Virtual Family Time
How Families Connect via Video Chat

Rachel Barr
Olivia Blanchfield
Georgetown University

Elisabeth McClure
LEGO Foundation
Billund, Denmark

Ellen Roche
Georgetown University

Jennifer M. Zosh
Pennsylvania State University at Brandywine

Gabrielle A. Strouse
University of South Dakota

Georgene L. Troseth
Vanderbilt University

Lauren J. Myers
Lafayette College

Abstract

More than a decade of research on how young children learn and connect via video chat takes on new importance as families and educators navigate relationship-building and learning during the pandemic. In this brief review, the authors summarize findings on how babies, toddlers, and their families have used video chat successfully to connect and learn, offering practical tips for parents, distant family members, and educators to connect with young children via video chat during the pandemic and beyond.

Video chat opens up new opportunities for learning and connection for children from birth to 3 years old. Unlike watching television or recorded videos, during video chat the person on the screen can see, hear, and react to a child in real time. Recent research on video chat with young children takes on new importance during the COVID-19 pandemic, which has upended young children's routines and disrupted their in-person relationships with grandparents, extended family, caregivers, educators, and peers. As families and educators adjust to the pandemic, they may be wondering: *Are babies and toddlers interested and engaged during video chat? Do they understand that the people and events they see on video chat are real? Can they recognize a person they meet as the same person who was "in the computer?" Can they learn new things from a person on video chat? Can video chat help young children maintain important relationships with people they don't see frequently in person?* These are the very questions that researchers continue to investigate. In this brief review, we describe the most recent video chat research with young children and provide practical tips for how to make video chat valuable and meaningful for them.

Video chat differs from other types of media exposure (e.g., television or digital games) in its content, supportive context, and focus on the individual child—what Guernsey (2012) called the "Three Cs." In terms of content, video chat provides a unique opportunity to interact sensitively with a child through their screen, in a way similar to an in-person interaction. Different from a TV program, the content of the video chat can be tailored to each individual child, adapting specially for the child's age, specific interests, and cognitive development (especially memory development). Finally, the context for using video chat with young children differs from using other media, in that it requires *joint media engagement* (Stevens & Penuel, 2010) from supportive adults (that is, shared focus on the activity of using media), whether watching with the child or talking to the child from the screen.

The Content and the Child: Connecting and Learning With Video Chat

Children learn, grow, and develop in the context of stable, nurturing relationships with parents, extended family, and

---

Competencies for Prenatal to 5 (P-5) Professionals™

P-5 ①   P-5 ③

For more information see page 4, or visit www.zerotothree.org/p-5

caregivers (National Research Council & Institute of Medicine, 2000). When grandparents, educators, and family members cannot be physically present, video chat may support young children's relationships with important adults.

The content of video chat is fundamentally different from other kinds of video (e.g., television, streamed video, and pre-recorded videos), because video chat gives children an opportunity to interact contingently with the people they see on screen. Social contingency is the sensitive serve-and-return style of interaction often seen in high-quality in-person interactions between adults and young children, such as smiling back at one another or following the other person's eye gaze to look where they are looking. These contingent interactions are key for developing social connections, attachment, and language (Beebe et al., 2010; Bornstein et al., 2008; Goldstein & Schwade, 2008; Hirsh-Pasek et al., 2015; Myers et al., 2017; Strouse et al., 2013; Tamis-LeMonda et al., 2014; Troseth et al., 2006). Even very young babies seem responsive to this contingency in video chat: In one study, 6- to 12-month-olds who played peek-a-boo with their mothers via video chat smiled just as frequently and gazed at their mothers for the same amount of time as babies who played with their mothers face-to-face (McClure et al., 2020).

Young children appear very interested in socially responsive video chat. In research studies, toddlers and preschoolers are more engaged and responsive to video chat than to video recordings (Gaudreau et al., 2020; Myers et al., 2017; Strouse et al., 2018), and they interact similarly with people on video chat and people visiting face-to-face (Myers et al., 2019). For example, when researchers read books to 4-year-olds in person, or via video chat, or had them watch a video recording of a person reading, children learned equally well across all three versions (Gaudreau et al., 2020). However, children who were read to in person and via video chat responded more to the reader's questions than they did to the questions in the recorded videos, suggesting that children readily detected the difference between actual responsiveness and the false sociability that occurred when the person on the recording asked a question and paused for a response. In other studies with toddlers, the children sang along, played Simon Says, and imitated actions with video chat partners who were truly responsive more than children did while watching recordings of people prompting them to engage in the same activities (Myers et al., 2017; Strouse et al., 2018).

By fostering social connection, videochatting may also support learning, especially for younger children, as they may view a responsive person on screen as a potential partner for play and interaction (Nielsen et al., 2008; Strouse et al., 2018; Troseth et al., 2018). Children are especially sensitive to whether a virtual partner provides information about the world that is accurate, timely, and reliable (Koenig & Harris, 2005; Roseberry et al., 2014; Sabbagh & Baldwin, 2001; Scofield & Behrend, 2008). In research studies, infants and toddlers learn more from videos that include socially responsive interactions than from videos that offer no opportunities

for back-and-forth with the person on the screen (Myers et al., 2017; Roseberry et al., 2014; Troseth et al., 2006). Compared to watching a prerecorded video of a person, video chatting with the person can help toddlers learn to imitate new actions (Myers et al., 2017), search for and find real objects (Troseth et al., 2006), and learn new words (Roseberry et al., 2014). For example, in one study, 12- to 25-month-olds spent a week either video chatting with a researcher engaged in learning activities (teaching them new words and reading books) or watching recorded videos of the person doing the same activities (Myers et al., 2017). At the end of the week, children were tested on whether they recognized and preferred the researcher from the videos (compared to a stranger) and whether they remembered words and actions from the interactions. Although the youngest children (12–16 months old) showed no recognition, preference, or learning from either video format, children 17 months and older who had video chatted recognized the researcher from the video chat and preferred to play with them over a stranger. They learned more from the book reading activity from the video chat than children who watched the pre-recorded videos, and the oldest children (22- to 25-month-olds) also learned more new words.

These findings highlight the importance of the cognitive development of very young children, a key element of the child component of the "Three C's" framework (Guernsey, 2012). Children under 5 years have been shown to experience a *transfer deficit*: a difficulty in transferring or carrying over information from a screen to the real world. When solving a problem, they do not use information they learned from a screen as well as they use information learned from a face-to-face interaction (Barr, 2010, 2019; Kirkorian, 2018; Strouse & Samson, 2020). For example, infants learned to push a virtual button on a fire truck displayed on a touchscreen to trigger a siren sound, but many did not transfer this skill when they played with the actual fire truck toy (Zack et al., 2009). Toddlers did not recognize themselves on a TV screen and notice a sticker that had been placed on their hair for a full year after they recognized themselves (wearing a sticker) in a mirror (Suddendorf et al., 2007). A real-life example is that it can be hard for a young child to connect a picture of an elephant on a screen with the real elephant that they see at the zoo.

The studies summarized here suggest that children under 5 years old may more easily transfer learning when using video chat compared to learning from television and stream-ing recorded videos. Social contingency via video chat may help engage young children's interest and attention (Strouse et al., 2018), help focus their attention on relevant information (Nielsen et al., 2008), and help them remember new infor-mation they see on the screen (Krcmar, 2010; Kuhl, 2007). Because interactions on video chat can be tailored to the indi-vidual child (e.g., the person on screen calls them by name and refers to their toys, parents, and pets), this may cue children that what is happening on screen is relevant and meaningful to them personally and help them draw a connection between

what they see on the screen and their in-person experiences (Strouse et al., 2018; Troseth, 2003, see Figure 1). Together, these factors may reduce the difficulty of learning from screens for very young children.

The Context and The Child: Supporting Video Chats With Young Children

The latest research is also bringing to light the importance of context for video chats with babies and young children. Young children look to trusted people around them to make sense of many media experiences, including video chat. A parent or other co-viewer watching alongside a child can direct *attention* by looking and pointing at the screen; can pro-vide *cognitive* support (e.g., ask questions, draw connections between on-screen and live events); and can provide *social* feedback (e.g., respond to the person on screen to model appropriate interaction; Strouse et al., 2013). In two different studies, 24- to 30- month-old children demonstrated greater responsiveness to the on-screen person and better learn-ing from video chat when they had a responsive co-viewer watching along with them during the video chat interaction (Myers et al., 2018; Strouse et al., 2018), even though the co-viewer only modeled responsiveness and did not provide direct explanations. In some studies, when an adult was not present to facilitate children's video chat experience with the person on the screen, young children learned no more from video chat than from a video recording (Strouse et al., 2018; Troseth et al., 2018; Tsuji et al., 2020). Therefore, co-viewers

··

Figure 1. A Toddler Attempts to Show His Toy Space Shuttle to His Grandparent.

Adapted figure reprinted with permission from McClure & Barr, 2017, Springer Nature.

are important for supporting young learners to engage with video chat partners.

Especially for young children, establishing social relationships is of primary importance to promote both social–emotional development and learning. Parental support may also play a key role in helping babies establish social relationships over video chat. In fact, the ability of sensitive adults to center video chat interactions around the child's responses and interests is one of the key differences between video chat and other media. In addition to bridging the gap between screens and real life, adults can describe technical difficulties to the child when video chatting. The caregivers' abilities to explain and playfully respond to those challenges during interactions with young children can help create and maintain an interactive video chat. For example, unexpected disconnections can be reframed as a game of peek-a-boo by playfully asking, "Where did Nana go?" when the video feed disconnects, and exclaiming "There she is!" when the video chat resumes (McClure & Barr, 2017).

Caregivers can also encourage effective video chats with infants and toddlers by orienting their child to the contents of the screen at the start of the video chat to make sure that they are checked in. Taking a moment to support a simple greeting between the child and screen partner could help children to adjust to the new interaction. In one study, babies whose mothers (on screen) spent longer orienting to them at the start of a video chat, prior to playing peek-a-boo, smiled more often than babies whose mothers spent less time doing this (McClure et al., 2020). After a brief greeting and orientation, babies delight in games like peek-a-boo that demonstrate the contingency of the interaction (Miller & Commons, 2010; Parrot & Gleitman, 1989; Roggman, 1991). Caregiver sensitivity during interactions appears to play an important role in eliciting positive responses from young children, whether they interact in person or via video chat (McClure et al., 2018, 2020). Reading a book, sharing a snack, playing with toys, doing a scavenger hunt, and singing songs are also highly engaging activities during video chat (McClure & Barr, 2017; Myers & McKenney, 2019). Particularly when the child is under 5 years old, the presence of a caregiver on each side of the screen helps to draw in and redirect the child's attention if needed (McClure & Barr, 2017; Myers et al., 2018, 2019; Strouse et al., 2018; Troseth et al., 2018).

In addition to participating in adult-initiated games, video chatting is an easy way for a child to share their own interests across the screen. For example, in an in-home study by McClure and colleagues (McClure & Barr, 2017; McClure et al., 2018), toddlers were observed initiating activities including: feeding their snacks (virtually) to their grandparents through the screen, showing their grandparents toys, and playing tag and hide-and-seek through the screen.

Navigating traditionally physical activities through a screen can be challenging for toddlers, yet young children are curious explorers who discover creative ways to play and
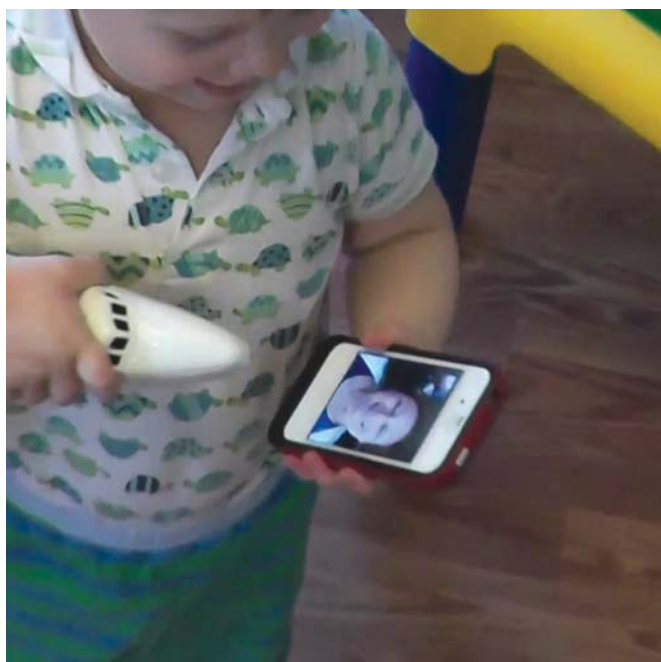
Figure 2. An 18-Month-Old Sharing Raisins With Her Grandfather, Which He Then Pretended to Eat

Adapted figure reprinted with permission from McClure & Barr, 2017, Springer Nature.

give affection via video chat. For example, McClure and Barr (2017) observed an 18-month-old sharing her raisins with her grandfather in a video chat, and he pretended to eat them (see Figure 2). Sharing snacks was a common activity initiated by toddlers during these home observations. The child repeatedly went around the tablet to share her raisins from the other side of the screen as well. Then she would return to the screen and watch her grandfather mime "eating" the raisin. It's not clear whether the toddler was engaging in pretend play, or whether she thought that going to the other side of the screen made the raisins "really" go through to her grandfather. Her mother, apparently sensing the toddler's confusion, asked the girl, "Remember, where's Pop Pop living?" The little girl pointed at the screen and said twice, emphatically, "Right there." While very young children are still figuring out what is going on during video chat, they can initiate highly meaningful activities like this one. With the support of their caregivers, they can even participate in physically interactive games (e.g. "This little piggy") and send virtual kisses through the screen (McClure & Barr, 2017).

Flexibility when video chatting with young children is key. In a naturalistic study (McClure et al., 2018), families with children between 6 and 24 months old spent an average of 20 minutes in a single video chat session. The toddlers were fully attentive (looking directly at the grandparent on the screen) for 40% of a 20-minute video chat, which did not vary across the different devices families used (McClure et al., 2018). Many toddlers enjoyed running around during the video chats, playing with their toys, playing tag with the grandparents, and bringing the phone or tablet to other areas of the house to show the grandparents different things. In this sense, it is important to be flexible with what engagement may look like for children at different ages, as it can sometimes involve a lot of movement, rather than still attentiveness or looking directly at the screen.

In fact, children from 9 to 24 months old are still developing *joint visual attention* (JVA) skills, or the ability to share attention with others (McClure et al., 2018). Sharing visual attention is important for both language development and social development more broadly. For younger babies, sharing attention across the screen while video chatting may be difficult because their JVA skills are not as strong and are challenged by the misalignment caused by screen cameras (McClure et al., 2018). This challenge is further complicated if the person video chatting

calls attention to something in the baby's environment located behind the child, as children only begin to understand JVA to objects located behind them at around 18 months old (McClure et al., 2018). Parents and grandparents can help babies overcome these challenges by telling toddlers when they cannot see what the child is showing them through the screen, and supporting toddlers to adjust the position of items they want to share so that everyone can engage with the objects together (see Figure 3a). Parents can also act as translators, telling grandparents what toddlers are displaying (see Figure 3a) or are pointing to on the screen (see Figure 3b).

Figure 3a. A Toddler Attempts to Show Her Cup to Her Grandparent

Figure 3b. A Child Points to Her Grandfather's Glasses, Visible on the Screen

Even with a supportive co-viewer, however, there may be limits to what very young children can understand and learn from video chat. Cues such as physical touch and being able to share attention to objects and events in the same physical environment are valuable when young children are developing social relationships (Leclere et al., 2014). These also matter for learning: In one study, an adult co-viewer helped 2- to 3-year-old children link information between video chat and in-person events, but the youngest 2-year-olds were more likely to learn challenging information (e.g., the names of new objects) from a partner who was in the room with them, compared to a video chat partner, even in this very supportive context (Myers et al., 2019). Infants and toddlers do detect differences between video chat and live interactions (Gusella et al., 1988), and through a screen there are fewer cues available to learn from than in real life (McClure & Barr, 2017). Therefore, in-person interactions with remote family, or mixing video chat with in-person visits, continues to be ideal when it is possible and safe for families to do so (see Box 1).

Video Chat Considerations During and Beyond COVID-19

Elder's (1974) research on children from the Great Depression showed that difficult experiences during childhood can affect development over the lifespan. Yet the impact of such experiences depends on how individuals cope and adapt. There has been a significant increase in the use of digital media and video chat by young children during the COVID-19 pandemic (Hartshorne et al., 2020; Smith, 2020), but many families were already using video chat with their babies and toddlers. Families have video chatted to connect during prior periods of separation including travel for work, military deployment, illness, incarceration, and foster care. Five years ago, researchers reported that in communities with high levels of work relocation, as many as one third of children under 2 years old used video chat at least once per week (McClure et al., 2015; Tarasuik & Kaufman, 2017). For many of these families, video chat experiences were an exception to their screen time or media rules (Ames et al., 2010; McClure et al., 2015; Rideout, 2017). A societal problem apparent during the pandemic is the quickly widening gap in availability of technology (Winslow, 2019). Inequities in digital access in terms of broadband, hardware, and technological skills (van Deuerson & van Dijk, 2018; Winslow, 2019) may drive disparities in the ability to connect.

With social distancing practices, parents and children may find themselves physically separated from family members with whom they previously had a close relationship. The grandparenting relationship benefits the entire family, as grandparents and great grandparents can provide warm emotional support and attention that helps babies feel secure and promotes early development (Dunifon, 2013). Strong family ties are critical for healthy child development (National Research Council & Institute of Medicine, 2000), yet grandparenting relationships in particular have been severely constrained (Parker-Pope, 2020). As the most vulnerable age group (65 years and older) and their

Box 1. Tips for Video Chats With Young Children

The following tips can support video chats with young children:

1. **Be sensitive:** Take a moment to connect before starting high-energy activities, and just tune in to the child. Consider using the same greeting at the beginning of each video chat.

2. **Be playful:** Use highly interactive, playful activities, even during technical challenges. Consider games like peek-a-boo, imitation games, scavenger hunts, sharing snacks and meals, and reading books together.

3. **Be flexible:** Center the video chat on the child, allowing the little one to do what comes naturally and following the child's interests. Encourage the child to bring objects to share with the person on-screen and follow the child's pointing toward something on the partner's side of the screen. It is very common for infants and toddlers to want to move around the room during video chat.

4. **Be present:** Although a toddler may be able to manipulate a phone or tablet on their own, having a supportive adult nearby will enhance their ability to learn and communicate via video chat.

5. **Be proactive:** Consider including children of all ages, beginning with newborns. Babies develop quickly and video chat can be a window for relatives to see these changes.

families follow recommendations to limit in-person interactions due to their high risk of death from COVID-19 (Centers for Disease Control and Prevention, 2020), older people are experiencing high levels of social isolation (Santini et al., 2020). However, technology provides a unique opportunity for families to remain connected despite being physically separated. Video chat may help grandparents and great grandparents maintain fundamental familial relationships (National Health Service, 2020; Werber, 2020). Connecting through video chat may serve as a lifeline for all seniors, but may be particularly beneficial to those in communities impacted the most by the pandemic, including residential facilities for aging populations.

Another group using video chat to overcome COVID-19 pandemic isolation is families separated due to foster care. For children in the foster system, supervised visits typically occur in person. During the pandemic, video chat has replaced in-person visits to maintain and support connections between birth parents and their children (Singer & Brodinsky, 2020). Although in-person visits are best for parent–child interactions, there is evidence that when babies and toddlers do not have physical access to their parents, they are more comforted when they can interact with their parent on video chat than when they can only hear their parent on a telephone (Tarasuik et al., 2011, 2013). Supervised video chat visits are not without complications, due to unstable Internet connections and privacy concerns (Barr, 2020). As described in the prior section, research has demonstrated that very young children need to be supported by adults on both sides of the screen (McClure & Barr, 2017; Strouse et al., 2018), meaning that the foster or

resource parent co-viewing with the child and supporting the video chat interaction will need to assume a greater role during video chat calls than during in-person supervised visits. Because both birth parents and resource parents need to have toys and props available, greater coordination and planning between the parents is needed than for a typical in-person visit that occurs in a child welfare office. An additional complication is that court orders often specify the duration and frequency of the visits based on in-person scheduling (Barr, 2020). Average video chats are much shorter than typical supervised visits (McClure & Barr, 2017). Also, young children forget information learned via media more quickly than information learned in person (Brito et al., 2012), which suggests that video chats for young children should be shorter and more frequent than in-person supervised visits. In response to this emerging data, family court judges as well as organizations such as ZERO TO THREE Safe Babies Court Teams and the Quality Parenting Initiative have been adapting quickly to assist both in-person caregivers and children's parents to maintain effective and meaningful video chat visits for these families. Beyond the pandemic, it may be possible to increase visitation by combining in-person and video chat interactions. Specialized evaluation of the frequency, length, and quality of video chats, and the role of the quality of the birth parent/resource parent relationship and later child outcomes is needed.

As of August 2020, an estimated 26% of U.S. school districts planned to start the school year fully remotely, with 12% starting in a hybrid format (Gross et al., 2020). Educators and early childhood education providers around the country are rapidly adapting to meet young children's learning needs in remote and blended formats. A growing body of research shows that very young children can engage meaningfully and even learn via video chat when it is used in warm, sensitive, and developmentally appropriate ways (see Box 1 and Screen Sense tools https://www.zerotothree.org/resources/series/screen-sense). Yet the increased use of video chat with young children for educational purposes during the pandemic raises important questions. *How will individual educators support multiple children simultaneously over video chat? What balance of online/offline learning is optimal for young children under these conditions? How can parents scaffold online learning with very young children while also working from home themselves? How can digital or blended learning actively mitigate inequities in support of children from families of low socioeconomic status, children of color, multilingual learners, and children with disabilities?* Furthermore, while video chat represents one powerful mechanism for coping with restrictions on attending school in person, it is not yet clear how much is too much and what "balance" is optimal during these sub-optimal circumstances (Kelly, 2020). While much is known, research is needed to examine how to improve access to broadband and to reduce other technology barriers to strengthen educational opportunities during COVID-19 and beyond.

This is a unique time in history when families are separated in an effort to reduce the spread of COVID-19. Safe, in-person interaction is ideal for young children because it allows for physical affection and shared hands-on play, but video chat contact is likely to be important for sustaining young families through this challenging time and for reducing loneliness and isolation in grandparents (Armitage & Nellums, 2020). Video chat technology has advanced to the point where even young children can use it to participate in meaningful interactions and relationships with their remote relatives. Video chat allows adults and young children to engage in the warm, sensitive interactions that are so important to children's development, and to play and share meaningful moments in their lives. The end of the pandemic will not mean the end of family members being separated by geography, employment, incarceration, divorce, foster care, or deployment. These circumstances provide a clear call for researchers to better understand how technology can support family closeness across the miles, and for society to provide more equal access to this technology. Although research in this area is ongoing, the evidence points to simple ways that adults can support video chat interactions: By being sensitive, playful, flexible, present, focused, and proactive, families can cope with challenging separations and find new ways to connect with their little ones at a distance.

Rachel Barr, PhD, is professor of psychology at Georgetown University and director of the Georgetown Early Learning Project. She is primarily interested in how children bridge the gap between what they learn from media and how they apply that information in the real world. Utilizing federal funding, she has published an edited book and almost 50 works on the topic. She was a ZERO TO THREE Leadership Development Institute fellow in 2005.

Olivia Blanchfield is the research program coordinator at the Early Learning Project at Georgetown University. She is a member of the Comprehensive Assessment of Family Media Exposure Consortium. In addition to media research, Ms. Blanchfield focuses on a longitudinal study on memory and cognitive flexibility.

Learn More

Maximizing the Potential for Learning From Screen Experiences in Early Childhood: What the Research Says
R. Barr, E. McClure, & R. Parlakian (2019)
ZERO TO THREE Journal, 40(2), 29–36.

Screen Sense: What the Research Says About the Impact of Media on Children 3 and Under
R. Parlakian, E. McClure, & R. Barr, (2018) *ZERO TO THREE*.
https://www.zerotothree.org/resources/series/screen-sense

Elisabeth McClure, PhD, is a research specialist at The LEGO Foundation, where she studies technology, creativity, play, and learning in childhood. She is a former research fellow at the Joan Ganz Cooney Center at Sesame Workshop (2015–2017). Dr. McClure received her doctorate from Georgetown University, where she was trained in developmental psychology with a focus on public policy. Her research on how babies and toddlers use video chat has been featured in news outlets such as *The New York Times*, *The Atlantic*, and NPR, and has been used to inform policies for the American Academy of Pediatrics and the U.S. Department of Education.

Ellen Roche, MEd, serves as executive director for Trust for Learning, a national philanthropic partnership advancing equity in early childhood by expanding play-based, developmentally appropriate programs for underserved children from birth to 8 years old. In addition to teaching and nonprofit leadership experience, her academic work has focused on progressive education history, antiracist pedagogy, and civic education.

Jennifer M. Zosh, PhD, is an associate professor of human development and family studies at Penn State University's Brandywine campus. As the director of the Brandywine Child Development Lab, she studies how infants and young children learn about the world around them. Her areas of expertise and publication include playful learning, working memory, mathematical cognition, language acquisition, and the impact of technology on children.

Gabrielle A. Strouse, PhD, is an assistant professor of human development and educational psychology at the University of South Dakota, where she is an active member of the Science of Learning Research Group and the Center for Brain and Behavior Research. Her research focuses on understanding how adults can best support young children's learning in mediated contexts, such as from picture books, ebooks, and videos, as well as how to create more supportive children's media.

Georgene L. Troseth, PhD, is an associate professor of psychology at Vanderbilt University, where she is a member of the Department of Psychology and Human Development, Peabody College. She has published research articles and chapters about very young children's symbolic development, their learning from digital books, and their understanding of pictures and video images as sources of information.

Lauren J. Myers, PhD, is an associate professor of psychology at Lafayette College. She directs the Lafayette Kids Lab (https://sites.lafayette.edu/kidslab), where she and her undergraduate research assistants conduct research on children's understanding and use of symbolic representations and interactive media (e.g., video chat). Her research has been published in various developmental psychology journals and has been covered in major news outlets such as NBC Nightly News, Child Trends, Web MD Magazine, and Medium.
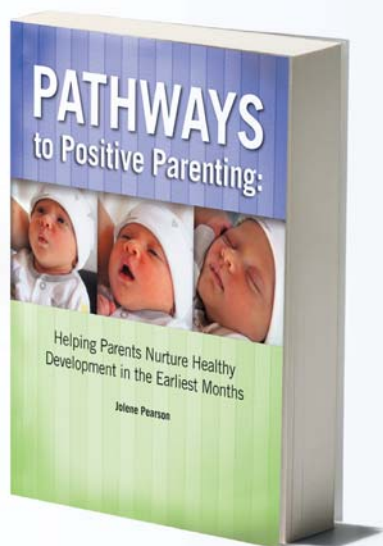
References

Ames, M. G., Go, J., Kaye, J. J., & Spasojevic, M. (2010). *Making love in the network closet: The benefits and work of family videochat.* [Paper presentation]. 2010 ACM Conference on Computer Supported Cooperative Work, Savannah, Georgia.

Armitage, R., & Nellums, L. B. (2020). COVID-19 and the consequences of isolating the elderly. *Lancet, 5*(5), E256. doi.org/10.1016/S2468-2667(20)30061-X

Barr, R. (2010). Transfer of learning between 2D and 3D sources during infancy: Informing theory and practice. *Developmental Review, 30*, 128–154. 10.1016/j.dr.2010.03.001

Barr, R. (2019). Growing up in the digital age: Early learning and family media ecology. *Current Directions in Psychological Science, 28*(4), 341–346.

Barr, R. (2020, June). *Virtual visitation: What courts should know.* [Webinar]. Quality Parenting Initiative. http://centervideo.forest.usf.edu/video/qpi/ylc/virtualvisitation/qpistart.html

Beebe, B., Jaffe, J., Markese, S., Buck, K., Chen, H., Cohen, P., Bahrick, L., Andrews, H., & Feldstein, S. (2010). The origins of 12-month attachment: A microanalysis of 4-month mother–infant interaction. *Attachment & Human Development, 12*, 1–2, 3–141.

Bornstein, M. H., Tamis-Lemonda, C. S., Hahn, C. S., & Haynes, O. M. (2008). Maternal responsiveness to young children at three ages: Longitudinal analysis of a multidimensional, modular, and specific parenting construct. *Developmental Psychology, 44*(3), 867–874. https://doi.apa.org/doiLanding?doi=10.1037%2F0012-1649.44.3.867

Brito, N., Barr, R., McIntyre, P., & Simcock, G. (2012). Long-term transfer of learning from books and video during toddlerhood. *Journal Experimental Child Psychology, 111*, 108–119. doi: 10.1016/j.jecp.2011.08.004. Epub September 10, 2011.

Centers for Disease Control and Prevention. (2020). *Older adults and coronavirus disease 2019 (COVID-19).* https://www.cdc.gov/coronavirus/2019-ncov/need-extra-precautions/older-adults.html

Dunifon, R. (2013). The influence of grandparents on the lives of children and adolescents. *Child Development Perspectives, 7*(1), 55–60.

Elder, J. H., Jr. (1974). *Children of the great depression: Social change in life experience.* University of Chicago Press.

Gaudreau, C., King, Y. A., Dore, R. A., Puttre, H., Nichols, D., Hirsh-Pasek, K., & Golinkoff, R. M. (2020). Preschoolers benefit equally from video chat, pseudo-contingent video, and live book reading: Implications for storytime during the coronavirus pandemic and beyond. *Frontiers in Psychology, 11*. https://www.frontiersin.org/article/10.3389/fpsyg.2020.02158

Goldstein, M. H., & Schwade, J. A. (2008). Social feedback to infants' babbling facilitates rapid phonological learning. *Psychological Science, 19*(5), 515–523. https://doi.org/10.1111/j.1467-9280.2008.02117.x

Gross, B., Opalka, A., Gundapaneni, P. (2020). Getting back to school: An update on plans from across the country. *Center on Reinventing Public Education.* https://www.crpe.org/sites/default/files/getting_back_to_school_brief.pdf

Guernsey, L. (2012). *Screen time: How electronic media—from baby videos to educational software—affects your young child.* Basic Books. https://books.google.com/books?id=zi2EzNLlpNYC

Gusella, J. L., Muir, D., & Tronick, E. Z. (1988). The effect of manipulating maternal behavior during an interaction on three- and six-month-olds' affect and attention. *Child Development, 59*, 1111–1124.

Hartshorne, J. K., Huang, Y., Garcia, C. R., Oppenheimer, K., Robbins, P. T., & Molino, M. D. V. (2020, September 17). *Screen time as an index of family distress.* https://doi.org/10.31234/osf.io/zqc4t

Hirsh-Pasek, K., Adamson, L. A., Bakeman, R., Owen, M. T., Golinkoff, R. M., Pace, A., et al. (2015). The contribution of early communication quality to low-income children's language success. *Psychological Science, 26*, 1071–1083. doi: 10.1177/0956797615581493

Kelly, H. (2020). Kids used to love screen time. Then schools made Zoom mandatory all day long. *Washington Post.* https://www.washingtonpost.com/technology/2020/09/04/screentime-school-distance

Kirkorian, H. L. (2018), When and how do interactive digital media help children connect what they see on and off the screen? *Child Development Perspectives, 12*, 210–214. doi:10.1111/cdep.12290

Koenig, M. A., & Harris, P. L. (2005). Preschoolers mistrust ignorant and inaccurate speakers. *Child Development, 76*(6), 1261–1277. https://doi.org/10.1111/j.1467-8624.2005.00849.x

Krcmar, M. (2010). Can social meaningfulness and repeat exposure help infants and toddlers overcome the video deficit? *Media Psychology, 13*(1), 31–53. DOI: 10.1080/15213260903562917

Kuhl, P. K. (2007). Is speech learning gated by the social brain? *Developmental Science, 10*, 110–120. https://doi.org/10.1111/j.1467-7687.2007.00572.x

Leclere, C., Viaux, S., Avril, M., Achard, C., Chetouani, M., Missonnier, S., & Cohen, D. (2014). Why synchrony matters during mother-child interactions: A systematic review. *PLOS One, 9*(12), e113571. 1

McClure, E., & Barr, R. (2017). Building family relationships from a distance: Supporting connections with babies and toddlers using video and video chat. In R. Barr & D. N. Linebarger (Eds.). *Media exposure during infancy and early childhood: The effect of content and context on learning and development*, (pp. 227–248). Springer.

McClure, E. R., Chentsova-Dutton, Y. E., Barr, R. F., Holochwost, S., & Parrott, W. G. (2015). "FaceTime doesn't count": Video chat as an exception to media restrictions for infants and toddlers. *International Journal of Child-Computer Interaction, 6*, 1–6. http://dx.doi.org/10.1016/j.ijcci.2016.02.002

McClure, E. R., Chentsova-Dutton, Y. E., Holochwost, S. J., Parrott, W. G., & Barr, R. (2018). Look at that! Video chat and joint visual attention development among babies and toddlers. *Child Development, 89,* 27–36. doi:10.1111/cdev.12833

McClure, E., Chentsova-Dutton, Y., Holochwost, S., Parrott, W., & Barr, R. (2020). Infant emotional engagement in face-to-face https://www.cairn.info/revue-enfance-2020-3-page-353.htm?ref=doi and video chat interactions with their mothers. *Enfance, 3*(3), 353–374. https://doi.org/10.3917/enf2.203.0353

Miller, P. M., & Commons, M. L. (2010). The benefits of attachment parenting for infants and children: A behavioral developmental view. *Behavioral Development Bulletin, 16*(1), 1–14. https://doi.apa.org/fulltext/2014-55579-001.html

Myers, L. J., Crawford, E., Murphy, C., Aka-Ezoua, E., & Felix, C. (2018). Eyes in the room trump eyes on the screen: Effects of a responsive co-viewer on toddlers' responses to and learning from video chat. *Journal of Children and Media, 12*, 275–294. https://www.tandfonline.com/doi/abs/10.1080/17482798.2018.1425889

Myers, L. J., Keyser, H., & Cors, M. (2019). Co-viewers support participation in video chat interactions, but live experiences promote richer word learning for 24- to 36-month-olds in the USA. *Journal of Children and Media, 13*, 415–432. https://doi.org/10.1080/17482798.2019.1646294

Myers, L. J., LeWitt, R. B., Gallo, R. E., & Maselli, N. M. (2017). Baby FaceTime: Can toddlers learn from online video chat? *Developmental Science, 20*, e12430. https://onlinelibrary.wiley.com/doi/abs/10.1111/desc.12430

Myers, L. J., & McKenney, E. E. (2019, October). *Run away or play with Grandma? How do parents support children's video chat experiences with relatives?* [Poster presentation]. Biennial Meeting of the Cognitive Development Society, Louisville, KY.

National Health Service. (2020). *Loneliness*. https://www.nhs.uk/conditions/stress-anxiety-depression/loneliness-in-older-people

National Research Council & Institute of Medicine. (2000). *From neurons to neighborhoods: The science of early childhood development.* J. P. Shonkoff & D. A. Phillips, (Eds), Board on Children, Youth, and Families; Commission on Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

Nielsen, M., Simcock, G., & Jenkins, L. (2008). The effect of social engagement on 24-month-olds' imitation from live and televised models. *Developmental Science, 11*(5), 722–731. https://doi.org/10.1111/j.1467-7687.2008.00722.x

Parker-Pope, T. (May 20, 2020). When can I see my grandkids? *The New York Times.* https://www.nytimes.com/2020/05/20/well/family/coronavirus-grandchildren-grandparents-when-can-i-see-my-grandkids.html

Parrott, W. G., & Gleitman, H. (1989). Infants' expectations in play: The joy of peek-a-boo. *Cognition and Emotion, 3*(4), 291–311. https://doi.org/10.1080/02699938908412710

Rideout, V. (2017). *The Common Sense census: Media use by kids age zero to eight.* Common Sense Media.

Roggman, L. A. (1991). Assessing social interactions of mothers and infants through play. In C. E. Schaefer, K. Gitlin, & A. Sandgrund (Eds.), *Play diagnosis and assessment* (pp. 427–462). John Wiley.

Roseberry, S., Hirsh-Pasek, K., & Golinkoff, R. M. (2014). Skype me! Socially contingent interactions help toddlers learn language. *Child Development, 85*, 956–970. doi:10.1111/cdev.12166

Sabbagh, M. A., & Baldwin, D. A. (2001). Learning words from knowledgeable versus ignorant speakers: Links between preschoolers' theory of mind and semantic development. *Child Development, 72*, 1054–1070. https://srcd.onlinelibrary.wiley.com/doi/10.1111/1467-8624.00334

Santini, Z. I., Jose, P. E., Cornwell, E. Y., Koyanagi, A., Nielsen, L., Hinrichsen, C., et al. (2020). Social disconnectedness, perceived isolation, and symptoms of depression and anxiety among older Americans (NSHAP): A longitudinal mediation analysis. *The Lancet Public Health, 5*(1), e62–e70.

Scofield, J., & Behrend, D. A. (2008). Learning words from reliable and unreliable speakers. *Cognitive Development, 23*(2), 278–290. https://doi.org/10.1016/j.cogdev.2008.01.003

Singer, J., & Brodinsky, D. (2020). Virtual parent-child visitation in support of family reunification in the time of COVID-19. *Developmental Child Welfare.* DOI: 10.1177/2516103220960154

Smith, S. (2020). Children—but also parents—adapt to life online over video chat during coronavirus pandemic. *NBC News.* https://www.nbcnews.com/tech/tech-news/children-also-parents-adapt-life-over-video-chat-during-coronavirus-n1174311

Stevens, R., & Penuel, W. R. (2010). *Studying and fostering learning through joint media engagement.* [Paper presentation]. Principal Investigators Meeting of the National Science Foundation's Science of Learning Centers, Arlington, VA.

Strouse, G. A., O'Doherty, K., & Troseth, G. L. (2013). Effective coviewing: Preschoolers' learning from video after a dialogic questioning intervention. *Developmental Psychology, 49*, 2368–2382.

Strouse, G. A., & Samson, J. E. (2020). Learning from video: A meta-analysis of the video deficit in children ages 0 to 6 years. *Child Development.* Advance online publication. https://doi.org/10.1111/cdev.13429

Strouse, G. A., Troseth, G. L., O'Doherty, K., & Saylor, M. M. (2018). Co-viewing supports toddlers' word learning from contingent and non-contingent video. *Journal of Experimental Child Psychology, 166*, 310–326. http://doi.org/10.1016/j.jecp.2017.09.005

Suddendorf, T., Simcock, G., & Nielsen, M. (2007). Visual self-recognition in mirrors and live videos: Evidence for a developmental asynchrony. *Cognitive Development, 22*, 185–196. doi:10.1016/j.cogdev.2006.09.003

Tamis-LeMonda, C. S., Kuchirko, Y., & Song, L. (2014). Why is infant language learning facilitated by parental responsiveness? *Current Directions in Psychological Science, 23*, 121–126. https://doi.org/10.1177/0963721414522813

Tarasuik, J. C., Galligan, R., & Kaufman, J. (2011). Almost being there: Video communication with young children. *PLoS ONE 6*, e17129. https://doi.org/10.1371/journal.pone.0017129

Tarasuik, J. C., Galligan, R., & Kaufman, J. (2013). Seeing is believing but is hearing? Comparing audio and video communication for young children. *Frontiers in Psychology, 4*, 64. 10.3389/fpsyg.2013.00064

Tarasuik, J., & Kaufman, J. (2017). When and why parents involve young children in video communication. *Journal of Children and Media, 11,* 88–106. https://doi.org/10.1080/17482798.2016.1233124

Troseth, G. L. (2003). Getting a clear picture: Young children's understanding of a televised image. *Developmental Science, 6*, 247–253. doi:10.1111/1467-7687.00280

Troseth, G. L., Saylor, M. M., & Archer, A. H. (2006). Young children's use of video as a source of socially relevant information. *Child Development, 77*, 786–799. doi.org/10.1111/j.1467-8624.2006.00903.x

Troseth, G. L., Strouse, G. A., Verdine, B. N., & Saylor, M. M. (2018). Let's chat: On-screen social responsiveness is not sufficient to support toddlers' word learning from video. *Frontiers in Psychology, 13.* https://www.frontiersin.org/articles/10.3389/fpsyg.2018.02195/full

Tsuji, S., Fiévét, A.-C., & Cristia, A. (2020). *Toddler word learning from contingent screens with and without human presence.* Manuscript submitted for publication. Preprint retrieved from https://psyarxiv.com/7hxjk

van Deursen, A. J., & van Dijk, J. A. (2018). The first-level digital divide shifts from inequalities in physical access to inequalities in material access. *New Media & Society, 21*(2), 354–375. https://journals.sagepub.com/doi/10.1177/1461444818797082

Werber, C. (2020). *How can we look after older people when the coronavirus has made it impossible to see them?.* Quartz. https://qz.com/1824445/how-can-we-look-after-older-people-when-coronavirus-has-made-it-impossible-to-see-them

Winslow, J. (2019, July). America's digital divide. *Trust Magazine.* https://www.pewtrusts.org/en/trust/archive/summer-2019/americas-digital-divide

Zack, E., Barr, R., Gerhardstein, P., Dickerson, K., & Meltzoff, A. N. (2009). Infant imitation from television using novel touch-screen technology. *British Journal of Developmental Psychology, 27*, 13–26 Doi:10.1348/026151008X334700

ZERO TO THREE
Early connections last a lifetime

LOOKING FOR MORE TOOLS TO ENHANCE YOUR
PRACTICE? BECOME A ZERO TO THREE MEMBER AND
GET FREE ACCESS TO PROFESSIONAL RESOURCES

Become a member of the ZERO TO THREE Community

SPECIAL OFFER! Use code AR5MB17 to save
$10 off an annual membership

FREE ZERO TO THREE JOURNAL SUBSCRIPTION
MEMBER ONLINE EXCLUSIVES
FREE VIRTUAL LEARNING EVENTS
DISCOUNT TO ANNUAL CONFERENCE AND BOOKSTORE
AND MUCH MORE!

VISIT
WWW.ZEROTOTHREE.ORG/MEMBERSHIP