Making Love in the Network Closet:
The Benefits and Work of Family Videochat

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ABSTRACT

In this paper, we explore the benefits of videochat for families and the corresponding work that home users engage in to make a video call run smoothly. We explore the varieties of social work required, including *coordination work, presentation work, behavioral work,* and *scaffolding work*, as well as the technical work necessary. We outline the benefits families enjoy for doing this work and discuss the ways in which families use videochat to reinforce their identity as a family and reinforce their family values, in effect making – as in creating – love. We conclude with recommendations for improving videochat and for designing with family values in mind more generally.

Author Keywords

Home networking, family, home, values, video, videochat, videoconferencing , identity

ACM Classification Keywords

H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

General Terms

Design, Human Factors

INTRODUCTION

Videochat technologies such as Skype and iChat have become increasingly commonplace in the home, allowing for the development of family practices involving them. In this paper, we study the practices around videochat for a family as a whole, including the remote relatives on the other end of the line. Most of the families we studied lived far from grandparents and other relatives; two-thirds had no local relatives. We found that video fit in a constellation of other activities that families perform to create, enact, and reinforce family values at a distance, in effect "making (as in creating) love" between various family members.

Our title is a reference to anthropologist Danny Miller's description of "making love in supermarkets," where

parents (predominantly mothers) put considerable work into balancing the various needs of their family members when shopping for groceries, in effect enacting the love they feel for their families in the course of shopping [21]. Similarly, the 22 families we observed put considerable work into balancing the various needs of their family members, from children to grandparents, in deciding when and how to keep in contact. This work is both a representation of love in itself and a chance to enact a particular family's values.

Our focus on the home reflects a broader shift in the CSCW community from studying just the workplace to studying aspects of the home and family life. Of particular relevance to us, several authors have explored the challenges of creating and maintaining home networks and deploying other technologies in the home [e.g. 15,29,28]. In addition, CSCW and HCI have seen extensive studies of the benefits of video in the workplace, which includes enabling more individual conversations and creating more of a sense of presence [e.g. 1,8,10,12].

More immediately relevant to this study is the limited work on video outside of the workplace. Of this, the most well-known is probably the videoProbe deployed as part of the Technology Probes study, which was an experimental technology to explore family practices [18]. Roussel and colleagues at Paris Sud have continued their work on the videoProbe by exploring issues such as videochat employing varying degrees of engagement [16]. We also found O'Hara et al.'s work on mobile video calling extremely useful for understanding the role of video outside of the office [24]. Gregg reported that dedicated-use videochat units helped four elderly users feel connected to their community [14], Yarosh mentioned that a third of the divorced families she studied used occasionally used videochat when parents were unable to make scheduled meetings with their children [30]. In this paper we build on this work to further understand existing practices around current videochat technologies and in particular their relationship to the social fabric of family life.

In this paper, we begin by describing our field study of 22 economically and culturally diverse families in the San Francisco Bay Area. We then present our results in two sections: the first covering the benefits to family members of videochat, and the second detailing the work that goes into making videochats happen. We then discuss these

results in the context of our families' values. Finally, we conclude by suggesting opportunities for changes to videochat technologies.

FIELD STUDY

This analysis of videochat is part of a larger study of family technology use. Two researchers visited the homes of 22 diverse families in the San Francisco Bay Area to observe a typical evening or weekend afternoon in their household, to observe a call to remote family members, and to interview parents about their values and practices around technology. In total, 77 local family members (36 parents, 39 kids, and 2 grandparents) and 39 remote family members participated in this study. We video- and audio-recorded all interactions, transcribed the family interviews, and coded both the interviews and our field notes from the observations.

For most of the visits, observation lasted two to three hours in the evening or on weekends. Most often, it would span the time from when kids would arrive home from school or after-school activities through their bedtime. This generally included several family rituals such as homework time, family dinner, and bedtime stories. At the beginning of our observation, we interacted with the children directly through some show-and-tell activities and a room tour. This 15-30 minute interaction let the children get to know us and become accustomed to our presence so that their day could then progress as usual. We could then observe for the next couple of hours without them acting shy or appearing overly aware of our presence.

We also observed at least one typical phone call to a remote family member with whom the family is in frequent contact (in all but three cases a grandparent). Seven of the families used videochat to call their remote family members, five used a mobile phone, and the remaining eleven used the house phone (cordless in all cases). Of those who used videochat, four of the seven families used Skype (two on PCs, two on Macs), and three used iChat on Macs. Five of the seven used laptops and all but one had built-in webcams. A similar mix of technologies was used by the remote family members. All families who used videochat had being doing so for a few months to several years.

We followed our observation with an open-ended interview with the parents for one to two hours about their practices and values about technology, toys, establishing rules, creating a sense of "family," and challenges of parenting. Many of our questions were intentionally open-ended to allow parents to express their own values and belief systems around parenting, technology, toys, and family. We also asked questions about what we had observed during the typical family time earlier. In six of the seven interviews with families who used videochat, we also interviewed the remote family member for 15-30 minutes over videochat. The patterns that emerged from these interviews, along with the content of the call to a remote family member, comprise the bulk of the data presented below. During these interviews, we found that an additional five families had tried videochat but did not use it regularly, so in total, we talked to twelve families who could comment on videochat in particular.

We recruited families using word-of-mouth, Craigslist, and a professional recruitment agency to be sure to include families from across the Bay Area's socioeconomic and cultural spectrum. The last five families that we observed and interviewed were recruited specifically because they used videochat. We initially recruited families with children between the ages of five and nine. However, because the siblings of these children often wanted to be involved as well, we interacted with children as young as one year old and as old as ten. (Several families also had older teens, but in all cases these teens were not present during the study because of after-school activities or jobs.) While others have focused on teens' technology use because of teens' relative independence and their trendsetting roles in culture (e.g.[19]), we were interested in this younger age group to understand how the stage is set for children's familiarity with technology, and how parents construct their roles as technological gatekeepers for their younger children.

SUMMARY OF RESULTS

We divide our results into two sets of observations. The first set concerns the benefits of videochat for families. In this section, we will describe the different benefits of videochat for the different users involved in the family calls we observed: grandparents, parents, and kids. Each of these groups has their own reasons for participating in video calls. One of these benefits is the kinds of interaction that other forms of communication – most notably phone calls – do not have. We use this division to start to explore the different 'values' that family users find in videochat, and to start to explore the notion of family values.

Our second set of observations concerns the "work" that goes into making a videochat happen and how it fits into the work to produce a "family" more generally. We begin by discussing previous research, including our own, which emphasizes the extensive *technical work* necessary for successful videochat in the home. We build on this by exploring the other kinds of work that go into making successful videochats which we characterize in a number of ways: *organizational work*, *presentation work*, *behavioral work and scaffolding work*. We then place this in context of previous discussions of the different kinds of work in the home, and discuss how families create and express values through the work they choose to do.

THE BENEFITS OF VIDEOCHAT FOR FAMILIES

As we will see below, keeping in touch with family using video takes a lot of work. Why do families choose to do it? In the current paper we focus on the social aspects of the technology that contribute to its unique use in family communication, having briefly explored some of the technical issues of home videochat in previous work [20].

We reported that all seven families who did use videochat had established videochat capabilities to allow

grandchildren and grandparents to get to know one another at a distance better than they could with voice alone [20]. These families all used video in addition to (not as a replacement for) phone calls, and most only used video when grandkids were involved in the call. Adults prefer to otherwise use the phone, in part because it enabled them to walk around and do things while on the call. In short, kids were the primary, if not sole, motivation for video calls.

Implicit in this discussion is a comparison of video communication to one-on-one interactions over the phone. At a most basic level, children enjoy videochat more than telephone conversations, and parents commented that they were more engaged with video than with voice alone (especially enjoying the ability to "show, not tell"), leading to longer and richer communication. The parents quoted below comment that their children's enjoyment of video is in part because they can see themselves on the screen.

> Mother: *The video component is really the thing for them. They'd much rather Skype with Grandma than talk on the phone. … They push each other to get in the middle [of the laptop camera's field of view].*

> Father: *The thing that is brilliant is that ... they can see themselves. [Family 8]*

Children, parents, and grandparents used the video capability for visual play, jokes that aren't possible with voice only, and other medium-specific uses [20]. For example, the daughter in Family 19 used iChat filter features to apply tropical and psychedelic backgrounds to the video they were transmitting to her grandparents. The daughter in Family 22 used Skype's chat window both to overcome language barriers with overseas grandparents – written text being easier to understand than spoken words – and to send long streams of animated emoticons that represented an Internet "party" to which her grandparents were invited.

Videochat is a Family Affair
We noticed that families valued the *group* nature of videochat, and that this changed the nature of interactions with remote family. Although it is possible to have more than two family members in a telephone conversation at a time by using speakerphone or multiple phones on the same line, only one family of the 22 we interviewed reported they had ever done this. Using a phone handset only affords one speaker and listener. By contrast, videochat is often set up so it broadcasts into the room and transmits all that occurs within earshot and in the field of view, so it is easier to include multiple family members on both sides of the call.

We observed that families interacted as a group in a video call, a different phenomenon from the one-on-one serial communication typical of (and afforded by) phone calls. As all members were equally able to hear each other and participate, the technology enabled a kind of group communication that reinforced the familial group identity.

Arranging a video call was usually intentional and coordinated, and various family members were deliberately included. In these ways, video communication bore more similarities to a ritualized "family visit," arranged by parents to show off grandchildren to their grandparents, rather than a typical phone call.

The group nature of videochat is a feature that benefitted everybody who participated in these calls. Now we will highlight some of the benefits that each of the three kinds of participants enjoyed in videochat: children could make more sense of a video call than an audio call, parents could better establish the importance of (even remote) family, and grandparents could feel that they were playing a larger role in the lives of their remote grandchildren.

The Benefit of Video for Children
The benefits of using videochat for children are best illustrated by comparing their experiences with video calls and phone conversations. Many kids were easily bored with phone conversation and wanted to get off the phone. The group aspect of videochat, in contrast, allowed kids to have varied levels of participation as a part of larger group discussion in which they could pop in and out. The visual aspect helped them be more engaged through eye contact or playful interactions. It also allowed them to assert their own participation more easily by putting something (an object, their body) in front of the camera rather than needing to find words to share.

For younger children especially, talking on the phone was difficult to negotiate, and adults were continually observed adjusting and supporting them in order to enable conversations, a technique known as scaffolding [3]. For instance, when children had difficulty holding the phone in the correct position, parents held it in place for them, or when they gestured to things unseen by the remote party, parents gently reminded them to explain where they were pointing (Figure 1). These particular interventions were not necessary in videochat, and young children could be included simply by sitting on a parent's lap or being in frame, even if not participating in the call at that moment.

Another common area of scaffolding phone conversations was in support of conversation itself. Children sometimes have trouble picking up conversational cues or speaking abstractly. For all the ages we studied, parents provided some kind of conversational support. They sometimes prompted children to share certain topics of information
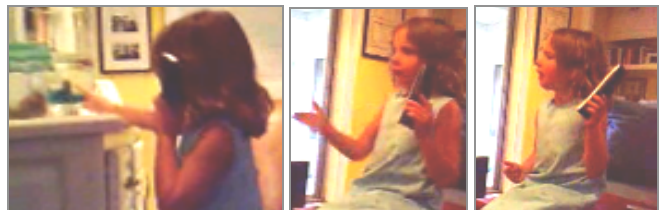

Figure 1. Some of the common problems young children have with voice calls: pointing to a pet (a), gesturing instead of speaking (b), and forgetting to hold the phone to her ear (c).

before or during a phone call or prepared grandparents with topics or questions beforehand and debriefed them on what the child was talking about afterward. In a phone call, this support was complicated by the fact that parents and grandparents could not hear each other to communicate while the child was on the phone. With videochat, children were able to get continuous feedback. For example, parents often repeated grandparents' questions or guided their child's response.

The Benefit of Video for Parents

We will see below that parents do a lot of work to socialize their children and give them a sense of what family means (which includes remote relatives). Though many parents were ambivalent about the amount of work video calls take, from initially setting up the network to managing the technical and social challenges during a call, they were motivated to do so because they felt that video gave grandchildren and grandparents a stronger connection with one another and taught their children many important lessons about the art of conversation, the importance of communication, and the significance of family ties.

Our participants echo larger narratives of family diaspora and the challenges of maintaining geographically-dispersed family ties. Of the 22 families we interviewed, 12, including all seven families that used Skype, had no local relatives. Several parents, such as this father, commented explicitly on the challenges of this distance and the desire to still construct family across it.

[The distance from grandparents] is not ideal. If we had a chance to do it all over again, maybe we would've made other decisions about where we're going to move. Not that that would keep everybody else together, but that's worth thinking about. Certainly you don't think about it until you have kids, because we didn't. "Oh gosh, this isn't very good. Well, we're not moving back there." And they're not moving here. [Father, Family 1]

For some international and long distance families, videochat was an affordable choice to keep in contact. Two parents had been already using Skype for voice calls to overseas relatives before video was available – for them, the economic benefit of Skype outweighed the decrease in audio quality (which was also bad on a landline), and video was an exciting addition to a tool they already used. One inter-state family also used it to save on cell phone minutes.

That's been a huge, huge change because before Skype our phone bills were hugely expensive, and that really limited how much you talked with [relatives overseas] and now, he talks with them several times a week sometimes. [Mother, Family 8]

Of the ways various parties benefit from video calls, the benefits that parents articulated were most ill-defined, but perhaps the strongest. After all, parents were largely responsible for establishing videochat capabilities. While the lives of all parents of young children are busy compared

to the lives of the children and grandparents, parents feel responsible for being the family glue, a theme we will explore in more detail when we discuss how families perform "family values" below.

The Benefit of Video for Grandparents

Almost all grandparents were geographically distant and only saw their children and grandchildren a few times a year. Almost all also expressed a desire to be as involved as possible in the lives of their grandchildren. Grandparents liked that with videochat they were able to keep children more engaged so that they could talk with them longer and get to know them better. We also witnessed that grandparents were often able to use visual cues as a source for finding topics to bring up with their grandchildren.

For one grandmother, videochat meant that she could see her grandchildren more often, particularly to witness their rapid changes and to have a sense of "being there" with them. It also ameliorated some grandparents' incessant thirst for more pictures of their grandchildren.

I think with the younger children it's even more fun because they change so fast. Our other granddaughter is two and a half, and lives in Portland. She changes so fast. Her language is emerging, and her idea of who we are and who she is. They're expecting a baby and changing so fast that it seems a lot more important for us there. [Grandmother, Family 19]

The aspect of "being there" was echoed by many grandparents as one of the greatest rewards of videochat.

I think when you're able to see who you're talking to it's almost like being there with them. [Family 20]

In the States we are coming only one time here. It's difficult – it costs a lot. It's very tiring also for us. So that's the reason we like to chat with Skype...Skype is very very interesting, because you can see them like if they were here in our own home. Right now … it feels as if you are here with us. [Grandparents, Family 21]

Frequent visual calls can also make the rarer in-person visits easier and more natural, as grandkids are less likely to treat the grandparents and other remote family members as strangers if they interact with them via videochat than if they only know them through static pictures and disembodied voices.

According to one mom, videochat "bridges the gap" for the kids' grandmother (Family 1), which can avoid the problem of children being shy with grandparents after long absences. In the words of one 'webcam evangelist,' recently quoted in the New York Times giving advice to grandparents, "You'll be able to pick up where you left off without those warming up to you, awkward moments." [17]

Thus, while parents generally set up the video network, grandparents enjoyed many benefits from having the ability to make video calls. Some grandparents were fairly technically savvy (one grandfather rebooted the machine

and cycled the house router to resolve technical difficulties with the video call), though others had to overcome aversions to technology to enjoy these benefits [19]. We will discuss the work grandparents do in the next sections.

THE WORK TO MAKE HOME VIDEOCHAT WORK

The benefits that these family members enjoy from video calls are contingent on the video calls running (relatively) smoothly and fulfilling the desires each family member brings to the call. These video calls, like phone calls, do not 'just happen': all family members, and parents in particular, perform a lot of work to orchestrate these calls and to handle the inevitable technical and social issues that arise. The question of how to recognize and discuss this work necessary for home videochat to be successful is a complicated one. This work often blends into the background and thus may be difficult to identify, but it is clearly important and arguably worthy of study, as without it the call cannot occur. We see parallels from our description of the difficulties describing work necessary for home videochat to Cowan's observations about the difficulties of recognizing housework:

> [T]he productive labor that is still being done in American homes is difficult to recognize, because the reigning theory of family history tells us that it should not be there, because the reigning methodology of the social sciences cannot be applied to it, because ordinary language has a penchant for masking it, and because advertisers have had a vested interest in convincing us that it has evaporated. [6:210]

We begin our discussion by looking at previous research that emphasizes the extensive *technical* work necessary for successful videochats. We build on this by exploring the other kinds of work that go into making successful videochats: the *organizational work* of scheduling videochats (and, in the case of younger participants, naps), the *presentation work* of arranging the family for the call and ensuring everyone stays in frame, the *behavioral work* of managing boredom, miscommunication, and other issues during the call, and the *scaffolding work* of prompting topics of conversation between grandkids and grandparents and managing a multi-party conversation. Our aim is not to treat this as a canonical list, but rather as a way to organize our own observations. We will then place this exploration in the context of previous discussions of the different kinds of work in the home, and discuss how families create and express their particular family values through the work they choose to do.

The Technical Work to Make Home Videochat Work

As we have discussed in previous work, videochat is anything but seamless, despite relatively simple interfaces and reasonably robust communication protocols [20]. Other researchers have characterized the difficulties of home networking [28,29]. Five of the seven families who used videochat had technical difficulties, while none of the other sixteen families had technical difficulties on the telephone. We saw that families often coordinate a video call and

establish a connection by using other more reliable communication such as telephones or chat. However, families frequently encounter technical difficulties even after the video call is established: unreliable Internet connections, microphones with feedback, video lag or visual artifacts, frozen screens, and crashed applications were all common. We also noted that these technical difficulties were often resolved by the resident "Technology Czar" [27], who was often the most technically savvy member and was responsible for setting up the videochat hardware and software. Without replicating our previously-reported results, we do want to emphasize the technical work that goes into making family videochat function. In particular, we want to add that for most families, including the family quoted below, parents played the role of Technology Czar by both establishing video capabilities (on *both* ends of the connection) and troubleshooting problems.

> We configured [my mother-in-law's] wireless LAN so she could move her laptop around. ... I wrote all the usernames and passwords and everything and just taped it to the device. [Father, Family 8]

Thus, this technical work centered on reconfiguring the home software, computers, and network without which the call would be unable to take place. However, another kind of work was also necessary for successful videochats.

The Social Work to Make Home Videochat Work

In addition to the technical work, we observed a great deal of what we call "social" work: scheduling the call, assembling the family, tidying up both family members and the space in the vicinity of the call, and so on. Work went into making sure all family members were present, seated, and positioned where they could be seen.

Coordination Work

We observed that video calls always started with a phone call or chat. However, neither video nor phone calls were generally scheduled in advance in the way a meeting or appointment is: many parents commented about how strange and unnatural it was to schedule a specific date and time for the call we observed in our study. (One family was a notable exception: they called grandparents at exactly 9am every Sunday, and even when they were visiting the grandparents, they called from upstairs.) Instead, parents said that normally a video call starts with a phone call that was either relatively spontaneous (e.g. "it's been about a week since we last called – we should call again") or semi-scheduled (e.g. "we call every weekend or so"). While most parents reported feeling pressure to keep in regular contact with remote relatives – sometimes self-imposed, sometimes applied by the remote party – the level of advance organizational work around making contact with family is relatively low.

The decision of whether to "upgrade" a phone call to a video call, however, took more work. Parents reported that video calls don't happen as often as normal phone calls: they were more like a special holiday visit than an everyday

occurrence, happening (for most families) every few weeks while calls happened weekly or more. This father didn't like that the extra fuss that video calls took, feeling that it eliminated the spontaneity he enjoyed in phone calls:

And finding the time when both parties will do a Skype conversation – it's almost not natural. Like ok I'm going to get my conversational wit ready, you get yours ready, we'll have a chat. It's not very spontaneous. The fun things are when it is spontaneous. [Father, Family 1]

Part of the work for this upgrade was technical: parents and grandparents first assessed whether their technology was set up for the video call, and whether they had the energy to deal with the technical difficulties. But other factors were also important: videochat took more time and required the full attention of all family members, and parents' busy lives didn't always allow for this kind of commitment.

Grandparents had a different kind of organizational work. Many didn't have the time commitments of parents, but they did have to work around their grandkids' bedtimes, activities schedules, and time zone differences. They also tended to have more technical trouble and less ability to troubleshoot (though this wasn't universal). One set of grandparents said they overcame problems with their more patient daughter, but often gave up with their other daughter who wasn't as willing to troubleshoot over the phone.

Presentation Work

Here, we discuss the work families put in to their appearance in front of the camera, which we call presentation work. The typical configuration of technology for videochats involved a laptop or desktop computer with a large screen and a camera with a relatively narrow field of view positioned on top of it. The video calls usually took place in a living room or a family room with a shared sofa for sitting or a number of chairs arranged in theater-like seating (Figure 2). Since the field of view of webcams is similar to the field of view of a typical camera, it forced families to assemble in a relatively small physical space, giving the impression of a living "family portrait." Furthering this impression, we saw parents tidy the part of the room visible in the video and adjusting their kids' hair in the 'mirror' of the local video feed. On the remote side, too, some grandparents mentioned dressing up and putting on their nice jewelry for the call.

In several cases parents positioned children on their laps to allow for a tighter fit within the camera frame (and to assist behavioral work, discussed below). This made it difficult for parents to reach to the computer controls during the call.

Certain family members sometimes stayed out of the direct videochat session or occasionally joined in more sporadically. In two calls the mother – who was the daughter-in-law of the remote grandparents – sat with the family during the call but purposely positioned herself so that she was not in frame. Parents who had been using videochat for some time sometimes left their older children to talk with their remote relatives alone after initial greetings (Figure 2f). One mother said that she occasionally used Skype on the computer in the living room to call her brother, but then left the field of view to talk with him from the kitchen while she made dinner, treating the call as if he was sitting in the other room.

Even though five of the seven families used laptops that could be mobile for their videochats, they almost never moved the laptops during the calls. Almost all parents said they personally preferred the mobility of using a cordless phone or cell phone, though they felt compelled to do videochat for their kids.

The video conference kind of requires too much formality -- I mean, maybe you sit in a chair and look at nothing while you're on the phone, but I roam around the house, I answer questions from [my daughter], I put dishes away, all these things that you do when you're talking to somebody. With videoconferencing there's this need [to sit still]. [Father, Family 6]

Many parents complained about how much work went into keeping their younger kids in this narrow field of view front of the computer (and some complained that they, too, didn't like to have to sit in one place). Five of the families who made normal (audio) phone calls during our visit had tried and abandoned videochat, citing this reason as primary, and several who used it regularly also commented on the work it took to keep everyone still and in frame. Grandparents sometimes had to be remotely guided back into frame as well. A few forgot where the camera was or forgot to

Figure 2. The presentation of families in Skype calls.

maintain their position, and moved during the call such that their face was only partially visible (Figure 3).
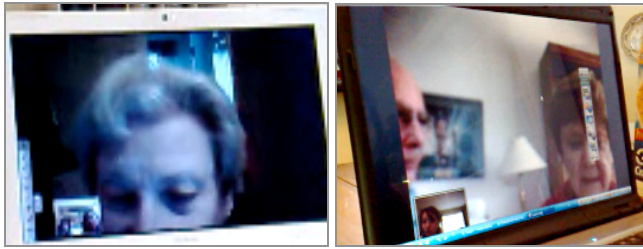

Figure 3. Some grandparents forgot to stay in frame at times.

In particular, all children under the age of seven that we observed seemed to have trouble sitting still during the call. Some squirmed or pushed, while others broke free from their parents' holds, roamed around the room, and checked back when something about the call piqued their interest. One father comments that his (older) children learned to manage themselves and stay in frame on their own over time. Another family, however, abandoned videochat because of these difficulties.

> *It was novel for them to do [videochat]. But they were kind of squirming around and stuff. ... It's easy to hand the phone to someone and they can go lie down on the bed or whatever and talk and then bring it back. If they have to sit in front of the computer it's a little harder. [Father, Family 2]*

A couple of children acted out when they were kept in frame and weren't allowed to roam free. Children's restlessness is difficult to manage generally (we saw similar behavior from some children at the dinner table), and parents' strategies for dealing with these and other kinds of behavioral issues led to another kind of work.

Behavioral Work
Children's desires and natural inclinations sometimes conflicted with the exigencies of the gathering. We observed children, particularly those younger than seven or with particularly high energy, blocking the camera with their foot or other objects, making faces, and sulking during video calls. Managing this behavior and other needs in ways that allowed the call to proceed fell almost entirely on the parents to handle. One family said they often had to send their son to his room during video calls because he would act out and disrupt the call (e.g. Figure 4). A daughter in another family left the call in a sulk because she felt her brother was being unduly favored by her mother in the managed turn-taking in front of the camera. One mother commented on the challenges of managing the behavior of her two older children (aged 5 and 8) during a call: it was not uncommon to see siblings fighting for attention in front of the camera. (We observed similar fights between siblings over the phone as well.)

> *I do have problems with them pushing each other out of the way. Or when [the five-year-old] is done with the*

conversation and would close the computer in the middle of a call. [Mother, Family 8]

In addition to managing these behavioral issues rooted in boredom or frustration, sometimes behavioral work had to accommodate children's physical needs. One mother started a video call right after the son arrived home from school, and his remote grandparents commented on his apparent reticence, not seeing that he was just eating his after-school snack. In another family, the parents described how they could only make video calls when their toddler wasn't around:

> *I've had problems with [the two-year-old] because he ... loves it but he wants to crawl into the keyboard and so I can't actually do calls anymore if he's around because he gets really frustrated and starts screaming when he can't get to the keyboard. Plus, drool on the keyboard… [Mother, Family 8]*

The toddler in one family had insisted earlier in the day that she didn't need to have her nap, which resulted in her being initially moody and unresponsive at the start of the video call, followed by falling asleep during the call. This prompted one of the few cases we observed of moving the laptop during a call: to allow remote grandparents to capture a still photo of their sleeping grandchild (Figure 5).

Parents also took the opportunity to emphasize appropriate manners: one son was told to take his feet off the table during the conversation by both his remote grandparents and then by his local parents. We saw other kids being told to take their hands out of their mouths during conversation by both parents and grandparents.

Scaffolding Work
Some of the social work both parents and grandparents engaged in was aimed at helping children adapt to this new form of communication, which we refer to as 'scaffolding work' in reference to the notion of scaffolding in learning research [3]. As is also the case with phone calls, many of the conventions of videochat that we take for granted have
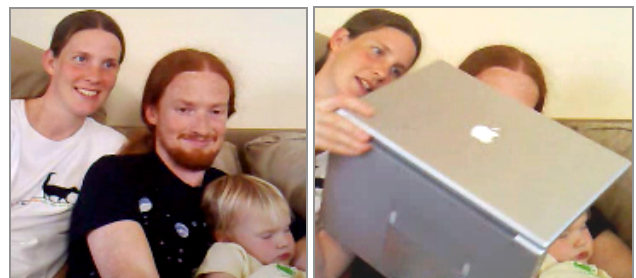

Figure 5. Showing a napping toddler to a remote grandparent.
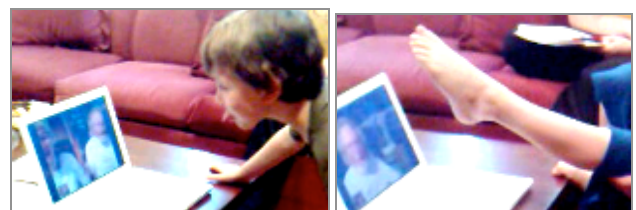

Figure 4. One six-year-old acts out during the Skype call by sticking out his tongue and blocking the camera with his foot until his leg is pushed away by his sister.
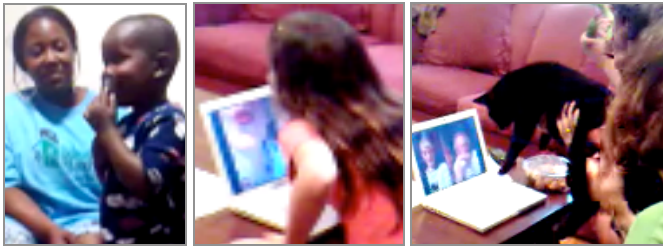
Figure 6. Phone kisses: a boy kisses the phone to say goodbye (a), a girl and her grandmother exchange a Skype kiss (b), and the family cat "kisses" the camera as well (c).

to be learned by children. Family videochat conversations make it necessary to learn turn-taking in a group, particularly because the exchange becomes overwhelming and hard to follow unless only one person speaks at a time. (This seemed to be accentuated by the videochat as compared to what might be expected for face-to-face group conversations.)

For younger children who were still learning basic conversational turn-taking skills, this presented distinct challenges but also provided opportunities for scaffolding this social skill. Sometimes the adults provided scaffolding in the form of subtle adjustments, like modifying their own speech rate and prosody, maintaining topics of conversation on children's level, or encouraging them to "take the floor" through gaze and other non-verbal communication. Other times they guided children's participation with explicit prompting, instruction, or encouragement, often helping children with the art of storytelling: prompts like "Tell Grandpa about what you did today" were almost universal.

IDENTITY, FAMILY VALUES AND VIDEOCHAT

In the previous section, we discussed two aspects of our study of family videochat. The first is the benefits to different members of the family from engaging in family videochat; the second is the work that goes into making videochat possible. For some of the families we studied there is considerable benefit in continuing to use videochat despite the work required, as evidenced by the simple fact that they continue to do so.

As we watched the interactions of the families around videochat, we realized that videochat was a way for families to articulate and communicate their family values. The work of families to support their values is familiar from other studies of family life. In *A Theory of Shopping*, anthropologist Danny Miller describes the many factors that go into the shopping decisions of one North London mother shopping for her family [21]. For example, purchases need to fit into the family budget, and that must be taken into account. However, that constraint is balanced with desires for each member of her family to get the foods they want to eat, but also to eat healthier than they otherwise might. Similarly, the family gets the clothes that they want to wear – but the mother also tries to make choices that will make them look more 'respectable.' Miller summarizes her logic in his chapter "Making Love in Supermarkets":

"In short, her shopping is primarily an act of love, that in its daily conscientiousness becomes one of the primary means by which relationships of love and care are constituted by practice. That it is to say, shopping does not merely reflect love, but is a major form in which this love is manifested and reproduced." [21:18]

For example, we saw that families would articulate membership in the family, *for that particular video call*, by who was included in the chat. In cases where the grandparent being called had remarried, we saw the step-grandparent being only peripherally involved in the conversation, perhaps just saying hello at the beginning of the call. We mentioned earlier that daughters-in-law would sometimes sit with the family in videochats with the husband's parent(s), but out of frame of the camera itself. By contrast, in a ritual that we have called "Skype kisses," each family member in turn would act out a dramatic kiss toward the camera – including the cat, who was considered very much part of the family. (We saw similar round-robin kissing rituals in phone calls as well. See Figure 6 for examples.) We saw this taken to an admittedly tongue-in-cheek extreme in one videochat when a remote grandfather included his brother in the call, who had been deceased for three years, by taking the canister of ashes off a nearby shelf and waving them at the camera for emphasis. In all these cases, we do not claim that this location construction represents an intrinsic notion of who is or is not in the family, but it rather emphasizes the different values that different family members get from the call. So, we do not claim the absence of the daughter-in-law from the call necessarily represents her explicit exclusion or disapproval by the paternal grandparents, but rather a recognition on both grandparents' and daughter-in-law's part that the value for the grandparents is in interacting with their grandchildren.

We began to see this notion of identity as a particular kind of situated family value, constructed and articulated by the family's behaviors. In the United States, the phrase "family values" is often invoked as a stand-in for abstract, often conservative cultural values: for instance, in recent news articles, "family values" has represented an ideological stance against abortion or same-sex marriage. However, in this study, when we talk about values, we are interested in what we call "small-v values": the negotiated values of a real family that are lived day-to-day. For one of our families, for example, they value regular communication with the grandparents so much that they actually call them on Sunday at 9am when in the same house. This represents a particular substantiation of this family's values. This kind of 'value' contrasts with the large-V Values that have been a dominant part of many discussions around the roles of Values in HCI and CSCW, such as Privacy, Trust and Security [i.e. 9,25,11,22] (and even, dare we say it, Sustainability). We do recognize the importance of taking into account big-V Values, but want to join our colleagues in simultaneously encouraging the recognition of small-v

values and furthermore the recognition that these small-v values have great worth to their creators [i.e. 7,13,5]. For example, families may identify as being "a family," but more explicitly identify as being "The Smith Family" with a particular combination of values, rituals, practices, and beliefs that produce that identity. We saw many instances where videochat played an integral role in maintaining family connectedness and reinforcing family identity when this could not be done face-to-face. For example, one family used videochat to celebrate Christmas together:

> Daughter: When we're not [together for the holidays] we usually do some sort of a [video] chat.

> Mother: Yeah. ... We did the videochat for Christmas, to show gifts and stuff like that. [Family 20]

In particular, we believe that designing for these small-v values can give opportunities for insight and novelty that can be hard to achieve in other ways.

CONCLUSIONS

The observations in this paper inspire a number of suggestions for the design of novel or improved devices to enable family communication using our understandings of the role that video can play in connecting distance relatives.

We previously recommended that videochat applications be streamlined for repeated contact with a few individuals (rather than casual contact with strangers), for remote troubleshooting (e.g. easy screen-sharing), and for easily switching from easy alternation between phone to and video and back [20]. We also mentioned that video calls may benefit from the recognition that they are often group affairs, a point we have elaborated on here.

Our first set of suggestions is aimed at enhancing the benefits of videochat for families based on the small-v values they experience with current systems. One key understanding comes from the nature of communication between distant relatives and young children who have not mastered the art of conversation. A sense of connection with a young child comes more from play than discussion, and video affords particularly rich opportunities for cross-generational play. Kids' evident pleasure in playing with the new video effects features in iChat suggests even richer interactions, using blue-screen techniques to allow playing with backgrounds and situations for remote storytelling or pretend play.

Similarly, the experience of videochat might be improved by designing specifically to create a stable, shared virtual space, be it a jungle or a house or a make-believe castle. By stable, we are suggesting a consistent place in which interactions take place and which can serve as a repository for shared digital artifacts. It might be a room with family portraits or the kids' latest drawings on the walls. Similarly, grandparents mentioned that they gained value from watching their grandchildren grow: perhaps a virtual growth chart could provide both generations with the

pleasure that comes from successive markings on the wall in a regular spot in the house.

There are other techniques that could draw from this feeling of sharing space that would be relatively simple to implement. For example, current home videochat systems typically have the remote participant in a large window – often expanded to fill the screen in many of the conversations we observed – with the local participant in a small, separate window superimposed in one corner. This may be a legacy of the assumption of one-on-one communication rather than the primarily group communication we observed. For example, windows arranged side-by-side with equal weight to each side of the conversation may provide more of a feeling of a shared space; slightly beyond this but still entirely within the bounds of current video processing is to composite both local and remote participant into a shared screen (as explored in [23].

Family groups have particular attributes that should be taken into account in the design of videochat systems for the home: for example, parents often have kids on their laps or otherwise between them and the keyboard, making it difficult to change settings or interact with the computer during the videochat. This suggests an opportunity for a variety of alternate control systems such as remote controls or even voice or gesture controlled interfaces.

A second set of recommendations center around mitigating the work performed in geographically-separated families. Increased physical and social mobility means that *all* families are becoming diasporic, at least to some degree. That underlines the need for communication tools for such families that are cheap, work internationally, and can help generations overcome cultural boundaries that often exist even within the same family. Several of our subjects noted the difficulties in scheduling videochat, which as we have seen were above and beyond the difficulties of scheduling voice calls. While others have studied the potential for shared family calendars and suggested that outright sharing may not be appropriate [4,26], the ability to place individual items or even just suggestions on the remote family calendar may help with scheduling videochat calls.

Alternately, solutions may involve further integration of cellphone and video technology, whether that is merely a video link in the cellphone contacts section, a notification on the cellphone home screen that one of a few selected remote family members is available for videochat now, or an easy way to switch from voice calls to video calls (even if that involves different devices). Other technologies for geographically separated families recognize the expense of communicating at a distance. At the simplest level, the increasing existence of mobile phones with Wi-Fi connections suggests that VoIP solutions running on mobile phones such as Skype, Gizmo and Truphone may have a strong future. Our work suggests that video over IP may be

an addition that is both cost-effective and valued, particularly if it can be made reliable and simple to use.

Finally, we contribute in this paper to the further study of work at home in CSCW. We recognize that in so doing we are contributing to a long history of studies of work in the field, and in particular adding our voices to those who have also recognized the difficulties in articulating often-missed work in the home. Our hope is that our effort to do so and our focus on the small-v values in the home will allow for more careful articulation of such work, and ultimately better technologies that take into account the values that will be layered upon them anyway.

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