

Studying and Designing Technology for Domestic Life: Lessons from Home

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As a lesson from home, we have always been taught to be thankful for everything we have. We are extremely thankful for our families, their love, and support.

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Foreword

In the past, technology was deployed in rather limited contexts such as the workplace. Today technology pervades all areas of our lives. One of the most significant trends in human computer interaction (HCI) over the last few years has been the move to studying the design, deployment, and effects of technology use in complex contexts such as the home. A great strength of past HCI research was the development of reliable scientific methods for evaluating and redesigning technology in contexts that were relatively well understood. While there is some disagreement about the details, researchers and practitioners effectively deployed techniques such as task-based evaluation, heuristic evaluation, cognitive walkthroughs, and contextual design. However, these tried and trusted methods fare less well in domestic contexts. Designing and deploying technology in new contexts, such as the home, has given rise to many new and pressing questions, which this book tackles head on.

Domestic technology design is challenging in many unique ways. First, adoption is *voluntary*: unlike in the workplace, no one legislates that specific technologies must be used by a family. As with many other consumer applications, this means that good design is a requirement. Users are volunteers and must be motivated to use the technology; they will rapidly abandon annoying applications that lack obvious benefits. Second, domestic spaces are *private*, which means that researchers hoping to study them must be sensitive about disclosure, both when studying families and when orienting to issues of privacy in their designs. Third, domestic spaces are *personal* and *inhabited*. Family practices are well developed and nuanced, and family spaces generally must be comfortable to live in. From a design perspective, domestic technologies therefore need to mesh well with existing family practices and fit into the aesthetic and sensibility of the home. Another important characteristic is that family spaces are highly *differentiated*: practices and design requirements are very different in shared public areas, such as the kitchen or family room, compared to private spaces, such as the bedroom or study. As several chapters observe, families are now complex in their configurations, with family members not necessarily living under one roof, or having complex arrangements that arise from divorce and separation. Finally, domestic technologies may be *social*: they need to match the practices of diverse users with differing interest in and expertise with technologies. The experienced researcher of domestic technology must deal with a range of users, from tech-savvy teens who are anxious to adopt new technologies to very young children and older adults, who may be fearful and skeptical of what technology might do for them.

The chapters speak to all of these issues. The advocated approach is iterative, user-centric design. The book does an excellent job of leading the reader through each stage of the iterative design method with refreshing honesty about what works and what doesn't. This honesty is critical for researchers and designers who are

seeking to apply these ideas, and what we learn from the information in this book is very different from textbook descriptions of these techniques.

The first part of the book discusses techniques we can use to understand what is going on when families interact with each other and with technology in the home. Most of the chapters advocate the use of interviews, guiding the reader through complex issues around recruiting and scheduling, especially where busy families with young children are concerned. They also discuss triangulating various reactions from family members. Several chapters add to these basic interview methods by addressing the use of additional information derived from design probes and observations. Other critical points are made, in particular, that requirements analysis doesn't stop at the design stage. Privacy concerns are addressed directly, with one chapter discussing how to engender trust and gather reliable information for topics where participants are wary about disclosure. The book does an admirable job of including a wide span of user types and situations, covering in-care elderly, young children, and families that are separated and divorced.

In the second part of the book, the reader is presented with fascinating descriptions of how to evaluate several potential designs. The above considerations mean that it is extremely difficult to design effective new domestic technologies and have them succeed the first time. One strong theme of the book is its focus on deployment, along with other approaches such as autobiographical and community-focused design. Deploying working prototypes is a highly effective way to gather concrete user feedback about new design ideas in context. Observing whether and how uptake occurs and gathering reactions to actual use make feedback much more useful than simply asking users about hypothetical scenarios or gathering reactions in short-term, structured task settings. Of course, the deployment approach has its limitations: there is tremendous effort involved in designing and deploying working technologies in contexts where domestic practices are well established, technological infrastructure may be missing, and users may be apathetic or, occasionally, hostile. However, the reader is left convinced that, despite these challenges, this is a compelling approach. The book provides a wealth of practical detail and advice gleaned from these deployments, including the need for permanent, remote system monitoring, the ability to respond to and troubleshoot unforeseen problems, and how to deploy technologies across multiple distanced households with differing participant skills and infrastructures. Various techniques are discussed that address this array of complex challenges, including using autobiographical design, embedding researchers into the participant setting, gathering remote logfile usage data, and providing online support. The case study approach is invaluable to both practitioners and academics.

This is an important book from methodological and research perspectives. As HCI research moves from the lab into people's homes and domestic lives, the shortage of information about the practical details of how to execute informative but sensitive research in complex, real-life settings is apparent. This book fills that gap. In particular, it provides very specific information about how to

design and evaluate new technologies that are actually deployed in real-life contexts. Anyone venturing into the design of new domestic technologies needs to read it.

Steve Whittaker
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An Introduction to Studying and Designing Technology for Domestic Life

1

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THE CHANGING LANDSCAPE OF COMPUTING

As we all know and have experienced, computational technology is now deeply engrained in our lives, from the way we listen to music and watch television to the ways in which we stay connected to people, places, and information. Whether we think about it or not, most people carry and use multiple computational devices throughout their day, including smartphones, laptops, computers, and tablets. There are also hidden or “invisible,” computational devices embedded in the everyday things we use, from our cars to our kitchen appliances to our entertainment systems. Thus, we are continually faced with technology usage in our homes, vehicles, workplaces, shopping malls, and virtually every other location we inhabit.

This changing landscape of computing and the ubiquity of technology has caused a shift in how we as a society aim to design new technologies and understand their usage. No longer are we concerned just with how one might use a computer at work. Instead, we are interested much more broadly in how technology affects our everyday lives. One important aspect of this is how technology is designed for and used as a part of domestic life within and outside the home for the fulfillment of connection, communication, coordination, social play, and the everyday accomplishment of seemingly mundane domestic activities. With more technology being designed for homes and families comes an increasing need for research in this domain to uncover insights about families’ routines and needs for technology design. It is also increasingly important to gain a deep understanding of how technology has changed family relationships and routines and in what ways it will continue to do so. With these shifts comes an increasing challenge for researchers and designers to design new technologies for domestic life, and study and evaluate them to understand how they affect people’s routines, activities, and, even more broadly, culture.

THE CHALLENGE OF STUDYING AND DESIGNING FOR DOMESTIC LIFE

Performing research and technology design for domestic life is by no means easy. Family life is increasingly rich and complex. Communication, awareness, and interaction routines are highly nuanced, and family members have different roles and dynamics. These may change from situation to situation or day to day, or vary based on location. Using existing research methods such as a laboratory study may be excruciatingly challenging if not impossible to do in this context. Many domestic activities occur within the context of the home or other private locations that are considered to be sacred places for only family and friends. By this we mean that many of the behaviors and rituals conducted at home are not privy to non-family members or those who do not live there. This makes it increasingly difficult to gather information from families about their actual routines and needs for technology. Domestic life also involves situations and activities that occur outside of the home, often interwoven with work, play, and other events. The notion of getting permission to study a family's activities as the family members move through them in various locations and contexts is, again, increasingly challenging.

There is a plethora of books that cover design and research methods in the field of Human-Computer Interaction (HCI). They cover topics such as conducting contextual inquiry in workplaces, performing controlled laboratory studies, deploying and studying technologies in the field, conducting interface inspections through formalized processes, and performing usability evaluation studies (Beyer and Holtzblatt 1998; Nielsen 1993; Rosson and Carroll 2002; Dix et al. 1998; Lazar et al. 2010; Hartson et al. 2012). While beneficial, these design and research methods are limited in that their use is not described for any one specific context. This makes it challenging to understand how these methods might be applied to present-day technology research within specific domains. When applied to families and domestic life, the methods may easily require alterations, or new methods may be needed altogether to overcome the complexities of studying domestic environments. Thus, there is a need for documentation on more specialized methods for conducting research in the area of domestic technology design and evaluation.

This idea comes from other researchers besides just us. Over the past five years, along with our collaborators, we have organized a series of workshops and special interest group (SIG) sessions at various HCI conferences. These include workshops at the ACM Conference on Computer-Supported Cooperative Work (CSCW) (Neustaedter et al. 2008), the ACM Conference on Computer-Human Interaction (CHI) (Neustaedter et al. 2009; Oduor et al. 2013), and the ACM Conference on Supporting Group Work (GROUP) (Neustaedter et al. 2010). One common theme that emerged during discussions in each and every workshop was a need for focused documentation on *research methods for studying families, domestic life,*

and domestic technology design. In all cases, workshop attendees had many questions about conducting research with families and in people's homes. They had all experienced challenges in studying families and had explored their own variations on research methods or sought new ways to better study family practices and technology design. As a result of discussions like these, academics, researchers, and designers attending our workshops pointed out that a strong need exists for a collected book on methods for studying and evaluating technologies for families. *This book is just that.*

THE PURPOSE OF THIS BOOK

This book documents the ways in which researchers are studying and researching technology design and evaluation in the context of the home and domestic life. However, it is not a typical research methods book. Instead, you can think of this book as the “inside scoop” for people learning how to perform research in the area of domestic life and home technology design. Each chapter is a candid discussion about one or more methods that were successfully used for research studies with a focus on the challenges that the researchers faced while using the methods and the best practices they learned. Chapters document and reveal the challenges and lessons learned by experienced researchers when studying or evaluating domestic technology, the application of existing research and design methods in new situations that require alterations to the methods, and new methods for studying and designing technology for domestic life. The authors of the chapters are established academics or researchers in the field of domestic computing. They have successfully used the methods they describe in the chapters, and most have published the results from their studies using these methods.

Of course, one could turn to journal articles or conference papers to learn about the research methods that others are employing when designing technology for domestic life or studying its usage, and we welcome readers to do so. However, such method descriptions will be vastly different than what you will find in this book. Journal articles and conference papers are limited in space, and the focus is often on the results of one's research and not the finer details about the methods employed. Researchers also often utilize tips or tricks they have learned throughout their experiences in conducting research but do not typically discuss these in journal articles or conference papers. This is the focus of our book: *the untold stories of how research methods were applied in real research projects*, including the ways in which a study might have gone wrong and the steps taken by researchers to fix the problems. It also includes specifics of the research methods used, rather than the typical high-level overview that we often see in journal and conference publications. There is also an underlying theme throughout the book that explores the *ethical considerations* when studying domestic routines and technology usage practices.

HOW TO USE THIS BOOK

With the increasing interest in designing and evaluating technologies for domestic life, this book can serve as a resource for academics, researchers, designers, and students wanting to learn about methods for conducting research on domestic life. First, it could be used as a textbook or a supplementary resource for university courses focused on studying domestic routines, technology usage, or designing and evaluating technology for families. The entire book or specific chapters could be used to teach and learn about particular methods and their applications in domestic settings. Second, this book can be used as a resource for students or new researchers wanting to learn about conducting studies of domestic life or domestic technology design. The information in the collection of chapters should enable them to learn about methods that have been successfully used and how to apply them. The chapters are also a resource in and of themselves, as each chapter includes a literature review and references related work. And finally, this book can be used as a reference for choosing an appropriate method for a research problem being worked on. Our companion website, lessonsfromhome.org, also contains additional materials from the studies described throughout the book.

Given the interdisciplinary nature of HCI research, this book can also act as a resource for researchers in various fields including design, computer science, engineering, sociology, psychology, and anthropology.

TOPICS AND ORGANIZATIONAL OVERVIEW

Throughout this book a range of topics is covered, with a focus on studying everyday practices and technology usage as well as the design and evaluation of new and innovative technologies. We have organized these topics into two sections—“Understanding Domestic Life” and “Technology Design and Evaluation”—with several chapters in each. Each chapter describes a research problem, choosing a research method, recruiting strategies, developing a study protocol, and collecting and analyzing data from the field.

SECTION 1: UNDERSTANDING DOMESTIC LIFE

The book begins with a collection of foundational chapters that focus on ways to *understand domestic life*. These chapters shed light on tried and tested methods that have been used to learn about the home and domestic life *before* designing and evaluating new technology or *during* the design process and creation of new technologies.

Chapter 2: Remote participants, interview, video chat. The first section begins with Hillman, Forghani, Pang, Neustaedter, and Judge’s chapter that discusses ways to conduct interviews with remote participants. Often the focus of a research project is on studying certain demographics that are not easily found within close

proximity to the researchers. Also, families are no longer defined only as those who live together but include those separated by divorce or split between two locations due to job restrictions or other complex living situations. To study families like these as well as families in other regions and countries, video communication technologies now play a pivotal role in user studies. This chapter discusses the challenges and lessons learned from conducting user studies with remote participants in three domains: family communication between grandparents and grandchildren, family communication during cases of chronic illness, and people's shopping behaviors on mobile devices while at home and when outside the home.

Chapter 3: In-home interviews, large families, children. Building on interviewing techniques, we move to Leshed and Håkansson chapter, which discusses best practices for conducting interviews with different types of families. This chapter starts off by discussing how the researchers interviewed and collected data from a fairly unique population: families who live and work on small organic farms. Although farm families may seem like a very specific type of family, Leshed and Håkansson draw lessons that extend beyond this population to studying families in various situations. For example, they share ways to deal with dynamic interviews, where family members may come and go during the interview, and also share strategies and considerations when recruiting families in unique situations.

Chapter 4: Children, adolescents, in-home interviews. Next, we shift the focus from interviewing families, to studying the behaviors and activities of children. Foss, Guha, and Druin draw from their rich experience in conducting studies of children and adolescents' search behaviors on the Internet. As one might expect, conducting studies with children is significantly different from doing research with adults. Conducting studies with children requires different kinds of recruiting, scheduling, interviewing, and observational techniques. They also discuss the added complexity of overeager parents, shy and distracted children, and hectic family homes, and suggest ways to overcome these challenges.

Chapter 5: Cultural probes, interviews, older adults. We explore research with older adults in Wallace and Lindley's chapter on using cultural probes with care home residents. These design probes enabled the researchers to creatively engage with the care home residents and supported in-depth conversation that allowed them to learn about participants' lives at the care home. They discuss the use of probes as a tool to facilitate conversation, challenges in conducting research in a communal space, and issues that may arise when dealing with the complex interplay between domestic and work environments in the care home context.

Chapter 6: Origami maps, behavioral changes, longitudinal study. Fox's chapter on the Business Origami Technique explores another type of design probe that can be used to facilitate conversations with families. This technique uses tokens to represent key parts of a technology ecosystem to answer "who, where, and how" questions about the ecosystem. This technique is not often used or documented within the HCI literature, yet it can be tremendously useful for studying domestic life. In this chapter, Fox describes using Business Origami to study and track changes in families' use of the Internet in their homes. The chapter also discusses

ways to adapt this technique from its traditional paper-based format to a digital format that enables the Origami artifacts to be used for longitudinal studies.

Chapter 7: Financial tours, sensitive topics, interviews. The final chapter in this section focuses on using probes and interviews to study sensitive situations like personal finances. In most countries and cultures, one's finances are often considered a very private topic. Kaye's chapter discusses techniques and tools that were used to understand participants' financial practices despite the sensitive nature of this information. These include using financial maps, index cards with financial events, and studying physical financial "tools" such as wallets. The chapter highlights ways to alleviate participant concerns about the privacy of personal information and the ways in which researchers can be cognizant about this issue.

SECTION 2: TECHNOLOGY DESIGN AND EVALUATION

In the second half of the book, we shift gears to *designing and evaluating* technology for domestic life. Evaluating technology that has been designed for families and the home presents new challenges that are specific to the context of domestic life. The chapters in this section explore ways to address these challenges.

Chapter 8: Autobiographical design, design research, self-usage. We begin this section with Neustaedter, Judge, and Sengers' chapter on autobiographical design in the home: a research method that involves detailed self-usage of a technology while one is designing it. Autobiographical design has previously been used within the field of HCI, yet its usage in the domestic setting presents new and interesting challenges. These challenges outlined in the chapter by describing the autobiographical design of the Family Window, an always-on video communications system for families. Through this example, Neustaedter et al. discuss the benefits, challenges, and limitations in using this method as well as more general lessons for successfully using autobiographical design in the home.

Chapter 9: In-home deployments, field trials, prototype evaluation. Next we move to Brush, Meyers, and Scott's chapter on in-home deployments, which is a research method that evaluates systems designed for families and the home. Although this method is widely used, as Brush et al. point out, it requires careful planning and considerable effort to avoid common pitfalls and successfully evaluate the usage of a system. They share insights drawn from the in-home deployment of PreHeat, a prototype thermostat that automatically controls home heating using occupancy sensing and prediction. The in-home deployment of PreHeat highlights important lessons, including the value of being able to remotely determine the state of the prototype and determine issues with the system, and the importance of adapting the system to deal with unexpected issues in the home environment.

Chapter 10: Multi-home deployments, field trials, prototype evaluation. Broadening the focus from single-home deployments, Judge and Neustaedter discuss ways to conduct in-home deployments with multiple connected households.

They compare and contrast single-home deployments with multi-home deployments by describing the design and evaluation of Family Portals, a multi-home video media space that connects three families' homes in order to promote feelings of connectedness among family members. The field trial of Family Portals highlights an increase in the level of complexity when conducting multi-home field trials due to the interconnection between households and an increase in privacy concerns when connecting multiple homes using always-on video.

Chapter 11: Prototype evaluation, field trials, intact social groups. Tang, Junuzovic, Inkpen, and Venolia's chapter explores new methods for studying the design and evaluation of personal communication technologies, including VideoPal, Experiences2Go, and TV2Gether. These technologies focus on connecting close friends and relatives over distance and are not easily studied in lab environments. They describe alternative methods focused on embedding researchers within an intact social group, observing technology usage outside the home, and passively capturing technology experiences through software. The overall lessons focus on the "invisibility" of researchers, privacy concerns, and observing realistic behaviors.

Chapter 12: Community groups, interviews, design, prototype evaluation. Massimi's chapter moves away from family interviews and home visits to explore how one can conduct research in community groups. Community support groups are places where family members often talk about their home lives, family relationships, and the challenges they face. Thus, these groups offer a unique avenue in which to gain additional perspectives on home life. In particular, they may allow researchers to explore the difficult times or emotional struggles that family members may face. Massimi describes the study and design of an online support web page called Besupp to explore these topics.

Chapter 13: Conflict, children, divorce, interviews, prototype evaluation, field trials. In Yarosh's chapter on conflict in family life, we again explore challenging situations that often arise in domestic life. Through an exploration of the design and field evaluation of the ShareTable, Yarosh documents the challenges in recruiting and conducting studies with adults and children in divorced families, where she draws on several theories of conflict. This chapter explores lessons relating to interviewing one versus multiple individuals at the same time, notions and definitions of family, the negative impacts of technology interventions, and ethical concerns and challenges.

LOOKING FORWARD

The domestic environment and domestic life are extremely important areas to study and research in the field of Human-Computer Interaction, yet studying them is becoming increasingly challenging. Through descriptions of research projects and case studies, this book reveals many lessons that academics, researchers, designers, and students can apply in their own research. However, domestic life is ever changing, as are the technologies that we use, design, and develop, so this

book is also a foundation for thinking about the present and looking forward to the future. As times change, along with culture, technology availability, and technology usage, researchers should develop new and interesting ways to study everyday practices and technology design in domestic life so they can build on the lessons, methods, and practices this book presents. Researchers should continue to create their own learnings, adaptations of methods, and new and interesting ways to conduct research in the fields of domestic computing and Human-Computer Interaction.

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Conducting Interviews with Remote Participants

2

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INTRODUCTION

Interviewing is a common approach for collecting data from people in a lab environment or in the field. It is also commonly used as a data inquiry method in studies of domestic life. In fact, many of the chapters in this book discuss the use of interviews in various settings and contexts. Yet the present-day complexities of study designs and the pragmatics of conducting research mean that it may not always be possible to interview study participants in person.

First, it may not be possible to find local participants for a study, given the demographic that one is interested in. Travel to another location could be cost-prohibitive, especially if potential participants are not located in the same city or within driving distance. This could happen if one wants to interview members of the same family, but they are distributed across different cities or even countries. Second, even if participants are located in the same city, travel time may be onerous, or traffic issues may present significant travel challenges. Third, study participants may be more comfortable without a researcher present at their home, or they may not feel comfortable meeting with a researcher at another location, such as a coffee shop (Weiss 1994). Given alternative options, they may be more apt to participate in a study if they feel safe and comfortable without a stranger (the researcher) physically present. Similarly, sometimes traveling to a participant's home or another meeting place may put the researcher's safety at risk (Weiss 1994). For previous research projects, we have had to travel to questionable neighborhoods (e.g., a crime-ridden neighborhood, a remote rural area) to conduct interviews. We have also interviewed participants in their home where the situation did not seem safe, given other household members in the setting or the mannerisms of the participant. This was even for studies of seemingly mundane topics such as photo sharing. There are also a host of other reasons why it is difficult and sometimes impractical to do in-person interviews.

Historically, phone interviews have been an alternative to in-person interviews, yet the richness of actually seeing a person during an interview can be lost (Weiss 1994). It can also be more challenging to build rapport with a participant, which in the past has sometimes led to shorter, less detailed interviews (Weiss 1994). As a result, interviewing methods often focus on being able to see the person and his or her surrounding as well as any pertinent contextual information. With the increasing ubiquity of video communications systems and the proliferation of free video chat applications such as Skype, Google+ Hangouts, FaceTime, and others, it is now possible to conduct interviews with remote participants. However, based on our collective experience of conducting over a dozen studies using video chat technology, we have recognized that this method is not as straightforward as simply calling a participant over Skype (or other video chat system) and conducting the interview. Many challenges can arise that turn a simple interview into a complicated one. Even worse, these challenges can cause issues when collecting critical data from participants.

The focus of this chapter is on describing lessons learned and best practices in conducting interviews over distance through the use of video chat technologies. We describe these lessons through case studies focused on grandparent-grandchild communication over distance, health information sharing, and mobile commerce (mCommerce) practices. We selected these three studies because they presented broad and varied situations in which we interviewed participants over video chat. The grandparent-grandchild study focused on older adults who were often less familiar with video chat technologies. The health information sharing study focused on a highly emotional topic for many participants. Participants also engaged in paper-based activities that were then discussed with the interviewer. The mCommerce study mostly focused on young adults, who discussed digital artifacts—in the form of diary entries and screenshots—during the interview. For each study, we focus in on the specific challenges that came up from the unique study contexts. These include the issues we faced as researchers when acquiring ethical clearance from our university, the challenges in recruiting and conducting each study, and the issues we faced when analyzing our data. We also share approaches that we took for addressing these challenges.

CONDUCTING FACE-TO-FACE INTERVIEWS

Before describing our three studies, we first review some basic principles and guidelines for conducting interviews with participants. Readers interested in more detail should refer to the books we cite in this chapter or others focused on interviewing techniques and methods.

First, interviews in Human-Computer Interaction (HCI) research are typically used to elicit qualitative user feedback on design ideas, concepts, or existing technology. These can occur before, during, or after (in a retrospective way) the use of a technology. Interviews can be used to learn about user routines, patterns, and

behaviors to determine the need for new technology. This latter style of interview is the type we focus on in this chapter, though the discussion is likely more broadly applicable to other types of interviews as well.

One-on-one interviews with study participants come in several forms, often varying in terms of the amount of direction that the interviewer gives to the participant (Schensul et al. 1999). These range from *structured interviews* to *semi-structured interviews* to *closed interviews*, where each has a slightly different purpose along with associated benefits and costs (Schensul et al. 1999). The three studies discussed in this chapter all utilize semi-structured interviews because the studies are all exploratory in nature, yet they focus on specific topics that we wanted to understand more deeply.

We have also seen the importance of context emerge as a part of HCI interview methods. This relates to a method known as *contextual inquiry* (Holtzblatt and Jones 1995; Beyer and Holtzblatt 1998). The goal of contextual inquiry is to understand the practices of interviewees within their actual environments. Originally, the method was developed for workplace studies, but it has since been used in home environments. By conducting interviews within the context of an interviewee's existing practices, the person is more likely to think about his or her practices and processes than if the interview was conducted elsewhere. This method has been used in domestic settings as part of *technology tours* (Baillie and Benyon 2007).

Physical objects and activities are now present in many face-to-face interviews. These may include design activities that are part of participatory design sessions (Sanders 1999; Sanders and William 2001). They may also include looking at digital or paper-based artifacts in focus groups (Goldman 1987). These techniques highlight the need to see and talk about objects and activities around participants during interviews, which is a focal point in all of the studies presented in this chapter.

During the interview, the interviewer should establish a relationship and rapport with the interviewee, respect the interviewee's perspective, and work to uncover detailed information about the focus of the interview (Weiss 1994). Interviewers must be good listeners, but good listening can be difficult to achieve in practice. There may be *situational* obstacles, such as noise from the environment or challenging topics being discussed (Nichols and Steven 1957; Wood 1996). There may also be *internal* obstacles, such as biases, a lack of focus, or diverse listening styles (Nichols and Steven 1957; Wood 1996). Good listening involves removing distractions from the environment (e.g., background noise), using open body postures (e.g., not crossing one's arms) and making eye contact, sitting attentively (e.g., leaning in toward the interviewee), being patient, and listening rather than talking (Nichols and Steven 1957; Wood 1996). All of these are important to remove internal distortion—problems with the method and environment in which the interview is conducted—and external distortion—problems with the interaction between the interviewer and interviewee (Book 1980). Throughout the interview, the interviewer can use various techniques to move the interview along, change direction, or probe for more details (Book 1980). These include a mixture of verbal statements in conjunction with body language. For example, *flow* techniques can be used to gain

more information on a topic. They involve an interviewer making statements such as “I understand” or using body movements such as nodding one’s head or leaning forward.

Thus, interviewing is about more than what is being said by the interviewee. It involves the environment in which the interview is conducted. Moreover, it involves complex body language, facial expressions, and gestures from both the interviewer and the interviewee. For the interviewer, these techniques set up the structure of the interview and can help transition topics, show interest, and gain deeper insight. In a similar nature, seeing the interviewee provides valuable details beyond what the person is saying. These can include valuable emotional information such as a participant’s discomfort with certain topics or questions. This illustrates the importance of both the interviewer and interviewee being seen by each other and also the importance of seeing the context or environment in which the interview is taking place to understand what distractions or other internal distortion threats may be present.

As one moves to interviewing participants remotely over video chat, it is important to ensure that the interviewing suggestions, techniques, and methods we have described above and those that are documented elsewhere continue to be thought about and applied as needed.

In the next section, we describe the ethics of having people participate in interviews over video chat. Following this section, we move into specific descriptions of each of our three studies and the lessons we learned about interviewing over video chat. Some challenges and lessons overlapped between all three studies and, for this reason, our first case study goes into more detail than the latter two.

THE ETHICS OF CONDUCTING STUDIES OVER VIDEO CHAT

The first challenge we experienced with conducting remote interviews over video chat happened before our studies even began. As is the case with nearly every university, one has to obtain clearance from an ethics review board (e.g., The Institutional Review Board [IRB] in the United States) for studies involving human participants to ensure the studies present minimal to no risk to them, including ensuring that data is kept confidential and anonymous.

For all of our studies, our university’s ethics board was concerned that participants’ identities and data would be transmitted electronically over the Internet during a video chat call. This created the small possibility that the video transmission could be intercepted by other individuals (e.g., hackers) and the person’s identity and data could be revealed to a third party. Thus, the ethics board at our university had a concern about us guaranteeing the confidentiality of our participants’ identities and associated data if the participants took part in a study over video chat. To circumvent this issue, we first explained to our ethics board that many data transmission protocols found in communications software (e.g., Skype) use secure connections that encrypt the data being transmitted. Yet despite this security feature, our

ethics board still had concerns that encryption and secure connections may not be 100% reliable. As a result, and in agreement with our ethics board, we instead included a statement in our study protocol and consent forms that the confidentiality of participant identities and data could not be guaranteed for those participants who participated in our study over video communication tools such as Skype, as our ethics board does not consider it to be a confidential medium. We also stated that participants could decide if they were willing to take this risk or not as part of their consent to participate in the study. To date, this has not presented any issues to our study participants. Yet, we caution that other ethics boards may have different policies than ours, and certainly one should learn about and understand what concerns may exist for participants as they relate to studies conducted over video-mediated communication systems.

LESSON

Conducting studies over video chat may introduce new ethical and confidentiality concerns for both participants and ethics review boards. Be cognizant about these concerns and address them in participant consent forms and the study's protocol.

CASE STUDY 1: GRANDPARENT AND GRANDCHILD COMMUNICATION

In the spring and summer of 2012, we conducted a diary and semi-structured interview study with grandparents and parents of children aged three to ten. The goal was to explore how grandparents and grandchildren conversed over distance using the phone, video chat, and other technologies. The study was primarily conducted by Azadeh Forghani, a PhD student, within her broader dissertation research. Full results from the work can be found in [Forghani et al. \(2013\)](#) and [Forghani and Neustaedter \(2014\)](#).

STUDY METHOD

In order to recruit our ideal participants with varying demographics (e.g., children's ages, technical abilities, occupations) and various amounts of distance separation, we tried several recruitment methods, including snowball sampling through friends and family, posts on Facebook and Twitter, emails to teachers and parents at a local elementary school, and advertisements on Craigslist (a North American-based online advertising site). Finding eligible participants was challenging, which is a common situation for most studies that we conduct. In this case, it was hard to find participants who were interested in being a part of a research study, had children or grandchildren in the desired age range, *and* experienced distance separation

between the grandparents and grandchildren. We also wanted to balance our participants to ensure we had a range of children's ages.

Eventually, we recruited eighteen participants; half of them were grandparents while the other half were the parents of children between the ages of three and ten. Because we broadened our recruitment efforts to meet our demographic needs, participants tended to be spread out geographically. Eight participants were from Greater Vancouver, a city that spans approximately 100 kilometers in the province of British Columbia, Canada. Five participants were from within Canada but outside of Vancouver, one was from the United States, three were from Iran, and one was from Australia.

The study consisted of two stages: a diary study and a semi-structured interview.

- 1. Diary Study:** Participants were asked to record diary entries for a period of three weeks through a study web page. We asked grandparents to record information after each instance of communication with their remote grandchildren and asked parents to do the same after each time their children communicated with the remote grandparents.
- 2. Semi-Structured Interview:** After the three-week diary portion of the study, we conducted a semi-structured interview with each participant. Naturally, it was not easily feasible to conduct face-to-face interviews with participants who lived in another country. Hence, we decided to interview them over either the phone or video chat. Given the large geographic spread of Greater Vancouver, the participants who lived in the city were asked if they preferred an interview over the phone, over video chat, or in person at home. Overall, across remote and local participants, only four interviews were done in person, while the remaining interviews were done remotely: five via the phone and another nine via video chat.

When using video chat, participants were asked to choose a video chat application they were most familiar with. This turned out to be Skype for all remote participants. Some local participants preferred the phone because they felt they were not familiar enough with video chat. Others preferred the phone because it allowed them to multi-task and watch their (highly mobile) young children during the interview as opposed to being stuck in front of a computer. While local participants did not give reasons why they chose not to do in-person interviews, we suspect this had to do with a researcher coming to their home, feeling somewhat uncomfortable with this person being a stranger, and also feeling obliged to clean up their home beforehand.

Next we address several challenges we faced while conducting interviews over video chat.

SCHEDULING

We found that connecting with participants at a designated time to conduct a video chat interview was often difficult. Participants were willing to schedule an interview, but last-minute cancellations happened far more often for video chat interviews than for in-person interviews. In general, participants felt less committed to a video chat

interview and would routinely contact us on the day of the interview and ask to reschedule. Participants were told ahead of time that interviews typically took an hour to complete. Thus, they knew we would be committing only an hour to the interview as opposed to taking the extra time to drive to meet them, and as a result, they were more likely to reschedule at the last minute.

We could not completely overcome such situations, but we learned that when we sent reminders by email the day before an interview and verified that the participants were still available during the scheduled time, they tended not to reschedule. This additional reminder and confirmation solidified commitments from both the participant and the interviewer to participate as previously scheduled.

LESSON

Participants may feel less committed to participate in a video chat interview and may cancel or reschedule more frequently than for an in-person interview. Remind participants of scheduled appointments and the interview's importance to increase their commitment.

When participants lived in a different time zone than we do, we faced additional challenges in trying to understand what days and times they were available to participate. We were very careful to figure out what the time zone difference was between our location and the participant's and explicitly detail this when talking about days and times. We also sent reminders to participants specifying the interview's time and date in their local time zone to make sure they were still available at the scheduled time. Even still, some participants were easily confused by the time zone differences, and this caused additional challenges when scheduling remote interviews as well as rescheduling ones that needed to be moved or were missed because of a mix-up in time zones.

TECHNICAL ISSUES AND SCAFFOLDING

Six interviews were conducted over video chat with grandparents between the ages of sixty and seventy-three. All were well educated and had basic computer knowledge; however, their experience with video chat applications varied widely. Some participants frequently used video chat systems for academic or work purposes, while others were less familiar with them and had to ask another family member (e.g., an adult child) to help with the application before we could start the interview. This meant that sometimes an additional adult was present at the interviews. This may not seem to be an issue, but some interview questions asked about communication challenges and social tensions that might arise between grandparents and parents. Having another person present and privy to hearing the participant's interview responses could compromise what was said, causing participants to hold back on their concerns or issues and not report them. We did not notice any instances of this in our study, but it is certainly something important to consider.