Carman Neustaedter
Steve Harrison
Abigail Sellen   *Editors*

Connecting Families

The Impact of New Communication Technologies on Domestic Life

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Editors
Carman Neustaedter
School of Interactive Arts
   and Technology
Simon Fraser University
Surrey, BC, Canada

Abigail Sellen
Socio-Digital Systems
Microsoft Research Cambridge
Cambridge, UK

Steve Harrison
Department of Computer Science
   and School of Visual Arts
Virginia Polytechnic Institute
   and State University
Blacksburg, VA, USA

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Contributors

Gregory D. Abowd   Georgia Institute of Technology, School of Interactive Computing, GVU Center, Atlanta, GA, USA
e-mail: abowd@gatech.edu

Ronald M. Baecker   Technologies for Aging Gracefully Lab, University of Toronto, Toronto, Canada
e-mail: ron@taglab.ca

Rafael Ballagas   Nokia Research Center, IDEA Group, 200 South Mathilda Ave., Sunnyvale, CA 94086, USA
e-mail: tico.ballagas@nokia.com

Stacy Branham   Department of Computer Science and School of Visual Arts, Center for Human-Computer Interaction, Virginia Polytechnic Institute and State University, 2202 Kraft Drive, Blacksburg, VA 24060, USA
e-mail: sbranham@vt.edu

Xiang Cao   Microsoft Research Asia, Beijing, China
e-mail: xiangc@microsoft.com

Jessica David   Technologies for Aging Gracefully Lab, University of Toronto, Toronto, Canada
e-mail: jessicam.david@utoronto.ca

Saul Greenberg   Department of Computer Science, University of Calgary, 2500 University Drive NW, Calgary, AB T2N 1N4, Canada
e-mail: saul.greenberg@ucalgary.ca

Steve Harrison   Department of Computer Science and School of Visual Arts, Center for Human-Computer Interaction, Virginia Polytechnic Institute and State University, 2202 Kraft Drive, Blacksburg, VA 24060, USA
e-mail: srh@vt.edu

Kori M. Inkpen   Microsoft Research, 1 Microsoft Way, Redmond, WA 98052, USA
e-mail: kori@microsoft.com

Tejinder K. Judge   Google Inc., Mountain View, CA, USA
e-mail: tkjudge@google.com

Joseph 'Jofish' Kaye   Nokia Research Center, IDEA Group, 200 South Mathilda
Ave., Sunnyvale, CA 94086, USA
e-mail: jofish.kaye@nokia.com

Panos Markopoulos   Eindhoven University of Technology,
Eindhoven, Netherlands
e-mail: p.markopoulos@tue.nl

Karyn Moffatt   School of Information Studies, McGill University,
3661 Peel Street, Rm 303C, Montreal, QC, H3A 1X1, Canada
e-mail: karyn.moffatt@mcgill.ca

Carman Neustaedter   School of Interactive Arts and Technology, Simon Fraser
University, 102 Avenue, 250-13450, V3T 0A3 Surrey, BC, Canada
e-mail: carman_neustaedter@sfu.ca

Hayes Raffle   Staff Interaction Designer, Google, 1600 Amphitheater Parkway,
Mountain View, CA 94043, USA
e-mail: hraffle@google.com

Ruud Schatorjé   Eindhoven University of Technology, Eindhoven, Netherlands
e-mail: mail@ruudschatorje.nl

Abigail Sellen   Socio-Digital Systems, Microsoft Research Cambridge,
JJ Thomson Avenue 7, Cambridge CB3 0FB, UK
e-mail: asellen@microsoft.com

Svetlana Yarosh   Georgia Institute of Technology, School of Interactive
Computing, GVU Center, Atlanta, GA, USA
e-mail: lana@cc.gatech.edu

Chapter 1
Connecting Families: An Introduction

Carman Neustaedter, Steve Harrison and Abigail Sellen

Abstract Family life is complex and dynamic. It forms a core part of our existence. Underpinning family life, is *family connection*: how families not just communicate with each other, but how they share their lives and routines, how they engage in social touch, and how they negotiate being together, or being apart. This book explores the various ways in which family members "connect" within the same household, across distance, or across time. It investigates the impact of new communication technologies on domestic life and the changing nature of connection across a variety of family relationships, including couples, parents and children, adult siblings, and grandparents and grandchildren.

Family

The idea of "family" can no more be defined by a network of blood relations than the concept of "home" can be described as a physical building. At some level, we may think of family as a collective of partners, parents, children, grandparents, and

C. Neustaedter (✉)
School of Interactive Arts and Technology,
Simon Fraser University,
102 Avenue, 250-13450, V3T 0A3 Surrey, BC, Canada
e-mail: carman_neustaedter@sfu.ca

S. Harrison
Department of Computer Science and School of Visual Arts, Center for Human-Computer Interaction, Virginia Polytechnic Institute and State University,
2202 Kraft Drive, Blacksburg, VA 24060, USA
e-mail: srh@vt.edu

A. Sellen
Socio-Digital Systems,
Microsoft Research Cambridge,
JJ Thomson Avenue 7, Cambridge CB3 0FB, UK
e-mail: asellen@microsoft.com

various other relations. But to stop here would be to gloss over what we really mean when we talk about being part of a family, spending time with family, or making a family home. These richer, everyday concepts point to a much more nuanced and profound idea of what a family is. When seen in these terms, it is clear that the notion of family is to some extent an aspiration—something we strive to achieve and a goal that we aim toward. Furthermore, moving toward this goal requires effort—and sometimes a great deal of effort—to maintain family, to nurture it, and to adapt domestic life to its changing needs and unfolding circumstances. In short, family is something that we *do*, not something that simply *is*. More than this, the doing of family is never complete. It is always a "work in progress".

To say that families require work is perhaps no surprise to the average hassled, over-tired parent. On the other hand, it may appear somewhat grandiose to speak of family life as aspirational. Indeed, the work that constitutes family life is at once both mundane and of fundamental importance. Research in anthropology, sociology, and, more recently, Human-Computer Interaction (HCI) has shown how the "doing" of family can be seen in many of the ordinary things we carry out every day. Examples include housework (Martin 1984), shopping (Miller 1998); cooking (Grimes and Harper 2008), the arranging of objects in the home (Miller 2008; Kirk and Sellen 2010), and even in how we deal with family clutter (Swan et al. 2008). But this research also shows that through these seemingly unremarkable activities, something much more valuable is achieved. When it comes to domestic life, we are not just tidying things up, bringing in provisions, preparing food and so on. Rather, we are fulfilling our duty, showing affection and concern for those we care about, and making a home in which family identity is expressed and reinforced.

In the midst of this, and in fact underpinning all of these activities, is *family connection*: how families not just communicate with each other, but how they share their lives and routines, how they engage in social touch, and how they negotiate being together, or being apart. This is the central theme of this collection of essays. In it we look at families from the most intimate relationships between couples to the dynamics of the immediate family, to extended and even fractionated families through divorce. We look at the sharing of ordinary life and special events, and the doing of everyday chores as well as play and laughter. And we examine how families strive to stay connected when they are separated by long distances, but also when they live together.

In these endeavors, technology has historically played a central supporting role, and, in turn, technological development has been spurred on by the needs of family connection. In today's world, technological change seems faster than ever, not just from the perspective of changes in speed, networking capacity, storage, and the proliferation of devices and services, but in terms of the choice that it offers up for new ways of connecting with family.

All of this raises important questions for the impact of new technologies on family life. Will new technologies help strengthen the bonds that already exist, or will they complicate or accentuate tensions? Will it allow us to connect more widely with others we care about, or will a pre-occupation with far-flung connections simply mean less time for those who are here and now, and closest to us? The answers

are not simple, and the impact of technology will not be neutral. What we can be sure of is a fascinating story that will unfold as new technologies evolve hand in hand with changes in domestic practice.

The Importance of Connection

So what then does it mean to be connected? Within the immediate family, it may mean the ability for families to communicate with each other to coordinate, share their experiences, mediate their relationship, maintain varying degrees of intimacy, and, simply put, feel closer to one another. Within the extended family, it may mean staying abreast of major life changes, health issues, or general locations such as when a family member might be in town to visit. Maintaining a connection may be easier for some family members than others and will vary greatly depending on how much value individuals place on staying connected, how "important" individuals are within one's social circle, and so on. There are also those who we are keen to stay aware of, those who are harder to stay in touch with because of busy lives and schedules, and, yes, by human nature, even those family members with whom we have little desire to stay connected.

The need to be "connected" is also highly dynamic. Immediate family members such as parents and children may have a constant need to be connected because their day-to-day activities and functioning depends on it. Yet extended family members may stray out of touch in the absence of new or exciting events that warrant communication. On the other hand, when major life events occur like weddings, graduations, and, sadly, even funerals, the meaning of connection changes and its importance elevates. This is not to say that connection is always good, however. There are times when being apart is as important as being together. For example, adult children who have moved away from home to go to college or live on their own may desire less connection than their parents try to achieve. Or, similarly, so-called "helicopter parents" may try to "overconnect" with their children as they try to remove obstacles from their children's paths.

Often of pivotal importance for staying connected is where family members are located. Past research suggests that most people prefer to connect with their close family members in person (Ling 2000; Hindus et al. 2001; Neustaedter et al. 2006; Greenberg et al. 2009; Tee et al. 2009). Yet not everyone is able to see their family members in person when they need to or want to. For family members who live together, connecting may occur within the same home or outside of the home between the various locations that people visit throughout the day, such as work or school. Family members who live apart must connect across distance where the distance might be small, such as across a city, or large, such as across the country or even the world. Because of this, family members have used varying "technologies" to connect with each other over distance. Prior to the dawn of the Internet, if opportunities for face-to-face communication or exchange were limited or not possible, families primarily connected with each other through the telephone and postal mail system.

For example, while at work, parents called each other using the phone to coordinate children's activities for the evening. Children similarly called their grandparents who live across country to tell them about their school or extracurricular activities. Families also relied on the postal system to send letters, cards, and other greetings to their remote family members where they would feel more connected despite the medium's less-timely communicative nature.

When we consider the notion of family connection, it is also clear that the value of connecting for families is quite different from that of connection in the workplace. In the fields of HCI, and more especially Computer-Supported Cooperative Work (CSCW), research in the workplace context and media space literature has shown how connection is rooted in moving information, coordinating tasks and negotiation (Bly et al. 1993; Harrison 2009). Mediated connection in the workplace is motivated by needs of workflow, projects, and organizational structures. As this literature developed, it became apparent that sociality was an important component of mediated workplaces, but "feeling connected" was not *a priori* a driver of system design. In contrast, the domestic realm focuses on connection for its own sake. The state of being "together" as a member of a household, as a member of a family, as a member of a couple bears only a superficial similarity to being together on a project with co-workers. "Connection" is part of the identity of being a family. The informational content of "connection" is often secondary to the reassurance of awareness and presence.

This raises the issue of how this new orientation to home life will build on existing research and literature. There are many reasons why work-related research will remain relevant. One is that the boundary between work and family is increasingly blurred, which means that some practices from the workplace will increasingly find their place in the home. Another is that the technologies and practices around connection that we focus on in this volume may be based on workplace technologies that have become re-worked in the family context. And finally, the contrast between family and work expands the definition of "connection" for both. There may be parallels with personal computing which began as a home-based phenomenon (although resting on technology from the workplace); personal computing spread into the workplace and reconfigured work, the workplace and working relations. So, will mediated connection in the family realm become a distinctively separate kind of technology from that in the workplace? If it does, how will it reconfigure work? It is important to both track the phenomenon and actively explore alternatives.

A Changing World

In order to track the changes going forward, it is important to have line of sight into the past. When we do, and as others have discussed (Harper 2010), we find that new technologies tend not to replace the old ones, but instead they add to the palette of possibilities. In turn, old technologies find their place, and sometimes evolve in

response to these new niches. As a case in point, in present day, the telephone and postal mail system are still used by family members to connect with each other, but the meaning of a phone call, or a letter or card has changed. In fact a paper card may in some ways be more special by the very fact that it is so much easier to send something digitally. Email, too, may now be seen as quite old fashioned in some ways, and may even be eschewed by younger generations who insist that social networking tools are the way to connect with friends. Yet email remains fundamental to how we do our work, and even teenagers recognize that email may be useful for communicating with teachers or doing other "work-related" things. In a sense, telephone, paper mail and email are all continuing to find their place in the world, even though that place is constantly evolving.

Driving these changes is a host of new technologies that provide additional means for connection, many of which have been brought about by the need to stay connected to family. Mobile phones, for example, have dramatically changed the nature of family connections by making family members accessible in nearly any place, at any time (Ling 2000). The Internet and mobile wireless networks have caused mail systems to evolve to support the exchange of messages almost instantly via email, instant messaging, and text messaging between friends and family. Research in computer-mediated communication has explored the ways in which family members use these communication, awareness, and interaction technologies, as well as how to best design family communication technologies of the future that can seamlessly bring people together and help them feel connected regardless of their location.

For example, we see focal points on bringing together grandparents and grandchildren in the moment through video communication systems (Judge et al. 2010; Kirk et al. 2010; Ames et al. 2010; Judge and Neustaedter 2010). This occurs in the context of the home (Sellen et al. 2006; Kirk et al. 2010; Ames et al. 2010; Judge and Neustaedter 2010) and also while family members are mobile (O'Hara et al. 2009). Research has also looked at how parents who long to stay aware of their adult children as they grow up and leave 'the nest' stay connected with them (Tollmar and Persson 2002; Plaisant et al. 2006; Lindley et al. 2009). The reverse has also been studied where researchers have investigated how adult children stay connected with their aging parents, often to ensure their health and welfare is fine (Mynatt et al. 2001). Together, this research and more has resulted in a number of technological advances for bringing together and connecting family members, including messaging systems, information appliances, and mobile applications (e.g., Strong and Gaver 1996; Hindus et al. 2001; Hutchinson et al. 2003; Romero et al. 2006; Sellen et al. 2009).

As is evident, technology is playing an increasing role in mediating family relationships. Here the social, cultural, and technological issues are increasingly rich and complex, as family members must understand what technologies are available to them, learn how to use them, and adapt them into their existing communication routines and practices. This brings challenges with technology usability where family members, such as children (Ames et al. 2010) or older adults (Mynatt et al. 2001; Lindley et al. 2008), might struggle with understanding how to get a technology to

"do what they want." Family members face issues with time zone separation where they must figure out how to best "schedule" or "time" their communication with those afar (Ciao et al. 2010). Family members must also balance their needs to stay connected with privacy issues of revealing or sharing too much information, or being "too connected" (Judge et al. 2010; Birnholtz et al. 2010). We also see issues with social isolation where individuals may want more connection with their family members, yet they are unable to achieve such connections for a variety of reasons (Grenade and Boldy 2008). This list could certainly go on and on, which is why the study of "connecting families" is of increasing importance in present day.

Beyond this, we are now seeing an increasing trend, which further brings this research space to the forefront. Computer-mediated communication technologies for families are now moving out of the research lab and into actual everyday practice. In fact, one might argue that some technologies, such as video-communication systems, are finding stronger purchase and presence in the home environment than in the workplace. These computing technologies are rapidly changing the way families can communicate, coordinate, and connect with others through readily available (and often free) applications, such as Google Talk, Skype, or Apple's FaceTime. The accessibility and proliferation of these applications means that family members are increasingly faced with new mechanisms to reach out and connect with their family and friends. For this reason, technology is now rapidly reconfiguring the way we think about and design for domestic spaces and domestic life. As it does so, researchers now must directly confront issues of family relations and the subtle negotiations that are part of that realm.

Purpose of the Book

In what follows, we bring together a collection of chapters that constitutes both a diverse overview of research into technologies for connecting families, and one that offers a comparative guide both in terms of the relationships under scrutiny, and the technologies that are evaluated. Specifically, it brings together studies with various relationship dynamics ranging from intimate partners to extended family such grandparents and grandchildren. It also explores a variety of technological solutions, including mobile devices, information appliances, and computer applications; media such as text, video, and audio; and, function where it explores awareness, interaction, and other forms of communication. The goal is to bring these case examples together in order to allow readers to draw their own perspectives and conclusions that cross relationships and technology boundaries.

The book can be used in a variety of ways. First, it can act as a tool for courses focused on studying domestic relationships, routines, or technology usage. In this way, the entire book, or specific chapters can be used as studies of particular facets of "connecting families". Second, it can serve as a resource for those conducting research in the area of family communication that brings together both state of the art and foundational literature, including the chapters themselves as well as the

works referenced within them. This should aid those who are studying varying family relationships including connecting partners, parents and children, children, and grandparents and grandchildren. It can also aid those studying various technology or communicative or media forms, such as video-based communication or messaging systems. Third, most of the chapters have important implications for new technologies we might design, both in terms of underlying concepts and the requirements for those technologies. As we shall see, the needs of different "user groups" as defined by their relationships (whether we are talking about couples, children with peers, intra-family relationships and so on) may be quite different. This in turn gives guidance as to what these different groups might value, and how technology might best support those values. The book then can be used by those who may have a more applied rather than theoretical focus.

Overview of the Book

The book is partitioned into three main sections based on the varying relationships that shape the nature of communication and the technologies that underpin it: couples and partners, immediate families and children, and the extended, distributed family.

1. Couples We start with what is often the core of a "family," the couple, to look at and understand the impact of technology design on couple relationships, communication, and feelings of closeness. In couple relationships, connection is often of the utmost importance to keep partners together, maintain the intimacy of the relationship, and coordinate day-to-day activities.

This section begins with Branham and Harrison's chapter on designing for Collocated couples that puts forward the notion of "couple-centered design". Here the emphasis is on designing technologies with "the couple" as core user as opposed to many designs, which focus solely on ensuring usability and usefulness for the individual. In this chapter, Branham and Harrison present a variety of technologies that have been designed over the years for both collocated and distributed couples along with their prototype of a Diary Built for Two and discussions of how it can promote deep interpersonal sharing for collocated couples. Together, this presents a framework for how one can think about couple-centered design.

Building on this, we then narrow the focus and move to Greenberg and Neustaedter's chapter on intimacy in long-distance couple relationships. This chapter explores the unique way in which long-distance partners have appropriated "off-the-shelf" video chat systems like Skype to stay connected. In many cases, these couples are using video chat systems akin to media spaces from the workplace (Harrison 2009) where the video and audio links are left on for extended periods of time. Here couples value being able to connect their distributed residences with the technology to create a shared sense of place. This "shared living" across distance helps them share life, experiences, and intimacy, despite social and technical challenges created by the technology.

2. Immediate Families & Children Section Two moves on to studies of immediate families that have expanded beyond just the individual or couple to include children. Here we present chapters that investigate the design of technology to connect families as a part of their everyday living practices within the home, or connecting across homes. This includes parents connecting with their children as well as the situations that arise when children want to connect with their friends over distance. The emphasis is on connection for communication, coordination, and play.

We begin the section with Schatorje and Markopoulos's chapter on intra-family messaging that explores "connecting" in households comprised of parents and teenage children. The chapter's emphasis is on designing family technologies in a flexible manner such that existing routines can easily migrate to new communication technologies. To this end, they describe the design evolution of Family Circles, a messaging system that allows family members to leave audio recordings for each other on tokens that can be placed throughout the home. This migrates family practices of leaving handwritten messages for one another to a new technological form.

Next, we examine parent-child relationships where communication and interaction has been complicated because of divorce. In these cases, the "simple" situation presented in the preceding chapter where parents and children all reside in the same household is no more, and at least one parent lives apart from his or her child. To this end, Yarosh and Abowd's chapter on enriching virtual visitation describes the challenges that divorced families face when trying to connect parents and children across households and the opportunities for designing technologies to support them. They present the design of the ShareTable that allows parents to interact and engage with their children over distance with the aid of an audio and video connection. The chapter also emphasizes the many pragmatic and challenging issues that can arise when moving a prototype out of the research lab and into the home for real usage.

Following this, we look more specifically at connecting children to investigate how technology can be used to mediate child-to-child relationships, such as friends or cousins, over distance. This is one part of domestic life that parents must often account for and facilitate in order to ensure their children have their social skills enriched and nurtured. As relationships in society become increasingly mediated by technology, so too do those amongst children who often desire to connect with their friends over distance. Inkpen's chapter explores how both asynchronous and synchronous video chat systems can support children playing and interacting over distance and the advantages that each brings forth. This includes the presentation of three prototype systems, Video Playdate, IllumiShare, and VideoPal.

3. The Extended, Distributed Family Lastly, we move beyond the immediate family to explore connections between extended, distributed family members. This includes connections between adult children and their parents, grandparents and grandchildren, and adult siblings. Here family members have grown older, moved away from "home," and forged "new" families. Yet they still have needs to connect with their existing family members. In these situations, we often see the most diversity in terms of connecting. The needs for connecting may be highly dynamic and change depending on life events. They may also be much more discretionary

if relationships are not particularly strong, or there could be a real desire by family members to connect more because they miss their extended family.

First, Cao's chapter on connecting families across time zones sets the framework for thinking about extended family connections. He describes the many challenges that parents and adult children, as well as siblings, face when trying to connect across distance when time zones come in to play. In these situations, family members must often coordinate, plan, and schedule interactions when each person may have a very different notion of time, day, night, etc. Cao juxtaposes the importance of synchronous and asynchronous communication in these situations.

Next we focus in on one type of technology that can connect extended family members who are distributed: video conferencing in the form of a domestic media space. Judge, Neustaedter, and Harrison's chapter explores the design and usage of two such systems, the Family Window and Family Portals, and how parents and adult children, grandparents and grandchildren, and adult siblings used the messaging features within these systems to stay connected. Some family members were separated by time zones, and all were separated by distance. Here the notion of connection refers to the ability for the systems to make family members feel close to one another and aware of their day-to-day activities.

Following this, we narrow in on the grandparent-grandchild relationship more deeply for the final two chapters in this section. First, Ballagas, Kaye, and Raffle's chapter explores "connected reading" and how video communication systems focused on play and reading can support grandparent interactions with young grandchildren. They present three systems, Family Story Play, Story Visit, and People In Books, where each embeds video within a storybook in a unique way. The act of tying family connection to an activity that children love, namely reading, allows grandparents to share longer, more meaningful time with their grandchildren than other more traditional technologies (e.g., the phone).

Lastly, Moffatt, David, and Baecker's chapter takes a step back from the previous chapter to explore grandparent and grandchild relationships more holistically to understand their role throughout life as they grow and evolve. This includes relationships between grandparents and young grandchildren as previously discussed, as well as teenage, and even adult grandchildren. They illustrate how a variety of technologies can support such relationships, including those focused on shared reading with young children, shared stories about family history for older grandchildren, collaborative reading for situations where grandparents have difficulties reading, and biographies to act as a catalyst for conversation.

Book Themes

Beyond the explicit structure that we have presented above, there are several themes that resonate throughout chapters within the book and spread across multiple sections. At a surface level, this includes designing for varying age groups and family roles. Yet,

beyond this, the chapters provide an additional understanding of the ways in which family connection has been studied. Some of the more prominent themes include:

Methodologies The book presents chapters that include a range of methodologies for studying family connection. This includes interviews to understand existing family practices and guide new designs (Chaps. 3–5, 7, and 9); information probes to inform and inspire design (Chap. 4); iterative design and prototyping of new technologies (Chaps. 2, 4, 5, 8, 9, and 10); field trials of prototype technologies coupled with interviews to more deeply understand usage (Chaps. 2, 4, and 8); and laboratory studies aimed at guiding design and understanding new technology usage (Chaps. 5 and 6). As can be seen, most often, family connection is studied using exploratory, qualitative methods where there is an emphasis on studies performed in homes or the field. However, there also exist studies that are more quantitatively focused or occur in a controlled, lab setting. The challenge is being able to create a natural and realistic setting that replicates domestic spaces or practices.

Design-Research Lifecycle Related to methodologies, we also see chapters that focus on varying points in the design-research lifecycle. Some are focused on early design research that explores a particular type of relationship, technology area, or family practice in the form of gathering design requirements or providing descriptive accounts of domestic life (Chaps. 3 and 7). This knowledge can then be used as a basis for designing future technologies. Some chapters are focused on the actual design and evaluation of technologies where a prototype system is created, often through iterative design, and then evaluated either in the field or lab (Chaps. 6, 8, and 10). Other chapters describe larger portions of the lifecycle and include stages of requirements gathering, design, and evaluation (Chaps. 4, 5, and 9).

Technological Medium A strong focus across chapters is also the technological medium being explored. Family connection can be supported in many ways through technologies and researchers have explored a variety of options. One of the most predominant mediums, at least explored in this book, is the use of video connections that are sometimes coupled with audio links (Chaps. 3 and 5 through 10). In addition to this, we also explore audio messaging (Chap. 4) and textual-based communication (e.g., diaries, handwritten messages, stories) (Chaps. 2 and 7 through 10). Across these mediums, some chapters are focused on synchronous communication where family members can connect in real time (Chaps. 3 and 5 through 10), while others explore asynchronous communication spread over time (Chaps. 2, 4, 6–8, and 10).

We hope that readers will latch on to these themes and others as they explore the research space presented in this book. This may be especially valuable for those using the book as part of a design or human-computer interaction course, or for researchers learning more about the topic of "family connection".

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