The Needs of Grandparents and Grandchildren in a Socially and Geographically Distanced World: A Case Study

Denise Y. Geiskkovitch*

School of Interactive Arts and Technology, Simon Fraser University, denise_geiskkovitch@sfu.ca

Department of Computing and Software, McMaster University, geiskkod@mcmaster.ca

Marilena Müller

School of Interactive Arts and Technology, Simon Fraser University, marilena.magnasco@gmail.com

Carman Neustaedter

School of Interactive Arts and Technology, Simon Fraser University, carman@sfu.ca

Grandparents and grandchildren are important parts of each other's lives. However, they may not be able to always be co-located to interact and share activities. We conducted case studies to explore how grandparents and grandchildren use video calls to spend time with each other, when being co-located is not possible for extended periods of time. We found that aspects such as framing and camera work, unilateral and shared activities, and contextual awareness are especially relevant for this type of interaction, especially for children. We additionally provide potential design and exploration avenues for future research.

1 INTRODUCTION

Grandparents are an important source of support, and the relationship between grandparents and grandchildren is very valuable for both sides [13, 14]. With the global outbreak and rapid spread of COVID-19, many restrictions, such as social distancing measures, were introduced around the world[1]. As a result, many families resorted to communicating through videoconferencing systems to stay in touch [8]. While studies have looked at the relationship and communication routines of grandparents and grandchildren [5, 22], this was at a time when travel and social closeness were not restricted. We are interested in whether traditional video communication systems meet the needs of grandparents and grandchildren to communicate when geographically or socially distanced, and how these should be designed to better meet their needs and foster a sense of connectedness with one another.

To explore these questions, we conducted case studies with two sets of grandparents and grandchildren. We observed each of the grandparent-grandchild pairs interact through video communication systems twice. Our findings suggest that grandparents and grandchildren experience several challenges when communicating through video, such as lack of shared context. We detail these and provide future areas of focus for design.

2 RELATED WORK

2.1 Family Communication

Tendencies in family communication can vary depending on the emotional closeness of the family members; the more connected the members are the more frequently they communicate, preferring in-person interactions. However, families sometimes rely on options such as phone calls or video communication systems [3, 9, 12, 21]. Phone calls are particularly popular, due to technological challenges or simply because they prefer such methods of communication [21]. However, children tend to express themselves through actions instead of words, and

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[1] The COVID-19 pandemic began in December 2019 and continues to be present in 2022. Public health measures include the limiting of close contacts, decreased local and international travel, and multiple lockdown orders.

generally rely on body language and facial expressions, which are not available in phone calls [22]. Video calls can solve these challenges, as children can follow body language as well as facial expressions and more interaction is possible [3], but the effort required for video calls is often high. Video calls are usually preceded by phone calls to ensure the other side is willing and available to video call, as these calls are considered to be more intrusive [12].

2.1.1 Communication Routines of Grandparents and Grandchildren

Grandparents are an important source of social support for the entire family, but especially for grandchildren [2], shaping and supporting them as they transition into adulthood [19]. Grandparents tend to view grandparenting as an integral and rewarding part of their lives [15]. Given the importance of grandparents' presence in grandchildren's lives, research has explored how to support this relationship and the incompatible needs of both [5, 6, 22]. When interacting through video calls, grandparents and grandchildren often create new activities to do, which helps engage the child and make communication easier [6, 22]. These exchanges can be supported by objects, which can have a meaningful effect and influence the frequency, duration, and emotional experience of their conversations [6]. Likewise, communication between grandparents and grandchildren can be facilitated by providing a "conversational context," such as shared storytelling, personal photos, and video [3, 22]. Approaches encompassing such aspects have been explored by researchers and are described below.

2.2 Video Conferencing Systems for Families

Much work has already explored the needs and challenges that families face when communicating over distance, and how the technological gap between them can be bridged (e.g., [3, 4, 17, 23]). Systems such as Family Window and Family Portals [10, 11] provide always-on video connections, making family members more aware of each other and feel less obligated to communicate. Tangible devices such as Storybox [23], allow an individual to share objects, handwritten notes, and voice messages with family members in a different home, creating shared visual stories. SINCOM, a prototype to send audio and video messages and participate in an asynchronous pet care game, follows a similar approach [18]. These systems support synchronous and asynchronous communication and enable older children to communicate with other family members in playful interactions without parental scaffolding. Other systems, such as G2G [4], are structured like shared calendars, to increase awareness of each other's lives. However, given the widespread use of video communication systems during the pandemic (in an attempt to fill the void of being physically present and together), we decided to focus on such a system and exploring how it is used.

Research suggests that video communication systems should provide structure and guidance, without limiting novel and unique methods of interaction. Further, they should support children's independent use, video interaction, include playful components, support synchronous and asynchronous communication, and the ability to share memories [4, 10, 18, 23], to provide a sense of intimacy and connectedness. Our research focuses on how existing video communication systems are used to support connectedness between grandparents and grandchildren, without any co-located interaction or additional tangibility (like previous research).

3 STUDY METHODOLOGY

We conducted interview and observation case studies to explore how grandparents and grandchildren use video communication systems (traditionally built for the workplace) to communicate and how these systems could better meet their needs (with social/geographical distance). This study was approved by our institution's ethics board.

3.1 Participants

We recruited two grandparent-grandchild sets. Grandparents were aged 60 or older, and grandchildren were between the ages of 7 and 13 (see Table 1). We specifically chose this age group to ensure that grandchildren were able to communicate with the researcher and grandparents (young children have difficulties with video calls and interview questions). We recruited participants through ads on social media platforms and snowball sampling. Participants were compensated with $75CAD for the grandparents and $75CAD for the grandchildren's family. These particular groups of participants were chosen due to differences in children's ages and the geographical distance between the grandparents and grandchildren (one local and one in a different continent).

Table 1: Participants in the study grouped by affiliation

Family	Label	Age	Gender	Country	Contact pattern
1	Grandparent 1	75	Female	Canada	Phone calls on a regular basis, occasional video calls
	Grandchild 1	7	Male	Canada	
2	Grandparent 2	75	Female	South Africa	WhatsApp audio calls on a regular basis, rarely video calls
	Grandparent 3	71	Male	South Africa	
	Grandchild 2	11	Female	Canada	
	Grandchild 3	13	Male	Canada	

3.2 Method and Procedure

The case studies were divided into two observation sessions for each grandparent/grandchild dyad, scheduled one week apart, and one interview each with the grandparents and the grandchildren of each pair. The study was conducted on Zoom, and all participants had previously used the platform. During observations, participants informed that they were free to use the time during the video call as they wished, and that they could interact with each other however they usually did. For all observations, our primary goal was to not disturb the grandparents and grandchildren in their communication, and obtain an idea of their communication practices. During the first observation, we utilized a fly-on-the-wall approach, where the researcher deliberately kept their camera and microphone turned off during the interaction and did not intervene. After a maximum of an hour, the researcher interrupted the conversation and ended the first observation session.

We used the second observation to ask intervening questions where it seemed helpful and whenever we felt like we needed to get a deeper understanding of the situation. For example, asking the grandparent whether they ever moved around their space as the grandchild often did. The researcher's audio and video where therefore on whenever they were asking questions, but off otherwise. After a maximum of an hour, this observation ended.

We conducted semi-structured interviews with grandparents and grandchildren separately, which took 30 to 60 minutes. We asked questions such as *"Please tell me about the challenges you have experienced when communicating with your grandchildren over distance during the pandemic," "What type of activities have you mostly engaged in and spent time on with your grandchildren during the pandemic?,"* and *"If you could wish for one functionality in the technology you used, what would it be?".* Grandparents were interviewed after the first observation session, and grandchildren after the second one. Parents could be present during child interviews.

3.3 Data Collection and Analysis

Observations and interviews were recorded. We conducted open coding on all data. The data was coded by one researcher, and through further iteration and discussions within the research team, we arrived at main themes, which are presented in the following section. Our findings stem from the combination of the observation sessions and responses from the interviews. The three main themes that emerged were: *Challenges with Framing and Camera Work*, *Unilateral and Shared Activities*, *and Contextual Awareness*.

4 RESULTS

4.1 Challenges with Framing and Camera Work

Camera placement and framing posed significant challenges for children. We observed that while grandparents quickly figured out how to position themselves in front of the camera (when using a computer) or how to hold their device (when using a tablet or phone), children took much longer to find the right framing. Children sometimes held their device in such a way that their fingers blocked the camera, or that the camera was not pointed at themselves so the grandparents could not see them. Children also often left the visible frame area completely, to retrieve something to show the grandparents or because something else caught their attention. Grandparents sometimes waited for extended periods before telling their grandchildren. In one case, the child was out of frame for three minutes because a toy had caught his attention. Although the grandchild and grandmother continued to talk during this time, the grandchild and what he was doing, were not visible to the grandmother.

While grandparents seemed to mostly point the camera at their face throughout the conversation and hold a static position, children modified the camera position quite frequently, switching between their face and the things they were seeing or doing. When asked, one grandparent indicated that she had not considered moving around her home or that it might be interesting for the grandchild to see her space *"I forget. Yeah, he's really good at showing me everything and then I forget" - GP1*. Children, who were mostly trying to include their grandparents in their play or, for example, show them drawings or toys they had made or received since their last call, had to keep repositioning their camera. While this provided more immersion, it also caused frustration.

4.2 Unilateral and Shared Activities

While in the interviews grandparents and grandchildren cited that spending time together and partaking in joint activities was their goal, during the observations, we noticed that most of the action took place on one side of the conversation, while the other side was limited to observation or commentary. Some pairs tried to play games together, but then retreated to more isolated activities; they were able to talk and see each other, but there was no real sense of "togetherness." At times, children started to play alone with toys that were only available to them, and grandparents had to remind them that they were still on the call. Interestingly, however, it was also primarily the children who tried to involve the grandparents in their activities. For example, we observed that children showed books, toys, or brought their pets in front of the camera, which they explained was akin to their co-located routine.

4.3 Contextual Awareness

During the observation sessions, conversations were dependent on prior contextual knowledge, and were therefore mainly initiated and conducted by the grandparents. Sometimes, we observed the two older children in our study asking questions when appropriate context was given, such as the grandparents having returned from vacation.

During the observations, it also became clear that grandparents and grandchildren sometimes do not have much common ground, and one grandparent shared that they sometimes look at pictures together to make conversation easier. Older children were also able to deal with their lack of context by simply asking their grandparents questions. One grandchild expressed in the interview that he would prefer to have more context and to see, for example, what happened in the room just before the call or be able to see the grandparents, similar to a hologram. All in all, the grandchild would like more contextual information,

> *"Let's say they're drinking coffee or making breakfast and then you could also see what they're doing and what's going on and maybe see what happened before the call. And see, just the mood in the room."* – GC3

5 DISCUSSION

In our case studies, we observed inadequate camera work and perspective taking by grandchildren. Children often forgot that they were on video, talked or played out of frame, and struggled when attempting to change what the camera was showing. This was also found by other researchers with younger children who did not understand field of view [1, 7]. Particular to our study, and not seen in the related work, we found that grandchildren moved around and interacted with their physical space, while grandparents mainly remained stationary and focused on their grandchildren. To support children, systems could provide multiple simultaneous camera views, increasing the likelihood of them being in frame. Systems could also track whether the child (or grandparent) is within frame and provide appropriate feedback, or even suggest grandparents move around their space or show objects to the grandchildren. Systems designed for children could autonomously pan to where the child is (similar to Facebook Portal), without the child worrying about camera work.

During our sessions, we observed that grandparents and grandchildren participated in joint and individual activities during their video calls. While current video communication systems mostly support individual activities, work is necessary to support joint activities. Several studies have investigated this area, creating systems that enable grandparents to read to their grandchildren [16, 17] and play together [20]. Moving beyond this work, our research suggests that the ability to engage with physical objects together (e.g., LEGOs) might be especially beneficial, and therefore should be investigated in future systems.

Through our case studies we found that contextual awareness is important for grandchildren. Grandparents often obtain information about life events and milestones from their grandchildren's parents, which they use to facilitate conversation with the grandchildren [3, 5, 22]. However, we found that children, who often lack information, were better able to participate in conversations with their grandparents when they had more contextual awareness. Thus, systems could provide prompts for grandchildren and grandparents on topics that they could discuss together or ask each of them to provide topics before establishing the video call. Parents could also be encouraged to provide children with more information about their grandparents, to facilitate discussion.

6 CONCLUSION

The relationship between grandparents and grandchildren is meaningful for both, however current video communication systems are not built to support such interactions. While our findings and generalizations are limited due to the small sample size of our case studies, we found that aspects such as contextual information and dynamic camera work are key in grandparent-grandchild video calls, and need to be better supported. Considering such aspects when designing systems for grandparents and grandchildren could help support their relationship and positive outcomes that stem from it.

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