

# Thinking Critically About Family Communication Technologies

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## ABSTRACT

I describe my work in designing and evaluating family communication technologies. This work has forced me to think critically about not only the benefits but also the costs introduced by such systems. At this workshop, I hope to bring to the table three challenges that may be relevant to other investigators in this domain: (1) designing for “non-typical” families, (2) considering the impact of a technology on each family member rather than the family as a monolithic unit, and (3) highlighting both the positives and the negatives of the technologies we design in the context of the ecology of systems already in use by the family.

## Author Keywords

Computer-mediated communication, children, family

## ACM Classification Keywords

H5.2. Information interfaces and presentation (e.g., HCI): User Interfaces. *User-centered design*.

## STATEMENT OF INTEREST

The HCI community has always been interested in technologies for family communication. Several studies examine established communication technologies families use. Ballagas et al. showed that the telephone is not an effective technology for communicating with children, as children face cognitive, social, and motivational challenges to audio-only communication [2]. Several studies of videoconferencing pointed to the great potential that this technology has for keeping families connected, because it enables show-and-tell and sharing daily activities [1,8]. A number of novel systems focus on connecting families remotely. The earliest work on the Casablanca project outlined some future directions in this space with several novel designs [7]. More recently, Collage [11] and eKiss [3] are two systems that support children and parents posting photos from a mobile device to an in-home display or blog. Virtual Box [4] and Globetoddler [9] focus on supporting children and parents in playing asynchronously while apart. Family Story Play [10] and Video Play [5] focus on expanding the interaction afforded by video chat by providing opportunities for synchronous play and reading together. These are just a few non-exhaustive examples of recent work in this domain.

The majority of this work has always been positive about the potential effects of new communication technology and has been aimed at intact families who face little conflict

around communication practices. While these characteristics may apply to many families, there is a great number of other households where conflict may play a large role in the communication and technology needs to be understood not only in terms of the benefits it provides but also in terms of the costs the family incurs in terms of privacy, unwanted obligations to communicate, or unmet expectations.

My questions for this workshop are as follows:

- What are the opportunities and challenges of creating technology for “non-typical” families (e.g., divorced, single-parent, same-sex partners, etc.)?
- What are some possible issues around creating technology that has different benefits and costs for each of the members of the family?
- How can we design evaluations of family technologies that go beyond “they like it” to a nuanced understanding of the pros and cons of each system and its role in the larger ecology of systems used by the family?

In the remainder of this position paper, I will describe my work in the space of designing communication technologies for families and summarize the new perspectives that I would bring to this workshop.

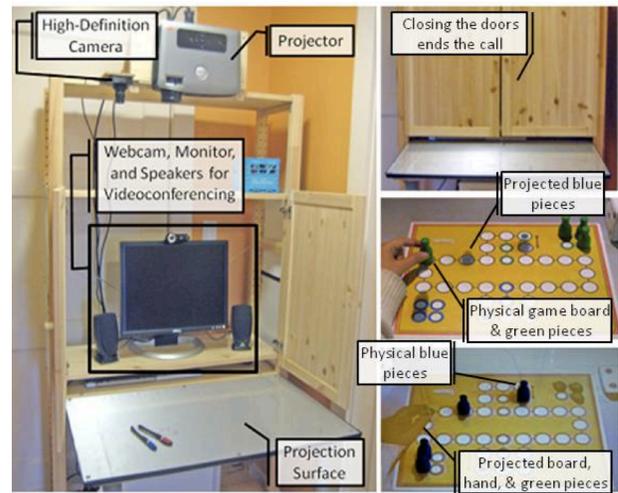
## PREVIOUS WORK DESIGNING TECHNOLOGY FOR FAMILIES

I have done a number of projects focusing on connecting parents and children who are separated by distance. I will briefly describe two formative investigations of parent-child separation and a system that I have developed to support these families. I will also briefly discuss a questionnaire that I have developed and validated in the course of this work that may be beneficial to future investigators.

To gain a rich, nuanced understanding of the design space of remote parent-child interaction in separated families, I conducted two qualitative interview studies of children and parents from divorced [14] and work-separated families [12]. I interviewed 10 parents (both residential and non-residential) and five children from divorced families to get a qualitative understanding of the challenges faced by these families and the role of technology in maintaining contact. I found that both parents had a strong need to maintain autonomy in raising the child, though the residential parent had more opportunities to be instrumentally involved. Both parents and children sought to manage tensions between the two households—parents by reducing interruption of the

other household, children by trying to keep contact with the other parent as private as possible. Our participants used the telephone as the primary means to stay in touch while apart but expressed dissatisfaction with the limits of audio-only communication. It was difficult to keep a phone conversation engaging—both parents and children instead sought ways to maintain contact through shared activities and routines but found little technological support to do so while separated. In a follow-up formative study, I compared the needs of divorced families with those of families that are separated by work (e.g., military deployment, immigration, etc.). I interviewed 14 pairs of parents and children (ages 7 – 13) from work-separated families to understand their experiences in living apart and the strategies and technologies that they use to keep their family together. I found that parents focus on combining scheduled synchronous and spontaneous asynchronous communication to maintain a constant presence in the life of the child. Children, on the other hand, focus on other sources of support, other activities, and the eventual reunion. Both the remote parent and the child rely heavily on a collocated adult to maintain awareness and contact. My two formative studies pointed to three common problems parents and children face in maintaining meaningful contact while separated: (1) audio-only contact is not effective with children, (2) video contact is difficult for the child to initiate without the help of a collocated adults, and (3) shared activities, rather than just conversation, are the best way for parents and children to build closeness. I sought to address some of these challenges by designing a novel communication system for the home.

The ShareTable is a synchronous communication technology aimed at addressing the three communication challenges faced by parents and children in separated families [15]. This system consists of two paired videoconferencing communication appliances (see Figure 1). A ShareTable in the child's home is connected via broadband to a paired parent's table. Videoconferencing provides an audio-video connection, while a camera-projector system superimposes a video stream of one table's surface on top of the other.<sup>1</sup> The two video streams are aligned so that the parent and child can view and layer physical artifacts in this shared media space, enabling activities like doing homework, reading, and drawing together. In order to make it possible for the child to use the ShareTable without the help of a collocated adult, I leveraged a physical metaphor of interaction. The ShareTable video monitor is hidden behind a set of cabinet doors: opening these doors initiates a connection to the other home or answers an incoming call; closing these doors ends the connection. After an encouraging formative lab evaluation of the ShareTable system [15], I worked to develop a robust functional prototype of the system that could be evaluated in the field.



**Figure 1.** A single ShareTable, consisting of videoconferencing and a camera-projector system. Images from the two tabletops are overlaid, supporting shared activities with physical objects. Opening or closing the cabinet door controls the connection.

I thought deeply about the design of the ShareTable field evaluation. Most home communications systems are evaluated using qualitative measures such as interviews and content analysis of diaries or recorded messages. However, I wanted to be able to compare the ShareTable to existing systems used by the family to understand the tradeoffs of this new technology and better place is in the ecology of communication systems used in the home. I found no existing validated tools that would allow for structured comparison between communication systems that would be appropriate for a field deployment and could be used with both parents and children. In order to address this gap, I designed and validated the Affective Benefits and Costs of Communication Technologies (ABCCT) questionnaire. The questionnaire was tested with 45 children [13] and 110 adults and found to be reliable and sensitive enough to differentiate between similar communication technologies (e.g. IM and SMS). An interview study with 14 parents and 14 children validated this questionnaire by comparing the results of the ABCCT to responses given in interview and by demonstrating the correlation of the ABCCT with related psychological constructs.<sup>2</sup>

I am currently in the midst of a study evaluating the ShareTable through a long-term deployment with six households (three sets of families), each with at least one child between the ages of 6 and 9. Each family is asked to keep communication diaries for two weeks before system deployment, four weeks during the deployment, and two weeks following the deployment. Throughout the study, I am conducting weekly interviews with both parents and the child. I am also collecting quantitative data on the length and frequency of remote communication (from diaries),

<sup>1</sup> A demonstration of the ShareTable system can be seen at [www.sharetable.com](http://www.sharetable.com)

<sup>2</sup> This work is currently under review for publication in the *HCI Journal*. But full-text of the ABCCT is available here: <http://home.cc.gatech.edu/lana/31>

logging ShareTable use, and collecting structured pre- and post- questionnaires to understand the impact of the system on the family dynamics. I am using validated measures such as the Network of Relationships Inventory (NRI) [6] to measure the ShareTable's effect on the relationships between the child, the parents, and the parents' new partners (if re-partnered). I am also comparing the ShareTable to other technologies currently used by the families on a number of emotional dimensions using the ABCCT Questionnaire, which I designed and validated for this purpose. The results of this evaluation should allow me to understand how a technology like the ShareTable is perceived and used by families and how such a technology affects communication between households.

### PERSPECTIVE

Working with divorced families has highlighted for me the fact that the family is always not a monolithic, harmonious. Rather, a family is made up of individuals, each of whom may have divergent needs, goals, and motivations. Additionally, each individual often weighs a number of complex factors when deciding which communication technology is appropriate in a given situation. To truly understand how technology is adopted by families, we need to understand the costs and the benefits of each technology that are relevant to each member of the family. This approach of thinking of the family as a collection of individual rather than as a whole and thinking of each technology as a single member of a larger ecology of possible technologies to use may be valuable to other investigators in the domain of family technologies.

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