Author: Tarasuik, Joanne; Kaufman, Jordy
Title: When and why parents involve young children in video communication
Year: 2017
Journal: Journal of Children and Media
Volume: 11
Issue: 1
Pages: 88-106
URL: http://hdl.handle.net/1959.3/425161

Copyright: Copyright © 2016 Informa UK Limited, trading as Taylor & Francis Group. This is an Accepted Manuscript of an article published by Taylor & Francis Group in Journal of Children and Media on 25 October 2016, available online http://www.tandfonline.com/10.1080/17482798.2016.1233124. This is the author's version of the work, posted here with the permission of the publisher for your personal use. No further distribution is permitted. You may also be able to access the published version from your library.

The definitive version is available at: https://doi.org/10.1080/17482798.2016.1233124
When and why parents involve young children in video communication

<table>
<thead>
<tr>
<th>Journal:</th>
<th>Journal of Children and Media</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manuscript ID</td>
<td>RCHM-2014-0070.R2</td>
</tr>
<tr>
<td>Manuscript Type</td>
<td>Original Article</td>
</tr>
<tr>
<td>Keywords:</td>
<td>child, video communication, screen media, interactivity, social engagement, technology, development family, computer mediated interaction</td>
</tr>
</tbody>
</table>
When and why parents involve young children in video communication

Abstract

Recent media reports have suggested video communication use by young children. However, the popularity of video communication by young children has yet been determined. Although some research has shown similarities between young children’s experience of a parent’s physical and virtual presence little is known about the ecological applications of video communication and its benefits to young children.

Using a brief quantitative questionnaire this study shows that younger children started video communication at significantly earlier ages than the older children in the sample (n=308). Qualitative responses from parents of 17 children suggested different perceptions of their children's video communication experience.

These preliminary findings are considered in the context of the value of video communication in different situations, the developmental factors associated with screen media including memory transfer across modalities, and the development of skills that facilitate effective communication.

Introduction

Video communication has undeniably exploded in popularity in recent years (Symantec Corporation, 2009). This trend is understandable in light of the perceived benefits that this real-time contingent audio-visual form of communication has to offer. For example, in a recent survey of 6000 online users, 42% reported that they engaged in video communication with family or friends and that this has a positive impact on their relationships (Symantec Corporation, 2009). A particularly interesting element of this new trend is that many young children appear to be taking part in these video communication sessions. Evidence for this can be seen in numerous media reports (e.g. Hone-McMahan, 2011) and by the recent development of video communication software directed specifically at young children (e.g. Ustyme, 2013).

In the developmental psychology literature, it is well established that a “warm, intimate, and continuous” relationship with a parent has developmental benefits for the child (Bowlby, 1951 p.11). Similarly, grandparent-grandchild relationships have been shown to benefit the attitudes and mental health of both generations (for a review see Smith & Drew, 2002). Consequently, the new trend in video communication is important to monitor and assess because it has the potential to maintain parental and other family contact in the myriad of situations under which a physical presence is not possible.

Indeed, in today’s society, various factors can interrupt the physical continuity of a relationship between a child and their parent and/or extended families (e.g. Striker et al., 1999). Media reports have recently highlighted that video communication is being used to overcome child-parent separations stemming from a number of causes including: divorce (Fleischer, 2012), paediatric illness ("Aberdeen Asset Management plc : Skype helps sick children stay in touch," 2013), parental incarceration ("Reading To Children Promotes Good Behavior Behind Bars," 2011), military duty ("LifeSize allows Iraq soldiers to attend birth of children," 2010), and even space exploration (McCann, 2010). Nonetheless, whilst video communication use by families...
has become a popular media topic, scientific analysis of this trend is currently lacking. The main purpose of this work is to address this gap.

New technologies are undeniably integrating more swiftly into society than ever. For example, whilst the telephone took 20 years and the television took 13 years to reach an audience of 50 million people, more recently the internet did so in only four years (L. Rosen, 2007), and iPad sales in the first quarter of 2014 alone reached 26 million ("Statista," 2014). This brings technology more and more into the home and within the reach of people of all ages.

Although a number of researchers have interviewed parents about their children’s use of specially designed video communication devices (Yarosh, Inkpen, & Brush, 2010) and standard video communication (Yarosh & Abow, 2011), little is known about video communication use by pre-school-aged children in the home. One study has shown that in a controlled laboratory environment, pre-school-aged children can be engaged by their parent and act as though the parent is physically proximal during video communication with them (Tarasuik, Galligan, & Kaufman, 2011). With these fundamental elements demonstrated, research should progress towards determining the ecological value of video communication in relation to young children, and establish whether video communication can “dilute to a significant degree some of the tyranny of distance” (Garth V Hope, 2008), as stated by a federal magistrate concerning the value of virtual visitation following parental divorce.

We aimed to answer three key questions about current video communication use by young children. The first question was: “At what age are children currently introduced to video communication?” In this regard we were also interested in how this has changed over the last decade. Based on anecdotal reports from newspaper, magazine and online articles (e.g. Hone-McMahan, 2011), it was hypothesised that children are currently participating in video communication during their pre-school-aged years and the starting age has been steadily decreasing. Although we do not claim to have obtained a cross-sectional sample, we are operating under the presumption that we attained a representative sample of the families with young children that participate in video communication.

The second question concerned expected and perceived benefits: “What motivates parents to involve their young children in video communication; and what perceived benefits and detriments do parents feel have stemmed from this experience?” There are many reasons that parents and children are geographically separated; employment travel, divorce, and increasing rates of expatriate assignments (Finaccord, 2014). Accordingly we hypothesized that video communication was being used for children to maintain contact with their parents, and also to develop or maintain intergenerational relationships with relatives that live a great distance away. We hoped that parental reports would give insight into both the benefits and dynamics of such interaction.

A third question related to children’s video communication behavior. Young children treat people on video differently than people who are physically present (e.g. Troseth, Saylor, & Archer, 2006) and we are in the primacy of exploring the role that contingency plays in this. Furthermore, they encode memories of 2D representations differently than 3D representations (Hayne, 2004), and for such reasons, we explored whether children conceptualized their virtual
and physical interaction with the same person as one relationship. Additionally, the impact of television and video communication exposure on expectations of screen media interactivity was examined since watching television fosters a conceptualization that people presented via screen media are non-contingent, which draws distinction from video communication. A laboratory-based study revealed a distinct difference in the experience of a video-link to a parent by children two-years of age, and those younger (Tarasuik et al., 2011). It was accordingly hypothesized that parents would report a change in their child’s video communication experience at a similar age.

Parents were asked to report if their children had taken part in telephone calls and if so, how it compared to video communication. As research has indicated that there are barriers to children holding telephone conversations (Ballagas, Kaye, Ames, Go, & Raffle, 2009), and video communication has the potential to overcome such barriers, it was expected that parents would report that video communication was the superior option for their child.

The research strategy employed to address these issues utilized mixed methodology; parents of young children completed a brief quantitative questionnaire, and some participated in a follow-up qualitative investigation. Parent reports are a resource-efficient method of obtaining data on ecological behavioural patterns, allowing examination of parental perceptions and child behavior.

Material and Methods

Participants

Pre-school-aged children were the cohort of interest, so parents of young children were the respondents of the quantitative questionnaire, and a small proportion of these parents also participated in the qualitative component.

The quantitative data concern children under 6 years of age (n=308) and their siblings (n=52) and were collected from 180 questionnaires completed by parents. Each respondent had at least one child under the age of 6 years, and were all aged in their 30s or 40s (M=36.2 years, SD=3.5 years). All resided in Australia, and most were female (86%) and part of a nuclear family (90%). Only 29% of participants were a parent of only one child, and more than half (56%) were the parent of more than one child under 6 years of age.

The qualitative data concerns 17 children that were under 1 year of age (n=3); 1 year of age (n=3); 2 years of age (n=4); 3 years of age (n=2); 4 years of age (n=3); and 5 years of age (n=2). Participants of the qualitative components were a sub-sample (15%, n=13) of the respondents of the quantitative questionnaire. They were parents of, on average, two children (M=1.77, SD=0.93) that had been participating in video communication with one or more relatives, all but one respondent was female, only one parent was not in a nuclear family, and they ranged in age from 30-43 years (M=36.2 years, SD=3.5). Thus this subgroup strongly reflected the group as a whole as far as gender, age and nuclear family were concerned.
Materials

Within the quantitative questionnaire, parents reported their family’s demographic details, how often their children engaged via video communication, and the age they started. The qualitative component involved a semi-structured interview of 14 questions which are listed in Table 1.

Table 1.

<table>
<thead>
<tr>
<th>Semi-structured interview questions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questions</td>
</tr>
<tr>
<td>1 What made you introduce your child to video chat, and who does your child video chat with?</td>
</tr>
<tr>
<td>2 What changes has it made to your child’s relationships with their video chat partners?</td>
</tr>
<tr>
<td>3 What is your child’s favorite thing to do whilst video chatting?</td>
</tr>
<tr>
<td>4 Do they participate in activities whilst video-chatting? E.g. reading books, singing, dancing.</td>
</tr>
<tr>
<td>5 Does your child video chat with any relatives that they also receive physical visits from? If so, do topics of conversations cross from video chat to real life or vice versa?</td>
</tr>
<tr>
<td>6 Since starting video chat, has the regulatory of physical visits changed? I.e. have the relatives visited more or less than they did before beginning to video chat?</td>
</tr>
<tr>
<td>7 Does your child use the computer for anything other than video chat?</td>
</tr>
<tr>
<td>8 Does your child have telephone conversations with their video chat partners or anyone else? If so, how would you describe their telephone conversations and video chat sessions?</td>
</tr>
<tr>
<td>9 Does your child watch television? If so, how much?</td>
</tr>
<tr>
<td>10 Do you ever record the video chat sessions?</td>
</tr>
<tr>
<td>11 Has the video chat experience changed as your child has got older? If so, in what ways?</td>
</tr>
<tr>
<td>12 Is your child closer to the relatives with whom they video chat?</td>
</tr>
<tr>
<td>13 Are there any other benefits to your child video chatting with relatives that you have not yet mentioned?</td>
</tr>
<tr>
<td>14 Do you have anything negative to say about your child video chatting with relatives?</td>
</tr>
</tbody>
</table>

Procedure

Most respondents were recruited via an advertisement on the social networking website Facebook. The advertisement was specifically targeted at profiles with registered ‘Likes’ and ‘Interests’ that related to young children and families. Previous participants of the Lab who had requested notification about future studies were also emailed an invitation to complete the questionnaire. The quantitative questionnaire was also completed by participants in other behavioral experiments undertaken by the research lab at the time. These subjects who were also recruited by Facebook advertisements.

The brief quantitative questionnaire collected data on the frequency and time-course of family’s video communication usage, and was specifically designed to address the first research question, what age children were first introduced to video chat and whether that was changing.
The 14-item quantitative questionnaire asked parents to report their family’s demographic details, the household’s computers and the family members’ patterns of video communication including how often they engaged via video communication, the age they started, who they had video communication with and any activities that they participated in during video communication sessions.

All respondents of the quantitative questionnaire were invited by email to participate in the follow-up qualitative investigation. Thirteen (15%) accepted the invitation to participate.

An interview time was scheduled via email communication, and at the beginning of the interview phone call, the researcher obtained verbal informed consent after reminding the respondents of the details of the study that were provided when they were invited to participate. They were also reminded of the estimated duration of the interview.

Interviews were undertaken over the phone by a post-graduate researcher, and participants were asked each of the 14 interview questions. During the interview the researchers dictated the key responses and any other comments made by the respondent that were thought to be relevant. Each interview took between 5 and 35 minutes to complete. Interviews with parents who had more than one child, or whose children had more collective experience of video communication, were naturally longer. The interview questions are presented in Table 1. The colloquial phrase “video-chat” was used in the interviews in place of video communication.

The transcripts were then non-hierarchically indexed by a single researcher, using priori ideas based on the literature (e.g., familial relationships, theory of mind, the impact of interactivity, previous experience and a child’s age on their experience of screen media; transferring memories across modalities, etc.) and research questions that the study aimed to address. Because participant responses were generally very straightforward reliability scoring was not applied to the qualitative data.

Results

Quantitative data was examined for each child, rather than by families. Frequency of video communication and the age of their first video communication experience are presented.

Deductive analyses were performed on the qualitative data, and the results are presented in themes. The themes, which conceptually link expressions obtained from the interviews, allowed us to answer the key questions of interest (Ryan & Bernard, 2003).

Quantitative data

When parents involve children in video communication

Frequency of video communication

Almost half (45.6%) of the children were reported to participate in video communication approximately monthly or more regularly, including 148 (48%) of the children who were under 6
years of age. The frequency of video communication of the children under 6 years of age is presented in Table 2.

**Table 2.**
The frequency of video communication by children aged <6 years that participated in video communication

<table>
<thead>
<tr>
<th>Regularity</th>
<th>Children under 6 year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occasionally</td>
<td>32.4%</td>
</tr>
<tr>
<td>Approx. monthly</td>
<td>18.2%</td>
</tr>
<tr>
<td>Several time a month</td>
<td>13.5%</td>
</tr>
<tr>
<td>Approx. weekly</td>
<td>17.6%</td>
</tr>
<tr>
<td>Several times a week</td>
<td>13.5%</td>
</tr>
<tr>
<td>Daily or almost daily</td>
<td>4.7%</td>
</tr>
</tbody>
</table>

**Age of First Video communication Experience**

We hypothesized that it is a relatively recent trend for very young children to be introduced to video communication. An analysis using Pearson’s correlation coefficient revealed a significant strong positive correlation between children’s current age and the age that they started to use video communication (r=.886, p<.001), indicating that younger children had started using video communication at an earlier stage of life than older children had. To evaluate this hypothesis further a logistic regression was conducted to assess how a child’s current age (i.e., age at the time of questionnaire completion) predicted whether the child had first been introduced to video communication before the age of two. This analysis revealed that child age was in fact a significant predictor; (χ²(1)=13.00, p=.0003, OR=1.35 95%CI 1.14-1.60) For each year earlier the children were born, they were likely to have started having video communication when they were approximately 1.35 older. We also undertook an analysis of the children 2 years and older so that we would not have to account for children under 2 years who had not yet started but could potentially do so before the child’s second birthday; (χ²(1)= 20.97, p<.0001, OR=1.96 95%CI 1.41-2.71). This analysis revealed that for each earlier the children were born, they were likely to have started approximately two years older. Further analyses examining the differences between each 12-month age group was then examined, which revealed that the groups significantly differed (p=.002). As there is clustering by families, analysis was also undertaken, including only the youngest child per family which showed the same pattern.

![Insert Figure 1 approximately here](http://mc.manuscriptcentral.com/rchm)

**Figure 1**
The percentage of children who were introduced to video communication before the age of two.
As evident from Figure 1 the greatest difference existed between the 3-year-old and 4-year-old children. It was also evident that there was a similar pattern across the 4-and 5-year-old children, and a distinct pattern that was similar across the four younger age groups. Notably, a high percentage (45%) of infants (aged less than one year) had already been introduced to video communication. Although this rate is somewhat less than what was reported for 1- and 2-year-olds, it is important to remember that these children had only been alive for a short period of time and many undoubtedly will be introduced to video communication over the next year.

Qualitative data

Parents’ motivation for involving young children in video

There were two main reasons that parents decided to involve their young children in video communication sessions; to connect with extended relatives who lived far away, and to maintain contact during times of parental absence. Most children using video communication had been integrated into the family’s already existing pattern of remote communication. In many cases video communication was the sole or main means of connecting children to extended family who lived overseas or out of state. In such cases, the parents credited video communication with enabling familial relationships that may have not otherwise existed. In a number of families, video communication was used to supplement regular physical visits with relatives who resided in close proximity.

Video communication was reported to be utilized following divorce and even included in court orders as a means of keeping children connected to both parents. There were both pros and cons reported about video communication use by young children living between two homes following parental separation. It was said to be beneficial in facilitating communication with both parents and half/step siblings, but was acknowledged to be challenging at times due to the separated parents’ degree of amicability. A divorce/separation specific video communication scenario was reported in this study; parental awkwardness on observing his/her estranged partner’s interaction with their young child and the perception that the child was enjoying the other parent’s company more so than their own. Similarly, interactions between half siblings were reported to be viewed unfavorably by the non-mutual parent and perceived by the mutual parent to reflect insecurities related to the child’s fondness of their ‘other home.’

Developing relationships via video communication

Respondents credited video communication for the existence of many familial relationships. In some expatriate families, a virtual presence was sometimes the only presence that extended relatives had and some respondents stated that having a virtual relationship also likely contributed to relatives’ desire to visit. Respondents reported that virtual relationships appeared to be a key component in the decision by some relatives to visit and even permanently return to Australia, where the remainder of the family resided.
One relationship, two modalities. Maintaining relationships with video communication

In addition to developing relationships, reports suggested that video communication was also used to maintain relationships with relatives between physical visits and to communicate with parents when they are away from their child. Some parents reported that their children who used video communication for both purposes, initially responded differently to the virtual presence of their parent compared to other family members. One respondent reported that her 2-year-old toddler had reacted quite differently to her father’s video communication presence during a business trip than she did with her grandparents, with whom video chat was her main form of communication. She had associated her grandparents’ voices with video communication and would move towards the computer monitor to see their faces when she heard their voices. However, when she heard her father’s voice projected from the computer speakers, the 2-year-old began to search the room, as her expectation was that he would be physically present rather than virtually present. Respondents who had relatives visit occasionally, reported that video communication in between the physical visits reduced or even eliminated the need to re-establish rapport at each physical meeting. Additionally, parents reported observing continuity in the relationship with children transferring both familiarity and memories between the modalities. Parents reported that face recognition generalized across modalities.

In addition to recognition of faces across modalities, respondents described continuity of conversation topics between relatives and children as young as 2 years of age. Furthermore, some children were reported to reflect on the video communication when they had face-to-face visits and vice versa, for example, “When we video-chatted on Wednesday, you were so funny.”

Telephone v video communication

As expected, respondents unanimously reported a belief that video communication was more suitable for children than telephone communication. Most children with even partially developed language skills were reported to have at least attempted to hold a telephone conversation, although with varying degrees of success. Unclear articulation, the use of non-verbal communication and a lack of understanding that relatives couldn't see what they child could see, dogged attempts to get young children to communicate over the phone. Relatives had expressed to parents that it was much easier for them to understand the child during video communication as the child’s body language and non-verbal responses made their intent easier to interpret.

Some respondents reported that their toddler appeared to be able to maintain a telephone conversation, although it is worth noting that according to the parents, some of the same children also appeared to be having a real conversation when playing with a toy telephone. As one parent admitted, it was unclear whether during a real telephone call, her child was trying to communicate with the person on the line, or was mimicking her parent holding a phone conversation. Correctly positioning a telephone to ensure that both the microphone and speaker could be used effectively and concurrently was reported to be beyond many of the young children. Other parents suggested that their children would hold the phone and listen but would not talk, which was awkward for the person on the line.
Video communication was reported to be more engaging and enjoyable for young children than telephone communication and always lasted much longer. Some parents reported that it was difficult for their child to maintain attention over the telephone, but they were more engaged and attentive in video communication. Some respondents reported that their children’s video communication sessions would continue for as long as the relative was happy to participate.

There were reports that the visual modality not only enables effective communication but also enhances the excitement of the video communication. Children were reported to be more animated and enthusiastic during video communication. The idea that children could act in their normal manner during video communication was also reported favorably, as it was quite natural and similar to how they would behave during a physical visit. The visual aspect was suspected to also contribute to children’s assurance during parental absence. Children were perceived to better comprehend that their parent was safe when they could see them compared to when they could just hear them. Furthermore, parents also enjoyed watching their children when they were away from home. Relatives were also reported to be quite content with less conversation and more observation of children at play during the video communication session.

A virtual play-date. Video communication is not just for chatting.

It was clear from respondents’ reports that children engage in an array of activities during video communication, further differentiating video and telephone use. The multi-modal facets were reported to be utilized by children to participate in a variety of activities with relatives with whom they would not have otherwise be able to play.

Whilst respondents mainly discussed video communication between a child and an adult, there were some reports of young children having video communication with other children. Virtual play-dates were reported to occur between cousins, and also between non-related children. One respondent reported that she introduced her children to virtual play-dates to supplement mothers’ group play-dates. During such virtual play-dates, the children were reported to discuss their most recent physical visit and also chat about their own activities since.

Respondents reported that there was often a learning and educational component to activities that were incorporated into their child’s video communication sessions, such as demonstrating and practicing learned behaviors, learning new skills and reading books together. Research has already identified that grandparents and other relatives provide cognitive stimulation (e.g., Cochran & Brassard, 1979). Reports revealed that sometimes, people at both ends would bring an object to the computer to interact with concurrently. One respondent reported that her daughter and the daughter’s grandfather each took an instrument to the computer and jammed together during their video communication sessions. Dancing and singing songs were other popular virtual activities, in which both parties performed together, or at least simultaneously.

In addition to dyadic interaction with relatives, some children were reported to virtually attend family events where a group of relatives congregated at one house. According to respondents, video communication appeared to be providing an opportunity and fulfilling a need of young children to experience active membership of their extended family.
Computer use beyond video communication

Video communication was reported to be but one example of computer use for half of the children of the respondents with computers. It was reported that the computer was a source of entertainment to look at photos, watch DVDs and YouTube clips, as well as a way of participating in creative activities, online computer games and educational programs.

Interactive vs. non-interactive screen media

One quarter of respondents reported that their children did not to watch any television, while on average, the group watched approximately 4.7 hours per week, with the highest being 10 hours. Both the parents of television viewers and non-television viewers reported that video communication had been beneficial to their children.

The video communication experience across development

As children’s ability to communicate developed, changes were reported to be concurrently evident in their physical and video communication interactions. Infants’ video communication prior to their first birthday was reported to consist of smiling and other signs of excitement, but once developed, language skills were automatically integrated into video communication.

As children’s language and conversation skills improve, their video communication sessions were reported to increase in duration, and become more in-depth. As awareness and attention span increased, children appeared more interested in listening to their relatives. Some children even planned in advance and took items to the computer to discuss. Children were reported to become increasingly more independent with age and the need for parents to intervene reduced until no parental input was required.

Although it was hypothesised that parents would report that children’s experience of video communication would be distinctly different after their second birthday, there was no specific age after which children were reported to distinctly change the way they experience video communication.

What’s the downside?

There was only one downside reported about young children having video communication. This concern, raised by a small minority of respondents, was that children can develop unrealistic expectations of people’s availability as a result of having regular video communication from a very young age.

Discussion

Quantitative responses support the claim that young children are participating in video communication, whilst qualitative responses provide ecological insight into this behavior, suggesting that video communication can overcome some of the problems associated with
physical distance. This conclusion was reached through the investigation of three key questions addressing when and why children were introduced to video communication; the perceived consequences of such interaction; and what children understand about video communication and virtual presence.

The fundamental contribution of this investigation was the verification that video communication has become popular with increasingly younger children and the consistent perception from parents that young children can maintain a sense of continuity of a relationship through a combination of face-to-face interaction and video communication. To the best of our knowledge, this is the first qualitative questionnaire to determine the benefits of video communication to young children as perceived by their parents.

As far as starting age is concerned, parents of 4- and 5-year-old children appeared to wait until their children had developed some verbal language skills before introducing their children to video communication, whereas others were willing to have infants participate in video communication.

The qualitative responses from parents provided a depth of insight into young children’s experience of video communication. Respondents indicated that video communication was used to keep their child connected to their parents, and also to enable relationships with relatives that live far away. One value of video communication may be the ability to connect children with parents with whom they don't reside. In Australia and abroad ‘virtual visitation’ as it has been coined, has become a common communication/visitatio n component of court orders and/or a condition of the residential parent relocating with the children away from their non-residential parent (e.g. Garth V Hope, 2008; Rossi V Rossi, 2008), although some fear it “is a slippery slope of parental replacement” (p54, Wolman & Pomerance, 2012). Commencing in 2004, numerous US states have passed virtual visitation laws (e.g. Utah State Legislature, 2004) which has been paralleled by an increase in media interest worldwide (e.g. Fleischer, 2012; Meyers, 2011). In Australia almost half of divorces involve children, and more than half of young children (<5 years) from separated families see their non-custodial parent less than once a fortnight (Australian Bureau of Statistics, 2008). Whilst some Australian family law professionals believe that virtual visitation may help offset the difficulties of separation, precedent holds that is it not adequate to replace physical visits, where a residential parent has the desire to relocate without due justification (Cales V Cales, 2008). Some drawbacks specific to parental separation which have been discussed in the literature (Saini, Mishna, Barnes, & Polak, 2013) were mentioned by respondents. These included conflict between the parents concerning the frequency of the video communication resulting from different interpretations of the phrase ‘regular contact’ that was stated in the Court order. The data presented here help inform this debate but are clearly not sufficient on their own to guide policy.

Diminishing contact with a father following divorce can negatively affect all of a child’s paternal relationships (Ahrons, 2007), so in addition to maintaining contact with parents and step/half siblings, video communication could also be used to maintain grandparent-grandchild relationships which have been shown to be negatively affected by divorce of the middle generation (Doyle, O'Dywer, & Timonen, 2010). Video communication provides a less intrusive
option for grandparents to stay involved in their grandchild’s life, particularly for the grandparents on the non-custodial side.

There was agreement among respondents that maintaining intergenerational familial relationships is important, which is consistent with a body of research spanning multiple decades (for a review see Smith & Drew, 2002). Grandparent-grandchild research has illustrated many different grandparental influences, some of which occur directly, e.g. cognitive stimulation, and others indirectly, such as child rearing advice (Cochran & Brassard, 1979). Previously direct grandparental influences that were disseminated during face-to-face interaction (Denham & Smith, 1989) might now be possible through virtual communication. Additionally, aunts and uncles are a ‘resource’ for young children (Bengtson, 2001) and through video communication could similarly become active contributors to their lives, although the body of research into such relationships is currently limited.

Furthermore, whilst previous research has indicated that geographical distance influences the amount of support that relatives provide each other, with distance negatively correlating with support (e.g. Mulder & van der Meer, 2009), video communication may negate this trend. Video communication between young children and extended family could strengthen familial bonds and motivate people to be more involved in each other’s lives despite geographic separation, which could diminish the correlation between distance and support.

For video communication to provide a sense of continuity in a relationship between times of physical presence, the interaction during both scenarios must be encoded as one single relationship. For most children, interaction with the parent/s that they reside with is predominantly face-to-face, whereas video communication is utilized during a parent’s short-term absence. Conversely, video communication may be the primary mode of interaction between children and their relatives that reside a great distance away, with only the occasional physical visit occurring. It is not surprising then that children develop expectations of how they interact with different people, which was evident from a scenario reported by a respondent.

A 2-year-old toddler who regularly had video communication with her grandparents was reported to react quite differently to her father the first time he made contact via video communication. According to her mother, when the girl heard her grandparents’ voices, she would run to the computer to see them, yet when her father’s voice was projected from the computer speakers, the 2-year-old began to search the room, as her expectation was that he would be physically present rather than virtually present; the opposite expectation than she had developed about her grandparents. This, however, occurred during the first and only time the father made contact via video communication, and based on reports from other respondents, the little girl’s expectations would change with repeated exposure, in a similar way that prior exposure to technology and physical objects enhances the transferring of learning from screen media (e.g. Troseth, 2003).

Respondents reported that video communication in between the physical visits reduced or even eliminated the need to re-establish rapport at each physical meeting. Additionally, parents reported continuity of interaction from video communication to face-to-face interaction and vice versa, which suggests that children contribute memories from each as one relationship. Such
real-life reports mimic the findings of Tarasuik et al. (2011) that a video-link during a time of physical separation can negate the effects of the absence.

Respondents in the current study are likely correct in their perception that from an early age their child was able to recognise people during video communication sessions. Previous research shows that infants have a preference for still images of their mother over a stranger (e.g. Pascalis, de Schonen, Morton, D’eruelle, & Fabre-Grenet, 1995), and can preferentially differentiate their mother from a stranger both in person and when shown via videos (Walton, Bower, & Bower, 1992). Recognition, from both auditory and visual cues occurs from an early age. Research has shown that voice assists newborn infants in recognising a video of their mother; and from three months of age infants can recognise their mother on video without sound (Burnham, 1993). Furthermore, infants develop the ability to learn and pair faces with voices of unfamiliar adults from as early as 3 months of age (Brookes et al., 2001). Such research supports respondents’ reports that infants can develop familiarity with a person via video communication, which numerous respondents perceived as developing a relationship. Furthermore, given that interactivity enhances learning from screen media (e.g. Troseth et al., 2006) infants are likely to recognize video communication partners earlier than they would from an auditory or visual stimuli such as a telephone call and/or pre-recorded media such as photos or a video.

As a remote communication tool, video communication was unanimously reported to be better suited to young children than the telephone. As already mentioned, it is difficult for young children to comprehend and master the complexities of a telephone conversation. Video communication doesn't require a handset and moreover, a parent can scaffold during video communication and also assist the child to respond if they see it necessary.

Video communication was also reported to enable ‘remote play’ (e.g. Yarosh et al., 2010) i.e., playing during video communication. Adapting for the absence of shared physical space, realizing that there is a limited visual field and understanding that you cannot pass objects through the computer, are specifically pertinent to partaking in remote play. According to reports, children appeared to cope with such limitations. Remote play can include most aspects of traditional play. Although no physical space is shared, playing can include mutual involvement in an activity. If the activity requires physical objects, this can be facilitated by having a toy each, such as action figures, or as one respondent reported, musical instruments. Similarly dancing, and singing songs can be performed simultaneously without shared physical space, which was reported by respondents to be a popular virtual activity.

Another aspect of playing that was reported involved activities that contained learning and educational components such reading books together. In addition to practicing counting, the alphabet and other academic skills, ethical and moral lessons may transpire secondarily to interaction. Such reports illustrate that contributing to children’s learning is yet another role that extended relatives appear to be fulfilling via video communication.

Whilst Computer Human Interaction researchers have begun undertaking research with devices specifically designed to enhance remote play (e.g. Follmer, Raffle, Go, Ballagas, & Ishii, 2010; Vetere, Davis, Gibbs, & Howard, 2009; Yarosh et al., 2010) to this point, ‘remote play’ has not
been investigated with toddlers or pre-school-aged children using standard commercially available systems.

Remote play can also extend to group activities. Video communication was reported to have facilitated family celebrations involving relatives across the globe and has allowed children to take part in singing birthday greetings, and taking part in other family occasions from which they would otherwise have been excluded. Parents perceived that virtually attending events such as Christmas and birthday celebrations generated a sense of belonging in young children; that they are an integral part of a larger family unit despite the geographic distance, which follows such reports in the media (e.g. Scelfo, 2011). According to the sociology literature, the importance of multigenerational bonds in this century aligns with the function of the nuclear family, and there is greater need and also greater opportunity for interaction, support and mutual influence involving more than two generations (Bengtson, 2001). Video communication appears to be playing a role in this opportunity for interaction. Furthermore, utilizing video communication to take part in family events can substantiate the sense of family unity for other relatives, emphasizing that the child is an imperative component of their extended family. In turn, this may enhance their desire for greater involvement in the child’s life, and a child’s sense of belonging to a greater extended family may also transpire.

All of the children in the current study had been involved in video communication since they were 4 years of age or younger, and many since their birth. Half of the children were reported to also use computers for reasons other than video communication such as watching YouTube clips, or interactive activities and games. Screen media appears to be playing a role in these children’s lives from such an early stage, they may not recall life without it, and may consider such a life incomprehensible. The technological focus in the upbringing of many children may be occurring secondary to the increased importance and reliance of technology in the lives of the parents. Furthermore, as countless apps for touchscreen devices have been designed for children, including infants, even parents who are not technologically savvy themselves may feel obliged to integrate technology into their children’s lives to prevent them falling behind their peers.

Previous generations of children were taught from a young age that television was non-interactive, and there were no other types of screen media. Today, however, many young children are exposed to both interactive and non-interactive screen media, which creates a scenario where children must determine whether their screen media is interactive each and every time. Both the parents of television viewers and non-television viewers reported that video communication had been beneficial to their children; a consistency that suggests that exposure to non-interactive 2D images of people does not necessarily negate the perception of interactivity during video communication.

Research by Troseth and colleagues (2006) illustrate that previous experience with screen media can influence how children perceive subsequent screen media, and the occurrence of this was reported by one respondent. The first time her child viewed television, she struggled to comprehend why the television characters would not engage with her; she expected interactivity as all her previous screen media exposure had been video communication. This response was limited to her first exposure to television, which would suggest that from that point forward, she
realized the need to establish on an individual basis whether or not the screen media she was exposed to was interactive.

While research shows that young children don't learn well from video, this does not seem to prevent them from participating in video communication. One reason for this is that the video deficits are almost always shown with non-interactive media. Video chat is interactive and thus different, leading to a richer experience which, perhaps unsurprisingly, is very compelling for both adult and child participants. We have already shown that such interaction is powerful by demonstrating that video links can help reduce separation anxiety in young children (Tarasuik et al., 2011).

No respondent reported a distinct difference in their child’s experience of video communication after their second birthday. A previous lab-based experiment found that children under 2-years of age responded differently than older children to a single five-minute video-link to their parent (Tarasuik et al., 2011). However this was a single trial, and it is possible that with repetition the younger children would have responded like the older children.

Thus far the influence of new technologies on young children has received minimal attention from developmental researchers, and consequently there are only anecdotal reports from which to ascertain the effects of new technologies on children during the first years of their lives. Whilst the scenarios through which video communication may benefit young children remains to be empirically verified, the above-mentioned reports are promising.

This study contributes to our understanding of the ecological role of video communication in young children’s lives. Considered alongside empirical investigations (e.g. Tarasuik et al., 2011), these findings can guide the direction in which we examine the true value of video communication to young children. Further work should begin to follow populations impacted by parental separation to examine the potential role of video communication in real time to lessen the disadvantages of geographical distance. Such research could utilize video communication recording facilities and other real-time measures, so not to rely upon retrospective report and the perception of others.

Acknowledgments
The authors would like to thank the parents who took the time to participate in either/both questionnaires.

Author contributions
Conceived and designed the experiment: JK, JT. Performed the experiment: JT. Analyzed the data: JT, JK. Wrote the paper: JT, JK.

Funding
This research was supported by a Google Faculty Research Award to JK.

References


Cales V Cales, Family Court of Australia (2008).


Doyle, M., O'Dywer, C., & Timonen, V. (2010). "How can you just cut off a whole side of the family and say move on?" The reshaping of paternal grandparent-grandchild relationships following divorce or separation in the middle generation. Family Relations, 59(5), 587-598.


Rossi V Rossi, Family Court of Australia (2008).


Utah Code, Husband and Wife, Chapter 3 Divorce, Section 33 Advisory guidelines (2004).


<table>
<thead>
<tr>
<th>Questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. What made you introduce your children to video communication, and who do your children video communication with?</td>
</tr>
<tr>
<td>2. What changes has it made to your children’s relationships with their video communication partners?</td>
</tr>
<tr>
<td>3. What is their favourite thing to do whilst participating in video communication?</td>
</tr>
<tr>
<td>4. Do they participate in activities whilst video-chatting? E.g. reading books, singing, dancing.</td>
</tr>
<tr>
<td>5. Do your children have video communication with any relatives that they also receive physical visits from? If so, do topics of conversations cross from video communication to real life or vice versa?</td>
</tr>
<tr>
<td>6. Since starting video communication, has the regulatory of physical visits changed? I.e. Have the relatives visited more or less than they did before beginning video communication.</td>
</tr>
<tr>
<td>7. Do your children use the computer for anything other than video communication?</td>
</tr>
<tr>
<td>8. Do your children have telephone conversations with their video communication partners or anyone else? If so, how would you describe their telephone conversations and video communication sessions?</td>
</tr>
<tr>
<td>9. Does your child watch television? If so, how much?</td>
</tr>
<tr>
<td>10. Do you ever record the video communication sessions?</td>
</tr>
<tr>
<td>11. Has the video communication experience changed as your child has got older? If so, in what ways?</td>
</tr>
<tr>
<td>12. Are your children closer to the relatives with whom they had video communication?</td>
</tr>
<tr>
<td>13. Are there any other benefits to your children having video communication with relatives that you have not yet mentioned?</td>
</tr>
<tr>
<td>14. Do you have anything negative to say about your children having video communication with relatives?</td>
</tr>
</tbody>
</table>
Table 2.
The regularity of children’s video communication

<table>
<thead>
<tr>
<th>Regularity of video communication</th>
<th>Percentage of children aged &lt; 6 years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occasionally</td>
<td>32.4%</td>
</tr>
<tr>
<td>Approx. monthly</td>
<td>18.2%</td>
</tr>
<tr>
<td>Several time a month</td>
<td>13.5%</td>
</tr>
<tr>
<td>Approx. weekly</td>
<td>17.6%</td>
</tr>
<tr>
<td>Several times a week</td>
<td>13.5%</td>
</tr>
<tr>
<td>Daily or almost daily</td>
<td>4.7%</td>
</tr>
</tbody>
</table>
The percentage of children that had been introduced to video communication before two years of age.

Figure 1
209x129mm (96 x 96 DPI)
Appendix A.

Video communication use by families with Young Children - A questionnaire for parents.

1. Are you a parent of a child aged 5 years or under?  Y/N
   If you have answered No to Q1, please turn to the final page.
   If you answered Yes to Q1, please continue to Q2.

2. Post code _ _ _ _

3. Gender - F/M (Please circle)

4. Please indicate your children’s parental situation.
   □ Single mother
   □ Single father
   □ Biological mother and father
   □ Biological mother and step father
   □ Biological father and step mother

5. How many children do you have? _____
   Please fill out the following details for each of your children
<table>
<thead>
<tr>
<th>Child</th>
<th>Age</th>
<th>Gender</th>
<th>Grade (If at school)</th>
<th>Days per week in childcare</th>
<th>Child resides with you-full-time, 50%, &gt;50% or &lt;50%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Does your household own a computer?  Y / N
   If you answer No to Q6, this is the final question. Thanks!
   If you answer Yes to Q6, please continue to Q7.

7. Using the following scale, how would you rate your computer expertise?
   0= Know very little about computers
   1= Almost competent
   2= Competent
   3= Highly competent
   4= Almost an expert
   0  1  2  3  4

8. Using the above scale, how would you rate your partner’s computer expertise?
   0  1  2  3  4  or  N/A
9. For each computer that you have, please indicate the
   • Type- PC or laptop
   • Operating system- Windows, MAC, Linux, Other (please specify)
   • Location- lounge, bedroom, study, kitchen, various etc.
   • If it is connected to the internet, the type of connection -dial-up, wired or wireless broadband

<table>
<thead>
<tr>
<th>Type</th>
<th>Operating system</th>
<th>Location</th>
<th>Internet connection ( N/A if no connection)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

10. Do any of your computers have a built-in or external camera capable of video-chat?  Y / N

If you answer No to Q10, please turn to the final page.
If you answer Yes to Q10, please continue to Q11.

11. For each member of your household, please answer the following questions

<table>
<thead>
<tr>
<th>Mother (or step-mother)</th>
<th>Father (or step-father)</th>
<th>Child 1</th>
<th>Child 2</th>
<th>Child 3</th>
<th>Child 4</th>
<th>Child 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>How often do they engage in video chat with another person?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0= Never</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1= Occasionally</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2= Approximately monthly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3= Several times a months</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4= Approximately weekly</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5= Several times a week</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6= Daily, or almost daily</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>At what age did they start engaging in video-chat?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do they engage with family members via video-chat?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Can they independently video-chat?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. Does anyone in your family use video-chat to talk to an otherwise unavailable person? E.g. Father when away on business, grandparent etc.
   Y/N

If so, please indicate which members do so, and who they communicate with.
________________________________________________________________________________________
________________________________________________________________________________________

13. Please list any activities that your children undertake whilst engaging in video-chat with relatives such as reading books, practicing times tables, singing etc.
    Please also indicate which child/children participate in such activities.
________________________________________________________________________________________
________________________________________________________________________________________

14. Which of the following software do you use for video-chat?

   □ Skype            □ iChat AV       □ Jabber       □ Windows Live       □ Yahoo!
   □ Windows Messenger             □ AIM Triton       □ ICU II
   □ Paltalk Messenger    □ SightSpeed    □ TryFast       □ Yahoo! Messenger w Voice
   Others. Please specify ____________________