



Author: Tarasuik, Joanne; Kaufman, Jordy
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When and why parents involve young children in video communication

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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

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3 45 has become a popular media topic, scientific analysis of this trend is currently lacking. The main
4 46 purpose of this work is to address this gap.
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7 48 New technologies are undeniably integrating more swiftly into society than ever. For example,
8 49 whilst the telephone took 20 years and the television took 13 years to reach an audience of 50
9 50 million people, more recently the internet did so in only four years (L. Rosen, 2007), and iPad
10 51 sales in the first quarter of 2014 alone reached 26 million ("Statista," 2014). This brings
11 52 technology more and more into the home and within the reach of people of all ages.
12 53

13 54 Although a number of researchers have interviewed parents about their children's use of
14 55 specially designed video communication devices (Yarosh, Inkpen, & Brush, 2010) and standard
15 56 video communication (Yarosh & Abow, 2011), little is known about video communication use
16 57 by pre-school-aged children in the home. One study has shown that in a controlled laboratory
17 58 environment, pre-school-aged children can be engaged by their parent and act as though the
18 59 parent is physically proximal during video communication with them (Tarasuik, Galligan, &
19 60 Kaufman, 2011). With these fundamental elements demonstrated, research should progress
20 61 towards determining the ecological value of video communication in relation to young children,
21 62 and establish whether video communication can "dilute to a significant degree some of the
22 63 tyranny of distance" (*Garth V Hope*, 2008), as stated by a federal magistrate concerning the
23 64 value of virtual visitation following parental divorce.
24 65

25 66 We aimed to answer three key questions about current video communication use by young
26 67 children. The first question was: "At what age are children currently introduced to video
27 68 communication?" In this regard we were also interested in how this has changed over the last
28 69 decade. Based on anecdotal reports from newspaper, magazine and online articles (e.g. Hone-
29 70 McMahan, 2011), it was hypothesised that children are currently participating in video
30 71 communication during their pre-school-aged years and the starting age has been steadily
31 72 decreasing. Although we do not claim to have obtained a cross-sectional sample, we are
32 73 operating under the presumption that we attained a representative sample of the families with
33 74 young children that participate in video communication.
34 75

35 76 The second question concerned expected and perceived benefits: "What motivates parents to
36 77 involve their young children in video communication; and what perceived benefits and
37 78 detriments do parents feel have stemmed from this experience?" There are many reasons that
38 79 parents and children are geographically separated; employment travel, divorce, and increasing
39 80 rates of expatriate assignments (Finaccord, 2014). Accordingly we hypothesized that video
40 81 communication was being used for children to maintain contact with their parents, and also to
41 82 develop or maintain intergenerational relationships with relatives that live a great distance away.
42 83 We hoped that parental reports would give insight into both the benefits and dynamics of such
43 84 interaction.
44 85

45 86 A third question related to children's video communication behavior. Young children treat
46 87 people on video differently than people who are physically present (e.g. Troseth, Saylor, &
47 88 Archer, 2006) and we are in the primacy of exploring the role that contingency plays in this.
48 89 Furthermore, they encode memories of 2D representations differently than 3D representations
49 90 (Hayne, 2004), and for such reasons, we explored whether children conceptualized their virtual
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3 91 and physical interaction with the same person as one relationship. Additionally, the impact of
4 92 television and video communication exposure on expectations of screen media interactivity was
5 93 examined since watching television fosters a conceptualization that people presented via screen
6 94 media are non-contingent, which draws distinction from video communication. A laboratory-
7 95 based study revealed a distinct difference in the experience of a video-link to a parent by children
8 96 two-years of age, and those younger (Tarasuik et al., 2011). It was accordingly hypothesized
9 97 that parents would report a change in their child's video communication experience at a similar
10 98 age.
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14 100 Parents were asked to report if their children had taken part in telephone calls and if so, how it
15 101 compared to video communication. As research has indicated that there are barriers to children
16 102 holding telephone conversations (Ballagas, Kaye, Ames, Go, & Raffle, 2009), and video
17 103 communication has the potential to overcome such barriers, it was expected that parents would
18 104 report that video communication was the superior option for their child.
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20
21 106 The research strategy employed to address these issues utilized mixed methodology; parents of
22 107 young children completed a brief quantitative questionnaire, and some participated in a follow-
23 108 up qualitative investigation. Parent reports are a resource-efficient method of obtaining data on
24 109 ecological behavioural patterns, allowing examination of parental perceptions and child
25 110 behavior.
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61 146 Pre-school-aged children were the cohort of interest, so parents of young children were the
62 147 respondents of the quantitative questionnaire, and a small proportion of these parents also
63 148 participated in the qualitative component.
64 149

65 150 The quantitative data concern children under 6 years of age ($n=308$) and their siblings ($n=52$)
66 151 and were collected from 180 questionnaires completed by parents. Each respondent had at least
67 152 one child under the age of 6 years, and were all aged in their 30s or 40s ($M=36.2$ years, $SD=3.5$
68 153 years). All resided in Australia, and most were female (86%) and part of a nuclear family (90%).
69 154 Only 29% of participants were a parent of only one child, and more than half (56%) were the
70 155 parent of more than one child under 6 years of age.
71 156

72 157 The qualitative data concerns 17 children that were under 1 year of age ($n=3$); 1 year of age
73 158 ($n=3$); 2 years of age ($n=4$); 3 years of age ($n=2$); 4 years of age ($n=3$); and 5 years of age ($n=2$).
74 159 Participants of the qualitative components were a sub-sample (15%, $n=13$) of the respondents of
75 160 the quantitative questionnaire. They were parents of, on average, two children ($M=1.77$,
76 161 $SD=0.93$) that had been participating in video communication with one or more relatives, all but
77 162 one respondent was female, only one parent was not in a nuclear family, and they ranged in age
78 163 from 30-43 years ($M=36.2$ years, $SD=3.5$). Thus this subgroup strongly reflected the group as a
79 164 whole as far as gender, age and nuclear family were concerned.
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6 139 Within the quantitative questionnaire, parents reported their family's demographic details, how
7 140 often their children engaged via video communication, and the age they started. The qualitative
8 141 component involved a semi-structured interview of 14 questions which are listed in Table 1.
9 142

10 143 **Table 1.**
11 144 Semi-structured interview questions.

Questions
1 What made you introduce your child to video chat, and who does your child video chat with?
2 What changes has it made to your child's relationships with their video chat partners?
3 What is your child's favorite thing to do whilst video chatting?
4 Do they participate in activities whilst video-chatting? E.g. reading books, singing, dancing.
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?
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?
7 Does your child use the computer for anything other than video chat?
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?
9 Does your child watch television? If so, how much?
10 Do you ever record the video chat sessions?
11 Has the video chat experience changed as your child has got older? If so, in what ways?
12 Is your child closer to the relatives with whom they video chat?
13 Are there any other benefits to your child video chatting with relatives that you have not yet mentioned?
14 Do you have anything negative to say about your child video chatting with relatives?

145
146 Procedure

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148 Most respondents were recruited via an advertisement on the social networking website
149 Facebook. The advertisement was specifically targeted at profiles with registered 'Likes' and
150 'Interests' that related to young children and families. Previous participants of the Lab who had
151 requested notification about future studies were also emailed an invitation to complete the
152 questionnaire. The quantitative questionnaire was also completed by participants in other
153 behavioral experiments undertaken by the research lab at the time. These subjects who were also
154 recruited by Facebook advertisements.
155

156 ~~The brief quantitative questionnaire collected data on the frequency and time-course of family's~~
157 ~~video communication usage, and was specifically designed to address the first research question,~~
158 ~~what age children were first introduced to video chat and whether that was changing.~~

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3 159 The 14-item quantitative questionnaire asked parents to report their family's demographic
4 160 details, the household's computers and the family members' patterns of video communication
5 161 including how often they engaged via video communication, the age they started, who they had
6 162 video communication with and any activities that they participated in during video
7 163 communication sessions.
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10 165 All respondents of the quantitative questionnaire were invited by email to participate in the
11 166 follow-up qualitative investigation. Thirteen (15%) accepted the invitation to participate.
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14 168 An interview time was scheduled via email communication, and at the beginning of the interview
15 169 phone call, the researcher obtained verbal informed consent after reminding the respondents of
16 170 the details of the study that were provided when they were invited to participate. They were also
17 171 reminded of the estimated duration of the interview.
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19 172

20 173 Interviews were undertaken over the phone by a post-graduate researcher, and participants were
21 174 asked each of the 14 interview questions. During the interview the researchers dictated the key
22 175 responses and any other comments made by the respondent that were thought to be relevant.
23 176 Each interview took between 5 and 35 minutes to complete. Interviews with parents who had
24 177 more than one child, or whose children had more collective experience of video communication,
25 178 were naturally longer. The interview questions are presented in Table 1. The colloquial phrase
26 179 "video-chat" was used in the interviews in place of video communication.
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28 180

29 181 The transcripts were then non-hierarchically indexed by a single researcher, using priori ideas
30 182 based on the literature (e.g., familial relationships, theory of mind, the impact of interactivity,
31 183 previous experience and a child's age on their experience of screen media; transferring memories
32 184 across modalities, etc.) and research questions that the study aimed to address. Because
33 185 participant responses were generally very straightforward reliability scoring was not applied to
34 186 the qualitative data.
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37 38 188 Results

39 189
40 190 Quantitative data was examined for each child, rather than by families. Frequency of video
41 191 communication and the age of their first video communication experience are presented.
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43 192

44 193 Deductive analyses were performed on the qualitative data, and the results are presented in
45 194 themes. The themes, which conceptually link expressions obtained from the interviews, allowed
46 195 us to answer the key questions of interest (Ryan & Bernard, 2003).
47
48 196

49 197 Quantitative data

50 198 51 199 When parents involve children in video communication

52 200 Frequency of video communication

53 201
54 202 Almost half (45.6%) of the children were reported to participate in video communication
55 203 approximately monthly or more regularly, including 148 (48%) of the children who were under 6
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204 years of age. The frequency of video communication of the children under 6 years of age is
 205 presented in Table 2.

207 **Table 2.**

208 The frequency of video communication by children aged <6 years that participated in video
 209 communication

Regularity	Children under 6 year
Occasionally	32.4%
Approx. monthly	18.2%
Several time a month	13.5%
Approx. weekly	17.6%
Several times a week	13.5%
Daily or almost daily	4.7%

211 *Age of First Video communication Experience*

212 We hypothesized that it is a relatively recent trend for very young children to be introduced to
 213 video communication. An analysis using Pearson's correlation coefficient revealed a significant
 214 strong positive correlation between children's current age and the age that they started to use
 215 video communication ($r=.886$, $p<.001$), indicating that younger children had started using video
 216 communication at an earlier stage of life than older children had. To evaluate this hypothesis
 217 further a logistic regression was conducted to assess how a child's current age (i.e., age at the
 218 time of questionnaire completion) predicted whether the child had first been introduced to video
 219 communication before the age of two. This analysis revealed that child age was in fact a
 220 significant predictor; ($\chi^2(1)=13.00$, $p=.0003$, $OR=1.35$ 95%CI 1.14-1.60) For each year earlier
 221 the children were born, they were likely to have started having video communication when they
 222 were approximately 1.35 older. We also undertook an analysis of the children 2 years and older
 223 so that we would not have to account for children under 2 years who had not yet started but
 224 could potentially do so before the child's second birthday; ($\chi^2(1)= 20.97$, $p<.0001$,
 225 $OR=1.96$ 95%CI 1.41-2.71). This analysis revealed that for each earlier the children were born,
 226 they were likely to have started approximately two years older. Further analyses examining the
 227 differences between each 12-month age group was then examined, which revealed that the
 228 groups significantly differed ($p=.002$). As there is clustering by families, analysis was also
 229 undertaken, including only the youngest child per family which showed the same pattern.

 Insert Figure 1 approximately here

236 **Figure 1**

237 The percentage of children who were introduced to video communication before the age of two.
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3 239 As evident from Figure 1 the greatest difference existed between the 3-year-old and 4-year-old
4 240 children. It was also evident that there was a similar pattern across the 4-and 5-year-old children,
5 241 and a distinct pattern that was similar across the four younger age groups. Notably, a high
6 242 percentage (45%) of infants (aged less than one year) had already been introduced to video
7 243 communication. Although this rate is somewhat less than what was reported for 1- and 2-year-
8 244 olds, it is important to remember that these children had only been alive for a short period of
9 245 time and many undoubtedly will be introduced to video communication over the next year.
10 246
11 247

12 248 Qualitative data

13 249 14 250 Parents' motivation for involving young children in video

15 251
16 252 There were two main reasons that parents decided to involve their young children in video
17 253 communication sessions; to connect with extended relatives who lived far away, and to maintain
18 254 contact during times of parental absence. Most children using video communication had been
19 255 integrated into the family's already existing pattern of remote communication. In many cases
20 256 video communication was the sole or main means of connecting children to extended family who
21 257 lived overseas or out of state. In such cases, the parents credited video communication with
22 258 enabling familial relationships that may have not otherwise existed. In a number of families,
23 259 video communication was used to supplement regular physical visits with relatives who resided
24 260 in close proximity.
25 261

26 262 Video communication was reported to be utilized following divorce and even included in court
27 263 orders as a means of keeping children connected to both parents. There were both pros and cons
28 264 reported about video communication use by young children living between two homes following
29 265 parental separation. It was said to be beneficial in facilitating communication with both parents
30 266 and half/step siblings, but was acknowledged to be challenging at times due to the separated
31 267 parents' degree of amicability. A divorce/separation specific video communication scenario was
32 268 reported in this study; parental awkwardness on observing his/her estranged partner's interaction
33 269 with their young child and the perception that the child was enjoying the other parent's company
34 270 more so than their own. Similarly, interactions between half siblings were reported to be viewed
35 271 unfavorably by the non-mutual parent and perceived by the mutual parent to reflect insecurities
36 272 related to the child's fondness of their 'other home.'
37 273

38 274 Developing relationships via video communication

39 275
40 276 Respondents credited video communication for the existence of many familial relationships. In
41 277 some expatriate families, a virtual presence was sometimes the only presence that extended
42 278 relatives had and some respondents stated that having a virtual relationship also likely
43 279 contributed to relatives' desire to visit. Respondents reported that virtual relationships appeared
44 280 to be a key component in the decision by some relatives to visit and even permanently return to
45 281 Australia, where the remainder of the family resided.
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3 2824 283 One relationship, two modalities. Maintaining relationships with video communication

5 284

6 285 In addition to *developing* relationships, reports suggested that video communication was also
7 286 used to *maintain* relationships with relatives between physical visits and to communicate with
8 287 parents when they are away from their child. Some parents reported that their children who used
9 288 video communication for both purposes, initially responded differently to the virtual presence of
10 289 their parent compared to other family members. One respondent reported that her 2-year-old
11 290 toddler had reacted quite differently to her father's video communication presence during a
12 291 business trip than she did with her grandparents, with whom video chat was her main form of
13 292 communication. She had associated her grandparents' voices with video communication and
14 293 would move towards the computer monitor to see their faces when she heard their voices.,
15 294 However, when she heard her father's voice projected from the computer speakers, the 2-year-
16 295 old began to search the room, as her expectation was that he would be physically present rather
17 296 than virtually present. Respondents who had relatives visit occasionally, reported that video
18 297 communication in between the physical visits reduced or even eliminated the need to re-establish
19 298 rapport at each physical meeting. Additionally, parents reported observing continuity in the
20 299 relationship with children transferring both familiarity and memories between the modalities.
21 300 Parents reported that face recognition generalized across modalities.

22 301

23 302 In addition to recognition of faces across modalities, respondents described continuity of
24 303 conversation topics between relatives and children as young as 2 years of age. Furthermore,
25 304 some children were reported to reflect on the video communication when they had face-to-face
26 305 visits and vice versa, for example, "When we video-chatted on Wednesday, you were so funny."

27 306

28 307 Telephone v video communication

29 308

30 309 As expected, respondents unanimously reported a belief that video communication was more
31 310 suitable for children than telephone communication. Most children with even partially
32 311 developed language skills were reported to have at least attempted to hold a telephone
33 312 conversation, although with varying degrees of success. Unclear articulation, the use of non-
34 313 verbal communication and a lack of understanding that relatives couldn't see what they child
35 314 could see, dogged attempts to get young children to communicate over the phone. Relatives had
36 315 expressed to parents that it was much easier for them to understand the child during video
37 316 communication as the child's body language and non-verbal responses made their intent easier to
38 317 interpret.

39 318

40 319 Some respondents reported that their toddler appeared to be able to maintain a telephone
41 320 conversation, although it is worth noting that according to the parents, some of the same children
42 321 also appeared to be having a real conversation when playing with a toy telephone. As one parent
43 322 admitted, it was unclear whether during a real telephone call, her child was trying to
44 323 communicate with the person on the line, or was mimicking her parent holding a phone
45 324 conversation. Correctly positioning a telephone to ensure that both the microphone and speaker
46 325 could be used effectively and concurrently was reported to be beyond many of the young
47 326 children. Other parents suggested that their children would hold the phone and listen but would
48 327 not talk, which was awkward for the person on the line.

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4 329 Video communication was reported to be more engaging and enjoyable for young children than
5 330 telephone communication and always lasted much longer. Some parents reported that it was
6 331 difficult for their child to maintain attention over the telephone, but they were more engaged and
7 332 attentive in video communication. Some respondents reported that their children's video
8 333 communication sessions would continue for as long as the relative was happy to participate.

9 334
10 335 There were reports that the visual modality not only enables effective communication but also
11 336 enhances the excitement of the video communication. Children were reported to be more
12 337 animated and enthusiastic during video communication. The idea that children could act in their
13 338 normal manner during video communication was also reported favorably, as it was quite natural
14 339 and similar to how they would behave during a physical visit. The visual aspect was suspected
15 340 to also contribute to children's assurance during parental absence. Children were perceived to
16 341 better comprehend that their parent was safe when they could see them compared to when they
17 342 could just hear them. Furthermore, parents also enjoyed watching their children when they were
18 343 away from home. Relatives were also reported to be quite content with less conversation and
19 344 more observation of children at play during the video communication session.

20 345
21 346 *A virtual play-date. Video communication is not just for chatting.*
22 347 It was clear from respondents' reports that children engage in an array of activities during video
23 348 communication, further differentiating video and telephone use. The multi-modal facets were
24 349 reported to be utilized by children to participate in a variety of activities with relatives with
25 350 whom they would not have otherwise be able to play.

26 351
27 352 Whilst respondents mainly discussed video communication between a child and an adult, there
28 353 were some reports of young children having video communication with other children. Virtual
29 354 play-dates were reported to occur between cousins, and also between non-related children. One
30 355 respondent reported that she introduced her children to virtual play-dates to supplement mothers'
31 356 group play-dates. During such virtual play-dates, the children were reported to discuss their
32 357 most recent physical visit and also chat about their own activities since.

33 358
34 359 Respondents reported that there was often a learning and educational component to activities that
35 360 were incorporated into their child's video communication sessions, such as demonstrating and
36 361 practicing learned behaviors, learning new skills and reading books together. Research has
37 362 already identified that grandparents and other relatives provide cognitive stimulation (e.g.,
38 363 Cochran & Brassard, 1979). Reports revealed that sometimes, people at both ends would bring
39 364 an object to the computer to interact with concurrently. One respondent reported that her
40 365 daughter and the daughter's grandfather each took an instrument to the computer and jammed
41 366 together during their video communication sessions. Dancing and singing songs were other
42 367 popular virtual activities, in which both parties performed together, or at least simultaneously.

43 368
44 369 In addition to dyadic interaction with relatives, some children were reported to virtually attend
45 370 family events where a group of relatives congregated at one house. According to respondents,
46 371 video communication appeared to be providing an opportunity and fulfilling a need of young
47 372 children to experience active membership of their extended family.

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3 374 Computer use beyond video communication

4 375
5 376 Video communication was reported to be but one example of computer use for half of the
6 377 children of the respondents with computers. It was reported that the computer was a source of
7 378 entertainment to look at photos, watch DVDs and YouTube clips, as well as a way of
8 379 participating in creative activities, online computer games and educational programs.
9 380

10 381 Interactive vs. non-interactive screen media

11 382
12 383 One quarter of respondents reported that their children did not to watch any television, while on
13 384 average, the group watched approximately 4.7 hours per week, with the highest being 10 hours.
14 385 Both the parents of television viewers and non-television viewers reported that video
15 386 communication had been beneficial to their children.
16 387

17 388 The video communication experience across development

18 389
19 390 As children's ability to communicate developed, changes were reported to be concurrently
20 391 evident in their physical and video communication interactions. Infants' video communication
21 392 prior to their first birthday was reported to consist of smiling and other signs of excitement, but
22 393 once developed, language skills were automatically integrated them into video communication.
23 394

24 395 As children's language and conversation skills improve, their video communication sessions
25 396 were reported to increase in duration, and become more in-depth. As awareness and attention
26 397 span increased, children appeared more interested in listening to their relatives. Some children
27 398 even planned in advance and took items to the computer to discuss. Children were reported to
28 399 become increasingly more independent with age and the need for parents to intervene reduced
29 400 until no parental input was required.
30 401

31 402 Although it was hypothesised that parents would report that children's experience of video
32 403 communication would be distinctly different after their second birthday, there was no specific
33 404 age after which children were reported to distinctly change the way they experience video
34 405 communication.
35 406

36 407 What's the downside?

37 408
38 409 There was only one downside reported about young children having video communication. This
39 410 concern, raised by a small minority of respondents, was that children can develop unrealistic
40 411 expectations of people's availability as a result of having regular video communication from a
41 412 very young age.
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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

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3 420 physical distance. This conclusion was reached through the investigation of three key questions
4 421 addressing when and why children were introduced to video communication; the perceived
5 422 consequences of such interaction; and what children understand about video communication and
6 423 virtual presence.
7 424

8 425 The fundamental contribution of this investigation was the verification that video communication
9 426 has become popular with increasingly younger children and the consistent perception from
10 427 parents that young children can maintain a sense of continuity of a relationship through a
11 428 combination of face-to-face interaction and video communication. To the best of our
12 429 knowledge, this is the first qualitative questionnaire to determine the benefits of video
13 430 communication to young children as perceived by their parents.
14 431

15 432 As far as starting age is concerned, parents of 4- and 5-year-old children appeared to wait until
16 433 their children had developed some verbal language skills before introducing their children to
17 434 video communication, whereas others were willing to have infants participate in video
18 435 communication.
19 436

20 437 The qualitative responses from parents provided a depth of insight into young children's
21 438 experience of video communication. Respondents indicated that video communication was used
22 439 to keep their child connected to their parents, and also to enable relationships with relatives that
23 440 live far away. One value of video communication may be the ability to connect children with
24 441 parents with whom they don't reside. In Australia and abroad 'virtual visitation' as it has been
25 442 coined, has become a common communication/visitation component of court orders and/or a
26 443 condition of the residential parent relocating with the children away from their non-residential
27 444 parent (e.g. *Garth V Hope*, 2008; *Rossi V Rossi*, 2008), although some fear it "is a slippery
28 445 slope of parental replacement" (p54, Wolman & Pomerance, 2012). Commencing in 2004,
29 446 numerous US states have passed virtual visitation laws (e.g. Utah State Legislature, 2004) which
30 447 has been paralleled by an increase in media interest worldwide (e.g. Fleischer, 2012; Meyers,
31 448 2011). In Australia almost half of divorces involve children, and more than half of young
32 449 children (<5 years) from separated families see their non-custodial parent less than once a
33 450 fortnight (Australian Bureau of Statistics, 2008). Whilst some Australian family law
34 451 professionals believe that virtual visitation may help offset the difficulties of separation,
35 452 precedent holds that is it not adequate to replace physical visits, where a residential parent has
36 453 the desire to relocate without due justification (*Cales V Cales*, 2008). Some drawbacks specific
37 454 to parental separation which have been discussed in the literature (Saini, Mishna, Barnes, &
38 455 Polak, 2013) were mentioned by respondents. These included conflict between the parents
39 456 concerning the frequency of the video communication resulting from different interpretations of
40 457 the phrase 'regular contact' that was stated in the Court order. The data presented here help
41 458 inform this debate but are clearly not sufficient on their own to guide policy.
42 459

43 460 Diminishing contact with a father following divorce can negatively affect all of a child's paternal
44 461 relationships (Ahrons, 2007), so in addition to maintaining contact with parents and step/half
45 462 siblings, video communication could also be used to maintain grandparent-grandchild
46 463 relationships which have been shown to be negatively affected by divorce of the middle
47 464 generation (Doyle, O'Dywer, & Timonen, 2010). Video communication provides a less intrusive
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3 465 option for grandparents to stay involved in their grandchild's life, particularly for the
4 466 grandparents on the non-custodial side.
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6 468 There was agreement among respondents that maintaining intergenerational familial
7 469 relationships is important, which is consistent with a body of research spanning multiple decades
8 470 (for a review see Smith & Drew, 2002). Grandparent-grandchild research has illustrated many
9 471 different grandparental influences, some of which occur directly, e.g. cognitive stimulation, and
10 472 others indirectly, such as child rearing advice (Cochran & Brassard, 1979). Previously direct
11 473 grandparental influences that were disseminated during face-to-face interaction (Denham &
12 474 Smith, 1989) might now be possible through virtual communication. Additionally, aunts and
13 475 uncles are a 'resource' for young children (Bengtson, 2001) and through video communication
14 476 could similarly become active contributors to their lives, although the body of research into such
15 477 relationships is currently limited.
16 478

17 479 Furthermore, whilst previous research has indicated that geographical distance influences the
18 480 amount of support that relatives provide each other, with distance negatively correlating with
19 481 support (e.g. Mulder & van der Meer, 2009), video communication may negate this trend. Video
20 482 communication between young children and extended family could strengthen familial bonds
21 483 and motivate people to be more involved in each other's lives despite geographic separation,
22 484 which could diminish the correlation between distance and support.
23 485

24 486 For video communication to provide a sense of continuity in a relationship between times of
25 487 physical presence, the interaction during both scenarios must be encoded as one single
26 488 relationship. For most children, interaction with the parent/s that they reside with is
27 489 predominantly face-to-face, whereas video communication is utilized during a parent's short-
28 490 term absence. Conversely, video communication may be the primary mode of interaction
29 491 between children and their relatives that reside a great distance away, with only the occasional
30 492 physical visit occurring. It is not surprising then that children develop expectations of how they
31 493 interact with different people, which was evident from a scenario reported by a respondent.
32 494

33 495 A 2-year-old toddler who regularly had video communication with her grandparents was
34 496 reported to react quite differently to her father the first time he made contact via video
35 497 communication. According to her mother, when the girl heard her grandparents' voices, she
36 498 would run to the computer to see them, yet when her father's voice was projected from the
37 499 computer speakers, the 2-year-old began to search the room, as her expectation was that he
38 500 would be physically present rather than virtually present; the opposite expectation than she had
39 501 developed about her grandparents. This, however, occurred during the first and only time the
40 502 father made contact via video communication, and based on reports from other respondents, the
41 503 little girl's expectations would change with repeated exposure, in a similar way that prior
42 504 exposure to technology and physical objects enhances the transferring of learning from screen
43 505 media (e.g. Troseth, 2003).
44 506

45 507 Respondents reported that video communication in between the physical visits reduced or even
46 508 eliminated the need to re-establish rapport at each physical meeting. Additionally, parents
47 509 reported continuity of interaction from video communication to face-to-face interaction and vice
48 510 versa, which suggests that children contribute memories from each as one relationship. Such
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3 511 real-life reports mimic the findings of Tarasuik et al. (2011) that a video-link during a time of
4 512 physical separation can negate the effects of the absence.
5 513

6 514 Respondents in the current study are likely correct in their perception that from an early age their
7 515 child was able to recognise people during video communication sessions. Previous research
8 516 shows that infants have a preference for still images of their mother over a stranger (e.g. Pascalis,
9 517 de Schonen, Morton, Deruelle, & Fabre-Grenet, 1995), and can preferentially differentiate their
10 518 mother from a stranger both in person and when shown via videos (Walton, Bower, & Bower,
11 519 1992). Recognition, from both auditory and visual cues occurs from an early age. Research has
12 520 shown that voice assists newborn infants in recognising a video of their mother, and from three
13 521 months of age infants can recognise their mother on video without sound (Burnham, 1993).
14 522 Furthermore, infants develop the ability to learn and pair faces with voices of unfamiliar adults
15 523 from as early as 3 months of age (Brookes et al., 2001). Such research supports respondents'
16 524 reports that infants can develop familiarity with a person via video communication, which
17 525 numerous respondents perceived as developing a relationship. Furthermore, given that
18 526 interactivity enhances learning from screen media (e.g. Troseth et al., 2006) infants are likely to
19 527 recognize video communication partners earlier than they would from an auditory or visual
20 528 stimuli such as a telephone call and/or pre-recorded media such as photos or a video.
21 529

22 530 As a remote communication tool, video communication was unanimously reported to be better
23 531 suited to young children than the telephone. As already mentioned, it is difficult for young
24 532 children to comprehend and master the complexities of a telephone conversation. Video
25 533 communication doesn't require a handset and moreover, a parent can scaffold during video
26 534 communication and also assist the child to respond if they see it necessary.
27 535

28 536 Video communication was also reported to enable 'remote play' (e.g. Yarosh et al., 2010) i.e.,
29 537 playing during video communication. Adapting for the absence of shared physical space,
30 538 realizing that there is a limited visual field and understanding that you cannot pass objects
31 539 through the computer, are specifically pertinent to partaking in remote play. According to
32 540 reports, children appeared to cope with such limitations. Remote play can include most aspects
33 541 of traditional play. Although no physical space is shared, playing can include mutual
34 542 involvement in an activity. If the activity requires physical objects, this can be facilitated by
35 543 having a toy each, such as action figures, or as one respondent reported, musical instruments.
36 544 Similarly dancing, and singing songs can be performed simultaneously without shared physical
37 545 space, which was reported by respondents to be a popular virtual activity.
38 546

39 547 Another aspect of playing that was reported involved activities that contained learning and
40 548 educational components such reading books together. In addition to practicing counting, the
41 549 alphabet and other academic skills, ethical and moral lessons may transpire secondarily to
42 550 interaction. Such reports illustrate that contributing to children's learning is yet another role that
43 551 extended relatives appear to be fulfilling via video communication.
44 552

45 553 Whilst Computer Human Interaction researchers have begun undertaking research with devices
46 554 specifically designed to enhance remote play (e.g. Follmer, Raffle, Go, Ballagas, & Ishii, 2010;
47 555 Vetere, Davis, Gibbs, & Howard, 2009; Yarosh et al., 2010) to this point, 'remote play' has not
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3 556 been investigated with toddlers or pre-school-aged children using standard commercially
4 557 available systems.
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7 559 Remote play can also extend to group activities. Video communication was reported to have
8 560 facilitated family celebrations involving relatives across the globe and has allowed children to
9 561 take part in singing birthday greetings, and taking part in other family occasions from which they
10 562 would otherwise have been excluded. Parents perceived that virtually attending events such as
11 563 Christmas and birthday celebrations generated a sense of belonging in young children; that they
12 564 are an integral part of a larger family unit despite the geographic distance, which follows such
13 565 reports in the media (e.g. Scelfo, 2011). According to the sociology literature, the importance of
14 566 multigenerational bonds in this century aligns with the function of the nuclear family, and there
15 567 is greater need and also greater opportunity for interaction, support and mutual influence
16 568 involving more than two generations (Bengtson, 2001). Video communication appears to be
17 569 playing a role in this opportunity for interaction. Furthermore, utilizing video communication to
18 570 take part in family events can substantiate the sense of family unity for other relatives,
19 571 emphasizing that the child is an imperative component of their extended family. In turn, this
20 572 may enhance their desire for greater involvement in the child's life, and a child's sense of
21 573 belonging to a greater extended family may also transpire.
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25 575 All of the children in the current study had been involved in video communication since they
26 576 were 4 years of age or younger, and many since their birth. Half of the children were reported to
27 577 also use computers for reasons other than video communication such as watching YouTube clips,
28 578 or interactive activities and games. Screen media appears to be playing a role in these children's
29 579 lives from such an early stage, they may not recall life without it, and may consider such a life
30 580 incomprehensible. The technological focus in the upbringing of many children may be occurring
31 581 secondary to the increased importance and reliance of technology in the lives of the parents.
32 582 Furthermore, as countless apps for touchscreen devices have been designed for children,
33 583 including infants, even parents who are not technologically savvy themselves may feel obliged to
34 584 integrate technology into their children's lives to prevent them falling behind their peers.
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38 586 Previous generations of children were taught from a young age that television was non-
39 587 interactive, and there were no other types of screen media. Today, however, many young
40 588 children are exposed to both interactive and non-interactive screen media, which creates a
41 589 scenario where children must determine whether their screen media is interactive each and every
42 590 time. Both the parents of television viewers and non-television viewers reported that video
43 591 communication had been beneficial to their children; a consistency that suggests that exposure to
44 592 non-interactive 2D images of people does not necessarily negate the perception of interactivity
45 593 during video communication.
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49 595 Research by Troseth and colleagues (2006) illustrate that previous experience with screen media
50 596 can influence how children perceive subsequent screen media, and the occurrence of this was
51 597 reported by one respondent. The first time her child viewed television, she struggled to
52 598 comprehend why the television characters would not engage with her; she expected interactivity
53 599 as all her previous screen media exposure had been video communication. This response was
54 600 limited to her first exposure to television, which would suggest that from that point forward, she

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3 601 realized the need to establish on an individual basis whether or not the screen media she was
4 602 exposed to was interactive.
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6 604 While research shows that young children don't learn well from video, this does not seem to
7 605 prevent them from participating in video communication. One reason for this is that the video
8 606 deficits are almost always shown with non-interactive media. Video chat is interactive and thus
9 607 different, leading to a richer experience which, perhaps unsurprisingly, is very compelling for
10 608 both adult and child participants. We have already shown that such interaction is powerful by
11 609 demonstrating that video links can help reduce separation anxiety in young children (Tarasuik et
12 610 al., 2011).
13 611

14 612 No respondent reported a distinct difference in their child's experience of video communication
15 613 after their second birthday. A previous lab-based experiment found that children under 2-years
16 614 of age responded differently than older children to a single five-minute video-link to their parent
17 615 (Tarasuik et al., 2011). However this was a single trial, and it is possible that with repetition the
18 616 younger children would have responded like the older children.
19 617

20 618 Thus far the influence of new technologies on young children has received minimal attention
21 619 from developmental researchers, and consequently there are only anecdotal reports from which
22 620 to ascertain the effects of new technologies on children during the first years of their lives.
23 621 Whilst the scenarios through which video communication may benefit young children remains to
24 622 be empirically verified, the above-mentioned reports are promising.
25 623

26 624 This study contributes to our understanding of the ecological role of video communication in
27 625 young children's lives. Considered alongside empirical investigations (e.g. Tarasuik et al.,
28 626 2011), these findings can guide the direction in which we examine the true value of video
29 627 communication to young children. Further work should begin to follow populations impacted by
30 628 parental separation to examine the potential role of video communication in real time to lessen
31 629 the disadvantages of geographical distance. Such research could utilize video communication
32 630 recording facilities and other real-time measures, so not to rely upon retrospective report and the
33 631 perception of others.
34 632

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37 635 questionnaires.
38 636

39 637 **Author contributions**

40 638 Conceived and designed the experiment: JK, JT. Performed the experiment: JT. Analyzed the
41 639 data: JT, JK. Wrote the paper: JT, JK.
42 640

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47 645 **References**

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For Peer Review Only

Table 1.

Semi-structured interview questions.

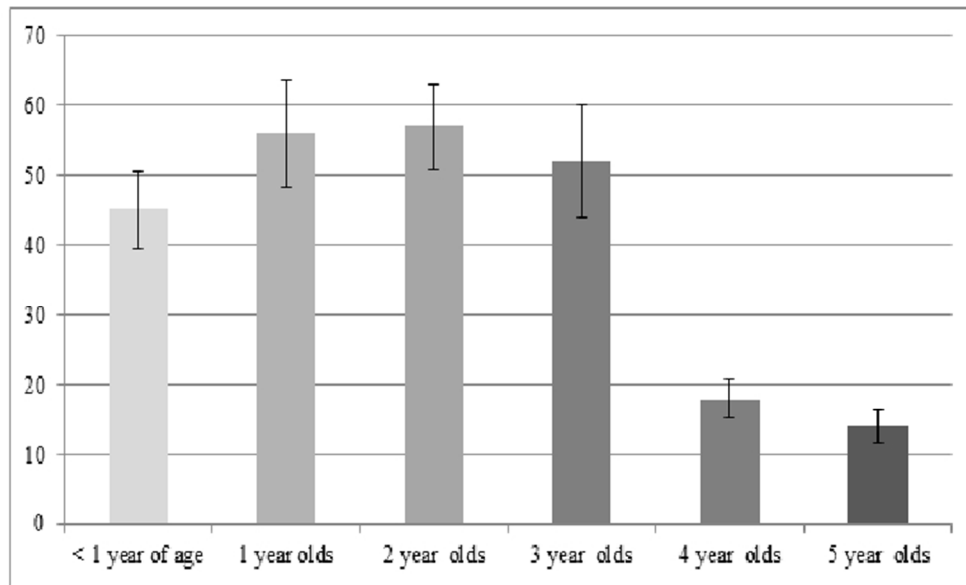
	Questions
1	What made you introduce your children to video communication, and who do your children video communication with?
2	What changes has it made to your children's relationships with their video communication partners?
3	What is their favourite thing to do whilst participating in video communication?
4	Do they participate in activities whilst video-chatting? E.g. reading books, singing, dancing.
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?
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.
7	Do your children use the computer for anything other than video communication?
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?
9	Does your child watch television? If so, how much?
10	Do you ever record the video communication sessions?
11	Has the video communication experience changed as your child has got older? If so, in what ways?
12	Are your children closer to the relatives with whom they had video communication?
13	Are there any other benefits to your children having video communication with relatives that you have not yet mentioned?
14	Do you have anything negative to say about your children having video communication with relatives?

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Table 2.
The regularity of children’s video communication

Regularity of video communication	Percentage of children aged < 6 years
Occasionally	32.4%
Approx. monthly	18.2%
Several time a month	13.5%
Approx. weekly	17.6%
Several times a week	13.5%
Daily or almost daily	4.7%

For Peer Review Only



The percentage of children that had been introduced to video communication before two years of age.

Figure 1

209x129mm (96 x 96 DPI)

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3 **Appendix A.**
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5
6 **Video communication use by families with Young Children -A questionnaire for parents.**
7

8
9 **1. Are you a parent of a child aged 5 years or under? Y/N**
10 If you have answered No to Q1, please turn to the final page.
11 If you answered Yes to Q1, please continue to Q2.
12

13 **2. Post code** _ _ _ _ _
14

15 **3. Gender - F/M (Please circle)**
16

17 **4. Please indicate your children's parental situation.**

- 18 Single mother
19 Single father
20 Biological mother and father
21 Biological mother and step father
22 Biological father and step mother
23

24 **5. How many children do you have?** _____
25 Please fill out the following details for each of your children
26

Child	Age	Gender	Grade (If at school)	Days per week in childcare	Child resides with you- full-time, 50%, >50% or <50%
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2					
3					
4					
5					
6					
7					

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39 **6. Does your household own a computer? Y / N**
40 If you answer No to Q6, this is the final question. Thanks!
41 If you answer Yes to Q6, please continue to Q7.
42

43 **7. Using the following scale, how would you rate your computer expertise?**
44

- 45 0= Know very little about computers
46 1= Almost competent
47 2= Competent
48 3= Highly competent
49 4= Almost an expert
50

51 0 1 2 3 4
52

53 **8. Using the above scale, how would you rate your partner's computer expertise?**
54

55 0 1 2 3 4 or N/A
56
57
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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

	Type	Operating system	Location	Internet connection (N/A if no connection)
1				
2				
3				
4				

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

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

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 Messenger Yahoo! Messenger w Voice
 Paltalk Messenger SightSpeed TryFast AIM Triton ICU II

Others. Please specify _____