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“Facetime doesn’t count”: Video chat as an exception to media restrictions for infants and toddlers

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ABSTRACT

The American Academy of Pediatrics has historically discouraged media exposure for children under two due to the absence of evidence supporting its benefits and the potential for negative effects (AAP, 2011); however, the AAP has begun to recognize that all screen time may not be equal (Brown et al., 2015). For example, many young children today are geographically separated from family members, and video chat in particular may allow them to develop and maintain relationships with remote relatives (Ballagas et al., 2009). Do babies and toddlers use this technology, or have their parents discouraged its use because it is a form of media exposure? An online media usage survey was distributed to 183 parents of children between 6 and 24 months in the D.C. metro area. There were high levels of video chat usage reported across all children, regardless of whether they were exposed to high or low levels of other types of media. Furthermore, some parents explicitly reported viewing video chat as an exception to otherwise restrictive media rules. The changing landscape of traditional and non-traditional media sources and the implications of increased access to video chat technology for family communication are discussed.

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1. Introduction

Many children in the United States are geographically separated from their parents or grandparents today [1–4]. Strong family ties are known to be critical for healthy child development [5], and modern communication technologies have become an important resource for families developing these bonds at a distance. Today, a military parent deployed abroad can still interact and play with his or her infant at home. Indeed, families report using video chat services like Skype and FaceTime to help their children develop and maintain relationships with parents who are separated from them by work [6], divorce [7], immigration [8], or military deployment [9]. Furthermore, it is also used with other remote family

members, such as grandparents [10], and can provide a supportive forum for discussions of family issues and a way for relatives to view the child’s developmental progress [11].

The accessibility of video chat technologies is important for the whole family, but it may be especially critical for children under 7 years of age, as they tend to have difficulty using audio-only media like telephones to communicate [12]. Furthermore, because the use of audio-only telephones requires verbal and cognitive skills that they have not yet acquired, infants and toddlers under 2 years of age are especially unlikely to be able to use such media effectively. Video chat may offer an alternative, but little is known about its use by such young children or its potential to support relationships among this age group. Instead, most existing research has focused on older children (e.g. [6]) or on the learning potential afforded by socially interactive screens (e.g. [13]). Preliminary studies have shown that toddlers remain content for longer when they have access to a parent via video chat than when they are completely alone [14] or when they have access to a parent via audio-only telephone [15]. However, there is also evidence that two-dimensional media can be difficult for babies to process (see [16], for review). While some studies with older children (24–30 months) suggest that the social contingency cues of video chat may ameliorate this problem [13], it is still unknown whether video

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chat technologies are useful for children under two years. Furthermore, even as the prevalence of smartphone ownership among families with young children has grown in the past 5 years – 75% of families with children between 0 and 8 years of age own smartphones or some other mobile touchscreen device [17] – and has made video chatting more accessible, there is still very little data on the frequency of video chat usage among these young children.

While video chat, as a visual medium, has the potential to offer a more effective communication alternative for toddlers, parents may face a dilemma when deciding whether to use this technology to support their children's long-distance relationships. The American Academy of Pediatrics (AAP) currently recommends that children under 2 years of age avoid screen media exposure entirely, due to the absence of evidence supporting its benefits and the potential for negative effects [18]. While pediatricians and developmental experts have been calling for changes to this recommendation [19,20] and the AAP itself has announced plans to temper the suggestion [21], strict recommendations like these that do not discriminate between types of screen usage may lead parents of infants and toddlers to avoid using video chat, simply because it is a type of media exposure.

Given the AAP's recommendation on the one hand, and the potential benefits of video chat on the other, are families actually using this highly accessible technology with their toddlers at home? Will parents see video chat as a worthwhile exception to current media usage guidelines for their babies, and if so, what can be done to support positive interactions with this technology by its youngest users? While nationally representative surveys report that those infants and toddlers who are exposed to screens spend an average of at least 1.5 h per day with them [22], none of these have yet collected data on video chat usage among such young children. This survey study aims to establish a preliminary understanding of the frequency of video chat usage among children under two years of age.

2. Material and methods

2.1. Procedure and participants

An online survey was distributed to families in the DC metro area who had at least one child between the ages of 6 and 24 months. These families were recruited at community events, through parenting listservs, flyers, and through word of mouth. Responses from 183 eligible families were collected, and participants were predominantly middle to upper-class (median household income between \$100,000 and \$150,000 per year), well-educated (79% master's degree or higher), Caucasian (93% White) mothers (3% fathers) with a mean age of 34 years ($SD = 4.6$). Children from each month between 6 and 24 months were represented in the sample ($M = 13$ months, $SD = 5.5$), 51% of them were female, and 33% had an older sibling.

2.2. Materials

The 38-item survey contained 16 questions regarding the family's income and parental education, race and ethnicity, the age of person completing the survey, the child's number of siblings, and other questions about the child's development; and 13 questions on the family's and child's general media usage (questions modeled on Rideout [17]). An additional 9 items regarding the child's use of video chat were asked only to those who had ever used this specific technology. All questions about the child's media usage were asked regarding the day prior to taking the survey in order to minimize memory biases, and participants were instructed to complete the survey with their 6- to 24-month-old child in mind.

3. Results

3.1. Video chat and phone use

Families in this sample reported using video chat with their infants often. In fact, 85% of survey participants reported that their infant had ever used it, while 60% used it at least several times a month and 37% used it regularly at least once a week. Thus, most of these infants and toddlers use video chat, and those who do use it do so quite often. Video chat usage also remained equally high across both the younger and older infants (84% of 6- to 16-month-olds, and 88% of 17- to 24-month-olds).

Video chat was used far more often to communicate with individuals living 30 or more miles away (91%) than with those nearby (9%), ($\chi^2 = 104.06$, $p < 0.001$). In approximately three out of four cases (76%), mothers were reported as being physically present most often with the child during these interactions. Children interacted typically with two individuals on the screen at a time (55%, the mode), usually with grandparents (85%).

Nearly all participants reported using either FaceTime (48%) or Skype (41%) most often to conduct the video calls, and the most popular devices to use were mobile phones (39%), tablets (32%), and laptops (26%). Twenty-six percent of the families who used video chat reported that they had ever used an open video connection – when the video link is left open for an extended period with no particular pressure to talk or remain in view on camera. Video chat was the preferred method of remote communication among the sample: Of those children who used video chat, only 43% had ever used voice-only telephone calls to communicate with others. As might be expected, the extent of this preference differed significantly by the child's age, such that only 34% of 6- to 16-month-old video chat users had ever used audio-only phone calls, while 63% of 17- to 24-month-olds did ($\chi^2 = 12.64$, $p = 0.001$).

3.2. General media exposure

To understand the social significance of early video chat usage more clearly, it is important to view it in the context of these children's general media exposure. It may be, for example, that all the video chat users came from a special subsample of children who are already high media users overall. To explore this further, the general media exposure of the sample was examined.

Among the whole sample of families, 100% owned a mobile phone of some kind and 97% owned a smartphone with both a touchscreen and internet access. Only one family in the sample did not own any devices that could potentially connect to the internet, including a smartphone, tablet, or a laptop or desktop computer. Because free video chat software like Skype and FaceTime is available for all smartphones and internet-enabled tablets or computers, all families but one in this sample could potentially access video chat technologies.

The media exposure data for this sample are reported in Table 1. Statistics from previous nationally representative media usage surveys for children 2 years and under are presented for purposes of comparison. While both this survey and previous ones asked about the child's media use on the day prior to taking the survey, comparisons across surveys should be made with caution: the current sample was not nationally representative, and important methodological differences exist between this study and those. However, the percentage of children who had ever watched television was similar in our sample to national estimates. The estimated time spent viewing TV and DVDs daily was much lower for our sample; however, the children in the current sample are much more likely to have been exposed to computers (18% in this sample versus 10% nationally) and mobile devices (56% in this sample versus 38% nationally; Rideout [17]). Additionally, 29% of

Table 1
Media use for children up to 24 months, over time.

Surveys	2005 ^a	2011 ^b	2013 ^c	This sample (2014) ^d
Have ever watched TV (%)	79%	75%	66%	63%
Have ever watched DVDs/videos (%)	65%	62%	46%	32%
Have ever used a mobile device (%)	^e	10%	38%	56%
Have ever used a computer (%)	^e	4%	10%	18%
Average time spent in a typical day, in hours and minutes (hh: mm)				
Watching TV per day (among all)	00:34	00:42	00:44	00:16
Watching DVD/videos (among all)	00:13	00:19	00:11	00:03
Watching TV (among those who watched)	01:02	01:30	^e	00:47
Watching DVDs/videos (among those who watched)	^f	01:16	^e	00:35

^a Rideout and Hamel [23]: 6–23 months.

^b Rideout [22]: 6–23 months.

^c Rideout [17]: 0–23 months.

^d This sample: 6–24 months.

^e Question not asked/data not reported.

^f Sample size too small for reliable results.

parents in this sample reported that their toddler had watched online videos, TV shows, or movies on a mobile device; nationally, 47% of children 0–8 years have watched videos on a mobile device, and 38% have watched TV or movies on one [17]. Not surprisingly, given the high-income status of the present sample, smartphone ownership in this group (95%) was higher than the 2013 national average (75%) of families with children 0–8 years [17]. However, neither statistic (mobile phone ownership nor video/TV/movie-watching on mobile devices) was broken down by specific ages in previous surveys, so the comparison is not exact.

Next, the sample was examined for latent variables that might distinguish discrete groups of children defined by their usage of various digital devices. To our knowledge, there is no existing research examining the potential existence of distinct types of media users among children under two; however, highly distinct user groups – for example, children who spend most of their media time watching TV versus those who spend it using mobile games/apps – have recently been shown to exist among children by the age of eight [24]. Due to the lack of research in this area, no specific hypotheses were made regarding the number of media use groups among children under two. The null hypothesis was that all children in this age group would simply have the same media usage patterns.

Participants were asked whether the child had ever used a/an: (1) educational game device, (2) handheld video game, (3) MP3 player without a video screen, (4) MP3 player with a video screen, (5) cell phone without a touch screen, (6) cell phone with a touch screen, (7) landline phone, (8) tablet device, (9) computer. Frequencies of affirmative responses for each device are reported in Table 2. Given that no parents indicated their child had used a handheld video game device, this question was excluded from the analysis. A latent class analysis revealed that a two-class solution offered the best combination of fit and parsimony.² Table 2 reports the parameter estimates for the 2-class solution, including: (1) the proportion of the sample assigned to each class and (2) the probability of an affirmative response among members of the sample assigned to that class. The posterior probabilities indicated a high degree of certainty in the assignment of children into each class (class 1 = 96.9%; class 2 = 90.3%), and overall model entropy

was acceptable (0.80). These results suggest that there are two distinct groups of media users among these infants and toddlers: those who do not use devices (class 1: low usage), and those who do (class 2: high usage). On average, children in the high device usage group were exposed to over twice as many minutes of media – 36.2 min ($SD = 54.3$) – as children in the low device usage group (class 1: $M = 15.1$, $SD = 31.3$), a statistically significant difference ($t(174) = 3.09$, $p = 0.002$).

An analysis was then conducted to examine whether membership in the low or high device usage classes was associated with video chat exposure. Class membership was indeed associated with whether children had used video chat ($X^2(1) = 6.62$, $p = 0.010$): A higher proportion of children in the high device usage group (91.7%) had used video chat than of children in the low device usage group (78.2%). Nevertheless, the vast majority of children, 78.2%, who did not otherwise use digital devices still used video chat. This also demonstrates that the high levels of video chat usage demonstrated in this sample were not exclusively the result of a subsample of high general media users. Class membership was not related to child gender ($p = 0.306$) or parental education ($p = 0.969$).

Finally, we examined this result in one other way. Participants had the opportunity to provide additional comments about their child's general media use at the end of the survey, and responses to this question were analyzed. Additional information in response to this open-ended question was provided by 102 participants. Consistent with the latent class analysis, many of them (38%) spontaneously reported that they placed constraints on media usage with their infants and toddlers; an additional 14% reported that the child was very rarely exposed to media, but did not specify a particular restriction. A typical example of a media restriction comment is, "We limit her video exposure as she is under age 2." These comments suggest that many parents in the sample were probably aware of the AAP's recommendation that media exposure be avoided for children under the age of two. Such comments about parental media restrictions were rarely (33%) written without caveats, however. Thirty-three percent of them conveyed media restrictions while also describing the child's incidental or unintentional background media exposure. For example, typical comments included, "We do not let [our child] watch TV but do sometimes have on a sporting event in the background like golf." Thirty-six percent of these comments conveyed media restrictions with an *intentional exception* made for video chat usage, in agreement with the class results reported. These included, "We don't let our daughter use media except for face timing [sic] with relatives", and, "We try to be very thoughtful about [our child's] media intake...Facetime [sic] calls with grandparents do not count." These comments indicate that even those who do restrict their infants' and toddlers' media usage

² The absolute fit of the model was good ($G^2(235) = 83.6$, $p = 1$), and a series of Lo-Mendell-Rubin likelihood ratio tests indicated that while a two-class solution was a significantly better fit to the data than a one-class solution ($\chi^2 = 148.1$, $p < 0.001$), a three-class solution was not a better fit than the two-class solution ($\chi^2 = 24.1$, $p = 0.306$). Finally, while the AIC and BIC decreased sharply from the one-class to the two-class solution (AIC: 1134.5–1003.2 and BIC: 1162.2–1057.8, respectively), a comparable decrease was not observed for the three-class solution (AIC = 996.5, BIC = 1080.0).

Table 2
Frequencies of affirmative responses for each device and probabilities of device usage by class.

Device	Affirmative	Probability of yes	
		Class 1 (n = 87)	Class 2 (n = 96)
Cell phone with a touch screen	87 (47.5%)	0.073	0.896
Tablet device	72 (39.3%)	0.077	0.725
Computer	33 (18.0%)	0.013	0.356
Landline phone	22 (12.0%)	0	0.246
Cell phone without a touch screen	16 (8.7%)	0.046	0.130
Educational game device	12 (6.6%)	0	0.134
MP3 player without video screen	9 (4.9%)	0	0.101
MP3 player with video screen	5 (2.7%)	0	0.056
Handheld video game	0 (0%)	–	–

may see video chat as a worthwhile exception to their otherwise strict adherence to the AAP's recommendation. Similarly, over half of the comments clarifying the child's minimal media exposure also included exceptions for video chat, like, "[My child] has not used any media yet, just Facetime [sic]". It appears, then, that at least some parents are introducing video chat to their infants earlier or more often than other types of media. It is important to note that these comments were made spontaneously in response to an open-ended question about the child's *general* media use, however. To explore this potentially common parental attitude further, targeted questions about this topic should be asked in future studies.

3.3. Motivations for using video chat

Families who reported using video chat with their toddlers were also asked a series of open-ended questions to assess their motivations for using video chat. First, families were asked to list their top two reasons for using video chat with their child. All 155 individuals who reported using video chat with their child provided at least one reason, and 123 provided a second, for a total of 278 reasons. Four hundred twenty-one unique words were used in the responses, but some words and phrases were used more often than others. To visualize the data, a word cloud was created and is shown in Fig. 1. The words parents used most often to describe their motivations were consistent with the survey data generally, and 92% of them fell into at least one of three categories. The first category encompassed the people with whom these families used video chat, and these were mentioned in 88% of the reasons (266 instances, or 13% of all words used). For example, words for generic family members (e.g. "family" and "relatives") were used 128 times; variations on the word "grandparent" were used 93 times; words for parents came next (e.g. mom, mother, dad, father, parent) with 32 instances; and "friend" or "friends" was used 13 times. The second category included words that describe types of interaction, and these were mentioned in 68% of reasons (213 instances of interaction words, or 10% of all words used), with visual words leading the group (e.g. "see", 89 instances) above words like "talk" (45 instances) and "communicate" (42 instances). The third category consisted of adjectives related to the distant location of the screen partner and were used in 44% of the reasons (112 instances, or 5% of all words used), with variations of the phrase "live far away" used 84 times. It is not surprising that these categories would appear, since communicating with, and especially seeing, far away individuals is the express purpose of video chat.

Second, participants who reported that they had ever used an open video connection were asked their reason for using it with their child as an open-ended question, and all but one responded ($n = 39$). Nearly half of these (46%) reported that they used open video connections because it conveniently allowed one participant (usually the parent) to remain in conversation using video chat while another participant (usually the child) was able to come and

go, as in the case of playing off-screen. For example, one parent wrote, "[My] child will say hi for a moment, then grandparents watch him run around and/or play. [My] child will check back in occasionally...[with] no pressure for him to sit on my lap to interact constantly". Similarly, parents also reported that open video connections were simply convenient or less stressful (23%). For example, one mother wrote, "It's just very laid back.... Having less focused conversations is less stressful, and I am willing to do it more often". Some (13%) also reported that open video connections helped them feel that the remote relative was "in the same room", that the interaction was "more real", or that it made it feel "as if they were with us". These comments related the enjoyment families received from maintaining routines and replicating more casual family interactions; for instance, one parent wrote, "[We can] chat and socialize with family as if they were with us on a weekend morning". Another parent wrote, "It feels more like a 'real' interaction. Grandparents can see him running around and playing in real time. He can come over and say hi if he wants, just as if they were in the room with him.". One parent also reported using an open video connection to allow relatives to be present for important childhood events: "[We use it to] allow grandparents to experience parts of [our child's] life (i.e. Christmas morning)". This video chat method appears to have resonated positively with the parents who use it, and their reports suggest that it may have potential for increasing the social presence of relatives and the naturalness of interactions.

4. Discussion

This survey demonstrates that the use of video chat among infants and toddlers under two is remarkably common, even among those whose parents know about the AAP's media usage guidelines and otherwise restrict media usage for their toddlers. The AAP is currently updating its guidelines for parents due to the rapidly changing media environment; it should consider this parental perspective regarding video chat as it updates its recommendations regarding infant media exposure. The new guidelines need to encompass different facets of the media environment, specifically video chat, particularly given that the current recommendations are largely based on research conducted on television usage.

While this survey did not assess the average length of families' video chat calls, our own observational research [25], conducted with a subset of this sample, indicates that families with children under two spend an average of 20 min in each video call and that the vast majority of the calls are both child-centered and focused either equally or mostly on interaction with the child (i.e. versus interaction with the present adult). The time spent in video chat is in addition to other reported media exposure and has not been captured in past estimates of media exposure during early childhood. This suggests that screen exposure may have been underestimated particularly for those families that use video chat at least once each week (nearly 40% of this sample), as well as

References

- [1] American Academy of Pediatrics, Helping children and families deal with divorce and separation, *Pediatrics* 110 (5) (2002) 1019–1023.
- [2] American Academy of Pediatrics, Health and mental health needs of children in US military families, *Pediatrics* 131 (6) (2013) e2002–e2015.
- [3] American Academy of Pediatrics, The impact of parental incarceration on the physical and mental health of young adults, *Pediatrics* 131 (4) (2013) e1188–e1195.
- [4] Pew Research Center. Who Moves? Who Stays Put? Where's Home? Pew Research Center, 2008.
- [5] J. Shonkoff, D. Phillips, *From Neurons to Neighborhoods: The Science of Early Childhood Development*, National Academy Press, Washington D.C., 2000.
- [6] S. Yarosh, G.D. Abowd, Mediated parent–child contact in work-separated families. Paper presented at the Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, 2011.
- [7] S. Yarosh, Y. Chieh, G.D. Abowd, Supporting parent–child communication in divorced families, *Int. J. Hum.-Comput. Stud.* 67 (2) (2009) 192–203.
- [8] M. Madianou, D. Miller, *Migration and New Media: Transnational Families and Polymedia*, Routledge, 2012.
- [9] J. Yeary, S. Zoll, K. Reschke, When a parent is away: Promoting strong parent–child connections during parental absence, *Zero to Three* 32 (5) (2012) 5–10.
- [10] M.G. Ames, J. Go, J.J. Kaye, M. Spasojevic, Making love in the network closet: the benefits and work of family videochat, in: Proceedings of the 2010 ACM Conference on Computer Supported Cooperative Work and Social Computing, ACM Press, 2010, pp. 145–154.
- [11] A. Forghani, C. Neustaedt, The routines and needs of grandparents and parents for grandparent–grandchild conversations over distance, in: Proceedings of the SIGCHI Conference on Human Factors in Computing Systems, ACM Press, 2014, pp. 4177–4186.
- [12] R. Ballagas, J.J. Kaye, M. Ames, J. Go, H. Raffle, Family communication: phone conversations with children, in: Proceedings of the 2009 ACM Conference on Interaction Design and Children, ACM Press, 2009, pp. 321–324.
- [13] S. Roseberry, K. Hirsh-Pasek, R.M. Golinkoff, Skype me! Socially contingent interactions help toddlers learn language, *Child Dev.* 85 (3) (2014) 956–970.
- [14] J. Tarasuik, R. Galligan, J. Kaufman, Almost being there: video communication with young children, *PLoS One* 6 (2) (2011) e17129.
- [15] J. Tarasuik, R. Galligan, J. Kaufman, Seeing is believing but is hearing? Comparing audio and video communication for young children, *Front. Psychol.* 4 (2013).
- [16] R. Barr, Memory constraints on infant learning from picture books, television, and touchscreens, *Child Dev. Perspect.* 7 (4) (2013) 205–210. <http://dx.doi.org/10.1111/cdep.12041>.
- [17] V. Rideout, *Zero to Eight: Children's Media Use in America*, Common Sense Media, San Francisco, CA, 2013.
- [18] American Academy of Pediatrics, Media use by children younger than 2 years, *Pediatrics* 128 (2011) 1040–1045.
- [19] D.A. Christakis, Interactive media use at younger than the age of 2 years: time to rethink the American Academy of Pediatrics guideline? *JAMA pediatr.* 168 (5) (2014) 399–400.
- [20] C. Lerner, R. Barr, *Screen Sense: Setting the Record Straight: Research-Based Guidelines for Screen Use for Children Under 3 Years Old, Zero to Three*, Washington, DC, 2014.
- [21] A. Brown, D.L. Shifrin, D.L. Hill, Beyond 'turn it off': How to advise families on media use, 2015. Retrieved from <http://www.aappublications.org/content/36/10/54.full>.
- [22] V. Rideout, *Zero to Eight: Children's Media Use in America*, Common Sense Media, San Francisco, CA, 2011.
- [23] V. Rideout, E. Hamel, *The Media Family: Electronic Media in the Lives of Infants, Toddlers, Preschoolers and their Parents*, Kaiser Family Foundation, Menlo Park, CA, 2006.
- [24] V. Rideout, *The Common Sense Census: Media Use by Tweens and Teens*, Common Sense Media, San Francisco, CA, 2015.
- [25] E.R. McClure, Y.E. Chentsova-Dutton, R.F. Barr, W.G. Parrott, S. Holochwost, (in preparation). Wave to Nana! How infants and remote relatives connect using video chat.
- [26] E.R. McClure, R.F. Barr, Building Family Relationships from a Distance: The role of communication technology, in: R.F. Barr, D. Linebarger (Eds.), *Media Exposure During Infancy and Early Childhood: The Effect of Content and Context on Learning and Development*, 2016, in press.
- [27] H. Raffle, G. Revelle, K. Mori, R. Ballagas, K. Buza, H. Horii, J. Kaye, K. Cook, N. Freed, J. Go, M. Spasojevic, Hello, is Grandma there? Let's Read! StoryVisit: Family Video Chat and Connected E-Books, in: Proceedings of the 29th International Conference on Human Factors in Computing Systems, ACM, New York, 2011, pp. 1195–1204.
- [28] L. Fenson, P.S. Dale, J.S. Reznick, E. Bates, D.J. Thal, S.J. Pethick, J. Stiles, Variability in Early Communicative Development, in: *Monographs of the Society for Research in Child Development*, 1994, i+iii-v+1-185.
- [29] M.G. Ames, J. Go, J.J. Kaye, M. Spasojevic, Understanding technology choices and values through social class, in: Proceedings of the 2011 ACM Conference on Computer Supported Cooperative Work and Social Computing, ACM Press, 2011, pp. 55–64.