to see Hannah playing and jumping.

Reflection

As described in Section 5.3.1 and also see Tables 5.10 and 5.11, it was found that the participant families viewed the presents created by the loved ones over and over again. This behaviour was considered as one of the most valuable factors of TimelyPresent, Look again on the receiver's TimelyPresent (see Chapter 4, Section 4.10.2).

Four people mentioned that when they missed their loved ones, they looked at the presents repeatedly. Even the children enjoyed viewing the presents several times.

GM2: ... Whenever I turn the TP on, I look through all the presents received over and over again. When I miss Alice and Joshua, I turn it on again and see the presents again. Whenever I see them, I get a feeling of fresh mind. As I see them more often, I feel more affectionate with them, more attached to them, because they are not here...

Cecilia: ... Joshua was very curious about the red T-shirt the grandfather was wearing in one of the presents so Joshua looked at the present several times saying, 'Grandpa usually does not wear such a red T-shirt but why he is wearing it?' At last, Joshua rang the grandpa and asked why. [Laughing]

Presence for young child

All four people with children mentioned that children could feel the sense of presence of the loved ones more since using TimelyPresent. As can be seen in Cecilia's quote below, Alice and Joshua seem to feel the sense of the presence of their grandfather in a light way rather than the grandfather's way of expressing his affection.

Jenny: ...TP helps us recognise each other's presence more precisely. Each other could feel a sense of being, a sense of presence of the other more surely. Although father is in Korea, Mark and Eddie could feel the sense of presence of father strongly since using TP.

C: It was the last one [present] they received from the grandfather. It was a little bit longer than others, saying 'We are missing you so much. We love you...' but Alice and Joshua seemed not listen to the grandfather saying on the present. They both were very excited to see him and jumping up and down and shouting with saying 'It's a grandpa, grandpa' several times but that's it.

Even a baby, Hannah, feels the sense of presence of her grandmother while seeing her in a present.

[Hannah is shouting at the present]

Hannah: Grandma! Grandma! Look! Grandma! ... Again!

Beth: Again?

Hannah: Yeah!!! ... Mommy, mommy, Grandma!!!

Beth: I see. [Beth just nodded, but did not answer to Hannah properly.]

Hannah: Mommy, mommy, mommy, mommy, mommy, [more loudly] Grandma!!!

H: Oh, grandma? See grandma again. Oh, poor thing. You are missing grandma.

[James is trying to show the present again for Hannah. The Archos was turned off by Hannah pressing something on the device.]

Object with meaning

Object with meaning was considered as one of the open codes which emerged from the probe study (see Chapter 2, Section 2.5.3; Table 2.3). A certain object with meaning was also shown in a present which made the receiver feel touched. Joshua's grandmother illustrated below about a teddy bear he was playing with in the present. She was happy to tell the author a long story about the teddy bear having a special history.

[A present is showing Joshua playing with a small teddy bear in front of a camera.]

GM2: Dear me! You cannot imagine how long the teddy has been carried and played with by Joshua. ... It was given by Joshua's uncle when he was born. But whenever Joshua came here he had to bring the teddy and play with it all the time. The teddy is used to travelling by flight just like his master. [Laughing...] The teddy came here and went back several times. Usually once a year the teddy has a travel with Joshua and whenever he

comes he has to play with it. So I cannot get rid of even very old toys. When they come they need something to play with. ... Yes, he is now playing with the ugly teddy.

The grandmother also felt excited and happy to see Joshua wearing his school uniform on his first day at school with his older sister.

GM2: The last present was on Joshua wearing his new school uniform. It was the first day for him to go to school. He just came home from the school and stood in front of a camera. He said, 'Grandma, the school uniform looks a bit big for me.' on the present. ... I couldn't believe that he is going to school now. I was so excited and happy to see Joshua wearing the new school uniform. I couldn't express the feelings I had. It was just amazing. ... When Joshua went to the UK at first, he was just 9 months old. Could you imagine that the baby is now going to school? I just wanted to cry for Joy. It was so delightful. I also rang them to see if Joshua was ok for adapting himself to a new environment at school. Cecilia said, 'Don't worry. Joshua seems fine. He was very proud of going to school wearing his new school uniform.'

A piano with a piece of music and the national flags can also be regarded as objects with meaning. These quotes including the story of Joshua's school uniform above can be parallel with one of the themes, 'Sharing the moment: a special event related to infants/children, with pride' which emerged in the probe study (see Chapter 2, Section 2.5.4.1).

David: ... There is another TimelyPresent message in which my first son showing me playing piano on the next day. ... He practiced 'Für Elise (by Ludwig van Beethoven)' a lot. He showed me practicing the piece. His face looks like a grown up man. H: It can't be. How did you feel, anyway? David: It was great. My wife and I wanted a lot to learn how to play piano but couldn't. So, when I saw him playing well, I was delighted. H: That is so sweet. Playing the piano for father... David: Yes. I was pleased with the fact that he made the time to play piano for me.

David: My second son showed me he can memorise the national flags of 32 countries attending the football Worldcup. ... You may not understand this. H: That is awesome. 32 countries.. David: I saw many children in England do that when I was there. All the young children memorise those using small cards. I think my son wanted to tell and show such things to me.

Answering to a present

This is considered as a specific value for the receiver of presents which emerged from the analysis of the interview transcripts. Due to the high quality of sound in video messages, receivers could feel the video and audio present playing was like seeing the real scene of the loved ones' daily life and tended to respond to it automatically such as by answering or nodding. In the quotes below dialogue on a present is printed in italics and dialogue from the interview in normal text.

David: 'I came home from the three days of education training in the company. How was the exam, Mark? Well, you played the piano very well. I am so proud of you. Just send me any present if there is something to say to me. I will send one for you again soon. Bye'

[Eddie says "Bye" even though his father could not hear him.]

The quotes below were captured during the face-to-face interview with Alice and Joshua's grandmother.

Joshua: 'Grandma, you have to see this, right?'

[Again, GM speaks to the TimelyPresent.]

GM: Yes, I do. Grandma is watching you now.

Alice: 'Grandpa, a present, a present. You told me that you would send me a present but you didn't. Why not sending me a present yet? Why not?'

[Again, GM speaks to the TimelyPresent.]

GM: Yes, I see. I will send one for you.

The quotes below were captured during the face-to-face interview with Cecilia.

Cecilia: The last present was on the grandfather saying hello to Alice and Joshua. ... 'Hi, Alice and Joshua. Thank you for the presents you sent us. We were very glad to see them. We love you.'

H: How do you feel?

C: ...Joshua seems quite different. When the grandma said 'I love you, Joshua' on the present, he was nodding to her and said 'I love you, grandma' spontaneously. I was so surprised to see Joshua responding to the present just like in return, just like the grandma was in front of him.

5.3.3.4 Technical problems and key features of TimelyPresent

This section illustrates technical problems involving the sleep mode and the poor touch interface using Archos 9 and TimelyPresent. Psychological problems also emerged such as worry about a new technology and the language barrier. In addition, the key features of TimelyPresent are considered here as codes involving present deleted from sender (see Chapter 4, Section 4.5.5), value of form factor, problems with the interface, and other design suggestions.

Sleep mode - need to restart, not always-on, too slow to start up

The idea of always-on (see Chapter 4, Section 4.5.2) was unable to be used using TimelyPresent. This is because the screen of Archos becomes black in sleep-mode if there is no interaction for a while and then it does not run appropriately. When TimelyPresent went into sleep mode although it was connected to the power, people had to turn the device off and then on again to start running TimelyPresent. Six people mentioned that it was too slow to start up Archos and run TimelyPresent. The whole process made them de-motivated to use it often. This problem also affected the time for the receiver to see if the present arrives at the same time of day which could be a critical point of using TimelyPresent.

B: What made me uncomfortable was on technical problem, rather than the concept of TP. The reason why I couldn't use the TP more often is that it becomes turned off automatically even though the power cable of the Archos was still connected. For opening the TP again, I had to turn the Archos off and then turn it on again, which took quite long

time for me. We tend to make a present without any plan for that, not predictably but when the time for opening the TP takes time for so long, I cannot be motivated to use it any more. ... Actually, even though I kept it on, the screen became blank like in a sleep mode after there was no activity for a while. Then I had to turn the Archos on again because the TP was not running properly when I touched any part of the screen for waking it up, which was quite uncomfortable. Meanwhile Hannah ran away from me and we missed the opportunity for making presents. Yes, we missed such a chance several times.

H: Did you mean that when you try to make a present but the TP isn't ready yet, the motivation for making it disappears?

B: Yes, it does. I think TP should be running quickly without any interruption. I think the concept of TP is 'One-click' for making a present on mobile phone or computer but if it is not satisfied with the concept, there must be a problem. And for the last two weeks, the TP is ok for the use but one day when I turned it on, it was not possible to make a present. The 'Make' button was faded and not working. [Four families had the same problem, on the time of day changed unexpectedly]

C: ...although a new present arrives in Korea, the grandparents cannot see it [TP cannot be on all the time], it is not easy for them to get the feeling that the present made in the morning in the UK is delivered at the same time of a day in Korea. If TP is always on, we could use it more often and might feel that we are living at the same time zone.

Touch interface

Five people mentioned that there was a problem using the touch interface when making a present or exiting from TimelyPresent.

T: Touching interaction was sometimes not working and ... a problem happened occasionally when I tried to turn the TP off, right after touching the 'Exit' button. It went wrong, just running without any other sign therefore I had to turn the Archos off by pressing the power button.

Psychological problems of worry about Technology and unfamiliar language used

Just one grandmother mentioned about her fear of using TimelyPresent in case she might break the new technology. Although Korean translations were provided particularly for grandparents, English words were still found to be shown on the screens in the whole process from starting up the Archos to running TimelyPresent which were still unlikely to be comfortable for them.

GM2: I should have learnt this. My husband didn't tell me anything about how to use it, because he is very worried about the TP... what if I might break it. He said, 'Don't even touch the device'. H: Did he? No, he shouldn't do that. [GM2 smiles]

GM2: ...I think many participants have the same difficulties on using it. To be honest, the thing (Archos) is not Korean, so we were unlikely to be able to digest the whole contents. The language is not familiar, isn't it? After I know the contents and see the pictures, then it was easy for me to use it.

Present deleted from sender

Eddie's mother did not want to keep the presents in her TimelyPresent because making and

sending a present was just like writing a letter.

Jenny: We just send it. The message is not so important so it doesn't need to be saved. It is just like writing a letter. Do you think you need to keep it before you write and send a letter? When you read it again you could feel uncomfortable, I guess.

However, parents of children were likely to keep the presents they made in order to see them simply for themselves feeling fun or for common ground for conversation while they talk on the phone with the remote families.

Cecilia: I hope the presents we had made and sent could be saved here. It would be fun when we could see sometimes. And it takes time for a present to be sent. Therefore, it would be great if I can make several presents in a series and then I can send them all at once. If so, I can leave the place while those presents are still being sent. While the first present was still being sent, Alice or Joshua had to wait for their turn. But it wasn't easy for them to wait. Once it was ready for making another one, they were already gone.

Beth: I hope the list of presents I already sent could be saved in my TP. Now there is nothing left. ... As I mentioned, it would be good for me to have a record of presents I sent. It gives me the chance to talk with my mum on the present I sent while we see the present together but in different places. I felt something lacking on that point. TP is digital media so it seems to be important that the presents sent are left.

James: ... I was quite disappointed at the present I had made which could not be kept on my device. And the presents cannot be used in a different computer or device. It would be great if the presents could be kept, transferred and played on our own computer. Yes, it could be good and bad actually. TPs are specially designed for the two only but it could be a kind of weak point.

On the other hand, Alice's grandmother said that she wanted to keep the presents created on her own TP in order to view them and improve her ways of making presents, such as her sayings, looks or postures.

Value of form factor (e.g., comment on need for PC version made here)

Three people mentioned about a version of TimelyPresent to be used as an application running on a Smartphone. Two other people wanted to use TimelyPresent as a PC version.

Mark: I want to use TimelyPresent as an application. on the iPhone. I just want to show what I am doing using my iPhone to father without any preparation for that.

Beth: I think it would be better to use TP on smart phone so I could send and get presents whenever and wherever I like to do it.

James: It would be great if the presents received or made could be saved in a computer. If so, I could see those present in my computer. The presents received on the TP and then the files could be used in a different computer. Additionally, it would be fantastic if the present files could be changed into mp3 or avi files format which could be connected to different programs.

Problems with the interface

Four people said that they liked the process of sending a present with the relevant messages.

H: When did you most enjoy making? While preparing it, making it, or reviewing it, or sending it? Jenny: I am glad to see the message of 'The present was sent. It will arrive at a certain time'. H: Why? Jenny: It is because the present was sent successfully.

Beth: I am glad to see the last message, too. My mother would be pleased to see that.

Tony also suggested below that he hoped that the presents received could be displayed or grouped with labels in order to search for particular presents he would want to view again.

Tony: I hope ... the presents I received could be displayed and found easily, such as the presents could be divided by monthly and saved as a folder. Labelling a present... such as birthday, or hello could be another idea for easy searching. It is not possible to distinguish which present contains more precious than others only by the date and time. When I wanted to find one, I had to see all the presents I already opened, which took a long time. [Int.2]

Other design suggestions

James wanted the ability to change the family photo on the first screen, so it could be updated with a scene from the last present received.

James: I think the program of TP is really well made. But it would be better if the photo of the first screen could be changed. More photos could be shown alternatively or the first scene of the recent present could be shown on the first screen, which gives us the TP is always updated.

Two people hoped the duration of making a present could be longer and one grandmother would like to have the screen of the present bigger by having a full screen option.

GM2: I hope to make the duration of making a present longer. ... I would like to see the longer presents Alice and Joshua make and send. I only have the expectation in seeing them longer and longer in mind.

GM3: I would like to make the screen of present bigger, such as the picture becomes full screen on the computer. When I see the present, the video file could be a full screen size.

Regarding the two clocks with the nations represented on the screen, James said these showed him a sense of meaning and a sense of the presence of the remote families whereas Beth seemed not to feel this meaning precisely. She also mentioned that a pair TPs would appeal to couples who are living separated.

H: What about the working two clocks on the first screen? Do you think they are meaningful or useful?

James: I think two clocks of each nation, the UK and SK show a sense of meaning, a sense of the presence. They remind me to think of the other person who will get a present from me. Actually we have been living here for a long time so we already know what time it is in Korea. Therefore I don't think I see the clock in order to see the time in Korea. But the working clock of Korea is there, by itself, which seems to give me the meaning. It is good for me to see it. The clock makes me think that there must be a person who will receive a present I make. It looks like a sense of the presence, a sense of the existence.

Beth: I am wondering whether the two clocks should be there because I didn't care about the clocks being there on the screen. It is also because I didn't care about the exact time of

day when I sent a present. I also didn't think that my mother would be able to receive the present at the same time of day at which time I sent it. It is because she is always busy. Therefore I don't feel that the content of the present is related to the time of sending it. However, simply rough time of day, such as dinner time ... I think when I made and sent a present around dinner time, I hoped vaguely that it would be great if the present could arrive around dinner time in Korea. The time of delivery could be such the meaning of indistinctive, inexplicit time of day in my mind with some level of hope.

Beth: I think TPs is used as a pair only so TPs seem to give a sense of meaning to a special person. So it would be good for couples to use TPs. TP just reminded me of the time when James was doing his PhD in Cambridge and I was working in Leicester. It would be fantastic for us to use TPs when we were living at a distance. ... TP shows everything including the voice and every message is kept like a record which is really good to see them again later. I think it is really good for a pair of couples living at a different time zone to use TPs that allows sharing the same time of daily events together in a very natural way. TP must be very good for very particular couples or families, such like a wild goose father. (father working alone in Korea and other members living in a different country)

5.4 Discussion and conclusions

As described in this chapter (Chapter 5), the aim of the field study of TimelyPresent was to understand the problems and opportunities provided by the participant families trying out TimelyPresent and allow them to tell us about their experiences using it. Four participant families were deployed and tried TimelyPresent out for more than two months. Three kinds of data were collected and examined here. The results were from: analysis of logs, analysis of the content of presents, and analysis of the interview transcripts.

In the analysis from the logs, three behaviours of using TimelyPresent were examined: previewing a present, sending a present and viewing a present. Regarding previewing a present, it would appear that amongst our participants mothers with children and some grandmothers enjoy previewing a present though the men did not. Based on the behaviour of sending a present examined, it can be thought that the family with young children can regard the act of sending a present as a playful and amusing activity. Through the familial interaction, TimelyPresent can help positive relationships between grandparents and grandchildren. Lastly, on the behaviour of viewing a present, it emerged that grandparents and also grandchildren viewed the presents received from the loved ones over and over again, which was considered as highly valued to all the participant families using TimelyPresent. These results quantify the value also seen in the interview data (see Reflection, Section 5.3.3.3).

Based on the analysis of the content of the presents, it was found that TimelyPresent provided opportunities for the remote families to demonstrate their affection through the act of making and sending a video message in a creative and playful way involving 'doing things', 'things I've done',

‘simple messages’, and ‘requests for action’ using the detachable USB camera. Although they are living at a far distance, most video messages were bright and positive rather than showing concern and that can support social relationships within the families.

Through the analysis of 113 pages of interview transcripts using Thematic Analysis (Braun & Clarke, 2006), four groups of categories emerged: (i) value for both the creator and receiver of presents involving nine codes, (ii) value for the creator of presents containing four codes, (iii) value for the receiver of presents consisting of seven codes, and (iv) technical problems and key features of TimelyPresent concerning seven codes. These are discussed in Section 5.4.1. Participants found value in TimelyPresent and created numerous presents during the period of two months despite technical difficulties as it was an early prototype. Section 5.4.2 will make suggestions for the re-design of TimelyPresent.

Just as emotional probes (see Chapter 2) were useful for eliciting emotional talk, the open ended questions used in the interviews in this field study (see Section 5.2.1.4) were successful in triggering deep feelings and the subtle positive and negative experiences of the users of TimelyPresent. This was particularly apparent when the participants talked around the presents that they had made and received.

The hypothesis was that family members might want to show their affection through the creative act of choosing and creating the gift (see Chapter 4, Section 4.1) was confirmed. The development of TimelyPresent and the field study of TimelyPresent were considered as a successful demonstration of how one can assist the families living at a distance to feel more connected.

5.4.1 Value of TimelyPresent

An important value of TimelyPresent is that it is considered as a different concept of communication media that conveys real scenes of the daily life of the sender to the receiver as a form of media ‘gift’ like a real present. This is best expressed in the quote from Lucy (in Section 5.3.3.1) ,

“Actually, the present is a simple short video file but the TimelyPresent shows the video file is made and sent as a present for me, so I feel that the file is not a simple video file, it seems to be a real present. ... Once we can see a new present arrived, we were very happy. When the present was blinking on the screen, I was very excited and rejoiced. The feeling of clicking the present and seeing the new present was extremely fantastic.”

This experience is harder to achieve through other communication media such as telephone or a Skype video-conference. The real scenes of daily life created by the sender can be oriented towards lifestyle, aspiration, and emotions (Tolmie et al., 2002) through which the receiver can

understand more about the remote family's life and feel more connected, feel closer or even feel like they are living together. David, Eddie's father says,

“...the message showing me my sons playing and bickering with each other in front of me was very refreshing...I think TimelyPresent made us to care more about each other. ... Eddie talked to me in such a manner that I am living with him together in the UK. That was the happiest.”

TimelyPresent allows them to feel that the geographic distance between the UK and South Korea disappears.

TimelyPresent allows all members of the family to enjoy creating video presents with its simple operation and the playful mode of use for the creator using a detachable USB camera at any time of day. Young children enjoy making a video message by themselves. As described in Chapter 4, Section 4.10.1, TimelyPresent can help in maintaining or building a better relationship between the two parties. Grandparents could, in particular, feel proud of being able to be a 'giver', not only be a receiver, which made them happy (Seligman, 2004).

Another value of TimelyPresent is conveying non-verbal social cues such as children's laughter or smiles and making the receiver feel happy. Even kid's innocent screaming could make the receiver laugh and feel reassured that the remote family members live happy lives. This is best expressed in the quote from Hannah's grandmother (in Section 5.3.3.3),

“Oh, Hannah is kissing to me. It is very funny to see the present of Hannah. It made me laughing. ... Hannah is dancing again, jumping up and down very actively. I like best to see Hannah playing like this.”

Reflection can also be another value to the receiver of presents using the Look Again feature placed on the main screen. It was found that people, even children, tend to view the presents created by their loved ones over and over again when they miss them or they are simply curious about a certain content of the present they viewed. Therefore viewing presents over and over again is not always due to yearning as reflection, but can be an amusing time to think of the loved ones. It is thought that children's laughter in a present could be one of the receiver's favourite presents which is viewed repeatedly as to act as long lasting keepsake for reflection.

Anticipation for a new present to arrive is one of the values for the receiver of TimelyPresent which can be parallel with one of the affective factors, 'raised expectation for communication' (Romero et al., 2007), see Chapter 1, Section 1.2.5. Six people mentioned this point saying '*always waiting to see if there was a new present to arrive*', '*waiting for a present feels very different from calling or video-chatting*', and the act of anticipating can make '*one's heart throbbing with expectation*', that is valued.

As mentioned before, the goal of designing TimelyPresent is not to replace the existing technology such as Skype, but to show families' affection through creating gifts with a special meaning to stimulate conversation. Regarding stimulating conversation, one of the codes which

emerged from analysing the interview transcripts was ‘carrying over into other communication media’ which is valued by both the creator and receiver. As illustrated in Section 5.3.3.1, certain presents made grandparents and grandchildren feel curious and puzzled so that they both tried to contact each other to find the issues about them in detail and all members of the family felt amused.

Unfortunately, TimelyPresent could not be always-on because there was a sleep-mode on the device, Archos. In the sleep-mode, the touch interface was unable to work so that users had to turn off the Archos and then turn it on for running TimelyPresent. Starting up the Archos also took time so that the whole process made people wait for a while which caused uncomfortable experiences in using TimelyPresent. In addition, this problem affected the time for the receiver to see if a new present arrives at the same local time of day, which was considered as the critical factor of designing TimelyPresent. Despite these technical problems which are to be expected in a first prototype, it was found that TimelyPresent is valued by families communicating across continents.

5.4.2 Suggestions for the re-design of TimelyPresent

The technical problems mentioned in Section 5.3.3.4 need to be overcome so that TimelyPresent can be always-on. Also, some extra effort needs to be made on designing TimelyPresent regarding the psychological problems of worry about new technology and the unfamiliar language, particularly for grandparents.

An obvious development would be to consider other platforms e.g., TimelyPresent could be re-designed as an application on the Smartphone for young users to send and receive presents whenever and wherever they wish. If so, an extra detachable camera could be added. However, this would damage the whole value of TimelyPresent, as a simple, single purpose photo display.

Regarding the time delay in delivering a present, three options are considered. The first is same local time of day as designed and developed here in the thesis. The second option is that the user states the time of day as discussed in Chapter 4, Section 4.4. The sender sets the time of day for a present to be delivered separately for each message sent. This could be very flexible and useful for celebrating special events and give the sender full control although it is less simple. The third is delivering a present directly, like emailing, as some participants would like to. Again, such modifications could devalue the simplicity and appeal of the design as tested. On the other hand they could improve its value. Further research is needed on this feature, using a prototype that is truly always on.

CHAPTER SIX. CONCLUSIONS

The objective of this thesis is to design a communication technology which allows people with family members living abroad to feel more connected with each other within their social context. It focuses on a particular user group: 3-generation families where at least one member of the family is separated from the others by a large distance. It has a special interest in the emotions felt by the members of these families. For this reason, Chapter 1 reviewed i) theories of emotion from psychological research and ii) affective communication technology and the claims made for it. Regarding theories of emotion, measuring emotions, facial expression, and the emotion self-report questionnaire using quantitative methods were regarded as insufficiently rich for understanding the complex and subtle subjective feelings experienced by the target families. The constructionist view of emotion was more appropriate as it considers: (i) social relationships and social context, and (ii) emotional communication as a skill in communicative situations. Concerning affective communication technology, the visual information provided by video and audio channels was also reviewed as being powerful for conveying complex, dynamic and subtle subjective emotional context. In addition, intentional technology was considered as appropriate for conveying complex and subtle subjective emotional contexts due to direct information being delivered and privacy concerns.

Chapter 2 considered a qualitative approach, to systematically identify the themes that emerge from the data with regard to family members' emotional needs and the practical constraints of communication technology. The aim was to formulate hypotheses inductively, based on natural and rich data, in order to inform design. For eliciting the data, the Probe study method, "emotional probes" combined with non-intrusive and non-directive interviews were conducted with six participants from these families living in the UK and three living in South Korea. Creative and attractive stimuli, emotional probes were formulated to trigger complex and subtle deep feelings experienced by 3-generation families. Methods of analysing qualitative data were also reviewed, involving grounded theory analysis with three main types of coding technique. Three steps of analysis were adopted here on the qualitative data derived from the Probe study using grounded theory analysis. Through the analysis of the data (17 recorded interview files with 134 pages of transcripts), 118 Open Codes with 281 relevant quotes and 37 Selective Codes associated with 118 quotes emerged. An example of one of these codes is: Sharing the moment – children's laughter with happiness, example of quote, "*My husband said he wants to hear the children's laughter every day*". We also discussed the overlap between the affective factors identified by Romero et al. (2007) and the codes in this study, the effectiveness of the Probe method, and the positioning of the coding method used here (see Section 6.1.1.1 and Section 6.1.2).

Chapter 3 considered ideas and requirements for designing inventions of communication

devices. While the summative findings in the analysis in Chapter 2 illustrated much about the emotions experienced by the families separated by large distance and time difference, it does not directly inspire design ideas for communication devices. An additional analysis was thus carried out to identify themes for design. The approach was conducted based on understanding the themes within the quotes, again aiming at thinking of problematic situations of communicating with family members and generating possible ideas and requirements for the design of technology in an intuitive or imaginative way. In order to get wider insights at this stage, two design sessions were conducted. Six design themes emerged including Finding time, Sending love, and Reflection. The quotes associated with these themes can be viewed as a rich way of expressing possible requirements for design. The latter two themes inspired the design of a device that would be used to send asynchronous media gifts - TimelyPresent (see Section 6.2.1).

Chapter 4 described the development of TimelyPresent by Andrew Monk, Gavin Wood (computer programmer, Culture lab at the University of Newcastle), and the thesis author during three months' iterative, intensive designing. TimelyPresent is a very simple to use device with which families can create gifts with special meaning to stimulate conversation and to act as long lasting keepsakes for reflection. The Archos 9 was selected as the platform, resembling an electronic photo album and providing touch interaction. The key features of this design are the metaphor of a present delivered after a time delay so that it arrives at the same time of day that it was created. Key functions for using TimelyPresent were illustrated including opening a new present, making a present, and looking again at presents. Initial design in the form of a storyboard was introduced and how screen shots, visual design elements, and the connectivity were changed for the final version of the storyboard of TimelyPresent. The results of user testing were then described using the method of cooperative evaluation conducted with three potential users. Finally, potential values of TimelyPresent to the sender and to the receiver were discussed (see Section 6.2.2).

Chapter 5 illustrated the results of trials of TimelyPresent by participants over a period of more than two months. The aim of the field study of TimelyPresent was to understand the problems and opportunities experienced by the participant families trying out TimelyPresent, and to allow them to tell us about their experiences using it. It focused on understanding how people feel using TimelyPresent and why they use it, alongside helping to improve the re-design of TimelyPresent. These goals were achieved by analysing the qualitative data derived from interviews and the contents of presents created by the participants. Four participant families were recruited and eight participants were interviewed after the first and second months of using TimelyPresent. In each interview, open questions were asked about how they felt about making and receiving presents and changes in their relationship with their remote family. Logs recording the traffic of use of TimelyPresent, 133 presents created by the participants, and transcripts of 15 recorded interviews

totaling 12 hours 27 minutes and 113 pages were analysed. In the analysis from the logs, three behaviours of using TimelyPresent were examined: previewing a present, sending a present and viewing a present. Based on the analysis of the content of the presents, it was found that TimelyPresent provided opportunities for the remote families to demonstrate their affection through the act of making and sending a video message in a creative and playful way involving ‘doing things’, ‘things I’ve done’, ‘simple messages’, and ‘requests for action’ using the detachable USB camera. Through the analysis of interview transcripts using thematic analysis, four groups of categories emerged: (i) value for both the creator and receiver of presents involving nine codes, (ii) value for the creator of presents containing four codes, (iii) value for the receiver of presents consisting of seven codes, and (iv) technical problems and key features of TimelyPresent concerning seven codes. Codes that emerged included: real scenes of daily life, like a real present, feeling closer, playful mode of use for creator, the value of laughter, and anticipation for a new present to arrive. Overall these data demonstrated the value of the design for both senders and receivers of presents (see Section 6.2.3).

This thesis is unusual in the respect that we were able to go through the whole process of design from an open ended Probe Study to the design and field study of a prototype. In this process various methods were tested and their value demonstrated in this particular context. The contributions of this thesis are discussed in the next section.

This thesis is unusual in the respect that we were able to go through the whole process of design from an open ended Probe Study to the design and field study of a prototype. In this process various methods were tested and their value demonstrated in this particular context.

This Chapter will draw attention to, and reflect on, the main contributions of this thesis to research and design. Under the first heading, innovation in the research methods used and the understanding gained of the emotions experienced by families communicating across continents are considered. Under the second heading, innovations in design methods and features of TimelyPresent are considered. In each case the importance of emotion in family communication is illustrated.

6.1 Contribution to research

This section will discuss contribution to methods (Section 6.1.1) and findings obtained (Section 6.1.2).

6.1.1 Methods

6.1.1.1 Emotional probes

While probe studies are now routinely used in ethnographic studies for design, we would claim that the probe methods used here were particularly effective for eliciting talk about emotional issues. Chapters 3, 4 and 5 demonstrate how the data obtained from using them were translated into a successful design. We would recommend that other researchers and designers could usefully include some or all of these probes into their own studies where some knowledge of the emotions felt by participants is required.

At the initial interview with a participant, drawing a 'Family map' (see Figure 2.9) was a natural, subtle and effective way of leading conversation with open-ended questions. It helped to identify every member of the family and to gather general information about their communication technology.

One effective probe was the Spirit of oracle cards (see Chapter 2, Section 2.4.2.1). These cards were intended as a stimulus for emotional reflection. Each card has its own name and image on the front such as 'emotions', 'intention', 'regret', 'angel over me', 'blessings', 'faith', 'remembrance', 'speak your truth', 'soul mate', 'honesty', etc (see Figure 2.12a). Participants were asked to choose a few of them that elicited thoughts or feelings about their family, and write or draw on the back of the card. Examples of the responses to the cards from participants written down on the back can be seen in Figure 2.13b.

Another effective emotional probe was the photos with prompts (see Chapter 2, Section 2.4.2.2). Participants were asked to take photos relating to any or all of 11 prompts listed on the instruction sheet (see Figure 2.14). These included: something about you that you like, something you like to share with your son/daughter, something you like to share with your husband/wife, something you like to share with your mother/father, an element of family life, a connection to someone you love, something connected to a favourite place, objects that are precious to you, and symbols of affection (see Figure 2.14). Some of the photo probe responses are of 'iPod to listen specific American radio programs together (Figure 2.15a)', 'the name and drawing scribbled by son (Figure 2.15b)', 'children's story book to read for son at bed time (Figure 2.16a)', and 'son's shouts at friends in football game (Figure 2.16b)'.

Finally, we would draw attention to the probe, Journey with my family where I was very happy (see Chapter 2, Section 2.4.2.4). A3 sized paper was offered for describing a happy journey

participants had with their family members. The instructions say ‘Write something next to “Start” and “Destination”. Add drawing, stickers, words or sentences along the given line between “Start” and “Destination” that tell the story of what happened on that journey. More than two events were expected to be described along the line on a journey in order to get as much data as possible (see Figure 2.19).

The overall effectiveness of these emotional probes is demonstrated in the analysis with using emotional codes (see Table 2.3) such as *Obligation, Doing things together, Object with meaning, Seeing each other, Talking to men, Loneliness, Phone hard for children, Who sees what, and Children’s laughter.*

6.1.1.2 Ethical approval

The probe study and the field study of TimelyPresent involved members of 3-generational families talking about their subjective and subtle experiences. Since the intention was to raise sensitive issues, the studies were carried out sensitively and carefully. Submissions were made and approval obtained from the University of York, Department of Psychology Ethics Committee including all Information Sheets and permission forms (see Appendices). As stated in our submission to the committee great care was taken to detect any possible distress on the part of the participant and not to leave any participant 'upset'. This was in fact never a problem.

The field study of TimelyPresent used a progressive process of permissions from the participants. The problem faced was that it was very hard for our participants to imagine what it would be like to use TimelyPresent before they had it installed in their homes. The first information thus did not go into any detail about the interviews "After one month, and two months, the researcher, Hyesook Kim, will arrange a time with you to have a longer chat about your experiences." They were warned that "the researcher will occasionally telephone you to see how you are getting on with TimelyPresent" and that "at the end of the trial I am afraid that we will have to ask you to send back your TimelyPresent, but we will pay all the costs of doing this." There was a whole section on privacy:

What about privacy?

We will not view the content of your video presents unless you choose to show us them. The data sent over the internet and the device is secure. Only you and your family will be able to see the video presents that you create. For research purposes we will record:

- when it is on or off (we hope you keep it on all the time, it uses very little electricity);
- when you create, view or send presents for each other.

These data will only be seen by the research team. If you feel that no longer wish to take part at any time after signing the form below just say so and we will stop and destroy any data we have collected.

Permission to record them talking about the experience of using TimelyPresent (see

Appendix 11) was only obtained after they had been using it for a while when they understood what they might be talking about and the interviewer had gained their trust through the telephone calls.

The final stage in this progressive process of permission was to get permission to view the complete set of present contents. During the interviews it became apparent that participants were not at all shy about showing the interviewer presents on their TimelyPresents. This was probably due to the closer understanding of the interviewer's motives gained during the two interviews. This unexpected opportunity was too good to be ignored and so we obtained permission by email (see Appendix 13) making very clear that only the author would view them. Every family gave their permission to do so except Eddie's father. The presents that he created were not viewed. It might be argued that this amounted to social pressure to reveal potentially intimate content however we do not believe this is the case. One of the advantages of doing it by email was that it would have been relatively easy for anyone to ignore the email or just reply "sorry no". In summary, we would recommend the progressive obtaining of permission used here, and commonly in clinical practice, to any researcher where participants may find it difficult to understand what is required in advance of actually doing it.

Another potential ethical issue concerns the interviewing of children. One child (aged 8) was interviewed in the probe study and one (aged 12) in the field study of TimelyPresent. Both of them spontaneously asked to be interviewed while their mothers were being interviewed. This request was via the mother who was present in an adjacent room throughout the interview. The audio recorded permission of child and mother were taken as permission in order to take advantage of this unexpected opportunity. These requests were given naturally when both the parent and the child fully understood the nature and purpose of the interview and there is no question that informed consent had been obtained. Indeed the parent, having taken part in an interview, and the child, having observed the parent's interview, would have had a much better understanding of the nature and purpose of the interview than a "normal" participant whose permission was obtained in advance.

All in all, the emotional probes and the Grounded Theory Analysis carried out on the resulting transcripts were highly successful in achieving our goal of providing a constructionist view of emotion that considers: (i) social relationships and social context, and (ii) emotional communication as a skill in communicative situations. This can be seen in the codes in Table 2.3 that include: *Obligation, Doing things together, Object with meaning, Seeing each other, Talking to men, Loneliness, Phone hard for children, Who sees what, and Children's laughter.*

6.1.2 Understanding the emotions experienced by families communicating across continents

The results of the emotional probes study represent another contribution, providing as they do an understanding of the emotions experienced by families communicating across continents. The aim of this part of the thesis was to provide a constructionist view of emotion in the context of social relationships in three generational families separated by far distance and the skills and communication devices they have available to them.

This was successful. As described in Chapter 2, Section 2.5.4, the results of Step 2 axial coding was thought of as the summative outcomes of the GTA involving 37 codes in 6 groups in association with the quotes. These groups included: 'happy & fun', 'comfort & yearning', 'reassurance & obligation', 'identity & hope', and 'trauma & upset'. The example codes are illustrated by the quotes below.

An example code in the group of 'happy & fun' was 'Sharing the moment: a special event related to infants/children, with pride' [A1] saying

"I was pleased to see when the baby [20months] said some new words. One day, the baby sitter told me that Benjamin understood the meaning of 'the same'. She asked him who was prettier between her two daughters. Benjamin said 'the same'. In the night, I asked Benjamin who was prettier between me and other girl on the photo. I was expecting to hear from the word 'same', but he said, 'mummy'. I was so happy and excited that I rang my husband [in Baghdad] and told him this story. He was so surprised and happy." [Helen Int.2, Diary] T1.

Another example code was 'Feeling happy from the bottom of your heart' [A4] illustrated by:.

"I found a letter in my husband's books and stuff accidentally. I could feel his very deep and sincere feelings about me and children by the letter. I think he was embarrassed to give the letter to me so didn't give it to me and forgot. But when I read it again I feel very happy to see his own heart." [Helen Int.1] T8.

'Showing the sense of being in play for children' [A7] was another code saying,

"... Simon [2.5 years old] wants to see the movie on the whole family in the swimming pool. He can play the video in the camera by himself and he puts the camera next to his head on the pillow and watches it so many times until he falls asleep every night. He wants to go swimming with his sisters but he is too young for that. But, he has learnt the image of swimming pool watching the video. He loves it so much." [Helen' friend Int.1] T18.

The 'Reassurance & obligation' group was composed of six codes containing quotes. An example for this was 'Sense of presence as reassurance by seeing each other' [A8], saying,

"I was very worried about Benjamin. He couldn't have enough time to get to know his father. So I showed him his father's photo almost every day. The problem was Benjamin thought every man in a photo was his father. When my husband came here with us, he was shocked at the problem. We were all in an elevator and my husband was holding Benjamin

with his arms. He asked where daddy was and Benjamin pointed at the picture on the wall with his finger and said ‘Daddy, daddy...’.” [Helen Int.1] T20.

Another example code was ‘Reassurance with regard to intergenerational obligations’ [A9] illustrated by: “I feel sorry for my parents when my children refuse to talk with their grandparents on the phone, even though I threaten them” [Tom, Int.1] T22.

The group of ‘comfort & yearning’ contained eight codes from the quotes. ‘Keeping a record to feel comfort from the media’ [A14] was one of them, saying,

"If only with a kind of conversation with someone, it disappears afterwards. ... I keep answer machine messages. ... I saved it for a year ... when I felt lonely, I just pressed the button. I can hear people say hi, Betty, it's me ... It's truly nice. I used to keep. I've got a friend in Australia, she's left me an answering message and I just used to keep it. I just want her voice." [Betty Int.1]

T34. Another code was ‘Comfort and consolation from yearning through seeing each other’ [A15], illustrated by,

“My husband seems quite relieved from missing us since using the webcam. He doesn't want to be alone on Saturday nights. It is too long for him to be alone. I feel to be at the same space by seeing him on the computer while he leaves Skype on and watches TV or wanders around. I feel free from restraint.” [Emma, Int.1] T36.

‘Sharing emotions’ [A20] was also considered in this group, saying,

“This one is ‘Can you feel me?’ [cards probe]. I wish Tim [her husband] and I could feel each other's emotion more. We are very different people. Tim has very different knowing, thinking, the way we communicate and we often ... he often understands what I mean. We just express ourselves in very different ways. So at least there are some misunderstandings. And often we don't have much time with each other. So that will also make it harder. It is easy misinterpreting.” [Anne Int.2, Cards] T57.

Seven codes from the quotes were in the group of ‘identity & hope’. While communicating identity might seem to be simply to be a matter of information exchange, the stories in this axial code were experienced as very emotional incidents by our participants. For example, ‘Establishing and maintaining identity: the presence of daddy’ [A26], is illustrated by:

“When my husband came here, Benjamin [9 months old] felt very upset about being with his dad. He is still a baby. So I show the photo of my husband and tell Benjamin he is your daddy, say hello and kiss him. Even though there is a kind of side effect, I am still telling him who daddy is and encouraging him to say hello and something like that. I think it is very important to tell him the presence of his daddy.” [Helen Int.1] T67.

‘Establishing and maintaining identity: being a good father to kids’ [A25] was another example code, saying, “...my husband was so proud of himself to push the buggy. He felt like a good father of his son and a good husband of me. He said to me that he was very very happy.” [Helen Int. 2, Happy journey] T66.

The ‘Trauma & upset’ group was composed of five codes from the quotes. An example code in this group was ‘Frustration and eagerness of talking with children/infants’ [A29], illustrated by:

“One day Benjamin was busy saying 'daddy, daddy, daddy...' on the phone when he was so excited to hear from his dad. But after that Benjamin was just listening to his dad, not talking to him. So my husband was trying to ask to say 'daddy' once more in very many ways, but ... yes, he is eager to hear his son's voice.” [Helen Int.1] T74.

‘Little room and little time to give comfort to each other’ [A31] was another example, saying,

“One day, my husband looked a bit depressed with some stress. His tone with the voice was so low. I asked what happened and he said the work was not easy, under his control. I just wanted to give a gentle hug to him but it was impossible. Even though I was talking on the phone, there was a limit of time and the way of expressing my feeling. He was talking on the way home but I was in my office. It's very inconvenient to talk. I wanted to say that I was thinking of him very much but sometimes it's not easy.” [Helen Int.2, Diary] T77.

The last group, ‘technology & media’ was composed of four codes from the quotes. One of them was ‘Specific uses for specific media [A34], illustrated by:

“I used to emailing and using blog in Korea. But email is usually used for specific information. When some information cannot be delivered by telephone, we use email for that, such as passport numbers, or important documents. [Tom, Int.1] T91.

Another example code for this was ‘Who sees what: level of privacy using media’ [37], saying, “*My daughter could like to use WhereAbouts Clock to ring me on where I am often. But I don't need it. Men do not want to be violated their privacy.*” [Tom Int.1] T115.

These codes from the quotes were considered as complex and subtle emotions experienced by the families with regard to communication and separation across the continents. Chapter 3, 4 and 5 demonstrate that the results of the GTA could be translated into a successful design, though this required the extra step described in Chapter 3. In the context of a PhD thesis it was valuable to gain a proper understanding of the probe study data and then to trace through the use of this understanding into a working prototype. This might not be practical if the purpose was design in a real design context. Quite how one might reduce the effort required is not obvious and would seem to be an obvious topic for further research.

6.2 Contribution to design

This section will discuss the contributions to design which are; a methodology for the systematic use of quotes (Section 6.2.1), novel features of the design for TimelyPresent (Section 6.2.2), and meeting the requirements for a design to connect family members (Section 6.2.3).

6.2.1 Methodology: Systematic use of quotes with ‘nearly-do-it inventions’

There is often a large “gap” between the results of an ethnographic study and the design it is intended to inform. In this thesis we have outlined how design decisions may be linked more

transparently to the ethnography by using quotes as the specification for design requirements.

Two design sessions were held. The objective was to come up with design ideas to illustrate and clarify the needs of the families as expressed in the quotes. These ideas could be physical inventions though they did not need to be practically realisable or to fully meet the requirements implied by the quotes. They were called, ‘nearly-do-it inventions’. Existing products, prototypes, or concept designs which could partially satisfy the desires expressed in some of the collection of quotes were also discussed. The quotes were re-grouped on the wall and a yellow sticky attached naming the invention to record these ideas. This combination of a small group of quotes from family members with a nearly-do-it invention that nearly meets some need that can be inferred from those quotes, was found to be a powerful and rich way of expressing possible requirements for design in this problem space. Table 3.2 summarises these results as six design themes. Each theme (e.g., Sending love) is broken down into requirements (e.g., Common ground for conversation, Lasting gift, Easy to share). Each of these requirements has between one and four associated quotes e.g., T46 “*My husband doesn’t enjoy talking with me. He says a very simple answer. I say five things, and then he says just one.*” [Emma, Int.2, Diary].

On the basis of the above work it was decided to design and build devices that would be used to send asynchronous media gifts. The quotes associated with the themes Sending Love and Reflection were to be used as specifications of the needs of the families with respect to these devices. These give support to the hypothesis that family members in such situations might want to show affection through the creative act of choosing and creating a media gift. Media gifts could also achieve value as demonstrations of daily routine.

This way of working chimes with Schon’s notion of design as a conversation and ‘reflection in action’ (Schon, 1983), also Cross’ concept of ‘creative leap’ between problem and solution (Cross, 2007). Both authors stress the importance of critical thinking in this process. The nearly-do-it inventions provide the vehicles for criticism while the use of groups of quotes as the specification of user needs avoids an overly reductionist approach when summarising the qualitative results as ‘requirements’.

6.2.2 Novel features of the design for TimelyPresent

This section describes two novel features of the design of TimelyPresent: delay of delivery and deletion on sending. Both these features deliberately go against people’s expectations of digital devices.

The first novel feature of design of TimelyPresent is the delayed delivery of a present. It was decided to design the time of delivery as the protocol as ‘same local time’ in system area due to

its flexibility and simplicity in operation. A present made and sent at the sender's local time of day arrives at the same time of day in the receiver's local time zone. Unfortunately, because of technical problems, the device was not always on. This meant that the value of delayed delivery could not be properly evaluated in the field study of TimelyPresent. However, we still believe that this feature could improve its value and further research is needed that focuses on this, using a prototype that is truly always on.

Another reason for choosing the feature of delayed delivery of a present comes from the study by Romero and his colleagues (Romero et al., 2007) and their notion of obligation (see Chapter 1, Section 1.2.5). When deciding on how to plan the arrival of a present the original idea of synchronising on some daily activity such as a meal time was rejected (see Chapter 2, Section 2.6.1) as it might create a new social obligation or expectation to communicate on a daily basis. Avoiding the creation of new social obligations and the value of gift-giving among families was also an important motivation for using the present metaphor. As described in Chapter 4, Section 4.10.3, giving someone a present should not be considered as part of a direct exchange of goods or information, the form is important. A present may imply some kind of weak obligation to reciprocate at some point in time, but there is not the obligation implied in a financial or conversational exchange, for example.

The second novel feature of the design is that a present is deleted from the sender's TimelyPresent after sending. In other words, the sender cannot keep a present which has been created and sent. It was thought that this idea reinforces the similarity to sending a real present. A gift is transference of goods and you cannot both give someone an object and at the same time keep it for oneself. It was also thought that this could make for more personal significance and uniqueness of meaning.

Based on the results of analysing the interview transcripts (see Chapter 5, Section 5.3.3.4), three kinds of responses to the feature of the present being deleted from the sender emerged. One participant, Eddie's mother, said that she did not want to keep the presents in her TimelyPresent because sending a present was just like writing a letter so that when she reads or sees it again, she might feel uncomfortable. However, parents of children were likely to keep the presents they created in order to see them simply for themselves feeling fun some day later or for common ground for conversation while they talk on the phone with their remote families. It was discovered that the content of presents was usually created by their children, not the parents. It was understood that parents are too busy looking after the children, thus, they might not find it easy to have time to enjoy seeing the value of children's laughter or the playful moments with them in their hectic daily life as a form of video message for reflection for themselves. Another thought on this feature was that one grandmother wanted to improve the way of creating presents, such as sayings, looks or postures. This can be regarded as effortful in creating a present for the receiver who would

appreciate this. Again, further research is required to explore the true value of this feature.

6.2.3 Analysis of content of messages in field study

We were particularly fortunate in being able to study the content of the presents created by the participants. Having been given permission to see the complete set of presents they had sent and received, 133 presents were collected and examined.

There were three modes of camera used for creating presents: (i) built-in camera, (ii) showing an appropriate angle and position but being fixed near to the device, and (iii) tracking moving people or objects.

Based on the analysis, 87% of presents created by all the participant families were made using the detachable USB camera whereas only 13% of presents were made using the built-in camera (see Table 5.12). Regarding the use of the detachable USB camera, a camera for tracking is more popular in creating a present (50%) than the one which is fixed (37%) (also see Figure 5.1). This could be regarded as significant on the use of the camera in creating video messages. This implies that people wanted to show their affection through the creative act of making a present in a playful way using the detachable camera. Future designs of TimelyPresent should, therefore, include a detachable USB camera.

In addition to the camera used, four modes of the function of presents emerged. Sending a video message using TimelyPresent has value for helping social relationships within the families involving 'doing things', 'things I've done', 'simple messages', and 'requests for action'. Most messages were related to expressing very natural aspects of the daily life of the family concerning 'doing things (68%)', and 'things I've done (8%)', or to demonstrating social greetings involving 'simple messages (17%)'. People also request affection by sending a message back, such as 'requests for action (7%)'. Some of these messages were created in a careful and thoughtful manner with hope whereas others can be thought of as playing jokes or 'poking fun' (Lindley et al., 2010).

We believe that TimelyPresent can provide opportunities for remote families to demonstrate their affection through the act of making and sending a video message in a creative and playful way involving 'doing things', 'things I've done', 'simple messages', and 'requests for action' using the detachable USB camera. This can be thought of as new results combining the analysis of interview data and content analysis.

In conclusion, we would consider that TimelyPresent meets a number of the requirements suggested by other authors with regard to connecting people and affective systems. This degree of overlap with other people's work is most encouraging. More generally, the codes generated in the

schematic analysis of the interviews from the field study clearly illustrate the emotional nature of the response of participant families to the presents that they generated and viewed, for example: like a real present, feeling closer, playful mode of use for creator, the value of laughter, and anticipation for a new present to arrive. Overall these data demonstrated the emotional value of the design for both the senders and receivers of presents (see Section 6.2.3).

6.2.4 Meeting requirements for a design to connect family members

Overall we believe our design achieves most of the desirable features listed by Romero and his colleagues (2007). All of the nine affective benefits and costs (see Table 1.1) described in the study of the ASTRA system were observed in our data derived from the field study of TimelyPresent. They are obligation, privacy, expectation, thinking about, need to be informed, staying in touch, sharing experiences, recognition, and group attraction.

The factor, ‘obligation’ was defined as “social obligations felt or created as a result of the communication activity”. This factor was already mentioned before, the novel feature of the delayed delivery considered this. The code of Privacy and obligation in association with the quotes emerged (see Chapter 5, Section 5.3.3.1). Eddie’s family and Alice/Joshua family have never felt obliged to send a present using TimelyPresent. On the other hand, Hannah’s family said that the feeling of obligation disappeared soon as time went by. However, Anne’s family and her grandmother felt a bit obliged to send a present although there was no pressure. They thought the concept of ‘gift-giving’ using TimelyPresent implied that reciprocal ‘gift-taking’ was needed for them all to feel pleased and happy together.

Privacy is another affective factor defined by Romero and his colleagues. TimelyPresent was designed as intentional interaction to provide a careful balance between privacy and autonomy as opposed to ‘incidental interaction’ which may be regarded as a monitoring system (see Chapter 1, Section 1.2.5). The data related to the code of Privacy and obligation (see Chapter 5, Section 5.3.3.1) showed that no participant family worried about privacy. The two-way closed internet connection achieved this result. An exception to this was Hannah’s grandmother who showed a little bit of worry about privacy but this could have been overcome if she had understood the nature of the closed connection better.

Another of Romero et al.’s (Romero et al., 2007) factors, ‘expectation’ can be related to the code, Anticipation for a new present to arrive (see Chapter 5, Section 5.3.3.3). Expectation to communicate daily might lead to a level of social obligation. However, four people illustrated that they had a ‘positive’ expectation for a video present to arrive ‘someday’ created by the loved one when they sent a present. For example, David said that waiting for a present felt different from other communication media.

The factor, 'Thinking about' was also explained in the results of the interview transcripts. One of the questions about the change in the relationship with the remote family was 'we think about each other' on three scales: more, same, less (see Chapter 5, Section 5.2.1.4). Six people mentioned that they thought and understood each other more since using TimelyPresent. They also felt more involved in the remote family's life. They said as they send a present to the loved ones more, they could think about them more.

'Staying in touch' defined as "The feeling of being connected" (see Table 1.1) has parallels with the code, 'feeling closer' (see Chapter 5, Section 5.3.3.1). The purpose of designing TimelyPresent was to allow families to feel more connected and closer. Four people mentioned that TimelyPresent made them feel closer to each other. Eddie's father illustrates this, saying "*...the presents reminded me of the moments of when we were living together*". Alice and Joshua's grandmother also illustrated her feelings, saying "*...it was like living very close to my grandchildren. It is because the children's ways of talking, looking, playing, or shouting are delivered just like they are*".

Another factor, 'Sharing experiences' described as "How much one feels other people are involved in his/her life, sharing experiences" (see Table 1.1). It can be related to the code, 'Real scenes of daily life' (see Chapter 5, Section 5.3.3.1). The video presents created by senders in the home environment could be oriented towards lifestyle, aspirations, and emotions and the receivers could understand the other's daily routines. This is valuable with regard to expectation, meaning in terms of action, and the context of the time of day (Tolmie et al., 2002). As noted before in Chapter 4, the receiver could understand more about the remote families by looking at the contents of the presents involving episodic daily activities with real images and the good quality of sound provided by Archos 9 using TimelyPresent (see Chapter 4, Section 4.10.2). In line with this, six people mentioned that TimelyPresent allowed them to create or to view real scenes of daily life of their loved ones in a very natural way. Cecilia and Beth said that they were pleased to create their children's natural looks and behaviours of their life as presents and share them with the grandparents. One grandmother (GM1) felt closer to her remote family by viewing the real scenes of their daily life. Two other grandmothers (GM2, GM3) mentioned that they were happy to understand the loved ones' real subtle scenes of life vividly. Due to the real aspects of the remote family's life being conveyed using TimelyPresent, the stories can also be related to another affective factor, 'Recognition' defined as "the extent to which each other's feelings are understood".

The factor, 'Need to be informed' was described as "knowledge of other people's activities". This can also be explained with the code, Real scenes of daily life and the related quotes (see Chapter 5, Section 5.3.3.1) as described above.

Group attraction was another factor, defined as "the feeling of being part of a group". This

may be related to the code, Including more than one person (see Chapter 5, Section 5.3.3.1). Five people mentioned that they feel happier to view a video present where more than one person is shown rather than just one. Cecilia mentioned about making and sending a video present showing Joshua and Alice wearing their school uniform together on the first day at school for Joshua. Cecilia also said that the present showing the grandparents being close together and expressing their affection to Alice and Joshua for the first time made all the family members feel happy, particularly Joshua who responded to it. Tony explained about the special occasion of his brother and wife's visit to their mother when they created a present showing them all.

Another more recent study in the field of communication systems is provided by Gooch and Watts (2011). They proposed six design factors for intimate communication systems that they used when designing the Magic Sock Drawer System (MSD). These are personalisation, sensory medium, effort, openness of the system, metaphor of use, and fleeting vs. realised output. These design factors have parallels with the data derived in the field study of TimelyPresent.

The factor, Personalisation considered "one's unique voice and style of handwriting that can be encapsulated and identifiable by the receiver who recognizes the one well" (Gooch & Watts, 2011, p.2). A present conveys the sender's unique behaviours and voice to the receiver. Every single video message contains, thus, the unique and personal information encapsulated as a form of 'present'. The code of Real scenes of daily life and relevant quotes can be related to this factor.

The factor, Sensory medium can be in part related to the 'sound' and 'sight' information that is associated with the code, the value of children's laughter (see Chapter 5, Section 5.3.2). Six people mentioned that children's laughter in a present made them laugh or feel happy in the interview. It was also found in the content analysis that kid's bright laughter or even children's innocent screaming was highly contagious to others around and these affective social cues in a present made receivers laugh. In addition, children's smiles made receivers feel happy as illustrated by four people.

Another factor, Effort, was described as 'the effort invested when creating a message is appreciated by the receiver'. The code of Preparation is related to this factor. Two people said that TimelyPresent encouraged senders to think about what to say to the receiver. TimelyPresent allows people to have a deeper and more meaningful conversation. It could be similar to text messaging where the act of creation is effortful allowing time to think and reflect before sending (Derks et al., 2008). In line with this, David said that before creating a present, he began to think what to tell his sons for their lives which he had never done before. As a grandmother (GM1) said, due to the limited time, she tended to forget to say something while talking on the phone or video-chatting. She wanted to send a meaningful message so she thought carefully about the contents before creating it. The act of creating and sending a video message to the loved one using TimelyPresent

was also regarded as ‘just like writing a letter’ in which the sender’s effort was involved. The feature of Previewing a present gives opportunities for the sender to make a present better with a level of effort as Anne’s grandmother said she had enjoyed doing in the interview.

‘Metaphor of use’ concerned the nature of the message sent through the system and it can be parallel with the code of Like a real present. Five people mentioned that the way of sending or receiving a video message using TimelyPresent felt like the way of dealing with a real present although it is just a simple video message. Tony, Anne’s father, illustrated below that TimelyPresent has exactly the concept of sending a present to the loved ones.

The last factor, Fleeting vs. Realised Output considered the nature of the outcome of the communicative act. The class of realised output can be saved and kept, such as letters or text messages, whereas the other class of fleeting cannot be retrieved such as telephone conversations. TimelyPresent is designed to provide permanent “realised” output. The code of Reflection can be related to this factor. It was found that the participant families viewed the presents created by the loved ones over and over again, as examined in the analysis of logs (see Chapter 5, Section 5.3.1; Tables 5.10 and 5.11). This behaviour was considered as one of the most valuable factors of TimelyPresent, ‘Look again’ on the receiver’s TimelyPresent (see Chapter 4, Section 4.10.2). In the analysis of interview transcripts, four people also mentioned that when they missed their loved ones, they looked at the presents repeatedly. Even the children enjoyed viewing the presents several times.

In conclusion, we would consider that TimelyPresent meets a number of the requirements suggested by other authors with regard to connecting people and affective systems. This degree of overlap with other people’s work is most encouraging.

6.3 Further research

We would like to believe that the delay and delete on sending features contribute strongly to the value experienced by our participants in the field study but there are many other features such as novelty, simplicity and so on. For this reason it would be very interesting to analyse these two features in some sort of experiment.

The first experiment might be set up to investigate the impact of whether the delay of a message is valued or not using TimelyPresent.

Two groups of participant families could be recruited for this experiment. Each family in one group has a pair of prototypes of TimelyPresents providing the feature of delayed delivery of a present. Each family in the other group has a pair of prototypes of TimelyPresent where a present is delivered straight away. It might be desirable to recruit at least ten families in each group. These

two groups should be matched on the relationship between senders and receivers, for example, mothers with children under five years in the UK and father in South Korea.

After the first and second month of the TimelyPresent trial, interviews would be carried out with the families in each group on how the families feel using TimelyPresent, and particularly on the feature of delayed delivery of a present. Romero and his colleagues' (2007) Affective Benefits and Costs of communication questionnaire (ABC-Q) could be used to provide quantitative comparisons of the two systems.

A second experiment can be set up regarding whether the feature of a present being deleted after sending might have value or not by providing personal significance or meaning.

Two groups of participant families could be recruited. Each family in one group has a pair of prototypes of TimelyPresent where a present is to be deleted after sending. Each family in the other group would be provided a pair of prototypes of TimelyPresent where a present is kept on the sender's device. Similarly to the first experiment, it would be desirable to recruit ten participant families in each group. These two groups of families should be matched on the relationship between senders and receivers, for example, parents with children under five years old in the UK and grandparents in South Korea. Similarly to the method of analysis in the first experiment, after the first and second month of the TimelyPresent trial, interviews would be carried out with the families in each group on how the families feel using TimelyPresent, and particularly on the feature of a present being deleted after sending. Again quantitative data could be provided using Romero et al.'s questionnaire (Romero et al., 2007).

There are considerable practical difficulties in running these kinds of quantitative experiment. Families have to be recruited and the apparatus supplied. Another possibility would be to take a small scale qualitative approach such as that used in Chapter 5, perhaps using a manipulation where families tried both variations of the design for a month.

Perhaps the best validation of our design decisions would be to make and market a commercial version of TimelyPresent.

Appendix 1: Information for Participants and Consent Form (Study 1: Probe study)

We would very much like you to help us with our research. This will involve talking to us about your day-to-day contact with members of your family. The information you give us will help us to invent new ways that technology can help people to communicate more effectively.

Do you have to take part?

No, not if you don't want to. If you do agree to take part, you will be asked to sign the consent form below.

If you feel that you no longer wish to take part at any time after signing the form just say so and we will stop and destroy all records of what you have said.

What will you be asked to do?

The researcher (Hyesook Kim) will visit you, at your home, on two separate days. The two visits will be a few days apart. Each visit will last for about 1 hour during which we will ask you to talk about your day-to-day contact with your family. You are free to talk about issues that are important to you, and will not be expected to provide any information that you do not wish to.

Visit 1: You will be asked about the members of your family that you are most commonly in contact with and how you communicate with them. Hyesook will also leave you with a box of 'things to do'. You can do as much or as little of this as you like in the few days before she returns for visit 2. We hope you will find these little activities interesting and fun.

Visit 2: The researcher will visit to talk about what you did with the box of 'things to do' and what they revealed to you about your every day contact with family.

Audio recording: On both visits we will record what you say. This is so that we can make sure we properly understand what you said. We may transcribe some of this recording and present quotes from the transcripts in papers or conference presentations. If this is the case it will be made anonymous, that is, edited to make sure that no one could work out who said it. All the information you give us will be stored securely and anonymously.

Who is carrying out the research?

The interviewer is Hyesook Kim. Hyesook is a Psychology PhD student at the University of York. Her research is focusing on the design of technology for communicating emotion. Her work is being supervised by Prof Andrew Monk, at the University of York.

How will you benefit from this study?

You will not benefit directly from the findings of the study though we hope that in the future people will do so. We acknowledge the major contribution that your information will provide. For this reason, we would like you to accept a small gift from us, ten pounds voucher for use at Marks and Spencer.

If you want to talk to someone about the project contact:
Hyesook Kim, 01904 432954, 0772 999 8932, or
Andrew Monk, 01904 433148 between 9am and 5pm Monday to Friday.

Consent Form

Tick a box

- Q1) Have you read the information sheet?.....
Yes No
- Q2) Do you understand that you can withdraw from this study at any time?
Yes No
- Q3) Is it okay if I record what you say?.....
Yes No

Please sign here:

..... Date.....

Appendix 2: A full list of open codes and references of probe study (see Chapter 2)

Frequency ranking	Code	Instances	Text Ref.
1	obligation	20	B18
2	doing things together	19	B76
3	object with meaning	19	B128
4	seeing each other	17	B4
5	specific uses for specific media	17	B61
6	no time	15	B22
7	talking to men	15	B17
8	pride	14	B67
9	reassuring	14	B16
10	loneliness	13	B57
11	phone hard for children	11	B14
12	Skype	11	B58
13	using webcam	11	B59
14	looking to the future	9	B174
15	unconditional love	9	B113
16	eating together	7	B89
17	keeping a record	7	B3
18	reunion	7	B84
19	children's laughter	6	B147
20	email	6	B193
21	just the two of us	6	B142
22	social network utility	6	B194
23	special event	6	B90
24	talking to children/infants	6	B45
25	Cyworld	5	B251
26	drawback of digital camera	5	B245
27	easy to share picture	5	B197
28	image with meaning	5	B145
29	phone	5	B10
30	who sees what	5	B62
31	writing	5	B213
32	all my love	4	B148
33	cards	4	B69
34	conflict	4	B34
35	cost	4	B188

Frequency ranking	Code	Instances	Text Ref.
36	drawing	4	B217
37	kissing + hugging	4	B141
38	maintaining identity	4	B154
39	trauma	4	B39
40	adapt	3	B127
41	being a stranger	3	B92
42	eating	3	B108
43	expressing emotion	3	B91
44	freedom	3	B97
45	from the bottom of my heart	3	B7
46	missing grandchildren	3	B137
47	reducing contact	3	B19
48	repetition	3	B64
49	sense of presence	3	B57
50	sorry	3	B34
51	talking together	3	B53
52	voice	3	B55
53	Whereabouts Clock	3	B25
54	yearning	3	B36
55	changed relationship	2	B259
56	frustration	2	B38
57	gift giving	2	B212
58	good mother	2	B168
59	HomeNote	2	B104
60	identity	2	B228
61	intimacy	2	B102
62	letter	2	B63
63	NateOn	2	B243
64	pride in own work	2	B225
65	relaxing together	2	B96
66	sharing	2	B1
67	sorrow	2	B220
68	specific places for specific things	2	B277
69	text message	2	B74
70	video	2	B65
71	worry	2	B24
72	anticipation of reunion	1	B6
73	balance between identity and sacrifice	1	B265

Frequency ranking	Code	Instances	Text Ref.
74	being connected	1	B184
75	being together	1	B159
76	best wishes	1	B150
77	companionship	1	B120
78	effort setting up Skype	1	B186
79	email not emotional	1	B210
80	equal opportunity to communicate	1	B18
81	Facebook	1	B241
82	feeling embarrassed	1	B183
83	feeling guilty	1	B118
84	feeling maternal love	1	B231
85	feeling thanks	1	B71
86	forgetful	1	B230
87	fun with paper	1	B67
88	good father	1	B85
89	good husband	1	B85
90	good model to children	1	B267
91	good story only	1	B117
92	grandparenthood	1	B88
93	hard to be creative	1	B70
94	image and sound with meaning	1	B146
95	intergenerational concern	1	B118
96	less intimate	1	B21
97	LG myphone	1	B238
98	looking back	1	B229
99	magic	1	B65
100	making family	1	B176
101	mobile phone	1	B23
102	nagging	1	B111
103	not an object-person	1	B272
104	obligation for the courtesy	1	B114
105	photos	1	B75
106	presence of father	1	B154
107	protecting children	1	B172
108	reconciliation	1	B34
109	satisfying	1	B5
110	sense of being in play	1	B224
111	showing things	1	B72
112	Skype distracting	1	B201

Frequency ranking	Code	Instances	Text Ref.
113	sound	1	B61
114	specific uses for specific needs	1	B13
115	symbol of affection	1	B70
116	talking about infants	1	B54
117	TV with Divix	1	B187
118	visiting	1	B86

Appendix 3: A full list of 281 text sections with 118 open codes of probe study (see Chapter 2)

Text Ref.	Open code	Sections of text	Informant
B1	pride sharing	I was pleased to see when the baby [20months] said some new words. One day, the baby sitter told me that Benjamin understood the meaning of 'the same'. She asked him who was prettier between her two daughters. Benjamin said 'the same'. In the night, I asked Benjamin who was prettier between me and other girl on the photo. I was expecting to hear from the word 'same', but he said, 'mummy'. I was so happy and excited that I rang my husband and told him this story. He was so surprised and happy.	Helen Int.2, Diary
B2	sharing pride special event reassuring	It was Joshua's first day of preschool. Husband asked me how he was there on the phone, so we had a long conversation about that. The very happy conversation was talking with my husband on Joshua's preschool experience. He was worried and anxious about his son's days at school. But luckily he settled down very quickly because his sister was watching him all the time. She helped him everything such as going to a toilet, having some snacks, playing together, and even interpreting what he talked about for the teacher. [Anne Int. 2]	Hannah, Int.2, Diary
B3	keeping a record	Nowadays, I can get email once or twice but before the marriage, Laura [daughter in the UK] emailed me very often. So my husband printed them out with photos to make a book, which would be her special present for the marriage. We have enjoyed to see these letters and photos.	Jane, Int. 1
B4	seeing each other obligation	My husband seems quite relieved from missing us since using webcam. He doesn't want to be alone on Saturday nights. It is too long for him to be alone. I feel to be at the same space by seeing him on the computer while he leaves Skype on and watches TV or wanders around. I feel free from kind of restraint.	Emma, Int. 1
B5	seeing each other using webcam satisfying	I thought I could be uncomfortable to show everything but it [using webcam] is very convenient. Just by the sight, I can see how he is busy, where he goes, what he eats, and everything, because we knew each other's all daily activities. I don't know how we lived without the webcam. I don't feel very uncomfortable and at the same time I am satisfying my husband's needs. So it's nice.	Emma, Int. 1
B6	anticipation of reunion yearning	I was already excited to be able to see my daughter soon. We had a very happy short conversation on the phone. We have been living separated using this kind of communication for almost 15 years. We are always missing and yearning for each other as a family.	Jane, Int.2, Diary

Text Ref.	Open code	Sections of text	Informant
B7	from the bottom of my heart	They don't think the telephone is the best. Even if you are talking with someone, it's not always the best way. I know when Mike rang me the other day to see about ... see how I was and tell me he loves me. And I sent him a short text of thank you for your love, then he sent a text back of I always love you. It was really nice.	Betty, Int.1
B8	from the bottom of my heart	Well, let's see the happy occasion. I remember I've been reading about love. Mike rang me to see if I was all right, and all the things and arrangement of the party. It was nice. I sent him a message thank you for your love. And he sent me a message he would always love you.	Betty, Int.2
B9	reassuring	Whenever she rings me, I become really happy. Because she didn't tell me worries. She tells me good news only. Even though she has some problems, she says everything is going to be ok, don't worry. She has always been positive. So after the talk with her, my husband and I become very happy with delight. I am humming a song to myself.	Jane, Int. 1
B10	obligation phone	My parents are satisfied with talking on the phone. I mean, if my kids can make a time to talk with them, that makes them happy enough with whatever topics.	Hannah, Int.1
B11	obligation phone	I feel happy when my kids are having a good conversation with their grandparents on the phone, because they are happy.	Tom, Int.1
B12	object with meaning	That would be on our iPod. There are stories which were from the American radio program, some American Lives. We both linked to the ... He put things on my iPod. We have an iPod. Tim put things on it from the radio program. We both listen different time and different program. So we share that interesting.	Anne, Int.2, Photos
B13	phone hard for kids specific uses for specific needs	I don't like talking on Skype because there is a time lag between what you say when they hear it. I think it a kind of system but you say something and then they wait for seconds and then they reply ... but we already start to say next thing so often with William and my parents, they are often cross a bit of the purposes because William says...my mum asks something and then he reply something quite slowly but she already asks next thing... so sort of thing is not a proper conversation ... but anyway they enjoy it.	Anne Int 1.
B14	phone hard for kids	William [grandchild] hates talking to them [grandparents] on the phone.	Anne Int 1.
B15	phone hard for kids	The grandparent's thing is interesting. My mum often wants to talk to Jessica [age 6] but Jessica doesn't want to talk. She can be silly. She is stuck on the silly conversation.	Betty Int.1

Text Ref.	Open code	Sections of text	Informant
B16	reassuring	My mum rang me about her bad dream. She was worried about everything of our daily life. She asked to see if anyone is not well or my husband went on a business. I told her that the kids caught a bad cold, but now they are ok.	Hannah, Int.2, Diary
B17	talking to men phone	My younger brother is going to get married soon but my parents didn't know about their son's wedding in detail such as when and where he is going to his honey moon. So I asked him on that on the phone and told my parents that information. My brother doesn't want to make a phone call. He is a man of few words. Just because of his wedding, I could ring him more often to see if he is ok and we can meet up some time in Korea.	Hannah, Int.2, Diary
B18	obligation equal opportunity to communicate	On Sundays, the son in law, James rings me and says hello with some chat and then passes the phone to my daughter Laura to talk with me. They ring James's family, too. In that case, Laura rings them first and then passes the phone to James. They made a rule like that as equal. Giving a present, making a phonecall and everything should be equal between them. I like it.	Jane, Int.1
B19	obligationreducing contact	The topic of the conversation on the phone is usually to see if how I am and how they are. I am quite talkative as a friend but these days I try not to say too much, because they [daughter and her husband] are busy with a baby.	Jane, Int.1
B20	obligation reducing contact	Before she [daughter in the UK] got marriage, we talked about half an hour but now it takes about 10 minutes. Now, I need to have a regard for her feelings on the phone. I don't want to make the baby awake, and she is busy as a lecturer, a wife and a mother.	Jane, Int.1
B21	reducing contact less intimate	I used to ...when things go badly, I want to ring my mother and get some more support, you know. So I tend to ring her, you know. But, I don't ring her that much than at that time, but I used to, we used to have a long conversation when she's not with it, with usually some problem. I wanted her... you know, advice from her, really, sometimes advice, sometimes more support.	Anne, Int 1.
B22	Cyworld no time	When I was studying in Australia, my husband often put some photos of Benjamin on the Cyworld for me to look at. But now I couldn't do that. I feel very annoying. I know it is not so difficult to do that but I am always busy working and looking after Benjamin. I don't want to spend the time for putting the photos or something like that.	Helen, Int.1
B23	mobile phone obligation	I think mobile phone or telephone can be the objects to share with my daughter. Long ago, I used to ringing her very often, but now I feel a bit constrained to ring her. But it's ok. It is understandable. I believe in her and her husband.	Jane, Int.2, Photos

Text Ref.	Open code	Sections of text	Informant
B24	worry talking to men	My father is suffering from diabetes, so I ask him to see if he takes medicines, drinks alcohol, or goes to surgery. He listens to me only, so I need to ring and ask him.	Emma, Int.2, Diary
B25	reassuring phone worry	My husband asked me to see if I am ok on my back through the phone. I had been suffering from the back pain and recently I had an operation for that. But when I am tired I still feel a bit aching on my back. He is always worried about my health. He says please do take care of myself and don't be so hard, no matter what happens to me.	Lucy, Int.2, Telephone log
B26	obligation	I ring my parents and the parents in law more often than before I did in Korea.	Tom, Int.1
B27	obligation	I ring my parents more often as a kind of obligation because they are very old now. I think I have to at least ring them more. As I mentioned, I didn't ring them so often in Korea.	Tom, Int.1
B28	obligation phone	I feel happy when my kids are having a good conversation with their grandparents on the phone, because they are happy.	Tom, Int.1
B29	obligation phone hard for kids	When my kids refuse to talk with their grandparents on the phone even though I threaten them, I feel sorry to my parents.	Tom, Int.1
B30	obligation	I ring to my father in low to see if he is ok once a week. It is a kind of family duty.	Hannah, Int.1
B31	obligation phone hard for kids	I feel sorry if my kids don't want to talk with my father on the phone.	Hannah, Int.1
B32	obligation phone hard for kids	On my parents' birthday, we ring them to say happy birthday. We try to persuade my kids to say the same to my parents on the phone. I need to give pocket money or sweet to my kids for the conversation.	Hannah, Int.1
B33	obligation	Even though one of family members had good news, we couldn't come and say congratulations face to face. I rang them and said congratulations, and gave some money for that. But they seemed upset about us not to come.	Lucy, Int.2, Diary

Text Ref.	Open code	Sections of text	Informant
B34	conflict phone sorry reconciliation	I was [in South Korea] cross with Laura [daughter in the UK] the other day. Maybe it was the first time I had a bad conversation with my daughter. She didn't answer my phone several times and I became worried more. So I had to keep ringing more often but she still didn't answer me. One day, unexpectedly, she picked up the phone and said to me 'Why?' with a very annoying voice. I was heartbreaking to hear her tone rather than her excuse. So I said that I would not ring her any more. ... Laura rang me soon after the bad conversion, and asked me "Are you upset?". She said Hanna [her daughter, 10 months old] was crying and hard to be settled down for a while so she's got upset and exhausted. Laura said sorry for letting me annoyed. I had to say sorry for that.	Jane, Int.1
B35	conflict phone	I had a phone conversation with my mum, who criticised... she didn't mean it nastily, but she was saying that my house was a mess, and it made me awful. Then I thought of Amanda, and Amanda just said me that. That just made me laughing. She was having a joke, laughing me and teasing me. She's texted big up your messy house.	Betty, Int.1
B36	yearning talking to children/infants	One day Benjamin was busy saying 'daddy, daddy, daddy...' on the phone when he was so excited to hear from his dad. But after that Benjamin was just listening to his dad, not talking to him. So my husband was trying to ask to say 'daddy' once more in many ways, but ... yes, he is eager to hear from his son's voice.	Helen, Int.1
B37	frustration phone	There is no facial expression, no gesture. It is hard to explain everything to my husband on the phone especially I was not well with Benjamin. So I had to select something important to talk about and then quit the phone.	Helen, Int.1
B38	frustration phone	One day, my husband looked a bit depressed with some stress. His tone with the voice was so low. I asked what happened and he said the work was not easy, under his control. I just wanted to give a gentle hug to him but it was impossible. Even though I was talking on the phone, there was a limit of time and the way of expressing my feeling. He was talking on the way home but I was in my office. It's very inconvenient to talk. I wanted to say that I was thinking of him very much but sometimes it's not easy.	Helen, Int.2, Diary
B39	trauma phone	I had a phone conversation with my mum, who criticized me. She didn't mean it nastily, but she was saying that my house was a mess, and it made me feel awful. Then I thought of Amanda, and Amanda just said to me that big up your messy house. That just made me laughing.	Betty, Int.1

Text Ref.	Open code	Sections of text	Informant
B40	no time	I rang my mum daily when she was in Oxford, almost daily when we worked together. Also we don't work together now...but I used to have to ring her about lots of her business but now though....we just ring to find out which there are ...now...	Anne, Int.1
B41	conflict	Mum rang to see if I was ok. I hadn't spoken to her since the 1st of the 12, after the bad conversation. We normally speak on Mondays, Thursdays and weekends. She asked if she had made upset me, and apologized and offered to help to clean and tidy the house when she comes here next week. She blamed Dad. Actually, dad was really difficult. ...Even though it was quite special, maybe I felt better, but still stressed. I should have but it was beginning for me. It wasn't very special. It was beginning for me to feel a bit better. I still didn't feel great but felt glad that she apologized and she recognized that she had upset me she took responsibility for that. She's never apologized. She recognized that the conversation had been really bad timing.	Betty, Int.2, Diary
B42	trauma	The day before that my birthday, wedding anniversary party which they attended, the house was very messy due to two weeks of illness for me and Nina, 6 year old. They had called round to the home before the party at restaurant. Mum mentioned the state of the house and gave me a pep talk re cleaning, tidying and keeping on top of things etc. I felt very petrified and insulted re how the house would work by Christmas and their coming to stay. She said, "Oh, they won't look like by the Christmas." They give me some credit. You know, I will make it night for Christmas. Piss me off!!! I don't want to speak to her again. I felt much wound up after the call and irritated. Even rest of the week, we didn't eat. Without feeling quite low anyway, I didn't want to hear it. The day after the party I was exhausted. I didn't want to have the party. I was so low. If I could have cancelled it, I would cancel it. I already rearranged it once and I didn't want to have the party. So I was very upset and unmotivated. ... Mum rang to see if I was ok. I hadn't spoken to her since the 1st of the 12, after the bad conversation. We normally speak on Mondays, Thursdays and weekends. She asked if she had made upset me, and apologized and offered to help to clean and tidy the house when she comes here next week. She blamed dad. Actually, dad was really difficult. ... Even though it was quite special, maybe I felt better, but still stressed. I should have but it was beginning for me. It wasn't very special. It was beginning for me to feel a bit better. I still didn't feel great but felt glad that she apologized and she recognized that she had upset me and she took responsibility for that. She's never apologized. She recognized that the conversation had been really bad timing.	Betty, Int.2, Diary
B43	trauma phone	I had a phone conversation with my mum, who criticized... she didn't mean it nastily, but she was saying that my house was a mess, and it made me awful.	Betty, Int.2, Diary

Text Ref.	Open code	Sections of text	Informant
B44	talking to children/infants	They [Tom's parents] like talking with their grandchildren on the phone. They are waiting for even hearing from their grandchildren's voice, not a proper conversation, because my kids don't like talking on the phone.	Tom, Int.1
B45	talking to children/infants	My husband wanted to talk with his daughter on the phone. He even wanted to hear her voice.	Lucy, Int.2, Telephone log
B46	special eventtalking to men	Recently, my mother prepared her calligraphy exhibition so I could talk with her more often thesedays. It takes about 20 to 30 minutes talking with my mother but just 1 minute talking with my father on his health problem. He's got diabetes so sometimes we talk on the phone simply about his hospital or drugs.	Emma, Int.1
B47	talking to men/father	While I feel very comfortable talking on the phone with my mother, I don't feel that comfortable talking on the phone with my father than that. Probably it is because of him.	Anne, Int.1
B48	no time	He wants a bit of romantic conversation on the phone, such as 'I love you'. But since I became a mother of a baby it seems hard to say that. I need to keep an eye on my baby even while I am on the phone. So there is no room for saying emotional words to him.	Helen, Int.1
B49	unconditional love	Sometimes they [her parents] ring me several times a week. If my kids are busy eating, talking with friends, or preparing to go out, then they ring on the very next day in order to hear their grandchildren's voice.	Hannah, Int.1
B50	Cyworld unconditional love	There are some simple video files on Cyworld. My parents are keen on watching them very often and persuade me to take photos more often. When the photos on Cyworld are not regularly updated, they ring me almost everyday to upload photos. If I say there is no more recent photos, they say just take photos of my kids right now.	Hannah, Int.1
B51	unconditional love talking to grandchildren	My parents are satisfied with talking on the phone. I mean, if my kids can make a time to talk with them, that makes them happy enough with whatever topics.	Hannah, Int.1
B52	phone hard for kids	I hope my kids would be talking with their grandparents more kindly on the phone.	Tom, Int.1

Text Ref.	Open code	Sections of text	Informant
B53	talking together	We [Lucy and her husband] talk on the phone every day for more than an hour. If not, we can't stand it. We are really talkative and say everything about the family. The time to have a chat is the most important part of our life. It is essential and gives us energy to live.	Lucy, Int.2, Diary
B54	talking about infants	Whenever I talk to my husband on the phone, we always talk about the baby, rather than his work or life.	Helen, Int.1
B55	voice keeping a record	If only with a kind of conversation with someone, it disappears afterwards. ... I keep answer machine messages. ... I saved it for a year ... when I felt lonely, I just pressed the button. I can hear people say hi, Betty, it's me ... It's truly nice. I used to keep. I've got a friend in Australia, she's left me an answering message and I just used to keep it. I just want her voice.	Betty, Int.1
B56	reassuring Skype using webcam seeing each other	Since using Skype, I don't feel too difficult to communicate with my family. I was so interested and curious about seeing each other through the webcam when we started to install that several days ago. I think I feel more comfortable psychologically when seeing each other, rather than just talking.	Emma, Int.1
B57	reassuringsense of presencelonelinesssorry	It seems like consideration for each other as a wife or a husband. I felt sorry for my husband being alone there but we could see and talk each other so I feel like being with him at the same place even though I cannot feel touching him.	Emma, Int.1
B58	Skype using webcam seeing each other loneliness	My husband seems not so uncomfortable since using webcam. He doesn't want to be alone on Saturday nights. It is too long for him to be alone. I feel to be at the same space by seeing him on the computer while he leaves Skype on and watches TV or wonders around.	Emma, Int.1
B59	using webcam seeing each other	When I used the webcam first, it was marvelous to see each other. Especially the parents in law were very happy to see my son.	Emma, Int.2, Diary
B60	phone	My son is 10 years old and he is good at talking on the phone with his grandparents [Emma's parents in law]. He lived with them for one year so probably he feels closer to them, rather than my parents.	Emma, Int.1

Text Ref.	Open code	Sections of text	Informant
B61	NateOn expressing emotion sound Specific uses for specific media	There is a communication media, called NateOn. If logged in, the character comes out from the window with a funny sound. If my husband clicks a button 'this is my heart', then a cartoon character called 'I love you' is coming to me. Well, I feel it is coming to me on the screen. We enjoyed expressing our emotions like this.	Helen, Int.2, Photos
B62	seeing each other using webcam who sees what	If we [her family in the UK] can see them [her parents in SK] through the web camera and they can see us, they must be very happy and my kids can be curious and excited. But I feel a bit reluctant to do that. I think I need to clean my house and make my kids smart for that, but it's difficult to keep the place clean with two kids. I could feel a bit nervous and irritated.	Hannah, Int.1
B63	from the bottom of my heart letter	I found a letter in my husband's books and stuff accidentally. I could feel his very deep and sincere feelings about me and children by the letter. I think he was embarrassed to give the letter to me so didn't give it to me and forgot. But when I read it again I feel very happy to see his own heart.	Helen, Int.1
B64	repetition video	In my case, Minser(2.5 years) wants to see the movie on the whole family in the swimming pool. He can play the video in the camera by himself and he puts the camera next to his head on the pillow and watches it so many times until he falls asleep every night. He wants to go swimming with his sisters but he is too young for that. But, he has learnt the image of swimming pool watching the video. He loves it so much.	Helen, Int.1
B65	repetitionmagicvideo	I found 'Holiday' and it has a mermaid. It reminds me of Nina and her love of the little mermaid, the Disney film. She wants to be a mermaid when she grows up. But she doesn't like the film as much as a story. She's only ever seen the film briefly. She doesn't like the film. She said the witch is scary. But we had to play every night for last two years, to play the game of little mermaid in the bath. We play the game or story in the bath with toys. I've been basically telling a story and she acted out. I love my daughter and love her enjoyment of life and all things magical.	Betty, Int.2, Cards
B66	Skype specific uses for specific media phone hard for kids seeing each other	He [William 6 years old] won't do on the phone. He hates talking to them [grandparents]... he won't talk on the phone, but he will do on Skype as he can see them and they can see him. It must be very important to him or he thinks it's more fun. The whole thing is more fun. It appears that something which is a bit fun. I don't think which involves visual image of my parents and real time so he wants the whole thing to be going on real time and they are there... their faces... images are terrible. They look awful on the screen. I don't want they are supplying that. ... He prefers it [Skype] to the phone which doesn't find it funny at all in my medium.	Anne, Int.1

Text Ref.	Open code	Sections of text	Informant
B67	pride fun with paper writing	She was famous for her good written work. When I taught her to write, I put every bit of paper where she wrote or drew on onto the wall. Every space was covered with her papers like a white board full of texts. When she put some written work on the wall, then I put my paper reply next to hers. Sometimes her father joined to put his own work as well. It was really fun for everyone. When my friends came to see the papers on the wall, they were all enjoying reading them and laughing. It was a kind of joke, paper puzzle, or a riddle. There was an arrow on a paper for me to follow for the next paper. We had played to write like that since she was young.	Jane, Int.2
B68	pride	My kids were close and helped them each other at school. I couldn't be so happier before. I was so proud of them.	Hannah, Int.2, Diary
B69	pride cards	This is happy birthday card. One day my son asked me to give him some money and then bought some very pretty cards for me. He is bluff but he sometimes prepares funny events.	Emma, Int.2, Photos
B70	hard to be creative keeping a record symbols of affection writing	She likes to write a card so I've got lots and lots of cards from her. But she was cross not to get a card from me. I don't want to do that because once I wrote one and the next time when I read it again, it was too dull, so I couldn't sent it to her. It was unfair that we [Jane and her husband] really love to get her cards but we do not send them to her. It is far more convenient for me to ring her but she seems to like to have a card from me. So symbols of affection could be the hundreds of cards from my daughter.	Jane, Int.2
B71	pride feeling thanks	My husband went to my mother's calligraphy exhibition instead of me so I felt thanks to him. And I was proud of my mother and happy to show my mother's ability to my husband.	Emma, Int.2, Diary
B72	showing things pride	I like Design and Technology time at school. I want to show what I made to my dad.	Sam, Int.1
B73	keeping a record	The voice? Why is it so important? S: But, I've got, you know, keep some messages, as well. Em...yes...yes. (She is thinking...) I think the nice things about letters or text messages or email. You are going to have a kind of concrete record.	Betty, Int.1

Text Ref.	Open code	Sections of text	Informant
B74	keeping a record text message object with meaning	I was really interested in the text message from Amanda. Yes, it was amazing. I gave her a CD for her birthday and then it was a very simple message, but you can visualise it. See, 'hi, I am dancing to the belly dancing CD. Good one. Big up your messy house.' I can only imagine her with a really good mood, the music is quite loud, Rahi has already in a sleep, she's dancing away, and she's happy with the CD from me. She really liked it. And she said the way of thanking and also having a joke. It's just great.	Betty, Int.1
B75	photos	When I said that we are watching the photos all the time, my daughter bought this photo frame, which contains several photos being changed automatically on the frame. It was nice.	Jane, Int.1
B76	doing things together just the two of us	A connection to someone I love... I think it is TV set with Divx player that contains lots of films and Korean programs. When my husband comes home, the kids are already in the bed. We have dinner and watch TV together. We like watching Korean soap operas together after the kids go to sleep.	Hannah, Int.2, Photos
B77	doing things together	The card, 'Soul Mate', reminds me of the scene of our love, and of taking a bath with the whole family. It feels very pleasant and joyful with love of the family.	Tom, Int.2, Cards
B78	doing things together	I love the sofa. When I sit on the sofa, my kids come to me and start to chat or play with me. We watch TV and have some snacks together there.	Lucy, Int.2, Photos
B79	doing things together	I want to bake muffins with my kids because they like it. I just want to share whatever they like, such as making cards, baking biscuits.	Hannah, Int.2, Photos
B80	doing things together	My kids made Christmas Cracker with me and became very proud of themselves.	Hannah, Int.2, Photos
B81	doing things together	When we go to swimming pool, they are happy to play with me. I feel to be a toy for them, not a father.	Tom, Int.2, Photos
B82	doing things together	My son drew about the experience of playing and riding a roller coaster in an amusement park with the whole family. He was really enjoying it.	Lucy, Int.2, Happy journey

Text Ref.	Open code	Sections of text	Informant
B83	reunion eating together	We [Helen, her husband and her son] had a trip to a mountain, Songnisan to get some fresh air. ... It was very special for my son to have lunch with us. He tends to have a kind of unbalanced diet. There has been little time for me to serve various food for Benjamin. But at the lunch with his dad, he ate other food without any hesitation.	Helen, Int.2, Happy journey
B84	reunion just the two of us	Thankfully, Benjamin was fast to sleep after the lunch. So my husband put him in a buggy and pushed it while we were taking a walk along the path on the mountain. We were very happy to have a long conversation.	Helen, Int.2, Happy journey
B85	good father good husband	My husband was so proud of himself to push the buggy. He felt like a good father of his son and a good husband of me. He said to me he was very very happy. I was also happy not to push the buggy.	Helen, Int.2, Happy journey
B86	visiting reunion eating together	We [Jane and her husband] went to eastern Europe and then came to my daughter's in the UK. We met her and her husband at the airport. We started to have a journey in the UK. It was the first journey of the four family members. Before that we travelled as three [Jane, her husband and her daughter] but at that time we were four [including her daughter's husband]. So we were very happy wherever we went, being comfortable, pleasurable, and delicious food.	Jane, Int.2, Happy journey
B87	reunion eating together	The children were happy to have a meal together with the dad who had come back home from his work in Bangladesh. [The father had been reunited in this trip]	Lucy, Int.2, Happy journey
B88	grandparenthood special event	I became a grandmother of a lovely granddaughter. This Christmas was the best day of my life. I couldn't be happier having my daughter's family here with us.	Jane, Int.2, Diary
B89	eating together special event	There was a big party for my husband's birthday. Many relatives came and congratulated. We all had a nice chat over lunch. I was so happy to introduce my daughter's family including a lovely granddaughter.	Jane, Int.2, Diary
B90	special event image with meaning	When I saw this card, "Balance", I felt to see the image of unborn child in my daughter's womb. After she had the first scan of her baby, she sent the image to me. I was really really excited to see that. It was marvelous.	Jane, Int.2, Cards

Text Ref.	Open code	Sections of text	Informant
B91	expressing emotion	This one is 'Can you feel me?'. I wish Tim [her husband] and I could feel each other's emotion more. We are very different people. Tim has very different knowing, thinking, the way we communicate and we often ... he often understands what I mean. We just express ourselves in very different ways. So at least there are some misunderstandings. And often we don't have much time with each other. So that will also make it harder. It is easy misinterpreting.	Anne, Int.2, Cards
B92	being a stranger	When my husband had came here, he wanted to have a trip with us. In the car, Benjamin felt still strange being next to his dad, so I had to be with him at the back seat and amuse him. It was hard for me. But this time was different. Benjamin was quite content to be next to his dad at the front in the car.	Helen, Int.2, Happy journey
B93	seeing each other being a stranger	I was very worried about Benjamin. He couldn't have enough time to feel his dad. So I showed him his dad's photo almost every day. The problem was Benjamin thought every man on the photo was his dad. When my husband came here with us, he was shocked at the problem. We were all in an elevator and my husband was holding Benjamin with his arms. He asked where daddy was and Benjamin pointed at the picture on the wall with his finger and said 'Daddy, daddy'.	Helen, Int.1
B94	kissing + hugging	We kiss each other very often on the sofa. Whenever I kiss my son, we have a simple quiz for fun, for instance, 'whose son?', 'mummy's son', 'whose love?', 'mummy's love', 'whose happiness?' 'daddy's happiness', ' whose blessing?', 'grandma's blessing'. Yes, we have a habit of making the meaningful jokes in our own way.	Lucy, Int.2, Photos
B95	obligation Skype using webcam	We feel less obliged, feel less being controlled by the device. When I talked on the phone, I had to talk only. But now I can read a book or study while Skype with webcam is still on. There is no restriction.	Emma, Int.1
B96	relaxing together	I like yellow and blue. This card, "Remembrance" reminds me of the most comfortable moment with my husband. We sit on the sofa watching TV without any stress or work on Sunday afternoon. There is no need to talk, just relax.	Emma, Int.2, Cards
B97	freedom relaxing together	I like smoking and chatting with my wife at the front of the house where is very warm. I feel the sense of freedom there.	Tom, Int.2, Photos
B98	object with meaning	The electronic dictionary my husband bought me is precious, too. This couldn't be special in Korea but it is very important for me to use here in the UK. I am not good at English so I always carry it when I go out just in case.	Hannah, Int.2, Photos

Text Ref.	Open code	Sections of text	Informant
B99	object with meaning	I like to have the pen one of friends of mine gave me from Korea. We like that. I used to having it with a camera on the table. Probably when she came back to this country, it was nice. I took it everywhere.	Betty, Int.2, Photos
B100	object with meaning	Mike and I chose the plate together, we were really pleased. It makes me kind of behind the movie.	Betty, Int.2
B101	phone hard for kids	It probably has to be something fun for children. You know, telephone is not much fun, really.	Anne, Int.1
B102	intimacy	I like it [mobile phone] because I found it ... feels how intimate than email. I don't know.... feel closer on the mobile phone, more personal.	Betty, Int.1
B103	text messaging drawing phone	I actually like text thing best. Young children can't do, they can't write, they can't read. But the immediacy of, you know, drawing I like that idea. But on telephone, I don't know. I don't always want to talk. I like text messages. I like text messages.	Betty, Int.1, HomeNote
B104	HomeNote	I like the first one. Yes, it's really good. Especially if you have got children and grandchildren, especially you can have that ...	Betty, Int.1, HomeNote
B105	special event reassuring	I asked Tim [her husband] how William's [her 6 year old son] play was. Because I was staying and a bit anxious about how William was in the play. He didn't like being too scared, nervous, embarrassed. I was just supposed to be reassured that he had not being too nervous or everything.	Anne, Int.2, Diary
B106	loneliness	I am ok staying with my son here but my husband seems quite alone in Korea. Even though he has breakfast and dinner with his parents every day, he feels lonely especially at night. His place is just for sleeping. It is very near to his parents'.	Emma, Int.1
B107	obligation	We already made an appointment to see each other at every 8am (5pm in Korea) on weekdays. Harry usually rings his father.	Emma, Int.1
B108	eating sorry	I feel very sorry for Laura's poor ability to cook. She always eats sandwich, chocolates, and biscuits. She cannot cook Korean food so whenever she goes to her Korean friend's, she eats what the friend cooked in Korean style. She always says to me that the food was great. Even though I send something to eat, she cannot cook properly with that and she even doesn't want to try to cook. I feel really sorry for her.	Jane, Int.2

Text Ref.	Open code	Sections of text	Informant
B109	eating	This card, "Divine Will", just looks like a kind of Korean dish, Kongnamul Bab. Whenever I see some delicious food, it reminds me of Laura. Sometimes I cannot buy some Korean tasty fruit just because of Laura who really love that fruit but cannot eat in the UK.	Jane, Int.2, Cards
B110	loneliness	It seems like consideration for each other as a wife or a husband. I felt sorry for my husband being alone there but we could see and talk each other so I feel like being with him at the same place just despite no touching.	Emma, Int.1
B111	reassuring nagging	I tell my husband about Harry's school things and ask him to stop Harry buying expensive cards, to persuade him to take a shower more often and something like that.	Emma, Int.2, Diary
B112	object with meaning eating together	This is the picture of muffins Harry baked for me. I couldn't have enough time to be with my son in Korea but now I am happy to have this kind of experience with my son here. I wanted to show this to my husband. If he came here, he would be happy to eat together. It reminds me of my husband.	Emma, Int.2, Photos
B113	unconditional love	... Especially, my father always tells me to show their [the grand parents'] pictures to my kids as often as possible, not to forget them. He always asks me to do so to make sure his grandchildren remember him, until when the whole family will meet at the airport	Hannah, Int.1
B114	obligation for the courtesy	They want some kind of proper expression of thanks when their birthdays come or on parents' day. We need to give some presents or some money, as a token of gratitude.	Hannah, Int.1
B115	obligation	I want to go shopping with my parents for at least a short time because they are not well. We cannot have a long holiday for a whole family.	Lucy, Int.2, Photos
B116	reassuring	We [she and her mother] used to have a long conversation when she's not with it, with usually some problem. I wanted her... you know, advice from her, really, sometimes advice, sometimes more support. But ...yes, When things are going well, there is supposed we sort of express much happiness. Things like, well, everyone's fine? Yes, William's party, William's swimming lesson's well? Yes. William do really well? Yes. Baby do really well? Yes, that's about it.	Anne, Int.1

Text Ref.	Open code	Sections of text	Informant
B117	reassuring phone good story only	My mother always told me what a wonderful time they're having in California, so when she was made appointed, telling me, every time she rang me, how they both loved California... Technically, she was... every single time she phoned me, she would say, we've both had such a fantastic, marvelous time. My thought, that's a bit of vicious by thought, what probably means that she is over defensive, you know, when people transform things very much, it is dealt to mean the opposite is true... She wouldn't tell me there is no problem. She always tells me a good story only. She tells me everything's going well... I think she's reassured me, probably things about ... I am upset about...	Anne, Int.1
B118	reassuring feeling guilty intergenerational concern	...that was a move of the thing, and she wants to reassure herself, because they moved for her. So, she feels probably guilty, she left her own children behind in England, and her grandchildren... Moving to California was her whole idea; my father said he didn't want to tell. She wanted to go. So, she has to reassure herself and lots of her family, if it's good idea. ... I think she felt sorry although it fully means they are happy there. She hasn't to tell me so often they are happy ... So our relationship became more distant and more polite since she moved away. So, yes, a bit less intimate I suppose.	Anne, Int.1
B119	sorrow reunion	When the time is coming to say good bye it is even harder for me, although the moment of reunion makes me really happy. Whenever they go, I am sobbing. Is this the way of human life?	Jane, Int.2, Diary
B120	companionship	I am content with being together with my husband in the same space and reading books. When we went to a play, we arrived there 1 hour earlier so we sat a very front seat. I started to read a book but my husband was very angry about my attitude so we went back home without watching.	Emma, Int.2, Diary
B121	loneliness	Even though, my husband comes to see us, I feel really distant and sometimes lonely because of the baby. It is really hard to look after the baby alone.	Helen, Int.1
B122	loneliness	I miss my husband but I feel harder to look after Benjamin on my own. There is no time for me to have a rest. I feel very isolated with Benjamin on weekends and sorry for him spending time just with me at home. Since he could touch and pull the handle of my car and try to change the gear, it was difficult for me to drive. It is very cold for him to go outside, so we just stay at home on weekends.	Helen, Int.1

Text Ref.	Open code	Sections of text	Informant
B123	loneliness	It was really hard to adapt to live at distance. I used to have a long conversation with my husband every day. I cannot express my feelings to others so my husband has to listen to me on any problem. When I feel upset about something, I have to say something, anything. I am quite out of temper. But he is always listening and trying to accept everything on me. Since he's gone, I felt very oppreseed. Instead, I tried to talk to my son even though he couldn't say anything. But I found there is a limit of talking with my son. There's no way of getting rid of my pent-up feelings. I felt so serious about not being able to talk. So when my husband came here from Bagdad after four months I told him that I was so worried about being separated. I needed someone to talk to. He was shocked and if so he wanted to stop working there. I said I didn't want him to do so but just try something more to comfort my feelings.	Helen, Int.1
B124	seeing each other	... to me visual image isn't important at all... parent's concern. Maybe brother's people, it would be. You know, suppose I have Mrs' nephews or friends of children or things like that. I would want to see them. Yes, but not my parents because I don't want to see them older, actually.	Anne, Int.1
B125	trauma	The day before that my birthday, wedding anniversary party which they attended, the house was very messy due to two weeks of illness for me and Nina, 6 year old. They had called round to the home before the party at restaurant. Mum mentioned the state of the house and gave me a pep talk re cleaning, tiding and keeping on top of things etc. I felt very petrified and insulted re how the house would work by Christmas and their coming to stay. She said, "Oh, they won't look like by the Christmas." They give me some credit. You know, I will make it night for Christmas. Piss me off!!! I don't want to speak to her again. I felt very wound up after the call and irritated. Even rest of the week, we didn't eat. Without feeling quite low anyway, I didn't want to hear it. The day after the party I was exhausted. I didn't want to have the party. I was so low. If I could have cancelled it, I would cancel it. I already rearranged it once and I didn't want to have the party. So I was very upset and unmotivated	Betty, Int.2, Diary
B126	yearning	I am always yearning to see her even though she settled down with her family in the UK.	Jane, Int.1
B127	adapt	Long time ago, I was thinking about her life with my own perspective but nowadays I found they [Jane's daughter and her husband] live their own lives with their own ways and I need to accept and encourage them to have their better lives.	Jane, Int.1

Text Ref.	Open code	Sections of text	Informant
B128	object with meaning	The watch could be the one, my wife bought me when I went on a business to the USA at first. I didn't wear it. I didn't need it because it's quite expensive and the mobile phone told me the time in Korea. But here I am wearing it most of the time, even at night. It is very practical to see the time. It reminds me of my wife.	Tom, Int.2, Photos
B129	loneliness object with meaning	This shoe rack reminds me of my husband who made it.	Emma, Int.2, Photos
B130	loneliness object with meaning	This is the picture of my house, which was taken when we came here first. My husband came to help us settled down so this picture makes me think of my husband. I feel sorry for him being alone. If he would come, we could have been happier.	Emma, Int.2, Photos
B131	object with meaning	The hair cutter reminds me of my wife as well. She made my hair cut this morning.	Tom, Int.2, Photos
B132	talking to father	I want to contact my father most, because mother is staying with me.	Sam, Int.1
B133	adapt	We didn't want to be separated but suddenly the situation made us separated. But we cannot blame the company only because my husband was chosen to go there with a good condition and my job is here. I just want to take some comfort with good excuse.	Helen, Int.1
B134	loneliness adapt no time	It was really hard for me not to be able to talk with my husband face to face. He was so generous to listen to me all the time but since he's gone, I couldn't control my pent-up feelings and frustration. So when he came here first I said to him that I was so serious. I exaggerated my worry about being separated or something like that. He was shocked and said if so he would stop working. I said 'Don't do that but just try to do something more'. Since then he tried to ring me more often so I just tried to adapt myself to this circumstances.	Helen, Int.1
B135	talking to men	When my husband came here, I needed to talk about all things over the night. I had to talk. But my husband was just happy to see me and Benjamin and that's all. I said he didn't need to come if he just wanted to see me, and not to talk. Well, we are just compromising for us all. We are trying to do the best for each other.	Helen, Int.1
B136	missing grandchildren	His mother [her husband's mother] would like to see her grandchildren. Yes, I mean, she is really keen on her family. She's close to lots of her family in Israel. She always says oh, visit... we should visit Israel...and we never visit it.	Anne, Int.1

Text Ref.	Open code	Sections of text	Informant
B137	conflict	My daughter said if we lived together, we would fight each other. We can love each other more because we live at a distance. We are missing each other more, so we can be gladder when meeting.	Jane, Int. 1
B138	keeping a record	I have just one daughter and she lived at a distance since she was a high school student. I have missed her since then and have kept everything about her, such as her old diaries, certificates, emails, cards, letters. Whenever I moved to another place, I took the all stuffs.	Jane, Int. 1
B139	pride	This is my son's artcraft I want to show to my husband. I wish he could live by working as an artist or a designer in the future just like making something he loves. I feel very impressed whenever he brought me what he made at school.	Emma, Int.2, Photos
B140	doing things together	I want to play cards with dad, which can be played by both of us. But he plays tetris only and dislikes others. My mother does, too.	Sam, Int. 1
B141	kissing + hugging	It feels like a big hug. When my daughter was less than 1 year old, I felt very nice and happy to hug her just after having her bath. Now she is too big for me to feel like that but I think when she gets married and becomes a mother, she could get feelings like me, and hope she remembers me hugging her when she was very little.	Tom, Int.2, Cards
B142	just the two of us	The card, 'Holiday', reminds me of the honeymoon at the beach in Thailand, where we had a very special time. At night, we were watching the sky with lots of stars. There's no one there except just the two of us.	Tom, Int.2, Cards
B143	doing things together no time to do things together	I hope to play with dad even though he is busy. He may not have time to play with me.	Sam, Int. 1
B144	just the two of us doing things together	Long ago, I got used to going to the cinema with my wife. When I took off from a train on Friday night, it was about 9 and a half or 10 pm. There was a cinema on my way home and we got used to watching film together many times. It will be good if there is something we can share with. I want to have a journey with my family, particularly when we are in the UK.	Tom, Int.2, Photos
B145	image with meaning reunion doing things together	This is the photo of the Geneva lake. It was so pretty. I wish I were living in this place. I hope to bring my family and parents here to lodge in a camp having a peaceful relaxing time for us all together.	Emma, Int.2, Photos

Text Ref.	Open code	Sections of text	Informant
B146	image and sounds with meaning	This picture is of Harry playing football with his friends. I want to show this picture to my husband, hopefully with Harry's shouts at his friends.	Emma, Int.2, Photos
B147	kids laughter	My husband said he wants to hear the children's laughter everyday.	Lucy, Int.2, Telephone log
B148	all my love looking to the future	This card, "Aura of Love", reminds me of my daughter and her husband who would love each other forever.	Jane, Int.2, Cards
B149	all my love looking to the future	I hope my daughter, Laura and her husband, James are all very happy ever after. Be happy, be healthy, love together.	Jane, Int.1
B150	best wishes looking to the future	We [she and her husband] have always said to my daughter that do what you want, do what you like, and do with the way of what you think. I tried to give her every opportunity but also her own responsibility. I believe she lives her life very well wit happiness.	Jane, Int.1
B151	all my love looking to the future	I love this card, 'Speak Your Truth'. This card is like a girl, reminds me of my daughter, Alice. I hope she will grow up just like this bright girl with the star. I like this picture of the way of representation with red colour in a subtle touch.	Hannah, Int.2, Cards
B152	doing things together	With the card, 'Soul mate', I wish I could share more hobbies with my husband. We just watch TV and that's all, but I need to do more with my husband.	Hannah, Int.2, Cards
B153	doing things together	When I go to Korea, if possible, I want to go cinema or coffee shop with my mum. Because she didn't have that kind of experience.	Hannah, Int.2, Photos
B154	maintaining identity presence of daddy	When my husband came here, Benjamin felt very upset about being with his dad. He is still a baby. So I show the photo of my husband and tell Benjamin he is your daddy, say hello and kiss him. Even though there is a side effect, I am still telling him who daddy is and encouraging him to say hello and something like that. I think it is very important to tell him the presence of his daddy.	Helen, Int.1
B155	doing things together	I like to go to a good restaurant with my parents, even though it is very expensive.	Tom, Int.2, Photos

Text Ref.	Open code	Sections of text	Informant
B156	image with meaning doing things together	I took a photo of the park where I jog. I like this atmosphere of freedom. No one is here. I love myself and hope to join this with my family.	Emma, Int.2, Photos
B157	object with meaning	This name on the wallet was written by Harry. When I think of the family, Harry could be the flower and the core of the family. His name has a special meaning, given by his grandparents so I took a photo of the name, rather than my son, Harry.	Emma, Int.2, Photos
B158	doing things together	I like to help my kids with their arts and crafts things.	Lucy, Int.2, Photos
B159	just the two of us being together	This is the photo of a pair of mugs I took. Even though my husband came here in Korea, there was little time just for us as a husband and a wife because he was always with his children. I really want to have a cup of coffee and have a chat with my husband face to face.	Lucy, Int.2, Photos
B160	eating together	I really want to have dinner together as a whole family at this table. While eating, I want to share the daily things and even very trivial things with my husband and my son.	Helen, Int.2, Photos
B161	eating together	I think it is very important to have dinner together at a dining table. Meanwhile we share with each member's daily activities, work, or study. We couldn't have the time for that but once we settle down in Bangladesh I will do that as the most important part of our family life.	Lucy, Int.2, Photos
B162	object with meaning	The photo of the whole family is my precious object, because it wasn't easy to be taken.	Lucy, Int.2, Photos
B163	object with meaning	I want to take photos of my whole family with my parents. However, it wasn't easy to do that. It would be very difficult for us to meet my brother's and sister's families including my parents.	Helen, Int.2, Photos
B164	object with meaning	Other precious things are my children's photo albums. They show their whole upbringing since they were born.	Lucy, Int.2, Photos
B165	object with meaning pride	My daughter likes to collect her own artworks. She is really proud of herself to make these things. My son's favorite is having toys of dinosaurs. He has to sleep with them on his bed every night.	Lucy, Int.2, Photos

Text Ref.	Open code	Sections of text	Informant
B166	doing things together	I want to spend even a short time with my son. I really want to read a book with my son before going to sleep	Helen, Int.1
B167	talking together reassuring	I think honesty is best for the relationship. Sometimes my husband doesn't want to say something. He didn't want me to worry about that. But I feel there is something wrong, and feel very stressed. So I hope he says to me about everything.	Helen, Int.2, Cards
B168	good mother	Something I would want to share with my son is to be a good friend of my son. I want to take photos of a mother and her son enjoying shopping together.	Helen, Int.2, Photos
B169	just the two of us	If we can make any time at any place, I really want to be with my husband, without the baby.	Helen, Int.2, Photos
B170	talking to children/infants	Every night, I have a talk about the daily things to my baby with stroking on his head while he is having milk	Helen, Int.1
B171	seeing each other	My husband said it was a hard day today but he was very excited and looking forward to seeing me and the children very soon.	Lucy, Int.2, Telephone log
B172	protecting children looking to the future	Angel over me. I wish I protect my children from bad experiences. Because when William starts school, things like that, you wish that all the other children would like him and be nice to him. How friends and.. Nobody would say nasty things to him. And I hope he will succeed in his faith he wants to succeed in, and he won't feel disappointed by other faith. So I only want him to have, you know, that's out of my control all of that. I can't tell him with that as a parent. But I wish to be a parent with all those things, you know, he will always have a happy time. But obviously he can't do that, really.	Anne, Int.2, Cards
B173	all my love looking to the future	I hope he will succeed in his faith he wants to succeed in, and he won't feel disappointed by other faith. I only want him to have, you know, that's out of my control, all of that. But I can't tell him with that as a parent.	Anne, Int.2, Cards
B174	looking to the future	I chose 'Blessings'. I think the rainbow image is likely to show happiness to the future of our family.	Emma, Int.2, Cards
B175	looking to the future	I chose the card, 'Blessings'. I wish my whole families would have bright and beautiful lives like this pretty rainbow image.	Jane, Int.2, Cards
B176	making family	The card, 'Instinct', could be the start of making a family. The first moment to meet the lover.	Tom, Int.2, Cards

Text Ref.	Open code	Sections of text	Informant
B177	loneliness	I don't care whether it is a phone call or a letter. I just want enough conversation in any type of way.	Helen, Int.1
B178	reassuring	They rang me on the 18th, at 11:30am to say that they arrived safely home. Almost every time they do.	Betty, Int.2, Diary
B179	Cyworld no time	I could often see some photos on her Cyworld but since she became a mother, she couldn't do that any more.	Jane, Int.1
B180	Skype seeing each other using webcam	Since using Skype, I don't feel it is too difficult to communicate with my family. I was so interested and curious about seeing each other through the webcam when we started to install that several days ago. I think I feel more comfortable psychologically when seeing each other, rather than just talking.	Emma, Int.1
B181	phone Skype email specific uses for specific media	Tim [her husband] particularly doesn't like remote communication at all. He never answers the phone. He hates the phone. I prefer talking on the phone cause I found Skype thing's distracting. I am totally mobile phone phobia. Email...I just use email.	Anne, Int.1
B182	Skype using webcam freedom	When I talked on the phone, I had to talk only. But now I can read a book or study while Skype with webcam is still on. There is no restriction. I don't feel very uncomfortable and at the same time I am satisfying my husband's needs. So it's nice.	Emma, Int.1
B183	using webcam feeling embarrassed	About the web camera, I don't want to show my face and my own place with my baby. It is really messy all the time. Yes, I can feel embarrassed.	Helen, Int.1
B184	being connected	I feel isolated if computer is off. I feel even anxious. When I had to wait for installation of internet, I was really anxious and restless. I couldn't concentrate on my other work. It was so stressing. I felt weird of myself. Even though I didn't use internet often, just 10 minutes a month, I had to get the internet things done and then felt comfortable.	Helen, Int.2
B185	reassuringSkypeseeing each other	I just leave Skype on for about 10 to 20 minutes on weekdays. It's free. The camera is still on. Even though we don't talk, we can see everything. We usually leave Skype on for about 2 to 3 hours on Saturdays.	Emma, Int.1

Text Ref.	Open code	Sections of text	Informant
B186	effort setting up Skype,	My mother's used to the computer things, but that's another drawback. I found my parents are not good at doing it at all. It took a lot effort to get them the skype worked out. Usually, Tim would do that for them. But now they have to do themselves, yes, they wouldn't be able to do anything difficult, technically.	Anne, Int.1
B187	TV with Divix specific uses for specific media	A connection to someone I love... I think it is TV set with Divx player that contains lots of films and Korean programs. When my husband comes home, the kids are already in the bed. We have dinner and watch TV together. Divx is important as well. It contains huge amount of photos and videos of my family.	Hannah, Int.2, Photos
B188	cost	I buy a phone card, which is paid about £50 for 600 mins talk. Before my daughter got married, I rang her every day. After that, I ring her once or twice and she rings me once a week, so I talk with her at least twice a week on the phone.	Jane, Int.1
B189	specific uses for specific media	When I said that we [she and her husband] are watching the photos all the time, my daughter bought this photo frame, which contains several photos being changed automatically on the frame.	Jane, Int.1
B190	cards specific uses for specific media	Laura [her daughter in the UK] likes to write a card so I've got lots and lots of cards from her. But she was cross not to get a card from me. I don't want to do that because once I wrote one and the next time when I read again, it was too dull, so I couldn't sent it to her. It was unfair that we really love to get her card but not send one to her. It is far more convenient for me to ring her but she seems to like to have a card from me.	Jane, Int.2
B191	Skype cost	I contact with my husband everyday using Skype with webcam. He bought a Netbook just for the network communication with about £250. He uses it every day.	Emma, Int.1
B192	Skype Specific uses for specific media	I just leave Skype on for about 10 to 20 minutes on weekdays. It's free. The camera is still on. Even though we don't talk, we can see everything... We usually leave Skype on for about 2 to 3 hours on Saturdays.	Emma, Int.1
B193	email Specific uses for specific media	We [with husband] email just for the information or photos.	Emma, Int.1

Text Ref.	Open code	Sections of text	Informant
B194	Cyworld Specific uses for specific media	Using messenger is usually for my friends, and Cyworld is used for the friends I've met here.	Emma, Int.1
B195	Specific uses for specific media	Using SMS is different from face to face communication. My daughter wants to contact with her friends in Seoul but just talking on the phone seems quite different from talking face to face. The time difference could be a big problem too. When she could SMS with her friend in Korea, she was really happy and excited, but it seems not easy for her to contact with her friends generally.	Tom, Int.1
B196	Specific uses for specific media letter being connected	Occasionally, they [her parents] write letter to William [6 years]. I didn't say that. They do write hand written letters. William's, my parents say, doing hand written letters. ... William writes letter to them, and then they write letter to him. I think they do that maybe, once a month, or something like that, or once every two month.	Anne, Int.1
B197	using webcam seeing each other easy to share pictures	I was happy to see my dad while talking using a webcam. It is better than just talking with him.	Sam, Int.1
B198	easy to share pictures	I am always busy and bothering to send a photo using computer. If this [Pogo] can be a digital album to store lots of photos, I will take photos of Benjamin whenever possible and then send them to my husband. I will tell him that 'While you were there, I was thinking of you like these photos with my feelings.'	Helen, Int.1, Pogo
B199	seeing each other easy to share pictures	For communicating with my daughter, can it [Pogo] be a video telephone to see her? I think I can talk to her while seeing her. I can carry this in my handbag and show my friends some photos of my granddaughter on it.	Jane, Int.2, Pogo
B200	cards specific uses for specific media	We send Christmas cards including children's photo to the parents in South Korea.	Hannah, Int.1
B201	Skype distracting phone	Yes, yes.....I prefer talking on the phone cause I found Skype thing's distracting...I really don't need to see my Dad....	Anne, Int.1

Text Ref.	Open code	Sections of text	Informant
B202	talking to men/father	My father doesn't talk so much, just for 1 minute or so. He is suffering from diabetes so we talk about the hospital, the medicines and something like that.	Emma, Int.1
B203	talking to men/father	My brother didn't tell the parents about his honeymoon and other things about the wedding. He is a man of few words. So I needed to tell them about his schedule.	Hannah, Int.2, Diary
B204	talking to men/father	My husband doesn't enjoy talking with me. He says a very simple answer. When I say five times, then he says just once.	Emma, Int.2, Diary
B205	talking to men/father	My husband doesn't like to discuss with me so much. He feels bored. He didn't want me to read books. He just wants me to watch him and play with him.	Emma, Int.2, Diary
B206	phone hard for kids unconditional love voice	They [grandparents] like talking with their grandchildren on the phone. They are waiting for even hearing from their grandchildren's voice, not a proper conversation, because my kids don't like talking on the phone.	Tom, Int.1
B207	missing grandchildren voice	Sometimes they ring me several times a week. When my kids are busy eating, talking with friends, or preparing to go out, not being able to talk, they ring on the very next day to hear their grandchildren's voice.	Hannah, Int.1
B208	missing grandchildren	The conversation is usually about my kids. My mother is quite content with talking with me on the phone, whereas my father needs to talk with my kids directly.	Hannah, Int.1
B209	No time	I don't think I can communicate with dad so often because he is busy. He may not have time to do that. On Sundays or on Saturdays he could do. No, he can see his friends so Sunday would be ok.	Sam, Int.1
B210	email not emotional	For Tim, I prefer just talking on the phone, but he doesn't like talking on the phone, so I should feel Tim without communication while he was apart. Email...you can't say anything emotionally, you know, I mean, just quick information, practical thing...so, we didn't actually communicate much at all for four months. Well, he would email, so, well... something like basic things like he is going to concert, or he is teaching this course, and I would say William's broken his leg or when he's gone to school, it was half past ten or something like that. It would be on that level.	Anne, Int.1
B211	pride	This is another craftwork of Harry, called "talent". He was chosen to show his work to the higher classes. I was so surprised to hear from him. I wonder at how he made this so elaborately. He wasn't good at English at that moment.	Emma, Int.2, Photos

Text Ref.	Open code	Sections of text	Informant
B212	pride giving	When I bought and gave a cake to my daughter, Sophie, she wanted to give it to her cousin, Sujie. I asked her why and she said Sujie caught a bad cold and was in bed. This cake would help her to get better soon. I was so proud of my daughter. She was warm and beautiful.	Lucy, Int.2, Diary
B213	pride keeping a record writing	I've got her all diaries since she was a second year student in the primary school. She had been famous for writing a diary in the neighbourhood. Her stories of the diary are really funny but I just showed the cover of the diary to my friends. I liked to talk about my daughter's diary with them.	Jane, Int.1
B214	kissing + hugging	Symbols of affection could be kissing with my daughters with big hugs.	Tom, Int.2, Photos
B215	kissing + hugging	Symbols of affection can be our skinship such as hugging and kissing each other.	Hannah, Int.2, Photos
B216	object with meaning	Objects that are precious to me? They are books. I love books. I want to make my own library at home. Sometimes I buy some books at car boots sale. I had some my friends gave me. They are very important and meaningful to me.	Hannah, Int.2, Photos
B217	drawing	William might like it. He might like it. Children might like it. Everyone thinks it is fun to scribble things and pictures	Anne, Int.1, HomeNote
B218	HomeNote	Well, I think of those. The first one... probably looks so nice, most applicable to us. I wouldn't think the others are very, very... I wouldn't use the others.	Anne, Int.1, HomeNote
B219	loneliness	My parents in law play computer games together but it is just because of their tedious life in a very rural area. They feel lonely.	Tom, Int.1
B220	sorrow	I cried a lot last night [when her daughter's family went back to the UK].	Jane, Int.2
B221	no time	Sometimes it is really nice to talk to somebody, but it's not always convenient. If you have a young child, it's hard to concentrate.	Betty, Int.1

Text Ref.	Open code	Sections of text	Informant
B222	loneliness object with meaning	This is a set of piglet candles my friends gave me as the birthday present. They all went back to Korea but these cute piglets remind me of them.	Emma, Int.2, Photos
B223	object with meaning	These are the books I will take to Korea. I am still collecting some. I like to display them, rather than read, but these books are my favorites and very meaningful to me.	Emma, Int.2, Photos
B224	sense of being in play repetition	Try to make a simple film of Benjamin and his dad and show the film very often to Benjamin. I think Benjamin will be very happy to see his dad playing with him with joy in the video.	Helen, Int.1
B225	pride in own work	I like these papers for myself. These are about the key points and the schedule of my PhD.	Emma, Int.2, Photos
B226	pride in own work	I like to cross-stitch. It is fascinating to make something on my own and I am surprised to see my strong patience and endurance to finish the work.	Lucy, Int.2, Photos
B227	image with meaning	The monastery, I think the icon of monastery, I used to work there. It was Chile and Chile I like. I mean there were a lot of pictures in there, hallway. It reminds me uplifting. In Chile I used to walk along this road. ... literally my house was on the very edge of Santiago. ... Fields and mountains were covered in snow. That was Chile picture. I love Chile.	Betty, Int.2, Photos
B228	identity	New Direction'. I am not sure that I'm doing with my life at the moment. My daughter is now in school and I don't work. I have been looking after her full time. I feel nervous and despondent sometimes. I had wanted another child, but not sure that will happen now I'm 43. I have no idea what else to pursue for work or study I interest. But the picture conveys an element of hope and that things will work out. I believe so. It is actually upbeat. The word of new direction, I think, was partly still kind of, has a hope and belief in something. Something will eventually happen although I am feeling like....	Betty, Int.2, Cards

Text Ref.	Open code	Sections of text	Informant
B229	looking back seeing the present	There is one picture upstairs. It is African embroidery. I like that one. H: Why? Is that special? I like it. I will show you. It's like a mother and her child. H: Do you like its image, or it's a piece of details, or the whole material, or just everything? Sometimes I just feel walk away from it all. But sometimes I was quite happy to spin it in little room and start again. Sometimes I forget what I've got, and when I was younger, like when I moved a house as a student, everything was going to be a trunk. Then I reopen the trunk, I saw, "Oh!" I feel really surprised. I've completely forgotten that. And I seem, something happens in my brain, I was completely different. I've never done it. I've never been to Hong Kong. I've never worked in Chile. Never travelled world. I completely forget. It's really weird, and annoying, but it happens.	Betty, Int.2, Photos
B230	forgetful	The problem is when I get depressed, or when I am ill, I am not very well. I struggled this autumn. I forget. I can't even remember. I don't remember what I've done these things. So, even what I am talking to you now is actually quite helpful.	Betty, Int.2, Photos
B231	feeling maternal love	With the card 'Intention', I feel maternal love with this card.	Emma, Int.2, Cards
B232	freedom	I like this card best, "Free Will". There is no restriction. She is not sexy, not so pretty but with full of freedom. She doesn't care for the public eyes.	Emma, Int.2, Cards
B233	email not emotional Specific uses for specific media	Tim [her husband] likes email, because it's impersonal, so rather than rings anybody like even to his friends or poor shop or anything, he would prefer email.	Anne, Int.1
B234	drawback of digital camera	You just take too many photos and then you don't bother to plan for reason of good one and you don't bother to print any of them out. So you end up nothing.	Anne, Int.1
B235	cost seeing each other	I wouldn't like that [showing her image on the computer]. I prefer my truth is. I wouldn't like to use Skype.	Anne, Int.1
B236	cost	It made me the cost, isn't it? If you want to talk for a long time, the cost is international cost.	Anne, Int.1
B237	mobile phone Specific uses for specific media	The mobile phone is used just for my son's emergency from his school or something like that.	Emma, Int.1

Text Ref.	Open code	Sections of text	Informant
B238	cost LG myphone	Skype can be used when computer is on with network, but LG myphone can be used with network. It doesn't need computer. It is easy to use and very cheap with just about 1 pound a month and free for the same system users.	Tom, Int.1
B239	email Specific uses for specific media	About email from my husband, I don't feel any emotion from it. It is the same for me to read many emails from others officially or just ordinarily. When some information cannot be delivered by telephone, we use email for that, such as passport numbers, or important document.	Tom, Int.1
B240	using webcam	I don't care about using webcam but my kids can be very curious and interested.	Tom, Int.1
B241	facebook Specific uses for specific media	He has cyber things, he's got facebook. ... he communicates not with his parents, just with his friends. Whatever calls it, he counts it and whatever.	Anne, Int.1
B242	email not emotional Specific uses for specific media	About email from my husband, I don't feel any emotion from it. It is the same for me to read many emails from others officially or just ordinarily.	Helen, Int.2, Photos
B243	NateOn Specific uses for specific media	I use MSN at times. I used NateOn with my wife who was working in Korea. There is a function to make the window invisible. One day there were some problems on the family so we used it all day long.	Tom, Int.1
B244	drawback of digital camera	We couldn't take photos of Stonehenge. Whenever we want to take photos, the camera battery has gone already.	Hannah, Int.2, Happy journey
B245	No time drawback of digital camera	We are so lazy that photos in the digital camera are not to be sent to the computer. I just leave the camera being able to be taken until the memory is full, so we cannot often take photos at very important times.	Tom, Int.2, Photos
B246	No time drawback of digital camera	Even using laptop, it is still cumbersome. My digital camera is always accumulated by lots of photos but not to be sent to the computer.	Helen, Int.2

Text Ref.	Open code	Sections of text	Informant
B247	drawback of digital camera	I don't bother with that [photos]. Actually bad. They [grandparents] ask them [kids photos]. They are all in our digital camera, and they are all in computer, then we didn't have any [printed one]. They said that so Tim and I went to a photo [studio] and then... I ...oh...I said, oh, I send it for that the other day.... and ... I thought I wouldn't think over that good. So we didn't send them many. ... We shouldn't send some....we don't think to have hard copies any more....so...I think digital camera is actually disadvantaged. You just take too many photos and then you don't bother to plan for reason of good one and you don't bother to print any of them out. So you end up nothing.	Anne, Int.1
B248	seeing each other	I think Pogo can be connected to the computer. I hope to use the Pogo screen with the computer one. I think the quality of Pogo will be better than that of the computer.	Sam, Int.1, Pogo
B249	easy to share pictures	It is not easy to manage and organise the whole photos in the computer. Need to select some and making a folder and open the email account and attach the photos... so complicating. If POGO is used as an album only, it will be fresh and new to me. It is important to think about the way of sending rather than receiving. It should be simple and easy without any condition.	Helen, Int.2, Pogo
B250	talking to men/father	My husband doesn't like talking on the phone. He even doesn't want me to talk on the phone for so long. He thinks the telephone conversation could reveal his privacy.	Hannah, Int.1
B251	Cyworld who sees what	It is sometimes not easy to do that [using Cyworld] and the photos are not for the family only. My friends can see some of them and I need to decide whether some photos are acceptable for the public or something like that.	Hannah, Int.1
B252	Whereabouts Clocks who sees what	Do you have to.... do their information get put theirinvoluntarily or do you have to put in? I mean, someone might not want their own way to know when they.... (Ben screaming). You don't want to be tracked by something. Maybe a prisoner with a tag or something.	Anne, Int.1
B253	Whereabouts Clock	About Whereabout Clock, Korean mothers do not need to ring the school. All information on the schools and academies can be seen on the mobile phone. The kids will not be happy about that.	Hannah, Int.1
B254	Whereabouts Clock	My daughter could like to use WhereAbouts Clock to ring me on where I am often. But I don't need it. Men do not want to be violated their privacy.	Tom, Int.1
B255	doing things together	It is important to have a direct connection between the mother and the children. Reading a book is good for everyone.	Helen, Int.1

Text Ref.	Open code	Sections of text	Informant
B256	talking together	Conversation is the most important part for the good relationship of the family	Helen, Int.1
B257	no time	When you have two young children, you have very little time with your husband. So we don't have much time to talk.	Anne, Int.2, Cards
B258	no time	It's not the question of money, it's about the time. Everything is free and everyone is ready to talk, so, that's the main problem. ... I think they are 8 hours earlier than us. I want to get to talk to them, it has to be after 5 o'clock in the afternoon, but that's just I start supper and bedtime for us... so my mother's obstacle is for 8.30 or 9 but by that time I am already in bed, putting my children in bed.	Anne, Int.1
B259	changed relationships	I think the relationship between me as parents and my children is the most important in the family. The relationship between my parents and me seems quite different now because I became an adult. I just accept their ways of lives and sometimes need to give up and understand some part of their relationship. Now, I have to concentrate on looking after my kids who really need me.	Hannah, Int.1
B260	unconditional love	The relationship between the grandparents and the grandchildren is very simple. Unconditional givers and unconditional takers.	Hannah, Int.1
B261	unconditional love	My parents and I have very different points of view for the kids. They want nothing from them. They sometimes want to accept everything of who they are, what they want. But I hope to make them having good characteristics, not spoiled.	Hannah, Int.1
B262	eating unconditional love	The mother in law is very concerned about Harry's eating habit, his english and his school life here in York and the father in law is anxious about Harry's lack of Korean life, such as attending Taekwondo [Korean martial art]. They are always talking about Harry, Harry, Harry. They seem both to cling on Harry.	Emma, Int.1
B263	unconditional love	The parents in law are always talking and thinking about Harry [grandchild] only.	Emma, Int.2, Diary
B264	phone hard for kids	The grandparent's thing is interesting. My mum often wants to talk to Jessica [6 years old] but Jessica doesn't want to talk. She can be silly. She is stuck on the silly conversation.	Betty, Int.1

Text Ref.	Open code	Sections of text	Informant
B265	balance between identity and sacrifice	I don't want to see the woman crying on the card, 'regret'. It seems too much sacrifice as a mother to me. That could be a burden on the family. If I give too much to my kids, then I could wish to take that much from them, because I am a human. Since I became a mother, I have thought of that. I don't want to be forced to sacrifice myself for them.	Hannah, Int.2, Cards
B266	identity	I don't want to lose myself just because of being a mother. It is important to identify myself and the relationship with my husband, and to think about the time when my kids go away from me.	Hannah, Int.2, Cards
B267	good model to my kids	I think it is very important to show my kids the good relationship between me and my husband with harmonious, reliable and hopeful way.	Hannah, Int.2, Cards
B268	changed relationships	I have liked my friends, not my mother, since I was a secondary school student.	Hannah, Int.2, Cards
B269	object with meaning	I took a photo of my ring, which will be my daughter's.	Jane, Int.2, Photos
B270	talking to men/father	My husband is good at analysing and criticising some political issues but he doesn't want to share it with me. He doesn't want to talk about that but I have to talk.	Emma, Int.2, Diary
B271	doing things together	What I like and what my daughters like are very different. I like physical exercise but they don't. When we went to Peak District, they didn't want to go to the top with me.	Tom, Int.2, Photos
B272	not an object-person	[She was asked about 'objects that are precious to you' in photo session.] I love my son and my husband and I am not keen on having an object.	Helen, Int.2, Photos
B273	cards Specific uses for specific media	With my sister, my sister and I have a very complicated relationship. If she's better [clearing her throat], we don't do well either on the phone or face to face. Usually, we do well exchanging post cards...holiday post cards, the most simple. Because, we don't like speak each other on the phone. And we don't like to see face to face much, to be honest. That's pity, but anyway there it is.	Anne, Int.1

Text Ref.	Open code	Sections of text	Informant
B274	talking to men/father expressing emotion	My father is good at expressing his affection to his grandchildren, such as 'I love you'. He doesn't need to talk to me when he can talk to his grandchildren.	Hannah, Int.1
B275	No time	An element of family life.... My husband goes to work very early and comes home very late when the kids are already in the bed. So it is hard to make time for the whole family to do anything. Except going shopping while Alice is in Korean school. Yes, shopping is very important. We need to go to Korean supermarket and Chinese one and Tesco or Morrisons. Sometimes we go Costco. So every weekend is usually spent for going shopping with the whole family.	Hannah, Int.2, Photos
B276	No time	The time difference was supposed to be the problem and we are so busy that it's hard to make time...and they are so busy, too. Actually my dad still does work but they go out to lots of cultural events and lecture figure, too. They go to opera, they go to their friends, they go to...	Anne, Int.1
B277	Specific places for specific things	My favorite part of my home is Alice's room which is warmer than other places. Her room can be filled with lots of sunshine through the window.	Hannah, Int.2, Photos
B278	specific places for specific things	The second place is here, part of the living room which is near the heater. I like talking with my friends here who are usually put their backs on the heater.	Hannah, Int.2, Photos
B279	things with special meanings	I took a photo of this dining table. When I cannot have a sleep, I come here to think of my daughter.	Jane, Int.2, Photos
B280	being a stranger	I often dream about members of my family. I would like to know how these relationships made me who I am. Because I do often dream about my parents and Tim in a strange and interesting way. They are always big presence in my subconscious. But I am not sure what exactly they are big part of who I am as my parents. I think [they are] less example to Tim. So it is curious to think about that.	Anne, Int.2, Cards
B281	obligation	I want to be a soul mate to my husband. Just like a very good friend without any authority, burden, or obligation.	Helen, Int.2, Cards

Appendix 4: The 37 axial codes with 118 quotes of probe study (summative results in Chapter 2)

Sharing the moment: a special event related to infants/children, with pride [A1]

"I was pleased to see when the baby [20months] said some new words. One day, the baby sitter told me that Benjamin understood the meaning of 'the same'. She asked him who was prettier between her two daughters. Benjamin said 'the same'. In the night, I asked Benjamin who was prettier between me and other girl on the photo. I was expecting to hear from the word 'same', but he said, 'mummy'. I was so happy and excited that I rang my husband and told him this story. He was so surprised and happy." [Helen Int.2, Diary] T1

"It was Joshua's first day of preschool. My husband asked me how he was there on the phone, so we had a long conversation about that. The very happy conversation was talking with my husband on Joshua's preschool experience. He was worried and anxious about his son's days at school. But luckily he settled down very quickly because his sister was watching him all the time." [Hannah Int.2, Diary] T2

Sharing the moment: Kid's laughter with happiness [A2]

"This picture is of Harry playing football with his friends. I want to show this picture to my husband, hopefully with Harry's shouts at his friends." [Emma, Int 2. Photos] T3

"My husband said he wants to hear the children's laughter every day." [Lucy Int 2, Diary probe] T4

Fun with doing things together [A3]

"With the card, 'Soul mate' [cards probe], I wish I could share more hobbies with my husband. We just watch TV and that's all, but I need to do more with my husband." [Hannah, Int.2, Cards] T5

"She was famous for her good written work. When I taught her to write, I put every bit of paper where she wrote or drew on onto the wall. Every space was covered with her papers like a white board full of texts. When she put some written work on the wall, then I put my paper reply next to hers. Sometimes her father joined to put his own work as well. It was really fun for everyone. When my friends came to see the papers on the wall, they were all enjoying reading them and laughing. It was a kind of joke, paper puzzle, or a riddle. There was an arrow on a paper for me to follow for the next paper. We had played to write like that since she was young." [Jane, Int.2] T6

"I've got her all diaries since she was a second year student in the primary school. She had been famous for writing a diary in the neighbourhood. Her stories of the diary are really funny but I just showed the cover of the diary to my friends. I liked to talk about my daughter's diary with them." [Jane, Int.1] T7

"We kiss each other very often on the sofa. Whenever I kiss my son, we have a simple quiz for fun, for instance, 'whose son?', 'mummy's son', 'whose love?', 'mummy's love', 'whose happiness?' 'daddy's happiness', 'whose blessing?', 'grandma's blessing'. Yes, we have a habit of making the meaningful jokes in our own way." [Lucy Int. 2, photos] T116.

Feeling happy from the bottom of your heart [A4]

"I found a letter in my husband's books and stuff accidentally. I could feel his very deep and sincere feelings about me and children by the letter. I think he was embarrassed to

give the letter to me so didn't give it to me and forgot. But when I read it again I feel very happy to see his own heart." [Helen Int.1] T8

"There is a communication media, called NateOn. If logged in, the character comes out from the window with a funny sound. If my husband clicks a button 'this is my heart', then a cartoon character called 'I love you' is coming to me. Well, I feel it is coming to me on the screen. We enjoyed expressing our emotions like this." [Helen Int.2, photos] T9

"They don't think the telephone is the best. Even if you are talking with someone, it's not always the best way. I know when Mike rang me the other day to see about ... see how I was and tell me he loves me. And I sent him a short text of thank you for your love, then he sent a text back of I always love you. It was really nice." [Betty Int.1] T10

Just the two of us: being together especially at reunion [A5]

"This is the photo of a pair of mugs I took [photo probe]. Even though my husband came here in Korea, there was little time just for us as a husband and a wife because he was always with his children. I really want to have a cup of coffee and have a chat with my husband face to face." [Lucy Int.2, photos] T11

"Thankfully, Benjamin was fast to sleep after the lunch. So my husband put him in a buggy and pushed it while we were taking a walk along the path on the mountain. We were very happy to have a long conversation." [Helen Int.2, happy journey] T12

"If we can make any time at any place, I really want to be with my husband, without the baby." [Helen Int.2, photos] T13

Seeing each other with easy to share photos [A6]

"For communicating with my daughter, can it [Pogo] be a video telephone to see her? I think I can talk to her while seeing her. I can carry this in my handbag and show my friends some photos of my granddaughter on it." [Jane, Int.1] T14

"When I said that we [she and her husband] are watching the photos all the time, my daughter bought this photo frame, which contains several photos being changed automatically on the frame." [Jane, Int.1] T15

"I am always busy and bothering to send a photo using computer. If this [Pogo probe] could be a digital album to store lots of photos, I would take photos of Benjamin whenever possible and then send them to my husband. I will tell him that 'While you were there, I was thinking of you like these photos with my feelings'." [Helen Int.2] T67

"I was happy to see dad while talking using a webcam. It is better than just talking with him." [Sam, Int.1] T16

Showing the sense of being in play for children [A7]

"If I can try to make a simple film of Benjamin and his father and show the film very often to Benjamin, he would be very happy to see his father playing with him with joy in the video." [Helen Int.1] T17

"In my case, Simon [2.5 years old] wants to see the movie on the whole family in the swimming pool. He can play the video in the camera by himself and he puts the camera next to his head on the pillow and watches it so many times until he falls asleep every night. He wants to go swimming with his sisters but he is too young for that. But, he has learnt the image of swimming pool watching the video. He loves it so much." [Helen' friend Int.1] T18

Sense of presence as reassurance by seeing each other [A8]

“It seems like consideration for each other as a wife or a husband. I felt sorry for my husband being alone there but we could see and talk each other so I feel like being with him at the same place even though I cannot feel touching him. [Emma, Int.1] T19

“I was very worried about Benjamin. He couldn't have enough time to get to know his father. So I showed him his father's photo almost every day. The problem was Benjamin thought every man in a photo was his father. When my husband came here with us, he was shocked at the problem. We were all in an elevator and my husband was holding Benjamin with his arms. He asked where daddy was and Benjamin pointed at the picture on the wall with his finger and said 'Daddy, daddy'.” [Helen Int.1] T20

Reassurance with regard to intergenerational obligations [A9]

"My mum rang me [from Korea] about her bad dream. She was worried about everything about our daily life [here in England]. She asked if anyone is not well or my husband was away on business. I told her that children had caught a bad cold, but now they are now ok." [Hannah, Int.2, Diary] T21

"I feel sorry for my parents when my children refuse to talk with their grandparents on the phone, even though I threaten them" [Tom, Int.1] T22

"... especially, my father always tells me to show their [the grand parents'] pictures to my children as often as possible, not to forget them. He always asks me to do so to make sure his grandchildren remember him, until when the whole family will meet at the airport." [Hannah, Int.1] T23

“When thing's going well, there is supposed we sort of express much happiness. Things like, well, everyone's fine? yes, William's party, William' swimming lesson's well? yes, William do really well? Yes, baby do really well? Yes....that's about it....”[Anne, Int. 1] T24

“We [she and her mother] used to have a long conversation when she's not with it, with usually some problem. I wanted her, you know, advice from her, really, sometimes advice, sometimes more support. But, yes, when thing's going well, there is supposed we sort of express much happiness. Things like, well, everyone's fine? yes, Dani's party, Dani' swimming lesson's well? yes, Dani do really well? Yes, baby do really well? Yes....that's about it.... I think, actually we communicate sort of more negative... worry... to make sure that every thing's ok, that's fine.” [Anne, Int. 1] T25

"[She moved]... and she [Anne's mother in the USA] wants to reassure herself, because they moved for her. So, she feels probably guilty, she left her own children behind in England, and her grandchildren." [Anne, Int.1] T26

“My mother always told me what a wonderful time they're having in California, so when she was made appointed, telling me, every time she rang me, how they both loved California... Technically, she was... every single time she phoned me, she would say, we've both had such a fantastic, marvellous time. My thought, that's a bit of vicious by thought, what probably means that she is over defensive, you know, when people transform things very much, it is dealt to mean the opposite is true... She wouldn't tell me there is no problem. She always tells me a good story only. She tells me everything's going well... I think she's reassured me, probably things about ... I am upset about... ” [Anne, Int. 1] T27

“I feel sorry if my children don't want to talk with my father on the phone.” [Hannah, Int.1] T28

Reassurance and obligation being at a distance with concern [A10]

“My father is suffering from diabetes, so I ask him to see if he takes medicines, drinks alcohol, or goes to surgery. He listens to me only, so I need to ring and ask him.” [Emma, Int.2, Diary] T29

“I ring my parents more often as a kind of obligation because they are very old now. I think I have to at least ring them more. I didn't ring them so often in Korea.” [Tom, Int.1] T30

Reassurance, equal opportunity for expression [A11]

“On Sundays, the son in law, James rings me and says hello with some chat and then passes the phone to my daughter Laura to talk with me. They ring James's family, too. In that case, Laura rings them first and then passes the phone to James. They made a rule like that as equal. Giving a present, making a phone call and everything should be equal between them. I like it.” [Jane, Int.1.] T31

Reminding of the importance of family: by object with meaning [A12]

“This name on the wallet was written by Harry. When I think of the family, Harry could be the flower and the core of the family. His name has a special meaning, given by his grandparents so I took a photo of the name [photo probe], rather than my son, Harry.” [Emma, Int.2, Photos] T32

“I like the pen ... from Korea. We like that. I used to having it with a camera on the table. ... it was nice... I took it everywhere.” [Betty, Int.2, Photos] T118

Reassurance and instructions with nagging [A13]

“I tell my husband about Harry's school things and ask him to stop Harry buying expensive cards, to persuade him to take a shower more often and something like that.” [Emma, Int.2, Diary] T33

Keeping a record to feel comfort from the media [A14]

"If only with a kind of conversation with someone, it disappears afterwards. ... I keep answer machine messages. ... I saved it for a year ... when I felt lonely, I just pressed the button. I can hear people say hi, Betty, it's me ... It's truly nice. I used to keep. I've got a friend in Australia, she's left me an answering message and I just used to keep it. I just want her voice." [Betty Int.1] T34

"Nowadays, I can get email once or twice but before the marriage, Laura [daughter in the UK] emailed me very often. So my husband printed them out with photos to make a book, which would be her special present for the marriage. We have enjoyed seeing these letters and photos." [Jane Int.1] T35

Comfort and consolation from yearning by seeing each other [A15]

"My husband seems quite relieved from missing us since using the webcam. He doesn't want to be alone on Saturday nights. It is too long for him to be alone. I feel to be at the same space by seeing him on the computer while he leaves Skype on and watches TV or wanders around. I feel free from restraint." [Emma, Int.1] T36

“Since using Skype, I don't feel too difficult to communicate with my family. I was so interested and curious about seeing each other through the webcam when we started to install that several days ago. I think I feel more comfortable psychologically when seeing each other, rather than just talking.” [Emma, Int.1] T37

“I [10 years old in the UK] was happy to see my dad [in South Korea] while talking using a webcam. It is better than just talking with him.” [Sam, Int.1] T38

Comfort and consolation from yearning by an object with meaning [A16]

"The watch could be the one, my wife bought me when I went on a business to the USA for the first time. I didn't wear it. I didn't need it because it's quite expensive and the mobile phone told me the time in Korea. But here I am wearing it most of the time, even at night. It is very practical to see the time. It reminds me of my wife." [Tom, Int.2, Photos] T39

“This shoe rack reminds me of my husband who came here and made it for us [her and her son].” [Emma, Int. 2. Photos] T40

“This is the picture of muffins Harry baked for me. I couldn't have enough time to be with my son in Korea but now I am happy to have this kind of experience with my son here. I wanted to show this to my husband. If he came here, he would be happy to eat together. It reminds me of my husband.” [Emma, Int.2, Photos] T41

“I took a photo of this dining table [for the photo probe]. When I cannot have a sleep, I come here to think of my daughter [in the UK].” [Jane, Int 2. Photos] T42

“I like the pen ... from Korea. We like that. I used to having it with a camera on the table. ... It was nice... I took it everywhere.” [Betty, Int.2, Photos] T118

Talking to men/father/grandfather [A17]

“My father is good at expressing his affection to his grandchildren, such as 'I love you'. He doesn't need to talk to me if he can talk to his grandchildren.” [Hannah, Int.1] T43

“When my husband came here, I needed to talk about all things over the night. I had to talk. But my husband was just happy to see me and Benjamin and that's all. I said he didn't need to come if he just wanted to see me, and not to talk. Well, we are just compromising for us all. We are trying to do the best for each other.” [Helen Int.1] T44

“My father doesn't talk so much, just for 1 minute or so. He is suffering from diabetes so we just talk about the hospital, the medicines and something like that.” [Emma, Int.1.] T45

“My husband doesn't enjoy talking with me. He says a very simple answer. I say five things, and then he says just one.” [Emma, Int.2, Diary] T46

“My husband doesn't like talking on the phone. He even doesn't want me to talk on the phone with others for so long. He thinks the telephone conversation could reveal his privacy.” [Hannah, Int. 1] T47

“My brother didn't tell the parents about his honeymoon and other things about the wedding. He is a man of few words. So I needed to tell them about his schedule.” [Hannah, Int.2, Diary] T48

“While I feel very comfortable talking on the phone with my mother, I don't feel that comfortable talking on the phone with my father. Probably it is because of him.” [Anne, Int.1.] T49

Unconditional love for grandchildren [A18]

“The relationship between the grandparents and the grandchildren is very simple. Unconditional givers and unconditional takers.... Sometimes they ring me several times a week. When my children are busy eating, talking with friends, or preparing to go out, not being able to talk, they ring on the very next day to hear their grandchildren's voice.” [Hannah, Int.1] T50

“My parents and I have very different points of view for children. They want nothing from them. They sometimes want to accept everything of who they are, what they want. But I hope to make them having good characteristics, not spoiled.” [Hannah, Int.1] T51

“The parents in law are always talking and thinking about Harry [grandchild] only.” [Emma, Int.2, Diary] T52

“His mother [her husband's mother in Israel] would like to see her grandchildren. She is really keen on her family. She's close to lots of her family in Israel. She always says oh, visit... we should visit Israel...and we never visit it.” [Anne, Int.1] T53

Direct channel between grandparents and grandchildren [A19]

“The conversation is usually about my children. My mother is quite content with talking with me on the phone, whereas my father needs to talk with my children directly.” [Hannah, Int.1] T54

“Occasionally, they [her parents] write a letter to William [6 years]. ... They do write hand written letters. William's, my parents say, doing hand written letters. ... William writes a letter to them, and then they write a letter to him. I think they do that maybe, once a month, or something like that, or once every two month.” [Anne, Int. 1] T55

“I hope my children would be talking with their grandparents more kindly on the phone.” [Tom, Int.1] T55

“The grandparent's thing is interesting. My mum often wants to talk to Jessica [6 years old] but Jessica doesn't want to talk. She can be silly. She is stuck on the silly conversation.” [Betty Int.1] T56

Sharing emotions [A20]

“This one is ‘Can you feel me?’ [cards probe]. I wish Tim [her husband] and I could feel each other's emotion more. We are very different people. Tim has very different knowing, thinking, the way we communicate and we often ... he often understands what I mean. We just express ourselves in very different ways. So at least there are some misunderstandings. And often we don't have much time with each other. So that will also make it harder. It is easy misinterpreting.” [Anne Int.2, Cards] T57

No news is good news [A21]

"I think ‘honesty’ is best for the relationship. Sometimes my husband doesn't want to say something. He didn't want me to worry about that. But I feel there is something wrong, and feel very stressed. So I hope he tells me about everything." [Helen Int.2, Cards] T58

Parents are wishing all their love for children? [A22]

“I chose this card ‘Angel over me’ [cards probe]. I just want to be an angel. I wish I could protect my children from bad experiences. Because when William starts school, things like that, you wish that all the other children would like him and be nice to him. How friends and.. Nobody would say nasty things to him. And I hope he will succeed in his faith he

wants to succeed in, and he won't feel disappointed by other faith. So I only want him to have, you know, that's out of my control all of that. I can't tell him with that as a parent. But I wish to be a parent with all those things, you know, he will always have a happy time. But obviously he can't do that, really." [Anne Int.2, cards] T59

"We [she and her husband] have always said to my daughter that do what she wants, do what she likes, and do with the way of what she thinks. I tried to give her every opportunity but also her own responsibility. I believe she lives her life very well with happiness." [Jane, Int.1] T60

"This card, "Aura of Love" [cards probe], reminds me of my daughter and her husband who would love each other forever." [Jane, Int. 2, Cards] T61

Establishing and maintaining identity: the balance between one's own identity and sacrifice as a mother [A23]

"I don't want to see the woman crying on the card, 'Regret' [cards probe]. It seems too much sacrifice as a mother to me. That could be a burden on the family. If I give too much to my children, then I could wish to take that much from them, because I am a human. Since I became a mother, I have thought of that. I don't want to be forced to sacrifice myself for them." [Hannah, Int.2, Cards] T62

"I don't want to lose myself just because of being a mother. It is important to identify myself and the relationship with my husband, and to think about the time when my children go away from me." [Hannah, Int.2, Cards] T63

"'New Direction' [cards probe]... I am not sure that I'm doing with my life at the moment. My daughter is now in school and I don't work. I have been looking after her full time. I feel nervous and despondent sometimes. I had wanted another child, but not sure that will happen. Now I'm 43. I have no idea what else to pursue for work or study I interest. But the picture conveys an element of hope and that things will work out. I believe so. It is actually upbeat. The word of new direction, I think, was partly still kind of a hope and belief in something. Something will eventually happen although I am feeling like...." [Betty Int.2, Cards] T64

Establishing and maintaining identity: being a good model of parents to children [A24]

"I think it is very important to show children the good relationship between me and my husband with harmonious, reliable and hopeful way." [Hannah, Int.2, Cards] T65

Establishing and maintaining identity: being a good father to children [A25]

"...my husband was so proud of himself to push the buggy. He felt like a good father of his son and a good husband of me. He said to me that he was very very happy." [Helen Int 2, happy journey] T66

Establishing and maintaining identity: the presence of father [A26]

"When my husband came here, Benjamin [9 months old] felt very upset about being with his father. He is still a baby. So I show the photo of my husband and tell Benjamin he is your daddy, say hello and kiss him. Even though there is a kind of side effect, I am still telling him who daddy is and encouraging him to say hello and something like that. I think it is very important to tell him the presence of his daddy." [Helen Int.1] T67

Establishing and maintaining identity: Looking back, seeing the present [A27]

“There is one picture upstairs. It is African embroidery. I like that one. I like it. ... It's like a mother and her child. ... Sometimes I just feel like walking away from it all. But sometimes I was quite happy to look at it in the little room. Sometimes I forget what I've got. ... When I was younger, like when I moved a house as a student, everything was put in a trunk. Then I reopen the trunk and I saw, "Oh!" I feel really surprised. I've completely forgotten that. ... something happens in my brain, I was completely different. I've never done it. I've never been to Hong Kong. I've never worked in Chile, never travelled the world. I completely forget. It's really weird, and annoying, but it happens.” [Betty Int.2, Photos] T68

“The monastery, I think the icon of monastery, I used to work there. It was Chile and Chile I like. I mean there were a lot of pictures in there, hallway. It reminds me uplifting. In Chile I used to walk along this road. ... Literally my house was on the very edge of Santiago. ... Fields and mountains were covered in snow. That was Chile picture. I love Chile.” [Betty Int.2, Photos] T69

General progressive reduction of contact [A28]

“I rang my mum daily when she was in Oxford almost daily when we worked together. Also we don't work together now but I used to have to ring her about lots of her business but now though....we just ring to find out which there are ...now... ” [Anne Int.1] T70

“I used to ...when things go badly, I want to ring my mother and get some more support, you know. So I tend to ring her, you know. But, I don't ring her that much than at that time, but I used to, we used to have a long conversation when she's not with it, with usually some problem. I wanted her... you know, advice from her, really, sometimes advice, sometimes more support.” [Anne Int.1] T71

“The topic of the conversation on the phone is usually to see if how I am and how they are. I am quite talkative as a friend but these days I try not to say too much, because they are busy with a baby.” [Jane Int.1] T72

“Before she got marriage, we talked about half an hour but now it takes about 10 minutes. Now, I need to have a regard for her feelings on the phone. I don't want to make the baby awake, and she is busy as a lecturer, a wife and a mother.” [Jane Int.1] T73

Frustration and eagerness of talking with children/infants [A29]

"One day Benjamin was busy saying 'daddy, daddy, daddy...' on the phone when he was so excited to hear from his father. But after that Benjamin was just listening to his dad, not talking to him. So my husband was trying to ask to say 'daddy' once more in very many ways, but ... yes, he is eager to hear his son's voice." [Helen Int.1] T74

From frustration and loneliness to adaptation [A30]

“It was really hard for me not to be able to talk with my husband face to face. He was so generous to listen to me all the time but since he's gone, I couldn't control my pent-up feelings and frustration. So when he came here first I said to him that I was so serious. I exaggerated my worry about being separated or something like that. He was shocked and said if so he would stop working there. I said 'I didn't mean it but just try to do something more'. Since then he tried to ring me more often so I just tried to adapt myself to this circumstances.” [Helen Int.1] T75

“There is no facial expression, no gesture. It is hard to explain everything about my feeling or daily things to my husband on the phone especially I was not well with Benjamin. So I had to select something important to talk about and then quit the phone.” [Helen Int.1] T76

Little room and little time to give comfort each other [A31]

“One day, my husband looked a bit depressed with some stress. His tone with the voice was so low. I asked what happened and he said the work was not easy, under his control. I just wanted to give a gentle hug to him but it was impossible. Even though I was talking on the phone, there was a limit of time and the way of expressing my feeling. He was talking on the way home but I was in my office. It's very inconvenient to talk. I wanted to say that I was thinking of him very much but sometimes it's not easy.” [Helen Int.2, Diary] T77

“When you have two young children, you have very little time with your husband. So we don't have much time to talk.” [Anne Int.2, Cards] T78

“It's not the question of money, it's about the time. Everything is free and everyone is ready to talk, so, that's the main problem. ... I think they are 8 hours earlier than us. I want to get to talk to them, it has to be after 5 o'clock in the afternoon, but that's just I start supper and bedtime for us... so my mother's obstacle is for 8.30 or 9 but by that time I am already in bed, putting my children in bed.” [Anne Int.1] T79

“Sometimes it is really nice to talk to somebody, but it's not always convenient. If you have a young child, it's hard to concentrate.” [Betty Int.1] T80

No time to deal with photos [A32]

“When I was studying in Australia, my husband often put some photos of Benjamin on the Cyworld for me to look at. But now I couldn't do that. I feel very annoying. I know it is not so difficult to do that but I am always busy working and looking after Benjamin. I don't want to spend the time for putting the photos or something like that.” [Helen, Int.1] T81

“Even using laptop, it is still cumbersome. My digital camera is always accumulated by lots of photos but not to be sent to the computer.” [Helen Int.2] T82

“I think digital camera is actually disadvantaged. You just take too many photos and then you don't bother to plan for reason of good one and you don't bother to print any of them out. So you end up nothing.” [Anne Int.1] T83

“We couldn't take photos of Stonehenge [at the journey]. Whenever we want to take photos, the camera battery has gone already.” [Hannah, Int.2, Happy journey] T84

“We are so lazy that photos in the digital camera are not to be sent to the computer. I just leave the camera being able to be taken until the memory is full, so we cannot often take photos at very important times.” [Tom, Int.2, Photos] T85

Arguing and reconciling [A33]

“I [in South Korea] was cross with Laura [daughter in the UK] the other day. Maybe it was the first time I had a bad conversation with my daughter. She didn't answer my phone several times and I became worried more. So I had to keep ringing more often but she still didn't answer me. One day, unexpectedly, she picked up the phone and said to me 'Why?' with a very annoying voice. I was heartbreaking to hear her tone rather than her excuse. So I said that I would not ring her any more. ... Laura rang me soon after the bad conversion, and asked me "Are you upset?". She said Hanna [her daughter, 10 months old] was crying and hard to be settled down for a while so she's got upset and exhausted. Laura said sorry for letting me annoyed. I had to say sorry for that.” [Jane, Int.1] T86

“The day before that my birthday, wedding anniversary party which they attended, the house was very messy due to two weeks of illness for me and Nina, 6 year old. They had called round to the home before the party at restaurant. Mum mentioned the state of the house and gave me a pep talk re cleaning, tidying and keeping on top of things etc. I felt very petrified and insulted re how the house would work by Christmas and their coming to stay. She said, "Oh, they won't look like by the Christmas." They give me some credit. You know, I will make it tight for Christmas. Piss me off!!! I don't want to speak to her again. I felt much wound up after the call and irritated. Even rest of the week, we didn't eat. Without feeling quite low anyway, I didn't want to hear it. The day after the party I was exhausted. I didn't want to have the party. I was so low. If I could have cancelled it, I would cancel it. I already rearranged it once and I didn't want to have the party. So I was very upset and unmotivated. ... Mum rang to see if I was ok. I hadn't spoken to her since the 1st of the 12, after the bad conversation. We normally speak on Mondays, Thursdays and weekends. She asked if she had made upset me, and apologized and offered to help to clean and tidy the house when she comes here next week. She blamed father. Actually, father was really difficult. ... Even though it was quite special, maybe I felt better, but still stressed. I should have but it was beginning for me. It wasn't very special. It was beginning for me to feel a bit better. I still didn't feel great but felt glad that she apologized and she recognized that she had upset me and she took responsibility for that. She's never apologized. She recognized that the conversation had been really bad timing.” [Betty Int.2, Diary] T87

Specific uses for specific media [A34]

“Tim [her husband] likes email, because it's impersonal, so rather than rings anybody like even to his friends or poor shop or anything, he would prefer email.” [Anne Int.1] T88

“Tim [her husband] particularly doesn't like remote communication at all. He never answers the phone. He hates the phone. I prefer talking on the phone because I found Skype thing's distracting. I am totally mobile phone phobia. Email...I just use email.” [Anne, Int.1] T89

“I actually like text thing best. Young children can't do, they can't write, they can't read. But the immediacy of, you know, drawing I like that idea [HomeNote]. But on telephone, I don't know. I don't always want to talk. I like text messages. I like text messages.” [Betty Int.1] T90

“I used to emailing and using blog in Korea. But email is usually used for specific information. When some information cannot be delivered by telephone, we use email for that, such as passport numbers, or important documents.” [Tom, Int.1] T91

“About email from my husband, I don't feel any emotion from it. It is the same for me to read many emails from others officially or just ordinarily.” [Helen Int.2, photos] T92

“I just leave Skype on for about 10 to 20 minutes on weekdays. It's free. The camera is still on. Even though we don't talk, we can see everything... We usually leave Skype on for about 2 to 3 hours on Saturdays.” [Emma, Int.1] T93

“Using messenger is usually for my friends, and Cyworld is used for the friends I've met here.” [Emma, Int.1] T94

“He [her husband] has cyber things, he's got facebook. ... he communicates not with his parents, just with his friends. Whatever calls it, he counts it and whatever.” [Anne Int.1] T95

“Using SMS is different from face to face communication. My daughter wants to contact with her friends in Seoul but just talking on the phone seems quite different from talking face to face. The time difference could be a big problem too. When she could SMS with her friend in Korea, she was really happy and excited, but it seems not easy for her to contact with her friends generally.” [Tom, Int.1] T96

“He [William 6 years old] won't do on the phone. He hates talking to them [grandparents].... he won't talk on the phone, but he will do on Skype as he can see them and they can see him. It must be very important to him or he thinks it's more fun. The whole thing is more fun. It appears that something which is a bit fun. I don't think which involves visual image of my parents and real time so he wants the whole thing to be going on real time and they are there... their faces... images are terrible. They look awful on the screen. I don't want they are supplying that. ... He prefers it [Skype] to the phone which doesn't find it funny at all in my medium.” [Anne, Int.1] T97

“I found a letter in my husband's books and stuff accidentally. I could feel his very deep and sincere feelings about me and children by the letter. I think he was embarrassed to give the letter to me so didn't give it to me and forgot. But when I read it again I feel very happy to see his warmest heart.” [Helen, Int.1] T8

“There is a communication media, called NateOn. If logged in, the character comes out from the window with a funny sound. If my husband clicks a button 'this is my heart', then a cartoon character called 'I love you' is coming to me. Well, I feel it is coming to me on the screen. We enjoyed expressing our emotions like this.” [Helen Int.2, photos] T9

“They don't think the telephone is the best. Even if you are talking with someone, it's not always the best way. I know when Mike rang me the other day to see about ... see how I was and tell me he loves me. And I sent him a short text of thank you for your love, then he sent a text back of I always love you. It was really nice.” [Betty Int.1] T10

“With my sister, my sister and I have a very complicated relationship. If she's better [clearing her throat], we don't do well either on the phone or face to face. Usually, we do well exchange post cards...holiday post cards, the most simple. Because, we don't like speak each other on the phone. And we don't like to see face to face much, to be honest. That's pity, but anyway there it is.” [Anne, Int.1] T98

“Occasionally, they [her parents] write letter to William [6 years]. I didn't say that. They do write hand written letters. William's, my parents say, doing hand written letters. ... William writes letter to them, and then they write letter to him. I think they do that maybe, once a month, or something like that, or once every two month.” [Anne, Int.1] T99

“In my case, John (2.5 years) wants to see the movie of the whole family in the swimming pool. He can play the video with the camera by himself and he puts the camera next to his head on the pillow and watches it so many times until he falls asleep every night. He wants to go swimming with his sisters but he is too young for that. But, he has learnt the image of swimming in a pool watching the video. He loves it so much.” [Helen Int.1] T100

“I am always busy and bothering to send a photo using computer. If this [Pogo probe] could be a digital album to store lots of photos, I would take photos of Benjamin whenever possible and then send them to my husband. I will tell him that 'While you were there, I was thinking of you like these photos with my feelings'.” [Helen Int.2] T117

Media depending on cost [A35]

“I just leave Skype on for about 10 to 20 minutes on weekdays. It's free. The camera is still on. Even though we [she and her husband] don't talk, we can see everything. We usually leave Skype on for about 2 to 3 hours on Saturdays.” [Emma, Int.1] T101

“It's not the question of money, it's about the time. Everything is free and everyone is ready to talk, so, that's the main problem. ... I think they are 8 hours earlier than us. I want to get to talk to them, it has to be after 5 o'clock in the afternoon, but that's just I start supper and bedtime for us... so my mother's obstacle is for 8.30 or 9 but by that time I am already in bed, putting my children in bed.” [Anne Int.1] T102

“I buy a phone card, which is paid about £50 for 600 minutes talk. Before my daughter got married, I rang her every day. After that, I ring her once or twice and she rings me once a week, so I talk with her at least twice a week on the phone.” [Jane, Int.1] T103

“I contact with my husband everyday using Skype with webcam. He bought a Netbook just for the network communication with about £250. He uses it every day.” [Emma, Int.1] T104

“Skype can be used when computer is on with network, but LG myphone can be used with network. It doesn't need computer. It is easy to use and very cheap with just about 1 pound a month and free for the same system users.” [Tom, Int.1] T105

“It made me the cost, isn't it? If you want to talk for a long time, the cost is international cost.” [Anne, Int.1] T106

Using a webcam [A36]

“Since using Skype, I don't feel too difficult to communicate with my family. I was so interested and curious about seeing each other through the webcam when we started to install that several days ago. I think I feel more comfortable psychologically when seeing each other, rather than just talking.” [Emma, Int.1] T107

“I don't like talking on Skype because there is a time lag between what you say when they hear it. I think it a kind of system but you say something and then they wait for seconds and then they reply ... but we already start to say the next thing so often with William and my parents, they are often a bit at crossed purposes because William says...my mum asks something and then he replies something quite slowly but she already asks next thing... so sort of thing is not a proper conversation, but anyway they enjoy it.” [Anne Int.1] T108

“... to me the visual image isn't important at all... You know, suppose I have Mrs' nephews or friends of children or things like that. I would want to see them, yes, but not my parents because I don't want to see them older, actually.” [Anne Int 1.] T109

“I don't care about using webcam but my children can be very curious and interested.” [Tom, Int 1.] T110

“If we [her family in the UK] can see them [her parents in SK] through the web camera and they can see us, they must be very happy and my children can be curious and excited. But I feel a bit reluctant to do that. I think I need to clean my house and make my children smart for that, but it's difficult to keep the place clean with two children. I could feel a bit nervous and irritated.” [Hannah, Int.1] T111

“About the web camera, I don't want to show my face and my own place with my baby. It is really messy all the time. Yes, I can feel embarrassed.” [Helen, Int.1] T112

Who sees what: level of privacy using media [A37]

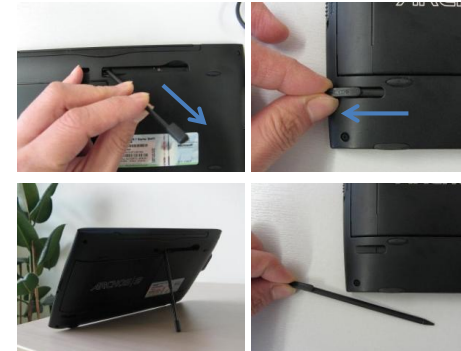
“It is sometimes not easy to do that [using Cyworld] and the photos are not for the family only. My friends can see some of them and I need to decide whether some photos are acceptable for the public or something like that.” [Hannah, Int.1] T113


“Do you have to.... do their information get put theirinvoluntarily or do you have to put in? I mean, someone might not want their own way to know when they.... (Ben screaming). You don't want to be tracked by something. Maybe a prisoner with a tag or something.” [Anne, Int.1] T114

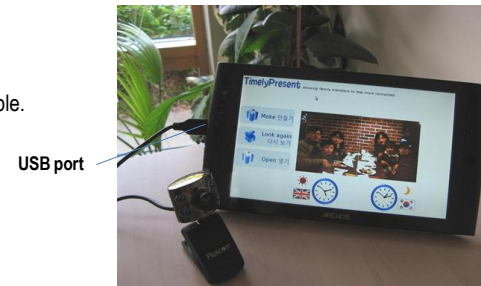
“My daughter could like to use WhereAbouts Clock to ring me on where I am often. But I don't need it. Men do not want to be violated their privacy.” [Tom, Int.1] T115

Appendix 5: “First things” Instructions for setting up TimelyPresent (see Chapter 4)

- a** Open the black box and get out the ARCHOS.
- b** Find the ‘Leg stand’ and pull it out from the knob to lengthen to stand it up and get out the ‘Stylus’ hidden on the bottom corner on the back of the ARCHOS.



- c** Connect the supplied power cable to the ARCHOS Power connector (bottom left part of the device) and to a wall outlet. The battery starts charging (the second blue light comes on).
- e** There are two cameras. One is built-in and the other is a separate USB camera which will widen the choice available. Connect the camera cable to the USB port on the left centre part of the device. There is no need to install it. When doing so, match the symbol  on the lid and on the back of the device. Try to connect the other way round.



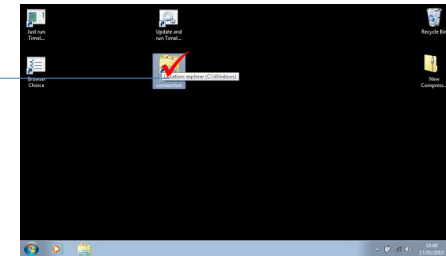
- d** Turn the ARCHOS on by pressing and holding the Power button for 3 seconds. There are three indicators on the left side of the device. (When the power is connected, the top light comes on. Wait for little nice tunes, this may take a while.) Eventually the screen will look like this.



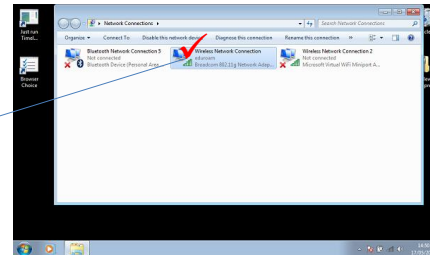
Connecting to the internet:

WiFi connection. Make sure you know your WiFi network's name as well as its security key.

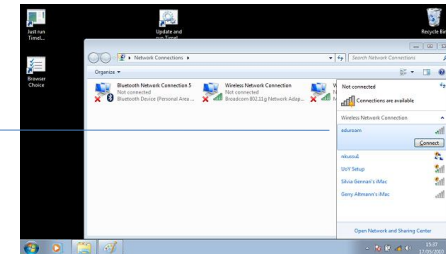
- a** For the connection, touch the icon, 'Network connection' twice quickly and sharply (two touch) using your finger or the Stylus pen.



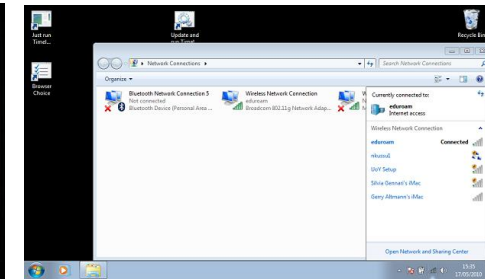
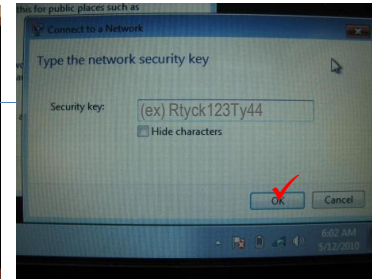
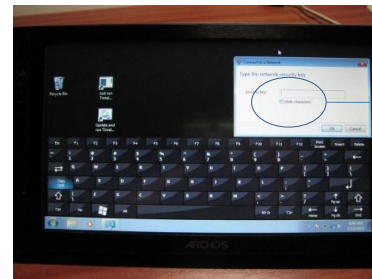
- b** Window will appear like this. Two touch 'Wireless Network Connection'.



- c** You will see all the WiFi networks detected by the ARCHOS. Select your WiFi network, and click on 'Connect'.

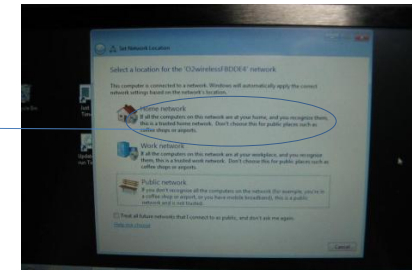


- d** If your network has password protected, you will need to type the security key which can be found in the documentation that came with your modem. For typing your network key, press the 'Keyboard' button and type them with the 'Stylus' pen hidden on the back of the device. Then click on 'OK'.



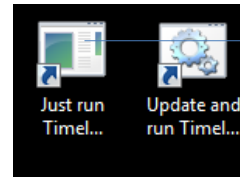
- e** A window will appear to select a location for the network. Select 'Home network' and touch 'close' button.

If you are having trouble with this, please contact Hyesook (hsk.kim@gmail.com, +44 772 999 8932)



Starting up TimelyPresent:

There is an icon, called 'Just run TimelyPresent' on the top, left of the screen. Touch it twice quickly and sharply using your finger or the stylus pen.



Eventually the screen of TimelyPresent will look like this. You will see your own family photo(s).




For more details, please see 'the instructions of TimelyPresent', which was provided together with this instructions.

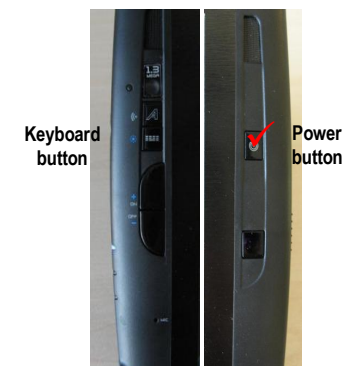
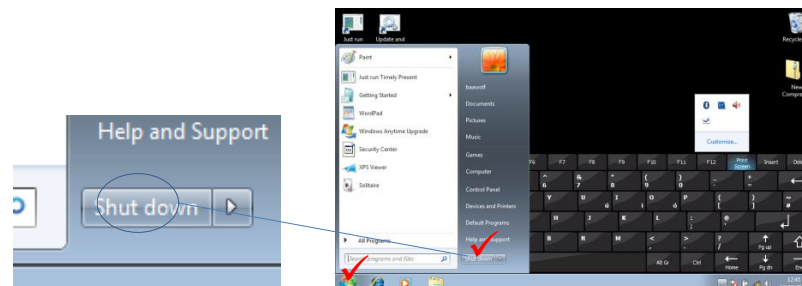
Switch off TimelyPresent:

There is no need to ever switch off TimelyPresent. If you have to turn it off, do the following.

- a When you have to turn off the TimelyPresent, touch 'the top, right corner' of the first screen. Then an 'Exit' button appears on the bottom left part of the screen. Touch it, then TimelyPresent stops.

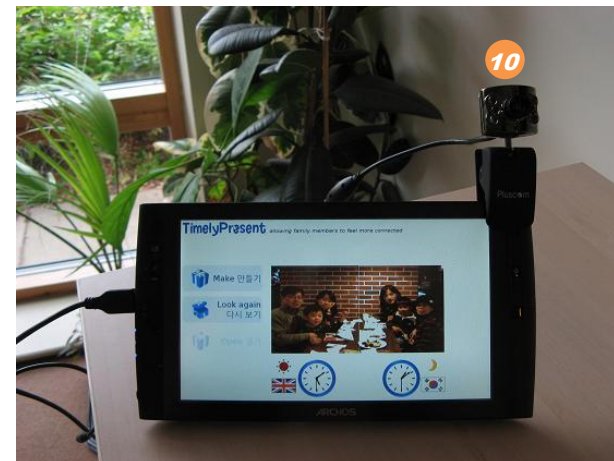
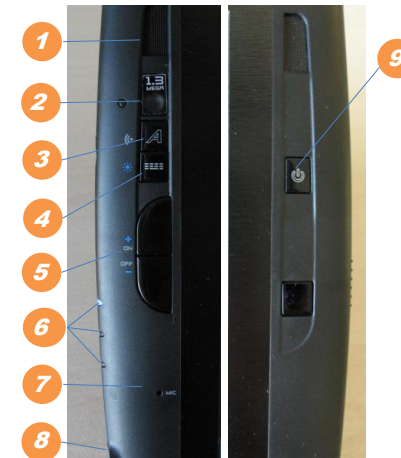


- b When you have to turn off the ARCHOS device, touch the button  (on the left, bottom side of the screen), and then window coming up. Touch 'Shut down' button. Or press and hold the "Power" button on the right side of the device.



Archos 9 Description:

- 1 Loudspeaker
- 2 Webcam: the LED indicator next to it turns on when the webcam is on.
- 3 "A" button: Press this button once is equivalent of pressing "Ctrl+Art+Del" on a regular keyboard. Hold this button and press the Mouse buttons to activate or deactivate the WiFi and Bluetooth connections.
- 4 Keyboard: Press once: display/hide the virtual keyboard.
- 5 Mouse buttons: the top one acts as a mouse's left button, the bottom one acts as a mouse's right button.
- 6 Indicators: 1. Power: turns on when the device is on. Blinks when the device is standby.
2. Charging: Light on - battery charging / blinking – battery charged
3. Hard drive indicator: blinking when the hard drive is active (playing /transferring files)
- 7 Built-in microphone
- 8 Power connector: to connect the supplied power cable
- 9 Power Button: press once to turn the device on.
In the event that the device cannot be shutdown via the Start menu > Shutdown item (at the bottom left of the screen), you can press and hold the Power button until the ARCHOS shuts down.
- 10 USB camera: it is connected to the USB port which will give you more opportunities to show around you and your home. USB camera has a very high resolution and it can see in the dark.



Appendix 6: User manual for TimelyPresent (see Chapter 4)

TimelyPresent is designed for family members to feel more connected by allowing you to make presents and send them to your loved ones. The present made on your TimelyPresent at your local time (in the UK) will arrive at your loved ones' Timely Present at the same time of day that you send it. (e.g., if you send it at 9.00am in the UK it will arrive at 9.00am at Korean time). We hope all your family members could feel that they are living at the same time zone.

There are 3 things you can do.
Whenever you want to go back to the first screen, touch 'TimelyPresent'.

1 See a new present you have been sent. Touch



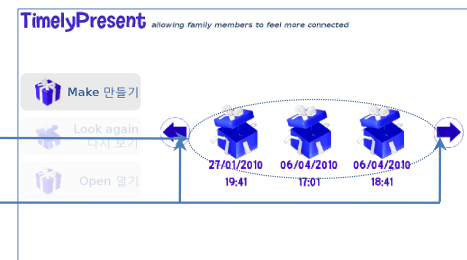
2 See present you have already looked before. Touch



2a This screen allows you to look the presents again.

To look, touch one of the presents arranged

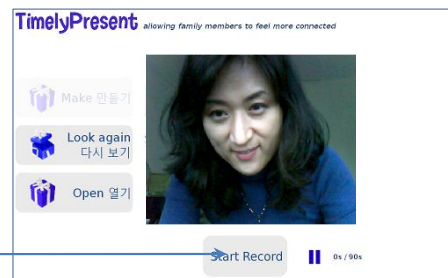
To navigate, touch one of the arrows



3 Make and send a present. Touch



3a This screen shows *TimelyPresent* is ready to record a present to start touch.



3b This screen shows *TimelyPresent* is recording. Touch when finished.



Present can be up to 90 seconds long

3c This screen allows you to preview and send your present.

To preview, touch.

To send, touch.

To delete, touch.



Appendix 7: Results of cooperative evaluation with Christine and Nancy alongside comments given by Rio and Joshua (see Chapter 4)

T1. The first experience of the first screen

Comments: It seems too complicated. The picture and other things on the screen should be arranged in a simple way. They look so amateurish. They are badly scattered (Christine). It seems unprofessional (Nancy). It is so crude and not attractive to play with, and the meaning is not immediately clear from the pictures (Rio). It is... quite... great.... (Sarcastically). When you concentrate on the contents, the graphics are not so important, but graphics can help with concentrating on the contents. There is no delineation of feeling (Joshua).

Flags: The flags are too big. Everyone knows the UK and South Korea (Christine). They should not be so big (Nancy).

Sun/Moon: The sun and the moon do not need to be up (above the family photo) there (Christine). I think the globe with bright daytime one side and dark night time on the other could be better (Rio).

Clocks: Are the clocks really working? Why not make the sun and the moon smaller and put them into the clock? (Christine) I didn't know the clocks are working. If a second hand is provided, it could show the clock working. What about a digital clock? (Nancy)

Family photos: Why two photos? They don't need to be separated. Why don't you put one very big picture of the family? They will go back to Korea at last (Christine). The family photo apart looks like a family divorced (Rio).

Icons: It is difficult to understand what the icons are for (Christine). The three icons should become smaller with just a few words to clearly show the meanings (Nancy). The box button colour is identical to the clock colour so it is confusing. Highlight the buttons and remove any boxes to avoid confusion. Too busy on the left half. Give more space around the buttons (Rio). Although icons were designed very nicely, they could not be fully understood by the user. Actually, it is almost 10% but... the fonts should be changed first (Joshua).

Screen saver: I don't like the dancing screen, which makes me feel nauseous. (Nancy)

T2 View new present

Comments: It seems easy, but it is not clear what the icon means. (Christine)(Nancy)

T3 Make a present

Comments: Is it really recording now? The 'Record' button should not be 'red' if it is just for being ready. The process of making and sending a present is not clear.... Some words for the sending icon and the delete icon may be helpful to understand the functions. (Christine)

It made me a bit confused on the screen. It is not clear how to make a present. ... When pressing a button, the feedback should be more obvious. The button becoming 'green colour' was not good enough. (Nancy)

Unexpected behaviour: Nancy thought she was already recording on the ready screen. So she started to say something for a while but it was not recorded. She was a bit disappointed when she had to say that again after pressing the 'Record' button.

T4. View the present if it is good or not: easy

Comments: It was very easy but why not be able to see the present sent again? (Christine)

Unexpected behavior: Suddenly the screen went back to the first screen because it had timed out through inactivity. In other words, there was no interaction on the screen for 1 minute. Christine was shocked. What happened? (Christine)

T5. Send a present

Comments: The 'Sending' icon should have a word because it was not clear if the present was sent or not (Nancy).

After she pressed the 'Send' button, she saw the following screen for a while (about 10 seconds) and it went back to the first screen quickly. She asked me if the present was gone or not. Why doesn't it show any message such as 'it's gone'.... (Nancy)

The blue long arrow for sending a present should be animated, moving continuously to show it is running properly. (Nancy)

T6. Make another present (long)

Comments: She does not want to show herself whenever Christine makes a present. She said, the position of the camera should be changed. The camera for the front is not fun. It seems too artificial, and not natural. There should be another camera with the ability to show where the children play in an easy and flexible way. (Christine)

T7. View old present

It is very easy. (Nancy)

Comments: Old presents should be displayed in a different way. New ones should be to the left and old ones should go right. (Christine)

T8. Try to delete one of the old present.

Comments: Why not show the first scene of the present as a thumbnail? (Christine) She does not want to open the all of the presents again to see what they are and which should be deleted.

She was confused to see the shaded present still on the screen after she deleted the present. The present should disappear, she said (Nancy).

Unexpected Behaviour: At first, Nancy didn't know where the 'bin' was. Once she found it, she selected the present with the mouse and dragged it to the 'bin' button. (Nancy)

T9. Go back to the first screen.

Christine and Nancy wanted to go back to the first screen before they were asked to do so.

Unexpected Behaviour: She tried to press any buttons to find the way to go back (Christine). I was a bit frustrated trying to find a button to go back (Nancy).

Appendix 8: Results of de-briefing in user testing and changes made to the design (see Chapter 4)

After the de-briefing session, there were some questions and requests from the users, Christine and Nancy.

On the question of what you want to do more about TimelyPresent, Christine answered that she wanted to keep some of the presents she created. She also asked to see if the presents could be copied as files and be put onto her desktop computer or TV set in order to show them to her friends. Nancy mentioned that more words for the icons would be helpful to explain the meanings more precisely.

Regarding the best thing about TimelyPresent, Christine said that she does not need to worry about privacy because users of TimelyPresent are the members of the family only. It makes her feel secure although using video files. Nancy answered that it was really good to make and send a present in the form of a video message. She said she had been expected to make a card or flowers but a video message seemed much better than other media.

The third question was on the worst thing about TimelyPresent. Christine mentioned about the position of the camera and that another camera should be provided for TimelyPresent. Nancy argued that the interactions seemed too vague and the icons were not clear enough to be understood. She insisted that more words or messages should be added to TimelyPresent.

With regard to the most difficult part in operation, Christine and Nancy both had a difficult time finding the way to go back to first screen.

After a discussion between Gavin Wood, Andrew Monk and the author about the comments given and unexpected behaviours shown during the user testing on 11th May, some changes were made to the design of TimelyPresent by 14th May.

Firstly, on the first screen, design elements were rearranged in a simple way in terms of fonts, colours, and the clocks having second hands. Secondly, the previous icons had shown symbols only, and did not have words. However, all icons were made full sign buttons with imperative words, in English and Korean. Icons were also resized for standardization. The third change was an extra USB camera, provided for making presents on TimelyPresent. Another change was the time for changing the screen. The time for activating screen saver mode was elongated from 5 minutes to 10 minutes. The time of 'no activity' for going back to the first screen was increased from 1 minute to 2 minutes. Finally, the arrangement of presents which had already been looked at was changed so they were displayed with the most recent first.

Appendix 9: Results of second level of user testing with Lucy using instructional manuals (see Chapter 4)

After redesigning TimelyPresent, the second step of cooperative evaluation was conducted. In this case, two instructional manuals were produced with new screen shots. One described how to start up the Archos, how to connect to the wireless network, and how to start TimelyPresent. The other was about how to use TimelyPresent, such as opening a present, making a present, and looking again at presents (see Appendix 5 and Appendix 6). It was intended for the user to follow these instructional manuals during the testing using cooperative evaluation. Every design element including the contents of the manuals could be the target for being evaluated and improved by the user.

The user, called Lucy (anonymous, aged 62) has little experience of using electronic devices. She visited the author's home on 18th May and performed the tasks given. The instruction manuals were provided for Lucy to follow all the instructions mentioned above. Meanwhile she also pointed out some parts of the manuals and made subtle comments. Lucy described 'how to get' and 'how to use' the 'leg stand' and the 'Stylus' pen, hidden on the back of the Archos in detail. Lucy also corrected the ways of connecting the supplied power cable and the power connector, and the extra USB camera cable and the USB port on the device more precisely. On connecting to the internet, the main problem was for her to touch the icon, 'Network connection' twice, called 'two-touch'. She had no idea how quickly or how sharply to do it. After several trials, she said that 'two-touch' made her frustrated. However, she also mentioned that what she needed was just to get used to it. Unfortunately, the touchscreen of Archos often proved unresponsive, even on the most basic tasks.

Lucy then tried to perform the nine tasks given one by one. Lucy was very confident to perform all the tasks and they were completed successfully and quickly. An unexpected behavior was that Lucy did not want to show herself on a recording window. When she was ready to make a present, the extra USB camera connected to the Archos was towards her. She said she did not want to be silly on the camera so the author changed the view of the camera to show the garden of the house. This behaviour of not wanting to be shown on camera was the same as Christine's. Lucy said every task was very easy and obvious to do.

Appendix 10: TimelyPresent Trial - Information for Participants 1 and Consent Form (see Chapter 5)

We would very much like you to help us with our research by trying out our prototype *TimelyPresent*. By telling us about your experiences using it we can together improve it.

What is the TimelyPresent?

We have designed *TimelyPresent*, to allow family members who are living apart in different time zones to feel more connected. It is simple in operation and designed to be used by young children and older adults who may have little experience with electronic devices.

TimelyPresent is pictured below displaying a photo of the loved one who is abroad and the current time there. With just a few touches of the screen you can create a video present for your loved one.

We will loan you two *TimelyPresents* and deliver one to the family member abroad and one to the family member in the UK.



What is the purpose of the research?

By trying out *TimelyPresent* and telling us about your experiences you will help us improve it. We think this is an exciting idea and can't wait to see the things people will find to do with it.

Will it cost me anything?

As this is research, we will pay all postage and other costs. You just need a broadband connection and an electricity socket to connect it to.

What will you be asked to do?

We will give you your *TimelyPresent* and show you how to use it. You are then free to use the *TimelyPresent* whenever you wish for two months. The researcher will occasionally telephone you to see how you are getting on with *TimelyPresent*.

After one month, and two months, the researcher, Hyesook Kim, will arrange a time with you to have a longer chat about your experiences. At the end of the trial I am afraid that we will have to ask you to send back your *TimelyPresent*, but we will pay all the costs of doing this.

What about privacy?

We will not view the content of your video presents unless you choose to show us them. The data sent over the internet and the device is secure. Only you and your family will be able to see the video presents that you create. For research purposes we will record:

- when it is on or off (we hope you keep it on all the time, it uses very little electricity);
- when you create, view or send presents for each other.

These data will only be seen by the research team. If you feel that no longer wish to take part at any time after signing the form below just say so and we will stop and destroy any data we have collected.

Who is carrying out the research?

The researcher is Hyesook Kim. Hyesook is a Psychology PhD student at the Univ. of York. Her research is focusing on the design of technology to connect 3-generation families at a distance. Her work is being supervised by Professor Andrew Monk, at the University of York.

Contacting us

If you want to talk to someone about the project please contact:

Hyesook Kim, (+44) (0) 1904 433165, (+44) (0) 0772 999 8932 or
h.kim@psych.york.ac.uk (English), hsk.kim@gmail.com (Korean)

Andrew Monk, a.monk@psych.york.ac.uk between 9am and 5pm Monday to Friday.

Consent Form

Tick a box

Q1) Have you read the information sheet?.....
Yes No

Q2) Do you understand that you can withdraw from this trial at any time?
Yes No

Q3) Do you understand that we will record when your TimelyPresent is on or off and when you record, view or send a video present?.....
Yes No

Q4) Do you understand that we will NOT view any of the video presents that you create without your permission?.....
Yes No

Please sign here:

..... Date.....

Appendix 11: TimelyPresent Trial - Information for Participants 2 and Consent Form (see Chapter 5)

Now you have been using our research by trying out our prototype *TimelyPresent*. We would like you to tell us about your experiences so we can together improve it.

What will you be asked to do?

The researcher (Hyesook Kim) will visit or telephone you, at your home, on two separate occasions for about 30 minutes during which we will ask you to talk about the experience of using *TimelyPresent* you have had. You are free to talk about issues on trying out of the *TimelyPresent*, and will not be expected to provide any information that you do not wish to.

Audio recording: On both visits we will record what you say. This is so that we can make sure we properly understand what you said. We may transcribe some of this recording and present quotes from the transcripts anonymously in papers or conference presentation. All the names and the information you give us will be stored securely and anonymously.

If you feel that no longer wish to take part at any time after signing the form below just say so and we will stop and destroy any data we have collected.

Who is carrying out the research?

The researcher is Hyesook Kim. Hyesook is a Psychology PhD student at the Univ. of York. Her research is focusing on the design of technology to connect 3-generation families at a distance. Her work is being supervised by Professor Andrew Monk, at the University of York.

Contacting us

If you want to talk to someone about the project please contact:

Hyesook Kim, (+44) (0) 1904 433165, (+44) (0) 0772 999 8932 or
h.kim@psych.york.ac.uk (English), hsk.kim@gmail.com (Korean)

Andrew Monk, a.monk@psych.york.ac.uk between 9am and 5pm Monday to Friday.

Consent form

Tick a box

Q1) Have you read the information sheet?.....
Yes No

Q2) Do you understand that you can withdraw from this trial at any time?
Yes No

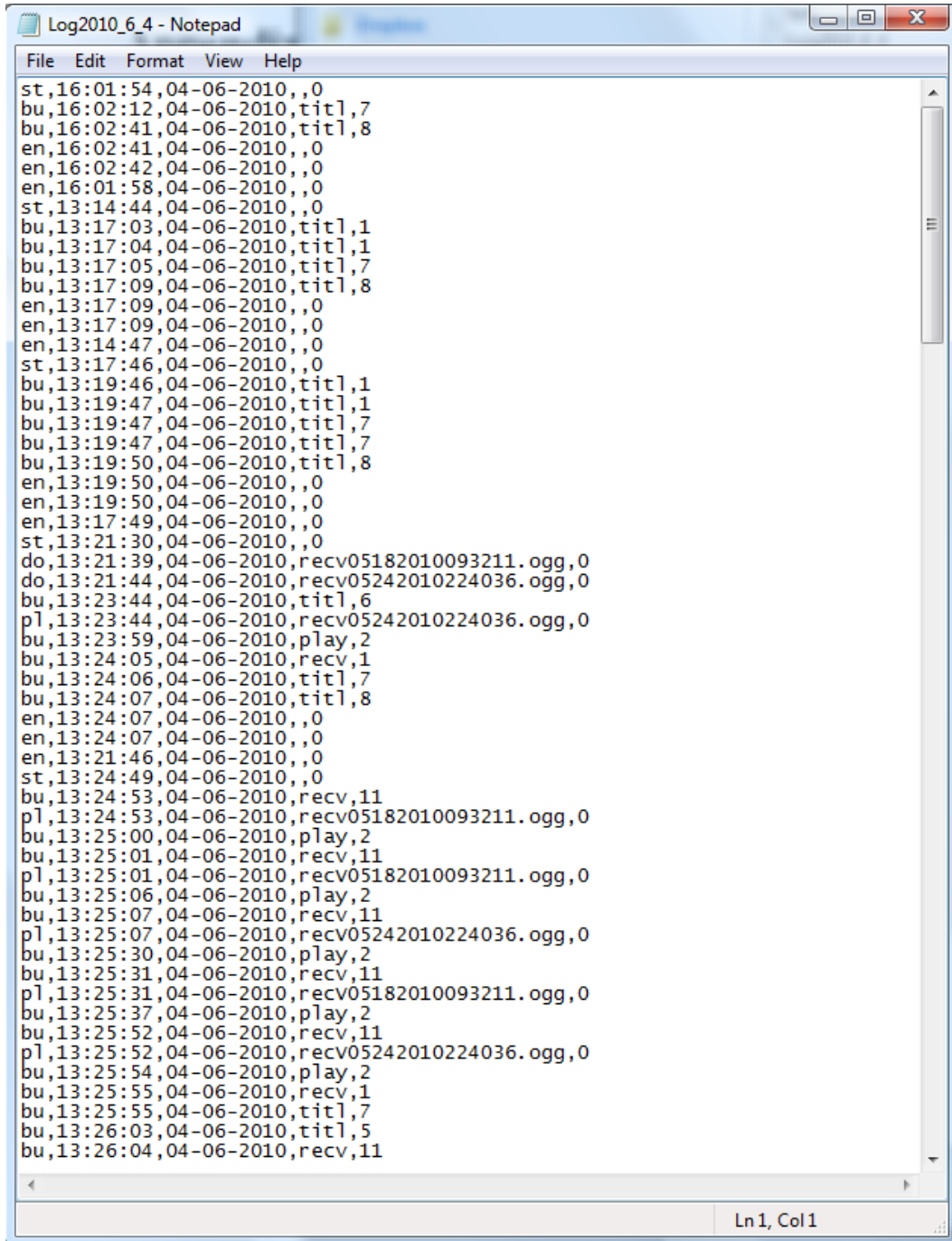
Q3) Do you understand that we will record what you say?
Yes No

Q4) Do you understand that we will NOT view any of the video presents that you have without your permission?.....
Yes No

Please sign here:

..... Date.....

Appendix 12: Example of an activity logs



```
Log2010_6_4 - Notepad
File Edit Format View Help
st,16:01:54,04-06-2010,,0
bu,16:02:12,04-06-2010,titl,7
bu,16:02:41,04-06-2010,titl,8
en,16:02:41,04-06-2010,,0
en,16:02:42,04-06-2010,,0
en,16:01:58,04-06-2010,,0
st,13:14:44,04-06-2010,,0
bu,13:17:03,04-06-2010,titl,1
bu,13:17:04,04-06-2010,titl,1
bu,13:17:05,04-06-2010,titl,7
bu,13:17:09,04-06-2010,titl,8
en,13:17:09,04-06-2010,,0
en,13:17:09,04-06-2010,,0
en,13:14:47,04-06-2010,,0
st,13:17:46,04-06-2010,,0
bu,13:19:46,04-06-2010,titl,1
bu,13:19:47,04-06-2010,titl,1
bu,13:19:47,04-06-2010,titl,7
bu,13:19:47,04-06-2010,titl,7
bu,13:19:50,04-06-2010,titl,8
en,13:19:50,04-06-2010,,0
en,13:19:50,04-06-2010,,0
en,13:17:49,04-06-2010,,0
st,13:21:30,04-06-2010,,0
do,13:21:39,04-06-2010,recv05182010093211.ogg,0
do,13:21:44,04-06-2010,recv05242010224036.ogg,0
bu,13:23:44,04-06-2010,titl,6
pl,13:23:44,04-06-2010,recv05242010224036.ogg,0
bu,13:23:59,04-06-2010,play,2
bu,13:24:05,04-06-2010,recv,1
bu,13:24:06,04-06-2010,titl,7
bu,13:24:07,04-06-2010,titl,8
en,13:24:07,04-06-2010,,0
en,13:24:07,04-06-2010,,0
en,13:21:46,04-06-2010,,0
st,13:24:49,04-06-2010,,0
bu,13:24:53,04-06-2010,recv,11
pl,13:24:53,04-06-2010,recv05182010093211.ogg,0
bu,13:25:00,04-06-2010,play,2
bu,13:25:01,04-06-2010,recv,11
pl,13:25:01,04-06-2010,recv05182010093211.ogg,0
bu,13:25:06,04-06-2010,play,2
bu,13:25:07,04-06-2010,recv,11
pl,13:25:07,04-06-2010,recv05242010224036.ogg,0
bu,13:25:30,04-06-2010,play,2
bu,13:25:31,04-06-2010,recv,11
pl,13:25:31,04-06-2010,recv05182010093211.ogg,0
bu,13:25:37,04-06-2010,play,2
bu,13:25:52,04-06-2010,recv,11
pl,13:25:52,04-06-2010,recv05242010224036.ogg,0
bu,13:25:54,04-06-2010,play,2
bu,13:25:55,04-06-2010,recv,1
bu,13:25:55,04-06-2010,titl,7
bu,13:26:03,04-06-2010,titl,5
bu,13:26:04,04-06-2010,recv,11
Ln 1, Col 1
```


Appendix 13: Letter for permission for the author to view a complete set of presents (see Chapter 5)

Dear participant,

Thank you all for trying out TimelyPresent and telling us about your experiences using it. All the stories you told us are greatly helpful to improve designing TimelyPresent. We will soon be sending you all a memory stick containing all the presents that you sent and received as a thank you for helping us in this way.

Some of you gave me permission to view a few presents you received and I have done so. Please be assured that no one else has seen the content of these presents.

I was very interested in viewing the presents again because they all look very touching to me and must be very precious to you. I also found that some kinds of messaging could be classified, such as particular messaging could make family members feel happy and laugh.

It would help my research if I could see a complete set of all the presents that you sent and received and I am wondering if you would give me permission to do so.

The reason for looking at them is just for finding the kinds of things you did for my research.

I will be the only person who views the presents and I will not use them for any other purpose.

Please could you discuss this with your family in Korea and then reply to this email, saying whether you are happy for me to do this or not. I have made a little form at the end of this message for you to answer with.

Best wishes, and thank you for your help with this.

Hysesook

I give Hysesook Kim permission to view the all the presents I received and sent on the TimelyPresent.

Yes / No

Name:

Appendix 14: Example of results of analysis of content of presents (Alice/Joshua-GP, see Chapter 5)

No	Who for	Who by	How many	Cam1	Cam2	Cam3	Transcript	Other(s) doing things (documentation)	Things I've done (diary) informing	Asking (precisely in a present)	Simple message
1437	GC	GF	2	1			Technician talking on the phone. GF seeing ST	GP testing			
1716	GC	GF	1	1				GP testing			
3251	GC	GF	1	1				GP testing			
0922	GC	GF	1		1		GP saying, 'Hello A, J, this is grandpa. It was good to see you playing and drawing well. Take care. I will send another. Bye'		GP saying he's got the TP and he will send one for you.		
1004	GC	GM	1		1		GM saying 'I don't know what to say. Grandma really love you, Alice and Joshua. Always be healthy. Grandpa will send another. Take care. Love you, grandma really love you.'				GM saying she loves A, J.
1620	GC	HK, GM	2		1		HK saying I came here to see your mother. Good to be able to say hello to you. Take care and have a good summer with your family. GM saying take care.				GM saying take care
1155	GC	GP, GM	2	1			GM instrunting GP, saying 'yes, you have to say right now', GP saying 'we've got presents and good to see them. But the presents...(cut)'	GM instructing GP	GP saying he's got the TPs and he will send one for you.		
0329	GC	GP	1	1			Error?				
0354	GC	GP	1	1			Error?				
2457	GP	M	1		1		Mom saying hello with waving				saying hello
5929	GP	A,J, M	3			1	Mom asking Joshua to say ST, Alice saying hello	showing two kids are laughing with big smile, saying hello	Mom being a prompter, Dad being a cameraman		saying hello
3030	GP	A,J	2			1	Mom asking helping them to learn Korean and english	two kids sitting and drawing something, mother asking them to answer	Mom being a prompter		

No	Who for	Who by	How many	Cam1	Cam2	Cam3	Transcript	Other(s) doing things (documentation)	Things I've done (diary) informing	Asking (precisely in a present)	Simple message
3514	GP	A	1			1	Mom prompting Alice to say something more, Alice just saying good night and laughing. camera chasing the face smile, Mom asking her to kiss to grandpa and she pretending to kiss him	Alice acting playful way, laughing, kissing			saying goodnight
0117	GP	A,J	2			1	Alice and Joshua just showing with excitement, Mom prompting Alice and Joshua to say something more, camera chasing the faces	Joshua saying I love GP, hi, uncle, hello. Pretend to be a dog, barking for a while.			saying love you
0718	GP	J	1		1		Just smile and a bit laughing, mother saying something background	Joshua just smiling with shyness			saying hello
0957	GP	A,J	2		1		Alice just smiling and laughing, pulling her face, putting out her tongue, mother asking to say ST background	Alice pulling her face, putting out her tongue for seconds and say hello	Mom being a prompter		saying hello
1202	GP	J	1		1		Joshua just shouting and saying hello, making noise	Joshua shouting (GM mentioned at Int.)			
2320	GP	A,J	2		1		short clip showing their faces	Joshua showing his face			
2631	GP	J	1		1		Joshua saying 'I love you but.... Love you.... Bye'				Joshua saying love you, good bye
2857	GP	A,J	2		1		Alice saying 'Hello, grandpa. I love you. By the way, I've got a present. When I come to korea or grandpa, grandma come here, I will show you.' M asks 'Is that it? Then say good night'. A saA 'good night, good night', J is behind her jumping up and down while putting out her tongue				
3128	GP	J	1		1		Alice saying good night to his grandparents. Joshua saying goodnight with a kissing gesture	Saying good night with kiss			saying good night
	GP	J	1			1	Joshua eating something at a dinner table	Joshua eating at a dinner table			saying hello

No	Who for	Who by	How many	Cam1	Cam2	Cam3	Transcript	Other(s) doing things (documentation)	Things I've done (diary) informing	Asking (precisely in a present)	Simple message
0846	GP	J, A	2			1	Joshua showing his big face saying 'grandpa, I will show you a picture I drew. That's it'. Alice is singing a song (humming) while dancing with a doggy doll behind Joshua	Joshua saying something, Alice dancing and singing behind			
0952	GP	A,J	2		1		Alice saying many presents will come so that please wait for them. Joshua is background moving and playing with the doggy doll suddenly showing the doll just in front of the camera to disturb A saying (GM mentioned about the doll Uncle bought)	Alice saying about TPs, Joshua playing behind with a dol (GM mentioned at Int.)			
1136	GP	A,J	2		1		Joshua saying something but almost singing and playing with a doggy. A is dancing behind with laughing	Joshua saying ST, playing with a dol, Alice dancing behind			
1502	GP	A,J	2		1		Joshua saying something but almost singing and playing with a doggy. A is dancing behind with laughing (object with meaning)	Joshua saying ST, playing with a dol, Alice dancing behind (at interview GM mentioned about the dol)			
0224	GP	J	1		1		Joshua eating banana chips and mother prompting behind asking what he is eating and what he ate such as cherries and icecream, asking what day it is today, what the weather is	Joshua eating, answering to the questions	Mom being a prompter		
0614	GP	J	1			1	Showing his big face saying hello	Joshua showing his face			saying hello
0724	GP	J	1			1	Joshua showing his big face chewing something in his mouth, mother asking where the sister is as background, Joshua raising his hand up answering his sister is upstairs	Joshua eating, answering to the questions	Mom being a prompter		
0939	GP	A	1			1	Alice showing her big face, shaking her head saying daddy...showing cuty face, mother asking 'where have you been?', A just shaking her face without saying nothing (wearing her pyjamas)	Alice preparing to go to bed wearing pyjamas			
6111	GP	A	1			1	Alice found the camera ready so that she ran to the camera and shaking her a bee dol in front of a camera with smile and laughter, meanwhile Joshua's noise heard, Mom asking 'what are you doing here?' as background	Alice shaking a dol with smile and laughter			

No	Who for	Who by	How many	Cam1	Cam2	Cam3	Transcript	Other(s) doing things (documentation)	Things I've done (diary) informing	Asking (precisely in a present)	Simple message
1306	GP	A,J	2			1	Alice and Joshua cheering Korean team at Worldcup game jumping up and down and shouting with excitement	Alice, Joshua cheering, shouting, jumping up and down			
1439	GP	A,J	2			1	Alice is operating TP, Joshua standing up high and drawing his right hand to his mouth such like a microphone saying 'hello this is in the UK, are you in Korea?' (like a reporter), Alice saying 'yeh?'	Alice and Joshua making a present in a playful way together, Joshua being a reporter			
1709	GP	J	1			1	Joshua standing back up and saying 'GM, you have to see this, right?' Coming towards a camera, Alice (background) saying 'don't come to me' (instructing)	Alice and Joshua making a present in a playful way together, Joshua being a reporter			
1827	GP	J	1			1	Joshua eating something at a table and coming towards a camera without saying nothing	Joshua eating at a table, coming towards a camera without saying nothing			
2056	GP	J	1			1	Joshua chewing something in his mouth and coming towards a camera saying eeee like a smile, Alice saying 'oh, it is a bit difficult' as background	Joshua eating at a table, coming towards a camera, showing smile, Alice saying ST			
2320	GP	J	1			1	Joshua is high up (on a table?) chewing something in his mouth and saying 'well... I need to think and then make another one later'	Joshua eating and saying ST			
2443	GP	J	1			1	Joshua picking up a piece of apple with a fork and putting it into his mouth. Alice is background saying 'yes, now try do that again' (instructing)	Joshua eating, Alice making a present of Joshua			
2624	GP	A,J	2			1	Alice is just in front of a camera doing something and looking at a camera putting out her tongue at it and then saying 'I've done it' at a table, Joshua is behind her	Alice drawing or writing			
2962	GP	A,J	2			1	Joshua coming towards a camera and saying 'grandpa!!!! @##%\$' with shouts	Joshua shouting			saying grandpa

No	Who for	Who by	How many	Cam1	Cam2	Cam3	Transcript	Other(s) doing things (documentation)	Things I've done (diary) informing	Asking (precisely in a present)	Simple message
3159	GP	A	1			1	Alice saying 'grandpa, why not sending me what I am doing'			Alice asking TPs to GP	
3430	GP	A,J	2			1	Alice saying 'grandpa, why not sending me a present? Well, we will get one soon. Take this present, please' while chewing something in her mouth.	Alice eating		Alice asking TPs to GP	
4044	GP	A,J	2			1	Alice sitting and doing maths at a table behind. Mom saying 'is that right?' helping her background. Camera came towards her for a while showing what she is doing exactly and then turned towards J who is just chewing something in his mouth	Alice doing maths	Mom being a prompter, helper		
5524	GP	A,J	2			1	Joshua saying 'grandpa, grandma, there are somethings here in the UK and Korea. So let's meet later with these', Mom saying 'you need to show these', camera showing two national flags made. Alice 'grandpa, you should come and see these'	Joshua showing two national flags made, Alice asking GP to come and see these		Alice asking GP to come	
1251	GP	A	1			1	Alice is at a table wearing pyjama. Her face showing and pretending not to see a camera but her eyes moving and her face is smile. Mom saying 'don't pretend'. Alice is giggling	Alice wearing pyjama, smile, giggling			
3513	GP	A	1			1	Alice is eating at a dining table. She put a spoon into her mouth and giggling with a smile, mischievous	Alice eating, showing funny face with a spoon			
3745	GP	J	1			1	Joshua is eating at a table. Something in his mouth and saying 'hello' in a funny mischievous voice	Joshua eating, saying in a funny voice			saying hello
3936	GP	A	1			1	Alice is showing her big face with a big smile giggling, camera is following and closing up her face	Alice showing big smile, giggling a lot			
2835	GP	A	1		1		Alice asking 'grandpa, why not sending me a present?, why not?'	Alice asking ST in a funny voice, face		Alice asking TPs	

No	Who for	Who by	How many	Cam1	Cam2	Cam3	Transcript	Other(s) doing things (documentation)	Things I've done (diary) informing	Asking (precisely in a present)	Simple message
3110	GP	J,M	2			1	Joshua saying 'grandpa, with a big club, Bang!!!!' with shouts, with a dramatic gesture, Mom saying 'Joshua is angry because there is no present come yet'	Joshua pretending to swallow a camera, showing his angry gesture			
3432	GP	A	1		1		Alice is wiggling her body for a while with shouts, wearing pyjamas	Alice wiggling her body, wearing pyjama			
3855	GP	J	1		1		Joshua is showing a big face with just shouts, Alice laughing as background	Joshua shouting, Alice laughing			
3636	GP	A,J,M	2			1	Joshua and Alice showing school uniforms together with laughter, Mom as background saying 'you need to show the school uniform to the grandparents', asking them 'how was the school today?', Joshua saying 'it was fun...', Alice saying, 'I like to go to school'	Alice and Joshua going to school together wearing school uniform with big smiles			
4354	GP	A, J	2			1	Joshua saying 'We saw the present, I will send another for you'. Mom asking 'do you like to go to school? Joshua saying 'Yes, grandpa, grandma, did you like to go to school?' with shouts, Mom saying 'who did you have lunch with' Joshua saying 'Joshep', Dad asking 'who is your school teacher?' Joshua laughing with smile, feeling excited	Joshua answering questions done by mom and dad. The very happy moment!!!! (Mom mentioned about this)	Mom and Dad become prompters,		
5048	GP	A,J,M	3			1	Joshua showing his school uniform next to Mom, Alice showing standing back doing something, Dad saying 'Joshua is wearing school uniform'	Joshua showing school uniform	Dad informing that		
5520	GP	J,M	2			1	Joshua playing with a blue balloon asking grandpa, why wearing red t-shirt on the present? Suddenly showing his backhand to his mom saying 'it hurts', Mom saying, 'oh, poor thing'... Mom and Dad saying ST	Joshua playing in a living room, asking GP why wearing red-T shirt		Joshua asking GF why red T-shirt	
56				6	18	32					

REFERENCES

- Aylor, B. (2003). Maintaining long-distance relationships. In D. J. Canary & M. Dainton (Eds.), *Maintaining relationships through communication: Relational, contextual, and cultural variations*. Mahwah, NJ: Lawrence Erlbaum: 127-140
- Adams, C. A., Lunt, P. & Cairns, P. (2008). A qualitative approach to HCI research. In P. Cairns & A. L. Cox., *Research Methods for Human-Computer Interaction*. Cambridge, Cambridge university press: 138-157.
- Averill, J. R. (1980a). *A constructivist view of emotion*. New York, Academy Press.
- Averill, J. R. (1980b). *The emotions*. Englewood Cliffs, NJ, Prentice-Hall.
- Baron-Cohen, S., Golan, O., Wheelwright, S. & Hill, J. J. (2004). *Mind reading: The interactive guide to emotions*. London, Jessica Kingsley Limited.
- Birdwhistell, R. (1970). *Kinesics and context: Essays in body motion communication*. Harmondsworth, Penguin.
- Blau, T. H. (1984). An evaluative study of the role of the grandparent in the best interests of the child. *American Journal of Family Therapy* 12(4): 46-50.
- Bly, S.A., Harrison, S.R., & Irvin, S. (1993). Media spaces: bringing people together in a video, audio, and computing environment. *Communications of the ACM* 36(1): 28-46.
- Blythe, M. & Monk, A. F. (2002). Notes towards an ethnography of domestic technology. . DIS 2002, ACM Press: 276-281.
- Brandstatter, H. (1983). Emotional responses to other persons in everyday life situations. *Journal of Personality and Social Psychology* 45(4): 871-883.
- Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2): 77-101.
- Brush, A.J., Inkpen, K.M., & Tee, K. (2008). SPARCS: Exploring sharing suggestions to enhance family connectedness. CSCW '08. San Diego, California, November 8: 269-638.
- Buck, R. & Mill, R. E. (1974). Sex, personality, and physiological variables in the communication of affect via facial expression. *Journal of Personality and Social Psychology* 30(4): 587-596.
- Burleson, B. R. (2003). The experience and effects of emotional support: What the study of cultural and gender differences can tell us about close relationships, emotion, and interpersonal communication. *Personal Relationships* 10: 1-23.
- Burleson, B. R. & Samter, W. (1990). Effects of cognitive complexity on the perceived importance of communication skills in friends. *Communication Research* 17: 165-182.
- Carroll, J. M. (2000). *Making use: scenario based design of human-computer interactions*. Cambridge, Mass: MIT Press.
- Angela Chang, A., Resner, B., Koerner, B., Wang, X., & Ishii, H. (2001). LumiTouch: An

- Emotional Communication Device. *CHI 2001*: 313-314.
- Chapanis, A. (1975). Interactive human communication. *Scientific American* 232: 34-42.
- Charmaz, K. (2006). *Constructing grounded theory: A practical guide through qualitative analysis*. London, Sage.
- Chung, H., Lee, C. J. & Chung, H. (2006). Lover's cups: Drinking interfaces as new communication channels. *CHI 2006*. Montreal, Quebec, Canada: 22-27.
- Cockton, G. (2009). When and why feelings and impressions matter in interaction design. *Kansei 2009: Interfejs Użytkownika - Kansei w praktyce*. Kansei.
- Consolvo, S., Roessler, P., & Shelton, B. E. (2004). The CareNet display: Lessons learned from an in home evaluation of an ambient display. *UbiComp*: 1-17.
- Conversy, S., Mackay, W., BeaudouinLafon, M., & Roussel, N. R. (2003) Sharing daily-life images with videoProbe. In *Proc. IHM2003*, 228-231.
- Corbin, J., & Strauss, A. (2008). *Basics of qualitative research*. London, Sage.
- Cross, N. (1997). Descriptive models of creative design: application to an example. *Design Studies* 18(4): 427-440.
- Cross, N. (2006). *Designerly ways of knowing*. London, Springer.
- Cutrona, C. E., & Russell, D. W. (1990). Types of social support and specific stress: Toward a theory of optimal matching. In B. R. Sarason, I. G. Sarason & G. R. P. (Eds.), *Social support: An Interactional view*. New York, Wiley: 319-366.
- Derks, D., Fischer, A. H., & Bos, A. E. R. (2008). The role of emotion in computer-mediated communication: A review. *Computers in Human Behaviors* 24: 766-785.
- DiTommaso, E., & Spinner, B. (1997). Social and emotional loneliness: A re-examination of Weiss' typology of loneliness. *Personality and Individual Differences*, 22 (3), pp. 417 – 427.
- Dix, A. (2002). Incidental interaction. Retrieved 25, October, 2009, from <http://www.comp.lancs.ac.uk/~dixa/topics/incidental/>.
- Duchenne de Boulogne, G.-B. (1862/1990). *Mecanisme de la physionomie humaine* [The mechanism of human facial expression]. Cambridge/New York, Cambridge University Press.
- Ekman, P. (1992). Facial expressions of emotion: New findings, new questions. *American Psychological Society* 3(1): 34-38.
- Ekman, P. (1993). Facial expression and emotion. *American Psychologist* 48(4): 376-379.
- Ekman, P. & Davidson, R. J. (1990). The Duchenne smile: Emotional expression and brain physiology II. *Journal of Personality and Social Psychology* 58(2): 342-353.
- Ekman, P. & Friesen, W. (1969). The repertoire of nonverbal behavior: Categories, origins, usage, and coding. *Semiotica* I: 49-98.
- Ekman, P. & Friesen, W. (1975). *Unmasking the face*. Englewood Cliffs, NJ: Prentice Hall.
- Ekman, P., Friesen, W. V., & Ancoli, S. (1980). Facial signs of emotional experience. *Journal of Personality and Social Psychology* 39(6): 1125-1134.

- Ficara, L. C., & Mongeau, P. A. (2000). *Relational uncertainty in long-distance college student dating relationships*. Paper Presented at the annual meeting of the National Communication Association, Seattle, WA.
- Fridlund, A. (1992). The behavioral ecology and sociality of human faces. In M.S. Clark (Ed.), *Emotion and social behavior. Review of Personality and Social Psychology* 13: 90-121.
- Gaver, W. (2002). Provocative awareness. *Computer Supported Cooperative Work* 11: 475-493.
- Gaver, W. & Hooker, B. (2001). *The presence project*. London, RCA: CRD Publishing.
- Gaver, W., Bouncer, A. Pennington, S., & Walker, B. (2004). Cultural Probes and the value of uncertainty. *Interactions* XI.5: 53-56.
- Gaver, W., Beaver, J. & Benford, S. (2003). Ambiguity as a resource for design. *CHI 2003*. Ft. Lauderdale, Florida, ACM: 233-240.
- Gaver, W., Dunne, T. & Pacenti, E. (1999). Cultural Probes. *Interactions* vi(1): 21-29.
- Gemperle, F., DiSalvo, C., Forlizzi, J., & Yonkers, W. (2003). The hug: A new form for communication. *Proceedings of the 2003 conference on Designing for user experiences*, 1-4.
- Georgila, K., Wolters, M., Moore, J. D., & Logie, R. H. (2010). The MATCH corpus: a corpus of older and younger users' interactions with spoken dialogue systems. *Language Resources and Evaluation* 44(3): 221-261.
- Gero, J. (1994). Computational models of creative design processes. In T. Dartnall (Ed.), *Artificial intelligence and creativity*. Kluwer Academic, Dordrecht.
- Gilbertson, J., Dindia, K., & Allen, M. (1998). Relational continuity constructional units and the maintenance of relationships. *Journal of Social and Personal Relationships*, 15, 774-790
- Glaser, B. G. & Strauss, A. L. (1967). *The discovery of grounded theory: Strategies for qualitative research*. Chicago, Aldine.
- Go, K., & Carroll, J. (2000). FAMILWARE: Communicating with someone you love. *Home Informatics and Telematics: Information, Technology and Society*. A. Sloane and F. van Rijn. Boston/Dordrecht/London, IFIP - Kluwer Academic Publishers: 125-140.
- Golan, O., Ashwin, E., Granader, Y., McClintock, S., Day, K., Leggett, V., Baron-Cohen, S., & Ashwin, E. (2010). Enhancing emotion recognition in children with autism spectrum conditions: An intervention using animated vehicles with real emotional faces. *Journal of Autism and Developmental Disorders* 40(3): 269-279.
- Gooch, D. & L. Watts (2011). A Design Framework for Mediated Personal Relationship Devices. *HCI 2011*, Newcastle, UK, BCS, London.
- Griff, M. D. (1999). Intergenerational play therapy: The Influence of grandparents in family systems. *Child and Youth Services* 20(1-2): 63-76.
- Guldner, G. T. (2004). *Long distance relationships: The complete guide*. Corona, CA: JF Milne.
- Guldner, G. T., & Swensen, C. H. (1995). Time spent together and relationship quality: Long-distance relationships as a test case. *Journal of Social and Personal Relationships*, 12, 313-320.

- Hegeman, J. (2008). *The thinking behind design*. The School of Design, Carnegie Mellon University. Master of Design in Interaction Design.
- Hindus, D., Mainwaring, S. D., Leduc, N., Hagstrom, A. E., & Bayley, O. (2001). Casablanca: designing social communication devices for the home. *CHI 2001*, 2:325-332
- Hirsch, J. (1981). *Family Photograph: content, meaning and effect*. New York, Oxford University Press.
- Holsti, O. R. (1969). *Content analysis for the Social Sciences and Humanities*. Reading, MA: Addison-Wesley.
- Horst, H. A. (2006). The blessings and burdens of communication: Cell phones in Jamaican transnational social fields. *Global Networks*, 6 (2), pp. 143-159.
- Ishii, H. & Ullmer, B. (1997). Tangible Bits: Towards seamless interfaces between people, Bits and Atoms. *CHI 1997*: 22-27.
- James, W. (1890). *The principles of psychology*. New York, Holt.
- Judge, T., K., Neustaedter, C. et al. (2010). The Family Window: The design and evaluation of a domestic media space. *CHI 2010*. Atlanta, Georgia, USA: 2361-2370.
- Keller, I., van der Hoog, W., & Stappers, P. J. (2004). Gust of me: Reconnection mother and son. *Pervasive Computing* January-March: 22-28.
- Khalid, H. & Dix, A. (2010). The experience of photologging: global mechanisms and local interactions. *Pers Ubiquit Comput* 14: 209-226.
- Kim, H., & Monk, A. (2010). Emotions Experienced by Families Living at a distance, *CHI2010*. Atlanta, Georgia, 2923~2926
- Kim, H., & Monk, A. (2009a). Informing design with emotional probes, In Proc. *IASDR 2009*
- Kim, H., & Monk, A. (2009b). Design of technology to connect 3-generation families at a distance, In Proc. *IASDR 2009*
- King, V. & Elder, G. H. (1997). The legacy of grandparenting: childhood experiences with grandparents and current involvement with grandchildren. *Journal of Marriage and the Family* 59(4): 848-859.
- Lee, A., Girgensohn, A., & Schlueter, A. (1997). NYNEX Portholes: Initial user reactions and redesign implications, in GROUP'97, *International Conference on Supporting Group Work*, ACM, New York.
- Licoppe, C., & Z. Smoreda (2005). Are social networks technologically embedded? How networks are changing today with changes in communication technology, *Social Networks*, 27, 317-35
- Liechti, O., & Ichikawa, T. (2000). A digital photography framework supporting social interaction and affective awareness. *Personal Ubiquitous Comput*. 4(1).
- Light, A. (2006). Adding method to meaning: a technique for exploring peoples' experience with technology. *Behaviour & Information Technology* 25(2): 175-187.
- Lindley, S., Harper, R. et al. (2009). Desiring to be in touch in a changing communications

- landscape: Attitudes of older adults. *CHI 2009*: 1693-1702.
- Lindley, S., Harper, R., & Sellen, A. (2010). Designing a technological playground: A field study of the emergence of play in household messaging. *CHI 2010*. Atlanta, Georgia, ACM: 2351-2360.
- Lottridge, D., Masson, N. & Mackay, W. (2009). Sharing empty moments: Design of remote couples. *CHI 2009*. Boston, USA: 2329-2338.
- Lowgren, J. & Stolterman, E. (2004). *Thoughtful interaction design: A design perspective on information technology*. Massachusetts Institute of Technology, Graphic Composition, Inc.
- Maguire, K. C., & Kinney, T. A. (2010). When Distance is Problematic: Communication, Coping, and Relational Satisfaction in Female College Students' Long-Distance Dating Relationships. *Journal of Applied Communication Research*, 38 (1), pp. 27-46.
- Maltz, D. N. & Borker, R. A. (1982). *A cultural approach to male-female miscommunication. Language and social identity*. J. J. C. (Ed.). Cambridge, UK: Cambridge University Press: 196-216.
- Mayring, P. (2004). Qualitative content analysis in Flickr. *A Companion to Qualitative Research*. U. Kardorff and E. Steinker. London, Sage.
- Merolla, A. J. (2010). Relational Maintenance and Noncopresence Reconsidered: Conceptualizing Geographic Separation in Close Relationships. *Communication Theory*, 20, pp. 169–193.
- Mesquita, B. (2003). Emotions as dynamic cultural phenomena. *The handbook of the affective sciences*. R. Davidson, H. Goldsmith and K. R. S. (Eds.). New York, Oxford University Press.
- Milne, E. (2003). Email and epistolary technologies: presence, intimacy and disembodiment, *Fibreculture*, 2. Available: http://journal.fibreculture.org/issue2/issue2_milne.html
- Miyajima, A., Itoh, Y., Itoch, M., & Watanabe, T. (2005). Tsunagari-kan Communication: Design of a new telecommunication environment and a field test with family members living apart. *International Journal of Human-Computer Interaction* 19(2): 253-276.
- Monk, A., Blythe, M., & Kim, H. (2010). What Do People Want from the Technology in Their Homes: Work at the Centre for Usable Home Technology (CUHTec), In Proc, ITI
- Monk, A., Wright, P., Haber, J., & Davenport, L. (1993). *Improving your Human-Computer Interface: A practical technique*. Trowbridge, Prentice Hall International (UK).
- Morris, M. E. (2005). Social networks as health feedback displays. *IEEE Internet Computing* 9(5): 29-37.
- Mynatt, E. D., Rowan, J., & Craighill, S. (2001). Digital Family Portraits: supporting peace of mind for extended family members. *SIGCHI'01*. Seattle, WA, USA, ACM: 333-340.
- Nelson, H. & Stolterman, E. (2003). *The design way: intentional change in an unpredictable world*. Englewood Cliffs, Educational Technology Publications.
- Niedenthal, P. M., Krauth-Gruber, S., & Ric, F. (2006). *Psychology of emotion: Interpersonal, experiential, and cognitive approaches*. New York, Psychology Press.
- Oleksik, G., Frohlich, D., Brown, L., & Sellen, A. (2008). Sonic Interventions: understanding and

- extending the domestic soundscape. *CHI 2008*: 1419-1428.
- Olivier, P. & Wallace, J. (2009). Digital technologies and the emotional family. *International Journal of Human-Computer Studies* 67: 204-214.
- Judith S. Olson, J. S., & Olson, G. M. (1995). What mix of video and audio is useful for small groups doing remote design work? *Proceedings of CHI '95 Human Factors in Computing Systems*. New York, ACM: 362-368.
- Owens, G., Granader, Y., Humphrey, A., & Baron-Cohen, S. (2008). LEGO therapy and the social use of language programme: An evaluation of two social skills interventions of children with high functioning autism and Asperger syndrome. *Journal of Autism and Developmental Disorders* 38(10): 1944-1957.
- Picard, R. W. & Liu, K. K. (2007). Relative subjective count and assessment of interruptive technologies applied to mobile monitoring of stress. *International Journal of Human-Computer Studies* 65: 361-375.
- Purves, D., Brannon, E. M., Cabeza, R., Huettel, S. A., LaBar, K., Platt, M., & Woldorff, M. (2008). *Principles of Cognitive Neuroscience*. Sunderland, Sinauer Associates, Inc.
- Reid, A. (1977). Comparing the telephone with face-to-face interaction. *The social impact of the telephone*. I. P. (Ed.). Cambridge, MA: MIT Press: 386-414.
- Riche, Y. & Mackay, W. (2007). MarkerClock: A communicating augmented clock for elderly. *INTERACT 2007*. Rio de Janeiro, Brazil: 408-411.
- Riordan, M. A. & Kreuz, R. J. (2010). Emotion encoding and interpretation in computer-mediated communication: Reasons for use. *Computers in Human Behavior* 26: 1667-1673.
- Romero, N., Markopoulos, P., van Baren, J., de Ruyter, B., IJsselsteijn, W., & Farshchian, B. (2007). Connecting the family with awareness systems. *Pers Ubiquit Comput* 11: 299-312.
- Rosenman, M. & Gero, J. (1993). Creative in design using a design prototype approach. In J. Garo & M. L. Maher (Eds.), *Modelling creativity and knowledge-based creative design*. Lawrence Erlbaum, New Jersey.
- Rowan, J. & Mynatt, E. D. (2005). Digital family portrait field trial: Support for aging in place. *CHI2005*. Portland, Oregon, USA: 521-530.
- Sahlstein, E. M. (2004). Relating at a distance: Negotiating being together and being apart in long distance relationships. *Journal of Social and Personal Relationships*, 21, 689-710.
- Samter, W. & Burleson, B. R. (1998). The role of communication in same-sex friendships: A comparison among African-Americans, Asian Americans, and Euro-Americans. *Personal Relationships*. New York, Saratoga Springs.
- Schon, D. (1983). *The reflective practitioner*. New York, Basic Books.
- Seligman, M. (2004). *Authentic Happiness: using the new positive psychology to realize your potential for lasting fulfillment*, New York, A Division of Simon & Schuster Inc.
- Sellen, A. J. (1995). Remote conversations: The effects of mediating talk with technology. *Human-*

- Computer Interaction* 10(4): 401-444.
- Sellen, A., Eardley, R., Izadi, S., & Harper, R. (2006). The Whereabouts Clock: early testing of a situated awareness device. *CHI 2006*. Montreal, Quebec, Canada: 22-27.
- Sellen, A., Harper, R., Eardley, R., Izadi, E., Regan, T., Tayler, A. S., & Wood, E. R. (2006). HomeNote: Supporting Situated messaging in the home. Conference on Computer Supported Collaborative Work. *CSCW '06*. Banff, Canada: 383-392.
- Short, J., Williams, E., & Christie, B. (1976). *The social psychology of telecommunications*. London, Wiley.
- Shweder, R. (1994). You're not sick, you're just in love. Emotion as interpretative system. *The nature of emotions: Fundamental questions*. P. Ekman and R. D. (Eds.). New York, Oxford University Press: 32-44.
- Shweder, R. A. (2002). What about female genital mutilation? and why understanding culture matters in the first place. *Engaging cultural differences: The multicultural challenge in liberal democracies*. R. Shweder, M. Minow and H. M. (Eds.). New York, Russell Sage Foundation Press.
- Sigman, S.J. (1991). Handling the discontinuous aspects of continuing social relationships: Toward research on the persistence of social forms. *Communication Theory*, 1: 106-127
- Stafford, L. (2004). Romantic and parent-child relationships at a distance, *Communication Yearbook*, 28, 37-85.
- Stafford, L. (2005). *Maintaining long-distance and cross-residential relationships*. New Jersey, Lawrence Erlbaum Associates.
- Stafford, L. & Merolla, A. (2007). Idealization, reunions, and stability in long distance dating relationships. *Journal of social and Personal Relationships*, 23, 901-919
- Stappers, P. J., van Rijn, H. H., Kistemaker, S. C., Hennink, A.E. & Visser, F. S.(2009). Designing for other people's strengths and motivations: Three cases using context, visions, and experiential prototypes. *Advanced Engineering Informatics* 23: 174-183.
- Strauss, A. & Corbin, J. (1990). *Basics of qualitative research*. London, Sage.
- Strong, R. & Gaver, W. (1996). Feather, Scent, and Shaker: Supporting Simple Intimacy. *CSCW'96*, Boston.
- Taylor, A. S. & Harper, R. (2002). Age-old practices in the 'New World': A study of gift-giving between teenager mobile phone users. *CHI 2002*.
- Thompson, E. C. (2009). Mobile phones, communities and social networks among foreign workers in Singapore. *Global Networks* 9 (3), pp. 359–380.
- Thompson, E. C. & Zhang Juan. (2009). Navigating transnationalism: immigration and reconfigured ethnicity, in B. Welsh, J. Chin, A. Mahiznan and Tan Tarn How (eds) *Impressions of the Goh Chock Tong years in Singapore*, Singapore: NUS Press.
- Tollmar, K., Junstrand, S. et al. (2000). Virtually living together: A design framework for new

- communication media. *DIS '00*. Brooklyn, New York, ACM: 83-91.
- Tolmie, P., Junestrand, S., & Torgny, O. (2002). Unremarkable Computing. *CHI 2002*. Minnesota, USA. Volume No. 1, Issue No.1: 399-406.
- Urry, J. (1990). *The tourist gaze: leisure and travel in contemporary societies*. London, SAGE Publications.
- van Baren, J., IJsselsteijn, W A., Markopoulos, P., Romero, N., & de Ruyter, B. (2004). Measuring affective benefits and costs of awareness systems supporting intimate social networks. *Proceedings of 3rd workshop on social intelligence design*, CTIT workshop proceedings series WP04-02: 13-19.
- Vangelisti, A. (2002). Interpersonal processes in romantic relationships. *Handbook of interpersonal communication* (3rd ed.). M. L. Knapp and J. A. Daly. CA: Sage, Thousand Oaks: 643-679.
- Van Horn, K. R., Arnone, A., Nesbitt, K., Desilets, L., Sears, T., Griffin, M., & Brudi, R. (1997). Physical distance and interpersonal characteristics in college students' romantic relationships. *Personal Relationships*, 4, 25-34
- Vetere, F., Davis, H., Gibbs, M., & Howard, S. (2009). The Magic Box and Collage: Responding to the challenge of distributed intergenerational play. *Int. J. Human-Computer Studies* 67: 165-178.
- Vetere, F., Gibbs, M. Kjeldskov, J., Howard, S., Mueller, F., Pedell, S., Mecoless, K., & Bunyan, M. (2005). Mediating Intimacy: designing technologies to support strong-tie relationships. *CHI 2005*, Portland, Oregon: 471-480.
- Weiss, R. S. (1973). *The experience of emotional and social isolation*. Cambridge: MIT Press.
- Whittaker, S. & O'Conaill, B. (1997). The role of vision in face-to-face and mediated communication. *Video-Mediated Communication*. K. E. Finne, A. J. Sellen and S. B. Wilbur. New Jersey, Lawrence Erlbaum Associates, Inc.
- Wilding, R. (2006). 'Virtual' intimacies? Families communicating across transnational contexts. *Global Networks* 6, (2), pp. 125-142.
- Williams, E. (1977). Experimental comparisons of face-to-face and mediated communication. . *Psychological Bulletin* 84: 963-976.
- Wood, J. T. (1993). Engendered relations: Interaction, caring, power, and responsibility in intimacy. *Social context and relationships*. S. d. (Ed.). Newbury Park, CA: Sage: 26-54.
- Wright, P., Wallace, J. & McCarthy, J. (2008). Aesthetics and experience-centered design. *ACM Transactions on Computer-human Interaction* 15(4): Article 18.
- Young, I. (2008). *Mental Models: Aligning design strategy with human behavior*. New York, Rosenfeld Media.
- Zizek, S. (2007). The Liberal Utopia: Part II The market mechanism for the race of devils. Retrieved from <http://www.lacan.com/zizliberal2.htm>