

# Exploring communication and sharing between extended families

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## Abstract

In recent years, computer and Internet technologies have broadened the ways that people can stay in touch. Through interviews with parents and grandparents, we examined how people use existing technologies to communicate and share with their extended family. While most of our participants expressed a desire for more communication and sharing with their extended family, many felt that an increase would realistically be difficult to achieve due to challenges such as busy schedules or extended family members' lack of technology use. Our results also highlight the complexity of factors that researchers and designers must understand when attempting to design technology to support and enhance relationships, including trade-offs between facilitating interaction while minimizing new obligations, reducing effort without trivializing communication, and balancing awareness with privacy.

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## 1. Introduction

The ability of technology to help people communicate has long been recognized, and many researchers have studied the value of technology for growing and maintaining social ties (e.g., Liechti and Ichikawa, 2000; Hindus et al., 2001; Venkatesh, 2005). In recent years, new computer and Internet technologies such as video chat, blogging software, social networking sites, and sites for sharing digital media have broadened the ways that people can stay in touch. The growing number of PC owners and Internet users in many countries (United Nations Common Database) increases the potential for people to make use of technology to stay in touch with those they care about.

Our interest lies in exploring how technology can help *extended family members* (people who are related, but do not live in the same household) maintain a sense of *connectedness*, defined by Romero et al. (2007) as a “positive emotional appraisal, characterized by a feeling of staying in touch within ongoing social relationships.”

This notion of generally feeling close to one's family and friends has also been called *affective awareness* (Liechti and Ichikawa, 2000) and *social communication* (Hindus et al., 2001). There have been many concepts and prototypes developed to support connectedness between families, including awareness displays (e.g., Mynatt et al., 2001; Consolvo et al., 2004; Dey and De Guzman, 2006; Plaisant et al., 2006), media spaces (e.g., Hindus et al., 2001; Hutchinson et al., 2003), and mobile device systems (Counts and Fellheimer, 2004; Romero et al., 2007). The amount of research in this area highlights the perceived opportunity to use technology to help extended family members feel more connected.

As part of a larger research effort investigating the use of technology to support connectedness between extended families, we first sought to better understand how people currently stay in touch with their extended family members. Through interviews with 28 parents and grandparents living in the northwestern United States, we examined how people communicate with their extended family, as well as how they share photos or event information with them. We also asked our participants about the kinds of information they wanted to share, and whether they felt that their needs were being satisfied with

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existing technologies. The data we gathered allows us to characterize parents' and grandparents' current communication and sharing patterns with their extended family members, including the challenges they faced as well as other factors affecting how they communicated and shared with their extended families.

We found that while most of our participants expressed a desire to increase their level of communication or sharing with at least one extended family member, many felt that realistically, this would be difficult to achieve due to various social or technological concerns. Some of our participants expressed a sense of obligation towards interacting with their extended family, and others noted feelings of guilt or pride concerning their communication and sharing habits. Thus, while technology can help people connect with others, our results highlight the complexity of factors that researchers and designers must understand when attempting to design technology to support and enhance relationships. In particular, our findings suggest that new technology must delicately balance the assistance it provides without creating additional burdens or obligations, while at the same time being easy to use without trivializing the interaction.

## 2. Related work

Many research fields study the role of information and communication technology in the home; in this section, we briefly overview work related to family communication and media sharing.

### 2.1. Family communication

Studies on family communication have shown that in recent years, email has become practically ubiquitous (Liechti and Ichikawa, 2000) and is often used interchangeably with phone calls in many North American households (Venkatesh, 2005; Neustaedter et al., 2006b). Instant messaging (IM) has also become widely adopted within certain populations such as teens (Grinter and Palen, 2002) and heavy computer users (Neustaedter et al., 2006b). With the explosion of newer forms of computer and Internet technologies for communication and sharing, combined with the increase in number of North American homes connected to the Internet (Horrigan, 2006), we were interested in whether parents and grandparents were starting to broaden the ways that they used technology to stay in touch with their extended family members.

In particular, we were interested in how they kept in touch with the group of extended family members who are *intimate socials* (the people with whom one is close to and has a strong desire to stay in touch with) and *extended socials* (the people with whom one's relationship is much more casual, Neustaedter et al., 2006b). The classifications that Neustaedter et al. identified correspond roughly with what Venkatesh (2005) termed *strong* and *weak* relationships and what Broadbent and Bauwens (2008) call

*intimate, close, and weaker ties*, and appear to drive what communication method is used to contact a family member as well as what level of detail is desired in updates about that family member (Venkatesh, 2005; Neustaedter et al., 2006b).

During his study of 25 families in the Southern California area, Venkatesh (2005) evaluated five communication technologies used within the home (telephone, email, mobile phone, instant messenger, and paper notes) along a number of social dimensions. These dimensions included whether the method was primarily *social* or *informative*, used by people that were *near* each other or *distant*, or encouraged *engaged* or *terse* dialog. For example, Venkatesh classified phone communication as primarily social, mainly for people who are nearby, and suggested that phone communication encourages engaged dialog. In contrast, he categorized email as primarily informative, used for both nearby and distant communication partners, with terse dialog. Though our attention on current and desired amounts of communication contrasts with Venkatesh's approach of comparing communication methods along social dimensions, we compare our findings to Venkatesh's when possible. Other studies (e.g., Liechti and Ichikawa, 2000; Neustaedter et al., 2006b; Romero et al., 2007; Broadbent and Bauwens, 2008) also help us understand the most popular ways families communicate, but they provide little detailed data on frequency of use or generational differences in how people use technology to communicate with their extended family members.

### 2.2. Sharing media and information

In addition to facilitating communication, technology has also greatly expanded the ability of people to share media and information with each other. For example, the number of websites (e.g., Flickr, Picassa) offering free space for sharing photos has grown, and their interfaces for uploading and organizing photos have greatly improved. Additionally, there are a growing number of commercial systems and websites that enable people to share other kinds of media and information, including calendars (e.g., Google Calendar, 30 Boxes), blog entries (e.g., Blogger, Live Spaces), videos (YouTube), and information about activities and interests as well as other media (e.g., MySpace, Facebook). With the availability of Internet technologies like these, we were interested in the degree to which people were using them for sharing digital photos and calendar information with their extended family.

Studies of digital photo sharing have shown that families tend to share digital photos through email (Frohlich et al., 2002; Kirk et al., 2006; Miller and Edwards, 2007), partly because email enables ongoing text conversation around the shared photos. In particular, Frohlich et al. found that families "experience as much joy from the feedback and subsequent conversation around the photos that they have sent, as they do from sending or receiving the photos

themselves.” Many of the websites for photo sharing now support “commenting” or “tagging” features that enable viewers to leave feedback and have conversations around shared photos. Additionally, some of these websites also support what Kirk et al. termed *photowork*, i.e., the activities that people must perform on their photos after taking them but before sharing them, which includes downloading, organizing, editing, sorting, and filing of the photos. In their study of the digital photo-sharing site Flickr.com, Miller and Edwards’ 10 participants fell into two distinct classes. Half of their participants could be identified as belonging to the *Kodak Culture*, described by Chalfen (1987), people that share primarily within an existing social group of their family and friends, and who take photos to archive. The other group, which Miller and Edwards called *Snaps*, took photos much more frequently, all tagged their photos, and shared primarily using a website with their friends and Flickr contacts rather than with their family. The participants in our study primarily fit the characteristics of the Kodak Culture, allowing us to further explore whether these types of parents and grandparents are satisfied with their current photo sharing practices.

Prior research on family calendaring practices has suggested that current online calendars are not well matched to families’ natural routines (Neustaedter et al., 2006a). Instead, most families use paper calendars, which are difficult to share with extended family (Neustaedter and Brush, 2006). While some people have started using digital calendars such as their work calendar as their primary family calendar, families typically coordinate and share information about upcoming events through other modes of communication (Neustaedter et al., 2006a). From our participants, we sought to understand how and what types of calendar information people were sharing with their extended family members. We were also interested in whether they desired better ways of sharing calendar information, both for coordination and for awareness of what was going on in others’ lives.

In the following sections, we report on our study of how parents and grandparents communicate and share with their extended family members.

### 3. Methodology

Data on communication and sharing with extended family members were collected during two studies with a total of 28 parents and grandparents. The first study was conducted in July 2006, and involved 12 participants (three mothers: M<sub>1</sub>–M<sub>3</sub>, three fathers: F<sub>1</sub>–F<sub>3</sub>, three grandmothers: GM<sub>1</sub>–GM<sub>3</sub>, and three grandfathers: GF<sub>1</sub>–GF<sub>3</sub>). A second study was conducted in May 2007 to gather more data, and involved 16 participants (five mothers: M<sub>4</sub>–M<sub>8</sub>, three fathers: F<sub>4</sub>–F<sub>6</sub>, four grandmothers: GM<sub>4</sub>–GM<sub>7</sub>, and four grandfathers: GF<sub>4</sub>–GF<sub>7</sub>). All of the parents had at least one child in their household. None of the participants were related with the exception of one mother and her mother who both participated in the study. All study sessions took place in our research laboratory.

Because we were interested in studying existing relationships, we recruited participants who communicated with one or more of their extended family members at least twice a month. We additionally required that participants take at least 30 digital photos a year, so that we could ask them about their photo-sharing practices. Beyond that, we sought a diverse group that varied in age (30–75), family composition (21 currently married or remarried; six single, widowed, or divorced), and experience with technologies such as digital calendars (15 participants used them regularly) and photo-sharing websites (13 participants used them more than once). Participants were recruited from the greater Seattle area, and each received a software item as remuneration.

Each session started with a semi-structured interview about the participant’s current communication and sharing practices. To ground the interview, we had each participant construct a partial family tree that included all the extended family members that the participant communicated with at least twice a month. See Fig. 1 for an example. For each person identified on the participant’s family tree, we asked how often they communicated with them, what methods of communication they used, and whether the participant was satisfied with the type and amount of communication taking place. We also asked participants similar questions with respect to photo

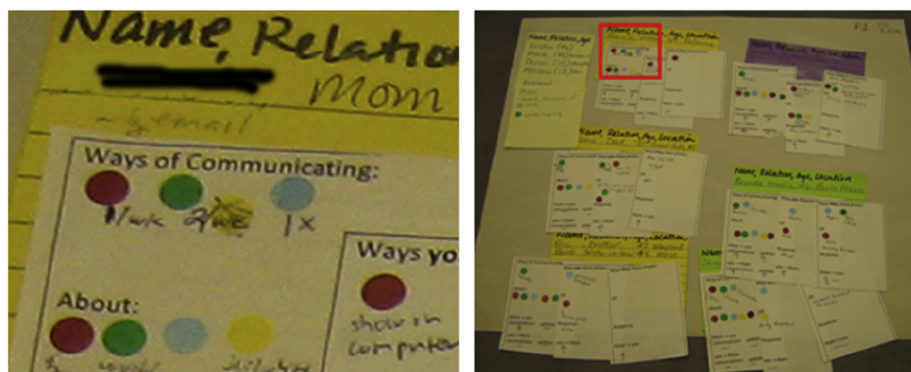


Fig. 1. A participant’s partial family tree, which shows the extended family members that they communicate with at least twice a month.

sharing. After this portion of the study, we asked participants to describe how they maintained their family calendar and how they shared event details with others in their extended family. Because none of the participants currently shared their calendar with extended family, we asked them to discuss their desired calendar-sharing practices in more detail than we did with communication and photo sharing.

In the second study, we asked the same questions as in the first study and collected additional data to give an even more detailed picture of our participants' communication and sharing practices. For one week prior to their interview session, each participant was asked to complete a communication diary. Participants recorded every communication that they had with an extended family member, including where they were when the communication took place, who they communicated with, what method of communication was used, whether they initiated the communication, and whether photos or calendar information were shared. Then, during the interview, participants were also asked to categorize their extended family members as intimate socials (people they felt close to and had a strong desire to stay in touch with) or extended socials (people with whom their relationship was much more casual). Each session was audio recorded and notes were taken on participants' communication and sharing habits. This qualitative data was analyzed using affinity diagramming to identify common themes.

#### 4. Current communication and sharing results

Data from the partial family trees and communication diaries gives us a detailed description of our participants' communication and sharing practices. From 28 partial family trees, we have data on 164 relationship pairs representing communication and sharing between a participant and an extended family member (see Table 1). From 15 communication diaries,<sup>1</sup> we have data on 462 communication occurrences between a participant and an extended family member. While we also collected some data on how participants communicated and shared with their friends, we focused in this study on extended family.

When reporting our results, we primarily use descriptive statistics. We also performed inferential statistics using non-parametric tests to compare communication patterns between people in the *parent generation* (in the same generation as the parents in our study) versus people in the *grandparent generation* (in the same generation as the grandparents in our study), based on their family relationships (see Table 2). In the following sections, we focus on key observations related to our participants' communication and sharing habits. While our results must of course be interpreted within the context of the culture in which they were collected, they nonetheless reveal interesting trends

that highlight the delicate balance between ease of use, frequency, and quality of interaction when considering tools to help families feel more connected.

##### 4.1. Current communication

Based on the relationship pair data from the partial family trees, our 28 participants each communicated with a median of six extended family members at least twice a month (see Table 1). Extended family members included parents, siblings, children who had grown up and left home, relatives, in-laws, and ex-spouses. Extended family members lived in the same state as the participant in 44% of the relationship pairs, elsewhere in the US in 43%, in Canada in 6%, and overseas in 7%. Also, our participants identified a median of 3.5 intimate socials (higher than what Neustaedter et al. (2006b) saw for middle-aged adults) and a median of 2 extended socials (much less than the median of 18.5 that Neustaedter et al.'s middle-aged participants identified). We suspect that these differences were a result of our focus on extended family members that participants communicated with at least twice a month, as well as our exclusion of friends and co-workers.

Fig. 2 shows the different methods of communication as well as frequency of use for our participants. Consistent with previous studies (e.g., Neustaedter et al., 2006b; Venkatesh, 2005), phone and email communication were most popular. All of our participants used telephone and email to communicate with at least one extended family member (Fig. 3), and both methods tended to be used on a weekly or monthly basis (Fig. 2). While telephone calls were used in more relationship pairs (92%, 151 of 164) than email (85%), this difference was not statistically significant ( $z = 1.62$ ,  $N$ -ties = 15,  $p = 0.105$ ). Looking at telephone versus email communication by generation, our participants (parents and grandparents combined) used phone significantly more than email to communicate with people in the grandparent generation ( $z = 2.04$ ,  $N$ -ties = 13,  $p = 0.042$ ), while there was no significant difference in phone versus email usage when our participants were communicating with people in the parent generation ( $z = 0.211$ ,  $N$ -ties = 8,  $p = 0.833$ ).

In many relationship pairs, participants also made face-to-face visits (73%) and some exchanged postal mail (30%); however, these methods were mostly used infrequently. We also did not observe any significant difference in the amount of face-to-face or postal communication with people in the parent versus the grandparent generation ( $z = 0.095$ ,  $N$ -ties = 14,  $p = 0.925$  and  $z = 0.460$ ,  $N$ -ties = 10,  $p = 0.646$  respectively). Other newer forms of communication such as text messaging (SMS) and video chat (e.g., Skype) were also mentioned by nine of our participants (32%), although these methods were not commonly used. Only 2 participants (7%) reported using a system that involved a webcam.

<sup>1</sup>One participant did not complete a communication diary as she had been away for the week prior to the study.



Table 1  
Breakdown of the relationship pairs that each participant included in their partial family tree (participants from the second study are shown below the dotted line)

Participant	Total	By family relationship					By location			By classification	
		Relationship pairs	Parents	Siblings	Children	Relatives	In-laws/ ex's	Same state	Different state	Outside USA	Intimate socials
M <sub>1</sub>	5	2	1	–	1	1	1	2	2	n/a	n/a
M <sub>2</sub>	5	1	1	–	1	2	–	–	5	n/a	n/a
M <sub>3</sub>	7	1	1	–	1	4	3	4	–	n/a	n/a
F <sub>1</sub>	5	–	–	2	2	1	–	3	2	n/a	n/a
F <sub>2</sub>	3	1	2	–	–	–	–	3	–	n/a	n/a
F <sub>3</sub>	6	1	–	2	–	3	4	2	–	n/a	n/a
GM <sub>1</sub>	4	–	1	2	1	–	1	2	1	n/a	n/a
GM <sub>2</sub>	9	1	3	3	–	2	3	6	–	n/a	n/a
GM <sub>3</sub>	7	–	2	3	–	2	2	5	–	n/a	n/a
GF <sub>1</sub>	6	–	2	2	2	–	2	4	–	n/a	n/a
GF <sub>2</sub>	3	–	–	1	–	2	–	1	2	n/a	n/a
GF <sub>3</sub>	4	–	–	2	1	1	3	1	–	n/a	n/a
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M <sub>4</sub>	7	1	4	–	2	–	3	4	–	5	2
M <sub>5</sub>	8	–	3	1	–	4	8	–	–	3	5
M <sub>6</sub>	2	1	1	–	–	–	1	1	–	1	1
M <sub>7</sub>	7	1	2	–	2	2	–	–	7	3	4
M <sub>8</sub>	6	2	–	–	–	4	5	1	–	4	2
F <sub>4</sub>	10	2	2	1	4	1	7	2	1	6	4
F <sub>5</sub>	6	1	–	–	4	1	1	5	–	4	2
F <sub>6</sub>	6	1	2	–	1	2	6	–	–	5	1
GM <sub>4</sub>	4	1	2	–	1	–	–	4	–	3	1
GM <sub>5</sub>	4	1	1	1	1	–	3	1	–	2	2
GM <sub>6</sub>	9	–	4	3	1	1	3	6	–	8	1
GM <sub>7</sub>	8	–	–	2	4	2	2	6	–	4	4
GF <sub>4</sub>	8	–	1	2	1	4	8	–	–	2	6
GF <sub>5</sub>	6	–	1	3	1	1	1	5	–	6	–
GF <sub>6</sub>	4	–	2	2	–	–	2	2	–	2	2
GF <sub>7</sub>	5	–	–	4	–	1	3	1	1	3	2
Total (%)	164	18	38	36	31	41	72	71	21	61	39
	100	11	23	22	19	25	44	43	13	63	27
Mdn	6	1	2	2	1	2	3	3	0	3.5	2
M	5.9	1.2	1.9	2.1	1.7	2.1	3.3	3.1	0.8	3.8	2.6
SD	2.0	0.4	1.0	0.9	1.1	1.1	2.2	1.8	1.6	1.8	1.6

For example, M<sub>4</sub> named 7 extended family members that she communicated with at least twice a month; one of those was a parent, 4 were her siblings, and 2 were relatives; 3 lived in the same state as her and 4 lived elsewhere in the US; finally, she classified 5 of them as intimate socials and 2 as extended socials.

Table 2  
Depending on the participant type (parent or grandparent), different extended family members were included in the parent generation and the grandparent generation

Participant type	Included in the parent generation	Included in the grandparent generation
Parent	Former partners, siblings <sup>a</sup> , cousins <sup>a</sup>	Parents <sup>a</sup> , aunts <sup>a</sup> , uncles <sup>a</sup>
Grandparent	Offspring, nieces <sup>a</sup> , nephews <sup>a</sup>	Former partners, siblings <sup>a</sup> , cousins <sup>a</sup>

<sup>a</sup>Ex's and in-laws were also included for these family relationships.

IM was only used in 15% of our relationship pairs, despite its growing popularity among teens (Grinter and Palen, 2002) and in the workplace (Nardi et al., 2000;

Cameron and Webster, 2005). While 14 of our participants had tried IM, only seven used it regularly (five parents and two grandparents). One additional participant in our study, M<sub>3</sub>, used IM but only to tell when her dad was online (i.e., home) so that she could call him. Although we did not find a significant difference in the amount of IM use with people in the parent versus the grandparent generation ( $z = 1.68$ ,  $N$ -ties = 13,  $p = 0.093$ ), 4 of the grandparents in our study expressed a strong dislike or even hatred of IM. They did not like having to sit at their computer waiting for others to reply, and they found it irritating when messages interrupted whatever they were doing on the computer. They saw IM as a means for synchronous, foreground communication, in contrast to the use of IM for multi-tasking or having multiple simultaneous conversations (Grinter and Palen, 2002; Isaacs et al., 2002).

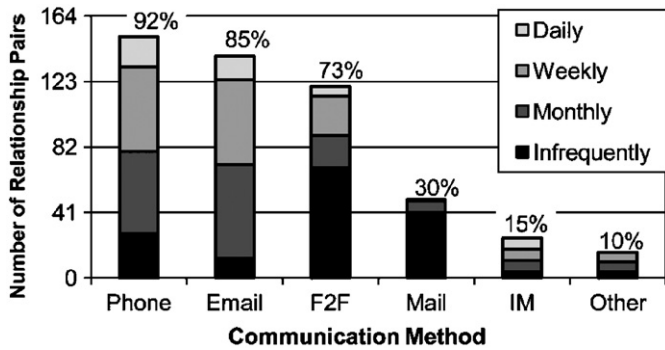


Fig. 2. Number of relationship pairs ( $N = 164$ ) in which each communication method was used. Frequencies of use are also shown.

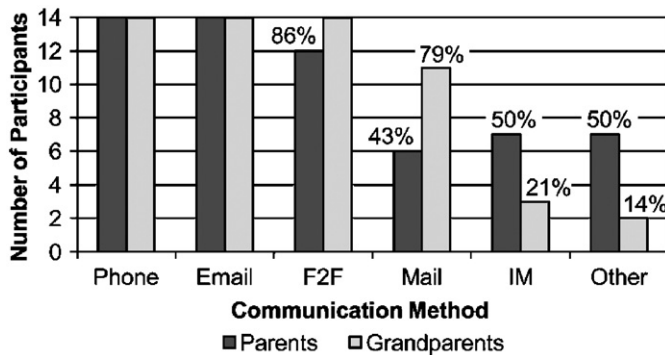


Fig. 3. Number of parents ( $N = 14$ ) and grandparents ( $N = 14$ ) who reported using each communication method.

Participants expressed that they were satisfied with their current amount of communication in many of the relationship pairs (in 60%, 98 of 164), while they wanted more communication in 36.5% and less communication in 3.6%. Beyond just increasing communication, many participants wanted to increase the “quality” of the communications. GF<sub>5</sub> stated, “I would like to hear less from him as far as his garbage (forwarded) emails, but more about what’s going on in the family.” M<sub>7</sub> told us, “I get forwards, I don’t get anything personal. It would help me feel more comfortable with her if I could hear more what’s going on in her life.” In total, 22 participants (79%) had extended family members that they would have liked to hear from more often, though there was a perception that “realistically that couldn’t happen,” since those people were so busy.

Some participants also felt that while they wanted to hear more from others, others did not want to hear more from them. Specifically, 12 participants (43%; four parents, eight grandparents) wanted to hear more from at least one son or daughter, but only two participants (11%; one parent, one grandparent) felt that their son or daughter would want an increase in communication from them. However, upon examining the opposite trend, we found that six participants (21%; all parents) felt that their parents would want to hear more from them, and five of those six participants also reported wanting to hear more from their parents, so perhaps participants’ concerns about

their children not wanting to hear from them were unfounded.

#### 4.2. Current photo sharing

Our 28 participants shared photos with a median of 5.5 extended family members ( $M = 5.1, SD = 2.1$ ). Overall, participants reported sharing photos in 88% of relationship pairs (144 of 164) and 21 participants (75%) reported sharing photos with all of the extended family members that they communicated with at least twice a month.

Participants received photos from a median of four extended family members ( $M = 4.1, SD = 1.7$ ). Overall, participants reported receiving photos in 70% of relationship pairs (114 of 164). However, only six participants (21%) reported receiving photos from all of the extended family members that they communicated with at least twice a month.

Email was the primary method participants used to share and receive photos (see Fig. 4), similar to Miller and Edwards’ (2007) Kodak Culture participants. Additionally, while all of our participants received photos through email, they received significantly more photos through email from people in the parent generation than from people in the grandparent generation ( $z = 2.04, N\text{-ties} = 23, p = 0.041$ ).

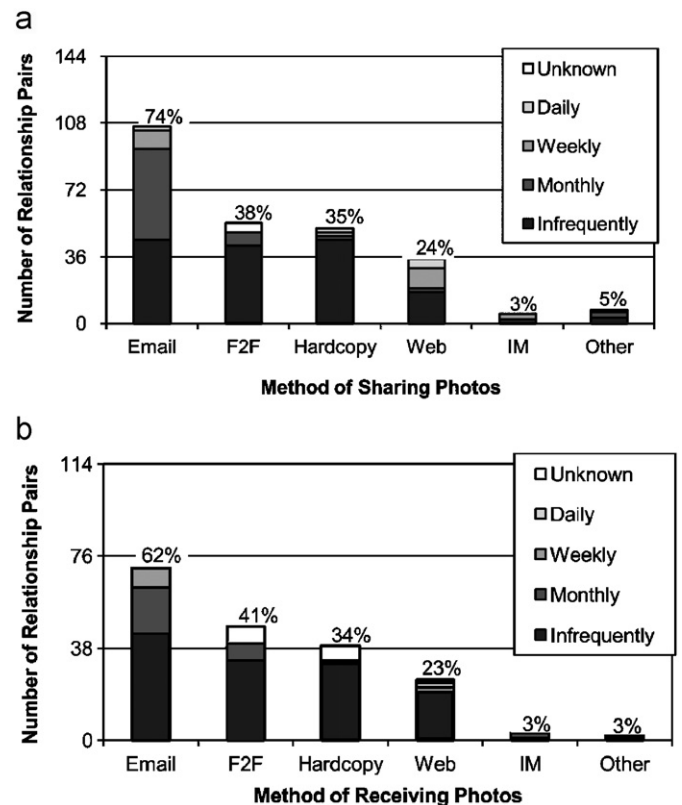


Fig. 4. (a) Number of relationship pairs ( $N = 144$ ) in which participants shared photos using each method. Frequencies of use are also shown. (b) Number of relationship pairs ( $N = 114$ ) in which participants received photos using each method. Frequencies of use are also shown.

Other ways of sharing photos included sharing in person during visits, through hardcopies exchanged using the postal mail, or on the web (see Fig. 4 for details). Participants also tended to share photos episodically, mainly on a monthly or infrequent basis such as when special events like parties or vacations occurred. This is consistent with other research on photo sharing (e.g., Chalfen, 1987; Miller and Edwards, 2007). The one participant that did share photos on a daily basis had a web blog that he updated frequently. While we saw other forms of photo sharing such as through IM or cell phones, these methods were not common.

Photos were seen as a good way of connecting with extended family since people generally enjoyed seeing them, as Frohlich et al. (2002) also found. GF<sub>3</sub> said, “Anytime we do send her (their daughter) photographs, she just loves it, she’ll take as many as we can get her.” M<sub>8</sub> told us her extended family always wanted more photos from her, saying, “Everybody wants to see more... If they all had their way, they would all have copies of every single picture that I take... more, more, more, more, more, all the time more!” Participants also commented on the enjoyment they get when pictures arrive. For example, M<sub>2</sub> commented, “Seeing pictures of people... you don’t think very often during the day, oh I wish I could go see different pictures of so and so, but when they arrive they are wonderful.”

In a little less than half the relationship pairs, participants were satisfied with the number of photos they were receiving (participants wanted about the same amount in 48% of relationship pairs, 55 of 114). However, in almost all the remaining relationship pairs (50%), participants wanted more photos (they wanted fewer in 2%). As GF<sub>2</sub> commented, “I’m tickled pink anytime I get a photo.” In total, 23 participants (82%) had at least one extended family member that they wanted to receive more photos from, although they were realistic about the challenges related to this. For example, GF<sub>3</sub> wanted more photos from his daughter but commented, “With the amount of time that they have, they’re doing a pretty good job of taking lots of photos and sending us copies.”

#### 4.3. Current calendar sharing

Our participants used a variety of paper and digital calendars. Twelve participants (43%) had two family calendars in their home, typically one paper and one digital. In total, 14 participants (50%) had a monthly wall calendar, 11 (39%) used a calendaring application (such as Outlook), 7 (25%) had a weekly or daily planner, 5 (18%) used a PDA, and one (4%) used an online/web calendar. We also had one participant who did not use a calendar, but wrote notes and appointments on her bathroom mirror as reminders to herself. No one explicitly shared their calendar with extended family, although 16 participants (57%) reported commonly sharing calendar information (primarily for coordination and scheduling purposes).

Participants also reported sharing calendar information in 141 of 462 (31%) of the communication occurrences recorded in the diaries, mainly through phone (68 of 141, 48%) and email (46 of 141, 33%).

When asked about calendar sharing with their extended family, 12 participants (43%) were interested in sharing their calendar with at least one other extended family member and 17 (61%) were interested in seeing at least one other extended family member’s calendar. Participants mainly expressed interest in seeing their parents’ and their adult children’s calendars, primarily for facilitating the coordination of events and activities. Participants were also interested in seeing their extended family members’ calendars to know when others were likely available for phone calls, to know when others were out of town, or simply for maintaining awareness about what others were up to, although there was some concern over being too intrusive.

Most participants reported that they would mainly want to share events and travel plans. Although some participants did not want to share things such as doctor’s appointments and certain social events like dates, most of them said they would not mind if others saw their calendar. Overall, participants seemed less concerned about sharing events than we expected; 21 participants (75%) could not think of any event that they would particularly want to keep private, and 12 participants (43%) commented straight out that they did not care if anyone saw their calendar. GF<sub>2</sub> commented, “We’re pretty open, we have no big deep dark secrets.” Generally, participants seemed comfortable with the idea of their extended family being able to see their calendar, although many did not think that their extended family would particularly care to see it—12 participants (43%) made comments such as “I just don’t think they’d be interested.” However, it seemed like some participants only considered calendar sharing useful for coordination, and did not consider its potential value for promoting awareness of what was going on in extended family members’ lives.

### 5. Common communication and sharing themes

In this section, we present some of the common themes that emerged from participants’ descriptions of how they communicated and shared with their extended families.

#### 5.1. Challenges in family communication and sharing

First, we highlight some of the challenges our participants faced in communicating and sharing with their extended families.

##### 5.1.1. Time and effort

People being busy was the most common reason given for not keeping in touch, which other researchers have also observed (e.g., Frohlich et al., 2002; Neustaedter et al., 2006b). As M<sub>5</sub> told us, “We are all so busy, it is really hard

to stay in tune with what everyone is doing.” M<sub>8</sub> said, “It’s just logistics, not so much that we’re ignoring each other, it’s just busy schedules.” When we asked about their desired amounts of communication and sharing, many participants wanted more or thought that an extended family member wanted more, but did not believe that an increase could happen in practice because everyone was already so busy. For example, M<sub>1</sub> said, “They would like to hear from us more, I’m sure, but we talk to them as much as we can.” Several participants also commented that while they would like to hear more or see more photos from particular people, they were satisfied with the current amount, because they knew that others were busy.

When sharing photos, the perceived amount of personal effort required to share was also an issue. For example, M<sub>2</sub> highlighted the tension between a life rich with experiences she wanted to capture and the time and effort required to handle her photos, saying, “The thing is, the more there is to photograph, the busier you are, and the less time you’ve got to process the pictures. Cameras should come with this little alarm saying ‘Hang on a minute! Do you have time in your life to deal with all these!’” The photowork activities that people must do before sharing their photos, such as weeding out bad photos and deciding what to share, was found to be overwhelming at times. As F<sub>1</sub> commented, “I can’t believe we are taking so many pictures.” In part because of time demands and the amount of effort required for photowork, our participants expressed a preference for photo-sharing applications that were easy to use. For example, M<sub>1</sub> commented that “if I could easily (share photos) just easily clicking a mouse and stuff, I would do it all the time. But it just seems like a real rigmarole to get the photographs from (photo application) into, you know, sending them to people, so we really don’t do it nearly as often as we would.”

### 5.1.2. Technological challenges: apprehension and obsolescence

While problems with technology come as no surprise given previous research (e.g., Stewart, 2003), we briefly highlight two key technological challenges our participants faced. This not only reinforces the fact that technology remains problematic today, it also highlights the extent to which family members currently must take technology into account when communicating and sharing with others.

In general, our participants commented that the computer was a valuable tool for communication. As GM<sub>3</sub> told us, “I think it’s wonderful with computers because we converse more having computers now than we ever did before.” However, keeping in touch through computer technologies was sometimes a problem. Fifteen participants (54%) had extended family members they were interested in communicating with or sending photos to through email, but these people were not “computer savvy.” For example, M<sub>2</sub> told us that her mother was “terrified” of the computer: “My dad’s got to drag my mother over to the computer and stand there and look at it.

She’d much rather have a piece of paper with a picture on it in her hand.” In these cases, participants either used traditional ways to communicate and share with these extended family members (e.g., calling on the telephone or mailing traditional prints), or they did not communicate or share photos with them at all. The feeling of extended family members not being technologically literate also extended to use of other technologies such as digital cameras; several participants cited lack of a digital camera or others not being savvy with digital cameras as reasons why some of their extended family members did not share digital photos with them.

Obsolete technology also made computer-mediated communication and photo sharing challenging for our participants; people having limited email storage space, slow connection speeds, or not enough computer memory were all mentioned as problems. These issues of adoption and use of technology are similar to those described by Stewart (2002), who identified a number of reasons for non-adoption of technology, including the apprehension described above by M<sub>2</sub>, as well as other reasons such as the perceived irrelevance of the technology, expense, infrastructure issues, and technical problems.

Interestingly, participants seemed to know a lot about their extended family members’ technical infrastructures and usage patterns, and considered them carefully when communicating or sharing through technology. For example, M<sub>1</sub> told us that she did not rely on email to communicate with her parents-in-law as they had an old computer and didn’t check often, and GF<sub>1</sub> said that he did not like to “hurt” people by sending a large file through email. Even more specifically, GF<sub>3</sub> said that he was very careful about what he emailed his daughter, because he knew that she did not check her email much and the emails would stack up until she did, causing her problems with her email account.

### 5.1.3. Social challenges: obligation and consideration for extended family members

The social complexity of communicating and sharing with extended family members cannot be overlooked. For our participants, communication and sharing was not as simple as dialing a phone number or attaching a few photos to an email. In addition to the pre-sharing effort of sorting and editing that Kirk et al. (2006) outlined, our participants described additional concerns tied to a sense of obligation to communicate as well as the importance of carefully considering family members’ feelings when communicating or sharing.

For many of our participants, there was a perception that more communication was better, and they felt guilty for not keeping in touch often enough. This in fact somewhat complicated our interviews at times, as we wanted to inquire about communication and sharing behaviors in as neutral a way as possible, but our questions for some people immediately triggered guilt. M<sub>1</sub> and M<sub>2</sub> both referred to our interview as being a “guilt trip”



because it made them more conscious of the gap between how often they wanted to keep in touch with particular people and how infrequently they actually did. Another participant, GM<sub>2</sub>, was proud that she kept in touch so often with her adult children, telling us, “I’m a good mom, aren’t I?” While we did not specifically focus on gender differences, our female participants self-reported or spontaneously mentioned expectations around keeping in touch noticeably more than our male participants did.

Participants also described putting a considerable amount of thought and effort into deciding what to share with their extended family; most participants commented that they only shared things with extended family members whom they thought would be interested, and they were also cautious about overloading people with too much information or too many photos. Part of this was an effort to avoid being seen as bragging—M<sub>2</sub> in particular was quite concerned about this, commenting that she was “always trying to find that balance between too much show-and-tell and just staying in touch with people.” Avoiding hurting others’ feelings was also a concern; for example, M<sub>3</sub> mentioned that the reason she uploaded photos to the web was to give everybody “the same opportunity to see all the same pictures. Otherwise if I’m sending one or two to each group, somebody’s feelings get hurt if they get left out.”

## 5.2. Other factors affecting communication and sharing

In addition to the challenges described previously, several other themes relating to communication and sharing emerged from the data.

### 5.2.1. Interest in children

As Chalfen (1987) also observed, there was a strong interest in children and particularly grandchildren, both hearing updates about them and seeing photos of them. Eleven participants (39%) commented that they wanted to see more photos specifically of “the kids”, including GM<sub>6</sub>, who said she wanted more “even though I’m out of refrigerator space,” and GF<sub>3</sub>, who told us, “Parents have an insatiable appetite for pictures of kids, you know.”

Interestingly, we also saw a corresponding lack of interest from four participants (14%) when a family did not have children. GM<sub>2</sub> said of her sister-in-law, “She has never been married and doesn’t have children... she doesn’t have a lot to share with me, it’s just a different life.” GF<sub>1</sub> was very interested in hearing more about his daughter’s family, but when asked about his son, he said he wasn’t currently interested, but “if he (his son) got married and had some kids, then yes.” M<sub>3</sub> commented about her sister-in-law, “I’m happy right now (with the number of photos being sent). If she had children of her own... I’d probably say ‘Send more photos’”. While we expected that children and grandchildren would hold a particular fascination for their grandparents and extended family members, we were surprised that several participants

indicated disinterest in particular families because those families lacked children.

### 5.2.2. Importance of feedback and reactions

Similar to observations by Frohlich et al. (2002), our participants enjoyed the reactions and conversation about the shared photos in addition to the actual photos themselves. Five of the seven participants (71%) that shared photos through a website reported captioning some of the photos that they shared. As M<sub>8</sub> said, “If people are going to be looking at it and I know there’s going to be an active dialogue about it, I’m more apt to put a caption and put maybe a blurb in regards to what was going on there (in the photo).”

Lack of feedback or reactions bothered some of our participants. For example, M<sub>2</sub> regularly posted photos of school and extracurricular activities online for other families to see, but she had no evidence that anyone else stored them or wanted them, which made her wonder why she still went to all the effort of putting them up. In other cases, lack of feedback or negative feedback was enough to cause people to stop sharing. GM<sub>3</sub> stopped sending photos of her grandkids to her brother after he did not respond, and three other participants mentioned that they had stopped sharing photos with an extended family member after they had received negative feedback from that person about their sharing practices.

### 5.2.3. Proximity of extended family

For our participants, proximity of the extended family seemed to play a role in what type of information (calendar or photo) participants wanted to share with them. Specifically, participants seemed to be more interested in sharing photos with extended family living far away and calendar information with those living nearby. Photos were seen as valuable in connecting extended family members who were not able to see each other often; as M<sub>7</sub> said, “If I can’t see them (in person), getting a photo is almost as good.” In contrast, eleven participants (39%) commented that they would not be interested in sharing calendar information with extended family members living far away from them because they did not need to know day-to-day information. “For me living so far away, it’s not very relevant to my life,” according to M<sub>7</sub>. “What we do has no effect on each other so a calendar is meaningless,” stated GF<sub>3</sub>.

Conversely, six participants commented that for nearby family members, they were not that interested in sharing photos. As GF<sub>1</sub> said, “I don’t think we care too much about photos. If you’re seeing the grandkids every day, that’s not all that useful. If we were living (farther away), then yes, my wife would be very interested in seeing the latest pictures.” Instead, they were interested in sharing calendar information in order to facilitate coordination. As F<sub>6</sub> said, “They only live a couple miles from us... the photo is not as important with them, more the events (are of interest).” It is important to note that participants

did not indicate that they minded sharing calendar information with extended family members who were far away or photos with those nearby, but rather, they saw photos as being particularly valuable for people far away, and calendar information particularly relevant for people nearby.

## 6. Discussion

Most of our participants had at least one extended family member that they wanted to increase communication or sharing with. While it is possible that people over-reported wanting more interaction because they were participating in the study and several seemed to have the expectation that more communication was perceived as “good”, the extent to which people expressed an interest in additional communication and sharing suggests that there are opportunities to develop new applications and technologies for connecting extended family members. Our results highlight several interesting trade-offs that should be considered when designing technology to support family communication and connectedness.

### 6.1. Affording interaction without introducing obligation

While many participants expressed an interest in more communication and sharing, comments like “this is a guilt trip, isn’t it” emphasize the delicate balance in building tools that help people fulfill social obligations (e.g., sending photos to grandparents) in a way that does not create new obligations. This delicate balance is especially true given the importance participants placed on receiving feedback from others when sharing photos, to know that their sharing was valued. In other words, both people sharing and people receiving seemed to feel some degree of obligation to their extended family members.

While any new technology that connects family members runs the risk of becoming just one more thing for a person to do or feel guilty about not doing, the technology may be even more problematic if it emphasizes frequent communication or sharing, given that most of our participants are currently engaged in infrequent sharing around large events. However, other research (e.g., Liechti and Ichikawa, 2000; Kaye et al., 2005; Romero et al., 2007) has suggested that a small amount of information (e.g., one photo or a trivial message) can be enough to create a sense of connection between people, and Romero et al. additionally found that short messages were liked because recipients did not then feel obligated to respond, as they did with longer messages; this direction seems promising given people’s desire for meaningful information about their extended family.

### 6.2. Enabling ease of use without trivializing the interaction

Based on our discussions with parents and grandparents, it is clear that a system for connecting extended family

members would need to be lightweight to fit in with people’s busy lives. Given the *process* effort that people recounted, e.g., starting up the computer to send an email or locating a photo in a directory, there are clear opportunities to reduce the overhead currently associated with using technology for communication and sharing, enabling people to focus their energies on the interaction itself, rather than on the technology. However, given that participants generally did not value or desire forwarded or generic information, there is a balance to be struck between reducing process effort while keeping the piece of the interaction that people find personal and special. For example, consider a program that finds and suggests photos for its user to share but still lets the user make the final decision of what to share as well as facilitates the process of personalizing the photos with captions or comments. Such a program could make the process of sharing photos easier for people while still enabling them to send meaningful messages that can be valued by the recipient.

### 6.3. Providing awareness while respecting privacy

Generally, our participants did not seem too concerned about privacy, likely because we focused on sharing between extended family members. Several participants mentioned how certain family members acted as a “communication hub” that kept everyone in the extended family updated about how others were doing. For calendar sharing, while there were some events that people wanted to keep private, participants seemed more preoccupied with the perceived lack of interest of their extended family members in their calendar data. Additionally, while some participants were interested in seeing others’ calendars, there was also concern over intruding on others’ privacy. This highlights the balance between awareness and privacy that a system for connecting extended family through shared information needs to maintain. However, it may be possible for such a system to also rely on the expectation that people will not share things that they do not want others to know about. For example, while GM<sub>7</sub> initially said that she did not care about seeing her extended family’s calendars as “it’s none of my business,” she later commented that if her adult children prescreened the events they shared on their calendar, she would be interested in seeing them.

Two participants did have particular extended family members that they did not want to share with because, as F<sub>6</sub> said, “(They) are pains and try to get into everything.” This highlights the challenge in designing connectedness systems where complex family dynamics means that one may want to share with some extended family members but not others. While particular extended family members could be denied access to shared communication or information through technology, this then raises other concerns. For example, how would one’s sister feel if she found out that she was being excluded?

## 7. Conclusion

Through interviews with parents and grandparents in the northwestern United States, we examined how people use existing technologies to communicate and share with their extended family. In addition to providing a detailed picture of their current communication and sharing habits, we found that although our participants were already communicating at least twice a month and sharing photos episodically, many had a desire for more communication and sharing, and seemed interested in exchanging photos and events with their extended family on a more regular basis. Additionally, the asymmetry we saw in how our participants perceived others' desires for communication suggests that people may be missing out on valuable opportunities to connect with others. Our study results reinforce the opportunity to create technology that can help families stay connected; the results also emphasize the care designers must take to strike a balance between the various social and technological factors people currently consider when communicating and sharing, such as the perceived value of the interaction, the effort required to communicate or share, issues surrounding obligation, and the need to respect others' privacy. Informed by our findings, our next steps include designing and evaluating a system that uses photo and calendar sharing to support connectedness between extended families.

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