

# Exploring Family Communication and Technology Use with an Eye to Design

Morgan Ames,<sup>1,2</sup> Janet Go,<sup>1</sup> Leila Takayama,<sup>1</sup> Hayes Raffle,<sup>1</sup> Mirjana Spasojevic,<sup>1</sup> Rafael Ballagas<sup>1</sup>  
<sup>1</sup>Nokia Research Center Palo Alto  
955 Page Mill Road, Palo Alto, CA  
<sup>2</sup>Department of Communication  
Stanford University, Stanford, CA  
{morgan.ames, janet.go, leila.takayama, hayes.raffle, mirjana.spasojevic, tico.ballagas}@nokia.com

## ABSTRACT

We are conducting open-ended interviews and field observations with 20 families from different ethnic groups and living in different locations to explore how technology is implicated in family communication and feelings of family “togetherness” for families with children in early elementary school. We intersperse these interviews with design exercises focused around play and around communication with remote family members, first with the members of Nokia Research’s IDEA team and later with families in participatory design exercises.

## Author Keywords

Communication Technologies, Family Communication, Qualitative Methods, Values in Design.

## ACM Classification Keywords

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

## INTRODUCTION

We are exploring how technologies are implicated in family communication and feelings of family “togetherness.” We focus on families with children ages four to nine, because when children reach these ages, parents begin to include them increasingly into both family communication (e.g. talking to remote relatives, sending emails) and the technological world (e.g. learning how to use various technological devices).

Investigating the meanings people create around the technologies in their everyday lives is, as always, a challenge. We are conducting open-ended interviews and field observations with 20 families from different ethnic groups and geographic locations to explore our questions. Along the way, design workshops bring the ideas gathered

in the field into the earliest stages of an iterative design process that aims to create new approaches to using technology to support families’ long-distance communications. Our objective is for our observational practices to inform new design questions and directions.

Our broader interest in this study is to design technologies to better support long-distance and cross-generational family communication. As a result, many of our questions focus on family communication practices, including face-to-face interactions within the household (e.g. rituals around dinnertime and bedtime), coordination among parents and other caretakers throughout the day using various media, and practices of keeping in touch with remote relatives and family friends. However, our perspective is that these topics can only be understood in the broader context of family values and more general practices.

For example, one facet of our work investigates the ways in which children’s play and toy designs are incorporated into communication patterns and values. We look specifically at the pedagogical and affective roles of toys and technologies, and the roles toys can take in helping children externalize and express their ideas [2, 10, 11, 12]. Our design workshops have focused on play, including investigating how toys’ and games’ propensity to promote collocated communication might be leveraged to also support remote communication. This theme has a history in HCI, including multiplayer gaming systems and more exotic approaches like exertion interfaces [9]. One possible distinction in our approach is our grounding in families’ communication needs than in the need for entertainment.

More broadly, we have been inspired by the Values in Design approach to investigation and brainstorming [5], as well as ideas in reflective design [13], the Social Construction of Technology [1], Technofeminism [15], and “ludic” design [7].

## METHODS

Because our study is focused on meanings and values, we have chosen to use qualitative methods of data collection. Based upon the sociological method of ethnomethodology [6], we aim to understand the ways that families makes sense of their worlds, of each other, and of their communications with each other. In particular, we have

chosen methods to study people in their everyday lives, observing their routines. We have opted to start our analysis with the categories of family communication that the families themselves use by using grounded theory [8] to inductively and systematically generate those categories in iterations between analysis and investigation.

### Family Observations and Interviews

The bulk of this study consists of three to five hour observations and interviews with families, generally conducted in the evening. To date, we have conducted seven of our targeted twenty interview-observations. Families are given a \$100 American Express gift check as compensation for their time and energy.

Our initial actions are focused around building rapport with the children and their parents and finding effective ways of talking about what could be very abstract concepts with children as young as four years old. A few days before the interview, we send the parents two activities for each of their children<sup>1</sup> to complete on their own before we arrive: a timeline depicting a day in the child's life and a picture representing the people in the child's life. We include clip art images for the children to use if they want, but in our instructions we encourage the children to draw instead. When we arrive, we ask the children to discuss their pictures with us. This form of *elicitation* [14] allows us to discuss (sometimes quite complex) family relationships with a concrete visual aid to ground the conversation, and also allows the child to get to know and trust us. We follow this with a tour of the child's room, toys, and play spaces.



**Figure 1. “The people in my life” exercise for one six-year-old boy, depicting his mother, grandparents, and counselors.**

<sup>1</sup> Originally we were planning to focus just on the children between ages five and nine in the household, but have found that siblings outside the age range often want to participate as well and have expanded our observations to include them in the interest of studying the overall family ecology and building trust and rapport.

We request to spend some time just observing the family's “usual” routine, which for evening sessions often includes dinner (we offer to bring pizza), bedtime rituals, and other evening family activities such as playing games or checking homework. During this time, we also give the family the option of contacting a remote family member they generally keep in touch with and allowing us to observe a “typical” conversation with them. We have found that this portion of the evening is often particularly interesting, especially the ways parents coach children to operate the phone and manage a remote conversation.

We conclude each session with an in-depth interview with the parents that typically lasts 1.5 to 2 hours, though a couple have gone longer. We are aware that despite our encouragement for the family to go about business as usual, our very presence alters their actions to some extent. Sociologist Michael Burawoy notes that as this intervention is unavoidable, it should be explicitly accounted for instead [3]; thus, we talk about how our presence might have changed the family's behavior. We talk through some of the observations we made earlier and also ask them questions about their strategies for talking with their kids, spouse, and other family members; their thoughts on and values around their kids' toys; their thoughts on their kids' use of technology (which includes values and strategies for teaching); general family rules, norms, and values; and how all of these contribute (or not) to creating a sense of family.

### Design Workshops

As we have conducted these investigations with families, we have synthesized and presented the results to our research team, and have used the emerging themes as inspiration in design workshops with this team. We then take the design ideas generated in these workshops back to the families we interview and incorporate a discussion of design directions into the end of the parent interview, enacting an *in situ* participatory design session. As we continue to develop the methods used in these workshops, we also plan to invite the parents in for group brainstorming and evaluation sessions, as described in participatory design.

In the workshops, we have used as a *focusing device* the idea of *play* as a topic around which to brainstorm, as play has emerged as a central family value in every family interview conducted. In our first two workshops we discussed the emergent themes of the interviews.

In the third workshop we used these themes in a game design exercise based on the Grow-A-Game tool developed by Mary Flanagan and the Values at Play group [4]. We created cards listing the games we observed in families' homes (and added some of our own favorites for brainstorming purposes), the initial value themes we had identified, and the communication patterns used by the families we had interviewed. In a series of design exercises, we drew game cards, value cards, and communication

cards, and brainstormed ways of altering the games to include new values and new modes of communication.

In the fourth workshop we expanded our brainstorming activities to toys more generally. As a focusing device this time, we asked the research team to think about the activities we observed around bedtime, and to incorporate communication with remote family members into those activities in some way.

We found that providing these focusing devices based on the results of the interviews in these design workshops kept us more closely tied to the results of the interviews and the emergent categories based on our observations, and also (paradoxically) allowed for a great deal of creativity within the bounds of the “rules” established. This latter point has been observed in game design more generally.

### **Representation and Social Justice**

More broadly, in this study we are committed to including voices that are often underrepresented in studies such as these. In many studies that rely on convenience sampling, the demographic that is often tapped is one that is relatively technologically sophisticated, well-to-do, and otherwise privileged and in positions of power and authority.

For instance, we have found that in the San Francisco Bay Area, residents of the relatively affluent town of Palo Alto are often tapped for studies such as ours and are both familiar with the workings of these studies and trusting of the research methods employed. In contrast, the town of East Palo Alto, which was 72% Latino in the 2003 US Census and includes sizable populations of other minorities as well, is rarely tapped for such studies, despite its close proximity to Palo Alto as well as numerous research universities and Silicon Valley companies.

Feminist and STS scholar Judy Wajcman discusses the implications of such exclusion in her 2005 book *Technofeminism* [15]. Though focusing on implications of the dearth of female designers on women’s relationship with technology, she demonstrates that many technologies – even technologies for the home – have overlooked women’s needs due to the lack of women in the design process. Moreover, she discusses how the analysis of “relevant social groups” in STS often overlooks groups that are excluded, such as women and minorities.

To address these concerns, we have been recruiting families outside of the commonly-tapped demographic. This includes lower-income minority families in the Bay Area to explore values, issues, and concerns that are unique to these groups, such as managing immigration issues, overseas relatives, and language barriers, to name a few. This also includes families outside of the Bay Area (e.g. from Sacramento, Reno, and farther afield), because we have noted that the relationship residents of the Bay Area have with technologies differs from other areas of the country where technology is not as pervasive and normalized. Whether Bay Area families choose to embrace,

conditionally accept, or reject them, or even if they are excluded from use by price or lack of access, they are embedded in the Silicon Valley culture that is heavily technology-focused and cannot ignore its influence.

Thus, as part of this study, we hope to be able to comment more on what these differences are and why it is important to include these diverse voices in social inquiry and technological design.

### **INITIAL FINDINGS**

Many families use a fluid combination of communication technologies to coordinate their busy lives, including text, emails, and instant messages. Phone calls seem to be increasingly used a last resort.

#### **Family values**

A subset of the family values are the values adults have around parenting and what is good for their children. A common theme was the tension that parents express in wanting their kids to be technically competent, yet worrying that technology use can inhibit their social development. (This was especially true of video games.) Many parents worry about their kids staying on track at school, yet are anxious that their children aren’t overwhelmed by pressure and ‘can just be kids.’ Thus various summer camps, family activities, and toys were praised for their educational value as well as how fun they were. Parents also have ideas around what they consider age-appropriate material and may limit the media content their kids see. Similarly, they influence the toys that surround their kids – either through their purchase, setting rules for gifts from others, or gently phasing toys out by hiding or removing them.

We have observed that parents often scaffold their child’s interactions with technology. We have found that they bridge both technical skills their kids lack, as well as the social skills and meaning making that they may not understand. For instance, a parent may help a child call her grandparent, both by dialing the phone number and prompting her on how to start the conversation.

Through our workshops we have immersed our team in the lives of our participants by sharing findings and raw data as soon as possible after our visits. In our design workshops, we have focused on different themes. In a Design for Values workshop, we grounded design activities using the values that had directly emerged from our research. Other design workshops have focused on Games and Play. One brainstorming session generated a number of play ideas related to bedtime routines such as a story book for remote grandparents. Overall, we have found these workshops to be a useful way to generate design ideas that can be based on the context of an actual family or particularly inspirational finding. We plan to keep our practice of conducting design workshops in tandem with our research, bringing our ideas back to families for feedback, and building on their feedback for continued design iterations.

## SUMMARY AND FUTURE WORK

This research is part of a larger initiative to study family communication; here, we use a combination of family observations and interviews with design workshops to learn about family communication, technology usage, and values. We plan to produce both written documents and artifacts from this study: we will write up summaries of these findings, particularly the family values, and we will continue to iterate on our design ideas as well as our workshop methodologies. We also plan to comment on the differences between the different groups we are recruiting; as this is still in process, we have not commented on that here.

## ACKNOWLEDGMENTS

We sincerely thank our participants for their time, patience, and honest feedback. As always, this research has been made possible by their invaluable contributions.

## AUTHOR BIOGRAPHIES

**Morgan Ames** is a PhD candidate in Stanford's Department of Communication, studying the social meanings of new communication technologies. Her other research includes the social meanings of personal photography, the role of fantasy in virtual worlds, and the social and cultural implications of the One Laptop Per Child project. She earned a bachelor's degree in computer science from UC Berkeley in spring 2004 and a Master's degree in Information Science from UC Berkeley in spring 2006.

**Janet Go** is working with Nokia Research Center, Palo Alto, in the Innovate Design Experience Animated (IDEA) team, where she is exploring how research into peoples' everyday lives can be effectively shared for a pragmatic and empathetic design of technologies. Her research interests have included how people think and learn through technology. She holds an M.A. in Learning, Design and Technology from Stanford University, and B.A. in Neuroscience and Behavior from Columbia University.

**Leila Takayama** is a researcher at Nokia Research Center, Palo Alto, where she studies how computational systems become invisible-in-use and how people interact with agentic objects. She recently completed her PhD in Communication at Stanford University, studying driver user interfaces, human-robot interaction, and voice mediation.

**Hayes Raffle** is a researcher at Nokia Research Center, Palo Alto, where he is focusing on directed research, design, and innovation in the space of family communications. He recently completed his PhD at the MIT Media Laboratory, where he studies new tangible approaches for children to learn new ideas—progressing from simple ideas and models to complex ones—through play with tangible technologies.

**Mirjana Spasojevic** is a senior principal scientist at Nokia Research Center, Palo Alto, where she leads the Innovate Design Experience Animated (IDEA) team. Her research focuses upon innovative mobile user interfaces, including user experiences and mobile services.

**Rafael Ballagas** is a researcher at Nokia Research Center, Palo Alto, where he focuses upon applying human-centered iterative design processes to ubiquitous computing. His primary interests are rapid prototyping tools, evaluation methods, and novel ubiquitous computing applications that address real human problems.

## REFERENCES

1. Bijker, W. E. *Of bicycles, bakelites, and bulbs: Toward a theory of sociotechnical change*. MIT Press: Cambridge, Massachusetts, 1995.
2. Brown, S. Institute for Play. [http://www.nifplay.org/science\\_intro.html](http://www.nifplay.org/science_intro.html).
3. Burawoy, M. The Extended Case Method. *Sociological Theory* 16, 1 (1998) 4-33.
4. Flanagan, M. Values at Play: Grow-a-Game cards. [http://valuesatplay.org/?page\\_id=9](http://valuesatplay.org/?page_id=9).
5. Friedman, B. Value Sensitive Design: Theory and Methods. UW CSE Technical Report 02-12-01. 2002. Department of Computer Science, University of Washington.
6. Garfinkel, H. *Studies in ethnomethodology*. Polity Press: Cambridge, United Kingdom, 1967.
7. Gaver, W. "Designing for Homo Ludens," *I3 Magazine*, June 2002.
8. Glaser, B. G., Strauss, A. L. *The Discovery of Grounded Theory: Strategies for qualitative research*. Weidenfeld and Nicolson: London, 1968.
9. Mueller, A. Exertion Interfaces for Sports Over a Distance, in *Extended Abstracts of UIST 2002*, 2002.
10. Papert, S. *Mindstorms: Children, Computers, and Powerful Ideas*. Basic Books, Inc.: New York, 1980.
11. Papert, S. *The Connected Family*. Longstreet Press Inc.: Marietta, Georgia, 1996.
12. Piaget, J. *Play, Dreams and Imitation in Childhood*. W. W. Norton and Company, Inc.: New York, 1962.
13. Sengers, P., Boehner, K., David, S., and Kaye, J. 'Reflective Design, in *Proceedings of the 4th Decennial Conference on Critical Computing: Between Sense and Sensibility*, 2005, 49-58.
14. Van House, N. A. Interview Viz: Visualization-Assisted Photo Elicitation, in *Extended Abstracts of CHI '06 (April 24-April 27, 2006, 2006)*, ACM Press.
15. Wajcman, J. *TechnoFeminism*. Polity: Cambridge, 2004.