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Media and Technology in the Lives of Infants and Toddlers

Research on Television Viewing

Electronic Media and Language Development

Toddlers and Touch Screens

Cultural Influences on Media Use

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Reflections of a ZERO TO THREE National Training Institute Neophyte

THIS ISSUE AND WHY IT MATTERS

There has been an explosion of technology and media in the lives of infants and toddlers. When we last published a Journal issue on "Babies, Toddlers, and Technology" (Oct/Nov. 2001), research was just beginning to explore its impact on child development in the earliest years. Since that time, both the opportunities for interacting with media and technology and the research on their impact have increased dramatically. While much has been learned, the research literature is still limited in this emerging area of inquiry. The question has changed from "Is media and technology good or bad for children?" to "How can we use media and technology responsibly and in helpful ways?"

One thing is clear: Media and technology are here to stay. In addition to computers, TV, and video games, statistics indicate that more than half of children have access to newer mobile devices in their homes (Rideout, 2011). Media use starts in the first year of life for many children. New media are also bringing new challenges. With the introduction of mobile devices, children are now more apt to be using more than one screen at a time, such as playing on a tablet computer while watching TV. How is this multitasking having an impact on brain development? What is the potential to use technology as an educational tool? What role do parents and caregivers need to play in order to effectively manage their children's exposure to media and technology? How do culture and socioeconomic status impact media use and its positive and negative effects? The contributors to this issue of *Zero to Three* share the insight gained over the past decade, explore the new questions raised, and reveal a complex picture of how children and their caregivers interact with the devices and media now available.

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Rideout, V. (2011). *Zero to Eight: Children's media use in America.* Common Sense Media, Washington, DC.

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What Researchers Have Learned About Toddlers and Television

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Alarmed by the rising tide of media directed at infants and toddlers, the American Academy of Pediatrics (1999) recommended that children have no exposure to screen media before they are 2 years old. They were able to cite almost no direct evidence in support of their recommendation, and so were acting in anticipation of possible harm. In 2001, Daniel Anderson and Marie Evans provided a piece for *Zero to Three* titled "Peril and Potential of Media for Infants and Toddlers" which posed far more questions than answers. Twelve years later, we review what has been learned since then. Almost all that has been learned concerns television, the medium most used by young children.

Anderson and Evans (2001) argued that a distinction should be made between TV in the "foreground"— that is, programming actually directed at infants and toddlers—as compared to media in the "background"—that is, media directed at adults or much older children but which are nevertheless experienced by infants and toddlers. Anderson and Evans argued that background and foreground TV likely had different effects on infants and toddlers. Because infants can understand little of TV directed at older viewers, background TV may function as a dynamic audiovisual distraction. Foreground media, designed for very young children, could potentially provide a basis for learning either individually or jointly with a parent. It is conceivable that foreground media could enrich parent–child interactions. The distinction between foreground and background TV has since been adopted by researchers in the field who, collectively, have helped clarify the impact of TV on very young children.

Background TV

Recent estimates indicate that American children less than 3 years old spend an average of about 5½ hours a day in the presence of a TV set that is in use when the child's primary activity is something other than watching TV, such as playing with toys, eating, or socializing (Lapierre, Piotrowski, & Linebarger, 2012). Averages, of course, conceal the reality that infant exposure to background TV varies widely from little or none to every waking hour of the day. Infants are frequently present as parents or older siblings watch their programs, or simply because the TV has been left on with no one watching (Schmitt, Woolf, & Anderson, 2003).

TV programming is designed to attract human attention. The onset of attention, particularly in infants, is elicited by visual and auditory change (Gola & Calvert, 2011). Sustained attention to TV, on the other hand, is related to comprehension of ongoing

Abstract

This article reviews research conducted after the American Academy of Pediatrics 1999 recommendation against screen exposure for children less than 2 years old. Television in the background disrupts play and parent–child interactions. Background TV exposure is associated with negative cognitive and language outcomes. Children begin to understand conventional age-directed TV programs between 1½ and 2½ years old, after which TV can be educational. Before about 2½ years, learning from TV is less than learning from equivalent real-life situations. Although TV exposure before 2 years old is associated with slower cognitive and language development, most of that research does not separate age-directed TV content effects from adult, background TV effects.

content, with further sustained attention being related to the viewers' knowledge and interests (Anderson & Hanson, 2010). Almost by definition, however, background TV is mostly not comprehensible to infants and toddlers. In the presence of background TV, infants pay relatively little sustained attention to the TV screen (Schmidt, Pempek, Kirkorian, Lund, & Anderson, 2008). Nevertheless, they glance at the screen about 46 times an hour, rarely sustaining attention for more than a few seconds.

Anderson and Evans (2001) hypothesized that background TV produces strong orienting reactions toward the TV and that these "orienting reactions disrupt very young children's ongoing play schemes, making it difficult to resume play at a mature level. Such reactions may also interfere with parent–child interactions" (p. 12). In effect, background TV could be a powerful source of environmental distraction to very young children.

At the time, there was no evidence to support this hypothesis. Since then, background TV has been implicated as a potential risk factor in early development. In two experimental laboratory studies, 1-, 2-, and 3-year-olds were observed both with and without a TV playing an adult-directed TV program in the background. In one study, solitary toy play was observed, and in the other, parent–child interactions were the focus. In both studies, background TV was a disruptive influence. Compared to no TV, toy play episodes in the presence of background TV were about half as long, with less focused attention during play (Schmidt et al., 2008; similar findings were reported by Setliff & Courage, 2011). Parent–child interactions were less frequent and were of lower quality in the presence of background TV. Parents were also less responsive to children's bids for attention (Kirkorian, Pempek, Murphy, Schmidt, & Anderson, 2009). Other laboratory studies have found reduced language and richness of language during TV viewing (Lavigne, Hanson, Pempek, Kirkorian, & Anderson, 2011; Pempek, Kirkorian, & Anderson, 2010; Tanimura, Okuma & Kyoshima, 2007).

A study of families with low socioeconomic status (SES) found that during TV use at home parents provide a less-rich language environment for their children than when the TV is off (Mendelsohn et al., 2008). As a disruptive force in the child's environment, the findings suggested that chronic exposure to background TV should be associated with poorer development. Thus far, research supports that conclusion. In a longitudinal study with low-SES families, Tomopoulos et al. (2010) found that background TV exposure at 6 months old negatively predicted both cognitive and language development at 14 months old. Another longitudinal study found that exposure to background TV at 1 year old negatively predicted executive function (attentional skills and cognitive self-control) as well as other aspects of cognitive development at 4 years old (Barr, Lauricella, Zack, & Calvert, 2010).

Taken together, the research indicates that background TV disrupts infants' sustained attention to self-initiated activities, reduces the quality of parent–child interactions, and reduces the quantity and richness of language directed at the child. It is not surprising, then, that chronic exposure to background TV is associated with reduced attentional skills, language development, and cognitive development more generally.

Foreground TV

Foreground TV consists of programming that is of interest to toddlers and which may be comprehensible. In general, it consists of programs that are specifically designed for very young children such as *Teletubbies* or the *Baby Einstein* videos. In 2001, Anderson and Evans could say little about very young children's comprehension or attention to foreground TV, although it was known that attention to *Sesame Street* increased with age in very early childhood (Anderson & Levin, 1976) and that children as young as 24 months paid more attention to a normal version of *Sesame Street* than they would to the same program if it was rendered less comprehensible (by randomly re-ordering shots, using backward dialogue, or foreign language; Anderson, Lorch, Field, & Sanders, 1981). These findings were suggestive that with age, programming becomes more understandable, and that understanding drives sustained attention (Anderson & Lorch, 1983). From that point of view, if babies were paying attention to baby videos, they might understand something from them, and therefore it was possible that they could be learning from them.

Comprehension

With the flood of baby videos and toddler TV programs in the 1990s, there were many anecdotal reports of babies watching TV, often with apparently sustained attention. Because programs were labeled as being for children as young as 3 months old, the obvious question was whether they could in fact comprehend and learn from them. Several research groups began to try to answer this question. Thus far, the research reveals that comprehension of video does not develop all at once; compared to real life, there is a deficit in comprehending and learning from video. Video viewing experience and the social context of viewing have been found to influence whether toddlers learn from video.

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Foreground media, designed for very young children, could potentially provide a basis for learning either individually or jointly with a parent.

The question of whether babies comprehend TV is actually quite complex. At a simple level is the question of whether they can recognize 2-D video images as representations of 3-D objects and settings in the real world. At a more complex level is whether they are able to integrate video and audio. On TV, after all, many sounds are not directly associated with characters and objects in the ways that they are in the real world. TV programs often use musical underscores, voiceover narrations, and other techniques that are not part of a baby's ordinary real-world experience. At an even more complex level, most TV programs are constructed by editing video clips together in a kind of film grammar that is unlike the real world. For example, a film might show the outside of a building followed by a cut to an interior scene. The adult viewer immediately recognizes that the interior scene represents a space inside of the building. But when do babies come to understand such shot sequences?

By 6 months old babies are able to recognize familiar real-world images on a video screen. For example, if babies are shown two screens, one with a video of the baby's father and one with the mother, and a central speaker says the word "mama" or "papa" (or other words the parents use to label themselves), 6-month-old babies will reliably look at the screen that matches the word (Tincoff & Jusczyk, 1999). This shows not only that babies can recognize images of

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By 6 months old babies are able to recognize familiar real-world images on a video screen.

their parents, but that they can also match that image to a voiceover sound. By 10 months old, babies recognize familiar intentional actions shown across single shots lasting several seconds, looking longer (at repetitions of the shots) if the action is interrupted or has an unusual ending (Baldwin, Baird, Saylor, & Clark, 2001).

But most video is edited; that is, it conveys actions and events across multiple shots. In the kind of video that infants would likely experience on TV at home, such shots average about 6 seconds in length, and the transitions between shots require some cognitive interpretation. Some transitions require interpretations of spatial relationships (e.g.,the transition between outside and inside shots), whereas others denote the passage of time, simultaneity of actions, character point of view, and so on. In a brain imaging study of adult viewers, a network of 17 distinct cortical areas was activated in order to interpret action sequences taken from Hollywood movies (Anderson, Fite, Petrovich, & Hirsch, 2006). Because many of these brain areas are slow to mature, one might suppose that comprehension of edited video is a challenging task for infants.

It had already been shown that children 24 months and older pay greater attention to *Sesame Street* if the shots occurred in normal, rather than random, order (Anderson et al., 1981). This would indicate that, by their second birthday, toddlers are extracting enough meaning from the normal sequence of shots that they prefer them to the same shots in random order. In order to determine when this begins, babies 6, 12, 18, and 24 months old were shown episodes of *Teletubbies* that were normal or that had shots in random order. Using both heart rate and looking behavior as measures of attention, Pempek, Kirkorian, Richards, et al., (2010) found that only at 18 months old did infants begin to pay more attention to normal shot sequences. It is likely that before 18 months infants could comprehend individual shots but were unable to appreciate the continuity of actions and story across shots. Taken together, these findings suggest that although children less than about 18 months old can understand individual images and actions on TV, they do not yet have a connected understanding over time in the way of an older child or an adult.

Once toddlers begin to have a connected understanding of TV, they can, in principle, learn from it. Certainly, older preschoolers greatly benefit from watching programs such as *Sesame Street* with positive impact traceable through adolescence (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001). That raises the question of whether and how much learning occurs during infancy.

One approach has been to use tasks with babies that are known to produce learning during live interactions. Because the baby usually has little difficulty learning from the live situation, the strategy is to provide on video the same situation, as closely matched as possible. This type of research has revealed that when they are less than about 2½ years old, children suffer from a *video deficit* (Anderson & Pempek, 2005). That is, children learn less from a video demonstration compared to an equivalent live demonstration.

A toddler, looking through a window, is shown a toy being hidden in an adjacent room. Children as young as 2 years readily find the toy when given a chance to do so. The key question is, if they see a closely matched video of the toy being hidden, will they also be able to find the toy? It is surprising that 2-year-olds are unable to find the toy even after viewing the hiding event on video, although 2½ -year-olds and older children are more able to use the video to guide their search (Schmitt & Anderson, 2002; Troseth & DeLoache, 1998). The difference in favor of a real-life experience holds even if the toddlers are simply verbally told where the toy is hidden either live or on closed circuit video (Schmidt, Crawley-Davis, & Anderson, 2007).

The video deficit extends to other situations. Rachel Barr and her colleagues have shown that 1-year-olds can readily imitate actions performed on a puppet (e.g., removing a mitten to find a bell inside), even a day later. When shown an exactly matched video, however, they evidence little learning of the demonstrated actions (Barr & Hayne, 1999). In a different imitation task involving assembling puzzle pieces on a magnetic board, they found a video deficit for children as old as 3 years (Dickerson, Gerhardstein, Zack, & Barr, 2012). Similarly, 12-month-olds imitated fewer actions seen on a video screen than the same actions seen live (Klein, Hauf & Aschersleben, 2006).

The video deficit extends to language learning. Patricia Kuhl and her colleagues examined the phenomenon of *perceptual narrowing* that occurs with respect to phoneme discrimination (phonemes are the fundamental sound units of languages). At about 6 months old, infants are able to distinguish between essentially all the phonetic contrasts used in all human languages. By 12 months old, they no longer discriminate between many phonetic units if those units are not used in the language to which they have been exposed. Kuhl, Tsao, and Liu (2003) showed that between 6 and 12 months, twelve 25-minute sessions of exposure to spoken Mandarin (using a real-life interactive adult speaker) were sufficient to maintain American infants' ability to discriminate between phonetic distinctions made in Mandarin but not in English. It is important to note that they also showed separate groups of infants either audiovisual DVDs or audio alone of the same person following the same script in Mandarin. The results were clear: Only the real-life condition prevented the perceptual narrowing by 12 months old.

The video deficit holds for word learning by older infants. It has been shown that from about 1 year and older, infants can learn labels for unfamiliar objects using a

technique called *fast mapping*. The labels are often learned with only a single presentation. Krcmar, Grela, and Lin (2007) compared word learning in 15- to 24-month-olds with live and video presentations (either exactly matched or in the context of a *Teletubbies* program). Again, word learning was far more successful with the real-life presentation. Another research group failed to find verb learning from video in children a year older unless the video was supported by an interacting real person present at the time the child watched the video (Roseberry, Hirsh-Pasek, Parish-Morris, & Golinkoff, 2009).

The video deficit is not absolute; it can be overcome in some situations. Georgene Troseth and her colleagues have shown that successful object retrieval based on video can occur if the toddlers have had experience seeing themselves as they interact in front of a camera on closed circuit TV (Troseth, 2003; Troseth, Casey, Lawver, Walker, & Cole, 2007). This interactive experience may help toddlers recognize that objects and settings on TV can have real world counterparts. Troseth and colleagues have also shown that social context can help the child overcome the video deficit. For example, if an experimenter develops an interactive social relationship with a child via closed-circuit TV, the child will subsequently be able to successfully find the hidden toy shown on video (Troseth, Saylor, & Archer, 2006). Similar results were found for imitation by Nielsen, Simcock, and Jenkins (2008). Lauricella, Gola, and Calvert (2011) found better performance on a cup-stacking task if it was demonstrated by a familiar character (Elmo) than by a strange puppet. Strouse and Troseth (2008) demonstrated that familiarity of viewing context can also influence whether or not there is a video deficit. Infants imitated actions seen on a video as well as seeing the actions live, but only if the video was presented on an unfamiliar TV in an unfamiliar room (compared to seeing the video at home on the family TV). This may indicate that toddlers tend to discount video information viewed at home, perhaps because they have seen so much that is not real on the family TV. These studies are suggestive that infants can learn from simple video presentations, but social and other contextual factors play important roles in whether learning occurs.

A single exposure to an infant-directed program, such as *Teletubbies*, influences 30-month-old children's toy preferences and play behaviors after viewing, suggesting that by this age, there is a transfer of learning from what they see on TV to their play with real-world objects (Hanson, Lavigne, & Anderson, 2012). It remains to be seen how early this form of learning begins to occur.

Laboratory studies have shown that toddler learning from simple videos is a sometimes thing, easily influenced by interactive video experience, social context, and familiarity with the viewing situation. In the real world, however, infants and toddlers often watch the same video over and over. It is not surprising that repetition increases learning from videos. For example, doubling the repetitions of a video was equivalent to a single live demonstration in an imitation task with 1-year-olds (Barr, Muentener, Garcia, Fujimoto, & Chávez, 2007).

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Children learn less from a video demonstration compared to an equivalent live demonstration.

Learning From Commercial Videos at Home

Under some conditions, infants show clear learning from video, and even when that learning is less than in a live comparison condition, many studies demonstrate some learning (Klein et al., 2006). So, especially with repeated viewing, the question is raised as to whether toddlers may in fact learn from commercial videos at home. In contrast to the typical laboratory, however, homes vary a great deal in hustle-bustle and other distractions. Older siblings often control the content of the TV available to toddlers, and parents themselves vary a great deal in how much age-directed video they make available for their toddlers to watch.

Studies of learning from commercial videos at home over a month have produced mostly negative findings—toddlers did not learn specific object labels (DeLoache et al., 2010; Fender, Richert, Robb, & Wartella, 2010; Robb, Richert, & Wartella, 2009). Vandewater (2011), however, found word learning from a commercial video over a longer period of time (3 months). Again, greater repetition may allow some video learning in very young children.

Linebarger and Walker (2005) reported a study that measured language development in relation to specific programs viewed over 2 years starting at 6 months old. Some programs were associated with increased language development (*Dora the Explorer, Blue's Clues, Arthur, Clifford*) whereas others were associated with slower development (*Teletubbies*). Yet other programs were associated with mixed results (*Sesame Street, Barney and Friends*). It is important to note that viewing particular programs involves self-selection by the infants and their parents. It could be that families with a greater focus on language select some children's programs in preference to others, or that children themselves select programs on the basis of how much language they can understand.

Development in Relation to Overall TV Exposure

It is much easier to simply ask parents how much TV their child watches than it is to have parents log exposure to specific programs or kinds of programs. Studies that take the easier approach have examined attentional, cognitive, language, and social development. These large-scale survey studies follow the strategy of statistically controlling for parent and family differences in trying to determine the association of media use with developmental outcome. The biggest problem in interpreting these studies is that they usually lump educational content

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Grandparents are connecting with their grandchildren over long distances via video chat applications.

Learn More

Books

The Handbook of Children, Media, and Development
S. L. Calvert& B. J. Wilson (2008)
Malden, MA: Wiley-Blackwell

Mind in the Making: The Seven Essential Life Skills Every Child Needs
E. Galinsky (2010)
New York, NY: HarperStudio

Into the Mind of Babes: How Screen Time Affects Children Birth to Age Five
L. Guernsey (2007)
Philadelphia, PA: Basic Books.

Children and Television: Fifty Years of Research
N. Pecora, J. Murray, & E. Wartella (Eds.) (2006)
Mahwah, NJ: Lawrence Erlbaum Associates

Web Sites

Center for Media and Health
www.cmch.tv/

Children Now
www.childrennow.org/index.php/

Common Sense Media
www.commonsensemedia.org/

Fred Rogers Center
www.fredrogerscenter.org/

Joan Ganz Cooney Center
www.joanganzcooneycenter.org/

Kaiser Family Foundation
www.kff.org/entmedia/index.cfm

Sesame Workshop
www.sesameworkshop.org/

with entertainment content in addition to background TV exposure.

These studies generally report either a negative relationship or no relationship between media exposure and healthy psychological development. One line of research reported an association between early overall TV exposure and attention deficit symptoms (Christakis, Zimmerman, DiGiuseppe, & McCarty, 2004; Landhuis, Poulton, Welch, & Hancox, 2007). A subsequent study reported that this relationship was due to noneducational TV exposure (Zimmerman & Christakis, 2007). Other researchers have found no meaningful relationship between attention deficit symptoms and early TV exposure (Foster & Watkins, 2010; Obel et al., 2004; Stevens, Barnard-Brak, & To, 2009; Stevens & Mulsow, 2006).

Early TV exposure predicts poorer cognitive development, including language. Zimmerman and Christakis (2005) found that TV exposure before a child reached 3 years old was negatively related to 3-year-old performance on tests of pre-reading skills. A Canadian research group found that TV exposure at 2½ years old negatively predicted 4th-grade classroom engagement and math achievement (Pagani, Fitzpatrick, Barnett, & Dubow, 2010).

Zimmerman, Christakis and Meltzoff (2007) found that video viewing by babies up to 16 months old negatively predicted language development, but viewing by children older than 16 months had no relationship. In a study conducted in Thailand, it was reported that children who began viewing TV before they were 12 months old had more language delays than children who began later (Chonchaiya & Pruksananonda, 2008). The question has been raised as to whether TV itself somehow slows language development or another factor associated with TV is the real cause. When TV is on, both home observations and laboratory studies have found that parents' language directed toward their toddlers is relatively impoverished compared to when the TV is off (Lavigne et al., 2011; Pempek et al., 2010; Zimmerman et al., 2009); parents speak less, use shorter sentences, and use fewer new words. As it is known that parent language directed at children is extraordinarily important for language development (Hoff & Naigles, 2002), these findings suggest that TV influences language development because it influences and distracts parents. This interpretation is supported by the finding that when parents' language directed to the child is statistically taken into account, the negative effects of TV viewing on child language are eliminated (Zimmerman et al., 2009).

In addition to cognitive and language development, there are some indications that TV may influence other aspects of early development. Early TV exposure is associated with later victimization by peers, soft drink consumption, less physical activity, and greater body mass index (Pagani et al., 2010).

Conclusion

The dozen years of research since the Anderson and Evans (2001) review has greatly increased the understanding of infant and toddler TV viewing and its impact. Consistent with their hypothesis, it is important to distinguish between foreground and background TV. Background TV is a negative influence on very young children. In contrast, research on foreground TV yields mixed findings. Although toddlers have difficulty understanding and learning from TV content, experience with interactive video and adult social support can produce some learning. As of yet, however, it is clear that producers have not demonstrated that they can produce effective educational videos for children less than 2 years old.

Researchers' understanding of the long-term impact of toddler foreground video viewing is still incomplete, particularly because most outcome research has failed to distinguish child-directed from other kinds of video exposure (essentially treating exposure to an adult horror movie as being equivalent to watching *Sesame Street*). That critical point made, the research gives a view that the impact of toddler video viewing is mostly negative.

There are an ever-growing number of new media technologies and applications, from tablet computers to online video chats, which undoubtedly have the potential to influence learning from media. We speculate that, similar to TV, these new technologies

hold both perils and potentials for young children. Many new media features, such as touch screen technology, have the potential to facilitate learning by capitalizing on strategies known to promote learning among infants and toddlers, such as interactivity and contingent feedback. In addition, new media have the potential to foster relationships and development. For example, grandparents are connecting with their grandchildren over long distances via video chat applications. These kinds of video interactions, in turn, have been shown to facilitate toddler learning from normal video.

The peril as well as the promise remains. For example, researchers know that background TV exerts a negative influence in part because it distracts parents from high-quality interactions with their children. As parents text on smart phones and check social networking web sites, our own observation is that they become even more distracted. The consequences for their children remain to be understood, but we would guess that they are not positive.

Daniel R. Anderson *is professor emeritus of psychology at the University of Massachusetts Amherst. He received the AM and PhD degrees in psychology from Brown University. He has published many studies of the impact of television on young children. He has also advised on the creation and production of numerous educational television programs for preschool children. Much of the research cited here that was coauthored by Anderson was supported by grants from the National Science Foundation.*

Katherine G. Hanson, *EdM, is currently a doctoral student at the University of Massachusetts Amherst in the developmental psychology program where she is investigating the influence of media on infant and toddler development as well as how young children learn from media. Prior to entering the doctoral program, she received a BA from New York University (2000) and an EdM from Harvard University (2004). She also worked for Sesame Workshop, the creators of educational media programs such as* Sesame Street. *As a research specialist in the Education and Research Department, she focused on ways to ensure the educational efficacy and quality of the Workshop's television programs.*

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Toddlers, Electronic Media, and Language Development

What Researchers Know So Far

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Abstract

Electronic media—whether child-oriented videos and games or background television—is increasingly embedded in young children's lives, raising questions of its impact on children's language skills. New research presents a multitextured picture of how different types of e-media—depending on content, context, and a child's age—can help and hurt. Research is mixed on whether children can learn words from video demonstrations alone before they are 2 years old. Between 2 and 3 years, more evidence emerges of the positive impact of video and interactive games designed for young children. Meanwhile, background television and adult-directed TV are associated with reduced language development starting from infancy.

More than 10 years ago, *Child Development* published a study on young children and media that contained a surprising finding. The study tracked what children watched on TV and how their language skills grew over 3 years, looking at differences in children's learning from educational programs designed for children versus TV made for adults. Known as the Early Window Study, its conclusions probably would not surprise those who have read studies on *Sesame Street*: Yes, the researchers found, educational content helps children learn and noneducational content does not. But one tidbit was especially noteworthy. The children who started watching at the youngest ages—2 and 3 years old, not 4 and 5—were the ones who benefited the most. Frequent watchers performed better on tests of early literacy than those who hardly watched at all (Wright et al., 2001).

While that research was underway, a separate group of researchers, in the United States and New Zealand, were completing experiments with children of slightly younger ages. Is it possible to test, they wondered, how much infants and toddlers remember and use information they see on video or TV? How does their learning compare to face-to-face interactions? The results showed that very young children learn more from in-person demonstrations than from the very same demonstrations shown on video, paving the way for coinage of a new term: the *video deficit*. (Anderson & Pempek, 2005; Barr & Hayne, 1999; see box, Explaining the Video Deficit). Something about watching on screen, they concluded, is not as powerful for young children as watching in real life.

Explaining the Video Deficit

Exploration of the real world is crucial for young children's learning. But mothers and fathers who have seen their babies imitate them—whether it's the movement of putting a cell phone to one's ear or sweeping the floor—know that young children learn by simply watching, too. Which begs the question: Do babies and toddlers have to watch those actions live and in person to learn them? Or could they learn to imitate—or speak a word, or follow directions—just as easily if they watched those actions on TV or through a touch-screen tablet's video screen?

Studies so far show that learning from a screen is certainly possible under certain conditions—with differences showing up depending on a child's age and what task or word the child is asked to learn—but that very young children learn best from in-person demonstrations.

One early example of this research comes from a study by Rachel Barr and Harlene Hayne of 276 children who were 12 months, 15 months, and 18 months old. Barr and Hayne designed a couple of "imitation tasks" that they performed in front of the children face-to-face and via video. The tasks involved simple but unusual actions that would be novel to infants and toddlers (to eliminate the chance the children had seen them before). One, for example, involved a puppet with a paw covered by a tiny mitten, with a bell stitched inside the mitten. The experimenters would position the puppet at the child's eye level, remove the mitten from the puppet's paw, and shake the mitten three times to ring the bell inside. When 12-month-olds and 15-month-olds were shown this task in real life, most of them imitated it immediately after viewing. But when they saw exactly the same thing on video, only one of them did so. The 18-month-olds were a different lot. They appeared to retain something from the video performance and could imitate the task (Barr & Hayne, 1999).

Since then (and before then as well, in a few studies from the 1970s), scientists have tested this phenomenon with different ages of children and different tasks. They have labeled the phenomenon the video deficit—a situation in which modeling or teaching something via the screen is not as conducive to learning compared to showing children something in person. As Marina Krcmar of Wake Forest University wrote in a recent report, "the television image seems less real and vital compared to real experience" (Krcmar, 2011).

But researchers also stress that the existence of this deficit does not mean that children at 1, 2, and 3 years old cannot learn from a screen at all. Success is possible with repeated viewings as well as if the video features characteristics that give toddlers a sense of having a "social partner" in the person or character they see on screen. Those findings are launching new questions about what very young children learn from interactive and two-way media.

Two lines of research; two seemingly contradictory findings that could have—and in some quarters already have had—significant bearing on how parents and teachers think about the impact of media on the very young.

As TV is now accompanied by interactive tablet computers, questions about what very young children learn from these forms of media—or whether they learn anything at all—are as hot as ever. Language development often tops the list of concerns. Parents, teachers, and caregivers want to know whether electronic media will cause their children to learn words less quickly, develop language skills at a slower rate, or be at a disadvantage when it comes time to learn to read. On the flip side, anecdotal evidence makes them wonder whether electronic media might, in fact, play a role in developing their child's vocabulary and other pre-literacy skills. Could media and e-games actually help?

Answers aren't black and white. And contrary to the mainstream media's fixation on the number of hours of "screen time" that children experience per day or per week, the implications of the quantity of children's media consumption are overshadowed by more complicated questions of what, how, when, where, and why children are watching. Science is pointing to the complex interplay between the content on screen, the context surrounding the watching or playing, and the developmental needs of the individual child. (See box *Making Choices About E-Media: The Three C's*.) Furthermore, just as young children go through myriad stages of development, building new abilities as they age and experience new things, researchers are finding that a child's ability to understand the multifaceted aspects of electronic media follows a developmental trajectory, too.

So far, debate has circled around the age of 2 years. This where the American Academy of Pediatrics has drawn a line in the sand. Its recommendation, released in 1999 and reiterated in 2011, is plain: "The AAP discourages media use by children younger than 2 years." (AAP, 2011). Yet, the book isn't closed on the 2-year-old mark.

Making Choices About E-Media: The Three C's

Taken together, research shows that parents and caregivers should focus on three interrelated factors when choosing whether to use electronic media with their children: content, context, and the individual child.

Content: Choose engaging content designed to be comprehended by toddlers and preschoolers. Try to find out if your children can follow the story by watching with them and asking questions about what they think might happen next. Don't leave the TV on as background noise. Avoid any media that displays violence or aggression.

Context: Consider how and whether electronic media has a place in the day given a child's other needs that day—from naps to gross-motor exploration and playground romps to quiet playtime. Pay attention to how you interact with your child when the media is on and off. Just as you would with books and music, look for e-media moments that can be jumping off points for joint engagement and joyful interaction with your child.

Child: Be aware of your child's stage of development and what content is meaningful to him at his age. Tune in to what he is interested in and pay attention to the questions he asks about what he is seeing or playing. Avoid media that makes him upset or seem out of control. If your child is not yet 2 years old, make sure that screen time includes social interactions with you or other caring adults.

Adapted from *Screen Time: How Electronic Media—From Baby Videos to Educational Software—Affects Your Young Child* (p. xv-xx), by L. Guernsey, 2012, New York: Basic Books.

Inquiring minds around the country are now closely examining what is happening within children's minds during this critical period of toddlerhood—both just before and after 24 months old. While the case for learning from certain types of media at and after 24 months is gaining strength, the evidence from the 6 months just before that second birthday is mixed. A multitextured picture is emerging of how different types of e-media, in different contexts and at different ages, can help and hamper the growth of children's language skills. What's more, the importance of the quality of children's interactions with what is on screen—as well as the impact of their parents' interactions with them prompted by what is on screen—is coming into sharper focus.

Learning New Words

When parents get excited about their toddlers gaining language skills, they often focus on word learning. It can feel extraordinary and almost miraculous to hear a child, who months ago could only gesture or babble in the face of a parent's requests, start to utter recognizable words in return. When my children were babies and toddlers, I remember wondering what sparked some of the new words in their vocabulary. Could they have come from watching something on the video screen? Or did they learn those new words from simply being around me, my husband, and their other caregivers? In truth, I had an even more basic question: When is a baby's brain developmentally prepared to learn this way in the first place? What is the youngest age at which a baby might learn a word by watching video?

Some early answers of word learning via video came from a 2007 study using a version of *Teletubbies*. It showed that it is not until children are about 21 months old that they provide any evidence of being able to learn words via a screen without help from a live person (Krcmar, Grela, & Lin, 2007). But a couple of years ago, the age for that possibility moved down to 18 months. A study led by Elizabeth Vandewater at the University of Texas at Austin showed that 18-month-olds who were introduced to a crescent shape on video (with a voiceover labeling the shape as a "crescent") were later able to point correctly to a crescent when tested using a book with the same image (Vandewater et al., 2010). The study adapted clips from *Brainy Baby*, a commercially produced video aimed at children from 1 year and older, and compared nonviewing babies and toddlers to those who had watched the videos in their homes over 2 weeks.

Still, researchers caution that parents may give videos too much credit for new vocabulary. It's possible that parents see their children learning words from video when what's really happening is that their children are in the throes of the phenomenon known as the "word spurt," uttering an avalanche of new words, seemingly within weeks. "It would be easy for parents to misattribute their children's sudden linguistic advances to recent video experience," Judy S. DeLoache, a developmental scientist at the University of Virginia, and other researchers recently reported (DeLoache et al., 2010, p. 1570).

To find out whether misattribution occurs, DeLoache and her colleagues (2010) designed an experiment with many similarities to that of Vandewater's for testing what level of word learning might come from video watching before children were 2 years old. The experiment included 72 children between 12 and 18 months old. The parents were randomly assigned to participate in one of four groups over a 4-week period. Researchers asked one group to show a baby DVD in their homes and interact with their children while doing so (without any particular instructions on what that interaction should look like). A second group showed the DVD but did not interact with their children while watching. A third group did not use the DVD and instead was asked to teach up to 25 words "in whatever way seems natural to you" (these 25 words were the same words featured in the video). And a fourth group—the control group—was not given any assignment but allowed their children to be tested on which of the 25 words they may have learned in those 4 weeks.

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When parents get excited about their toddlers gaining language skills, they often focus on word learning.

The children in each group took tests of their word knowledge before the experiment began and at the end of the four weeks. The tests were one-on-one assessments by adults who asked children to point at objects that matched the words featured in the videos, such as a clock, table, and tree. (In the case of large objects, like a tree, a representation of the tree was shown to the child.)

The test results showed that children in the group whose parents taught them the words answered nearly 50% of the questions correctly, while all the other groups answered fewer than 40% correctly. The performance of the two DVD groups was not statistically different from that of the control group. In short, children learned more words from their parents teaching them directly without aid of the DVD (though evidently, with only 50% of their answers correct, even the parents weren't perfect teachers or perhaps the children weren't ready to be taught). The viewing of the DVD—which totaled 10 or more hours a week in 20 or more video episodes—had essentially no effect, good or bad, on children's word learning.

Diary entries from the parents who had used the DVDs, however, showed that the parents thought their children had learned a substantial amount by watching, just as DeLoache had predicted. Parents took their cues from how engaged their children seemed to be: "She was practically glued to the screen today," wrote one. "She was very quiet today—stared intently at the screen and ignored me when I asked her to talk," wrote another (DeLoache et al., 2010).

Similar results came from studies conducted by Michael Robb and Rebekah Richert that examined the impact of the *Baby Wordsworth* video from the Baby Einstein series on children from 12 to 25 months old (Richert, Robb, Fender, & Wartella, 2010; Robb, Richert, & Wartella, 2009). The children made some "general gains in word knowledge attributable to time and age." (Richert et al, 2010, p. E4). But, they concluded, "children who viewed the DVD at home over 6 weeks did not demonstrate new knowledge of the DVD-highlighted words." (Richert et al., 2010, p. E4).

To recap, evidence from two experimental studies showed toddlers learning words via video around 18 and 21 months old, and two others showed no evidence of children learning words via video at about the same ages.

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Parents can point to and label fixed objects to help their children learn nouns.

What accounts for the discrepancy? Maybe it was the way the children were tested. Or perhaps there were subtle differences in how images were displayed and words were expressed on screen. Another possibility lies in the difference between teaching shapes and teaching objects—could one be easier than another? Scientists have uncovered evidence, for example, that some words—such as verbs—are more difficult to learn than others, on screen and off (Roseberry, Hirsh-Pasek, Parish-Morris, & Golinkoff, 2009). Parents can point to and label fixed objects to help their children learn nouns, but helping children learn the words for various actions requires children to see a full range of similar actions in different contexts before their brains can match verb to action. Studies from Temple University showed that children around 30 months old can only learn verbs from video if their watching is followed by a live demonstration whereas older children can learn verbs from video alone.

The bottom line for parents and teachers of 18- to 24-month-olds looking for clear answers on word learning from video alone: The possibility exists if the person or character on the screen is very direct in its teaching approach, but it certainly is not guaranteed.

What about even younger children? If it's unlikely that videos, on their own, are much benefit to babies, could it be that they might, in fact, do some harm? There is still much researchers don't know. Outside of the realm of experimental research, one study based on parental reports and survey data is often cited as evidence that baby videos are not simply benign but could actually reduce language development when watched heavily by children in the range of 8 months to 16 months old. Conducted by Frederick Zimmerman, Dimitri Christakis, and Andrew Meltzoff (2007), the study was based on a telephone survey of approximately 1,000 parents on what kind of videos or television, if any, their babies and toddlers watched. The survey also asked parents to respond yes or no to an inventory of 90 common words that babies may know, such as *cup* or *fast*. Results revealed that 17% of parents said their babies watched 1 hour or more of baby videos a day—and that those babies appeared to know significantly fewer words than the other children in the study.

But educators and parents should be careful not to assume that this means that video viewing caused children to have smaller vocabularies, only that there is a link between these two characteristics. One possibility is that the parents who played the videos for an hour or more at these very young ages were less likely to talk to their babies than those who played them for less time or didn't use them at all. It's certainly plausible that less talk from parents could cause less word learning in their babies. But be aware that the study was based not on vetted tests of word knowledge but on parents' reports of the words they thought their children already knew, and some parents may be less in tune with what their children know—or, conversely, more apt to exaggerate. And no such word gap was found among parents who reported on children from 17 months to 24 months old. Given these caveats and the limitations of survey data, Zimmerman and his colleagues (2007) have argued for more experiments and more studies that track children over time.

When the Media Is Interactive

Until a few years ago, screen media for infants and toddlers meant television and DVDs. The passive nature of the technology—all the babies can do is watch—triggers worry among child development experts. Two big factors in children's healthy growth and development—active exploration and social interaction—are missing. It was these concerns that drove the AAP to put out its recommendation to avoid screen media for children less than 2 years old.

But what happens when a child under 2 years old uses screen media that do enable her to explore and interact socially? That's the question hastened by the emergence of interactive apps on devices like tablet computers and video-phone or videochat technology. Scientists are keen to learn which features of interactive technologies could be helpful to children and which ones are a waste of their time. This is inspiring a new round of experiments on video deficit, the tendency of young children to learn more or more quickly from a live in-person demonstration than a demonstration on video.

In a study at Vanderbilt University, researchers wondered whether 24-month-olds might be able to overcome the video deficit if they felt they had a personal connection with or engaged in conversation with a person or character on the screen. They set up an experiment in which children used information presented via video to find a toy hidden in a nearby room. Which would be most helpful, they wondered: interactive video (in which children were seeing a person give hints on video in real-time, as if via a webcam), participatory but noninteractive video (in which the person on video faced outward and acted as if she was talking to the children), or a live demonstration? The results showed that the interactive webcam video and the live demonstration promoted the most learning. The participatory video was not helpful, except in the cases of the few children who were most engaged and responded to the character on the screen, a discovery that delighted makers of TV shows like *Blues Clues* that try to elicit those kind of reactions. (Guernsey, 2006; Troseth, Saylor, & Archer, 2006).

Marina Krcmar of Wake Forest University took the questions a step further by testing whether a child seeing his own mother on video would be more likely to learn from the video. She and her research team shot video of mothers showing actions (e.g., clapping hands) and teaching new words as if they were talking directly to their babies. They also recorded similar videos with strangers acting out the parts. The researchers then played the videos for the babies and toddlers assigned to age groups (6–12 months, 13–20 months, and 21–24 months old). The children in the middle age group responded by imitating actions they saw on the videos of their mothers but not of the strangers. But the learning of new words was difficult for them even with their mothers on screen. Only children in the oldest age group showed signs of knowing the words that their mothers had taught on video (Krcmar, 2011). In short, even when the person on screen is as familiar and meaningful as a parent, younger toddlers appeared to have difficulty recalling words taught via video. But the results do suggest a window of opportunity for older toddlers to benefit from real-time video conversations.

Then there's interactivity of a different kind: interactions stimulated by games on touch screen tablets and other child-friendly computers. Babies and toddlers are being regularly exposed to interactive games and apps, as any search online for pictures or videos of "babies and iPads" can attest. A new generation of researchers—not to mention parents—want to know the impact of these interactive games on cognitive development. No independent, published,

and peer-reviewed research has provided answers yet for the very young, but one study from Georgetown University does raise the possibility of 2½-year-olds gaining something from these games. In an experiment with 30- to 36-months-olds using a touch-based interface and a computer, researchers showed that an interactive computer game could rival face-to-face learning and was more useful in helping children learn than passive video (Lauricella, Pempek, Barr, & Calvert, 2010). "When faced with a cognitively challenging task, both developmental factors and interactivity are important for children's success" (p. 367) wrote Alexis Lauricella, the lead author. But experts agree that much more research is necessary to assess the educational value of different types of touch screens and apps, especially when unaccompanied by parental input or guidance.

Developing Language Skills of All Kinds

The focus of most research so far might leave you mistakenly thinking that word learning is the end-all, be-all of language development. Not at all. It merely happens to be one of the easiest factors to measure. Multiple factors within a child's environment, building upon each other over time in the first few years of a child's life, have enormous bearing on how well children learn to understand language, express themselves, and ultimately learn to read and write. (National Research Council & Institute of Medicine, 2000). There is a huge amount of research to do to unpack what video and interactive media means to language development from the earliest months of life, as babies start to recognize different sounds in speech and segment into words, to the preschool years, when children are putting thoughts together in complex sentences.

Take storytelling, for example. Being able to comprehend the content of a book and follow a narrative is crucial to understanding what that book is about and being able to talk about it. Studies of preschool TV indicate that the same is true for video. Video programs that contain flashbacks, dream sequences, or quick cuts between scenes are difficult for a young child to follow, while video stories that follow a linear sequence—taking a character from point A to point B—may be more comprehensible and therefore more potent as learning tools. One longitudinal study led by Deborah Linebarger of the University of Pennsylvania, who is known for her work evaluating the reading show *Between the Lions*, showed that some children gained early literacy skills from watching certain educational TV shows from when they were 12 months to 30 months old. The Nick Jr. show *Dora the Explorer*, whose simple plot lines were designed to enable 2-year-olds to follow them, was among them (Linebarger & Walker, 2005).

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Scientists are keen to learn which features of interactive technologies could be helpful to children and which ones are a waste of their time.

Studies of book-reading with preschoolers have shown that children are more likely to gain early literacy skills if adults not only read the books but also ask questions about characters, images, and what might happen next in the story. Such back-and-forth interactions are key to fostering language development. Yet preliminary findings from studies of children's e-books are troubling. By observing how parents interact with their children when using e-books, researchers have discovered that instead of talking about the story, parents issue directives (e.g., "Click here. Don't click there. Touch this!"). Early tests of children's comprehension show them less likely to recall elements of the story than children whose parents read the same books in print form (Chiong, Ree, & Takeuchi, 2012; Parish-Morris, Hirsh-Pasek, Golinkoff, & Collins, 2011; Robb, 2010).

Language learning may be most hampered by a more nefarious kind of screen time: TVs that are on when children aren't watching or that show adult-oriented programs children aren't paying any attention to. This background television—dubbed in a USA TODAY article as "second-hand TV" (Toppo, 2011, p. A1)—is ubiquitous in many households, with 39% of parents with children up to 4 years old reporting that they left the TV on most or all of the time (Vandewater et al., 2005). A recent study showed that infants are exposed to much more of it than preschoolers (Barr, Lauricella,

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Books

Reading With Babies, Toddlers & Twos: A Guide to Laughing, Learning, & Growing Together Through Books
S. Straub & K. J. Dell'Antonia (2013)
Naperville, IL: Sourcebooks

Pioneering Literacy in the Digital Wild West: Empowering Parents and Educators
The Campaign for Grade-Level Reading, (2012)
http://gradelevelreading.net/resources/technology-for-successful-parenting

Screen Time: How Electronic Media—From Baby Videos to Educational Software—Affects Your Young Child
L. Guernsey (2012)
New York, NY: Basic Books

The Elephant in the Living Room: Make Television Work for Your Kids
D. A. Christakis & F. J. Zimmerman (2006)
Emmaus, PA: Rodale

Web Sites

ELE, Early Learning Environment, Fred Rogers Center for Children's Media and Early Learning
http://ele.fredrogerscenter.org/

Common Sense Media
www.commonsensemedia.org/

Joan Ganz Cooney Center at Sesame Workshop
www.joanganzcooneycenter.org/

Wonderopolis, from the National Center For Family Literacy
http://Wonderopolis.org

Zack, & Calvert, 2010). There's evidence that background TV may have a significant impact on the parent–child interactions that are so critical to language development. Researchers at the University of Massachusetts have made careful observations of how children and parents interact in a room with the TV on, and they have found a significant decrease in the quantity and quality of the conversation between parent and child compared to cases in which the TV is off (Kirkorian, Pempek, Murphy, Schmidt, & Anderson, 2009).

Other researchers have found ill effects of adult-directed TV programs—including the nightly news, sitcoms, police dramas, and other programs that likely qualify as background television for the very young—on early language development. One longitudinal study of 60 children found a link between heavy exposure to adult-directed TV at 1 year old and poor cognitive outcomes at 4 years old, including lower vocabulary scores, compared to children without such exposure (Barr et al., 2010). Similar bad news arrived with a study of 259 children starting even earlier—at 6 months old. In that study, Suzy Tomopoulos and her team (2010) found that by 14 months old, children exposed to adult-oriented programs tested lower on measures of cognitive development and received lower language scores than children with less exposure. Here the sheer amount of time watching TV did matter; the more total TV time, the worse the scores. The lowest performance showed in babies who were "watching" more than 6 hours of TV a day. But content mattered, too: Aside from quantity issues, no significant adverse effects were found for infants exposed to educational programming designed for young children.

With background television, researchers continue to search for the culprit of lower language development. Is it the way an always-on TV lessens parents' interactions with their children, the noise from the television, the content or pace of what is on screen, or all of the above? Alan Mendelsohn, a pediatrician who researches the effect of TV on very young children, has found that encouraging parents to communicate with their infants and toddlers about what they see on TV can lessen the negative effects (Mendelsohn et al., 2010).

All told, the best advice gleaned from electronic media studies so far is that which encourages parents to communicate with their young children in general—whether it is during watching or playing, after watching or playing, or not connected to media use at all. As parents come under pressure from marketers and hear claims about new interactive games and electronic toys for their children, and as TV and interactive games continue to become ubiquitous in young families' households, they may need reminders of the positive power they can have on their children's development by being careful about content and simply talking and interacting with their kids. And most of America could use a nudge on background TV as well: If the tots aren't watching, turn it off.

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The Media Environments and Television-Viewing Diets of Infants and Toddlers

Findings From a National Survey of Parents

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Researchers, physicians, and child advocates have expressed growing concern about screen media in the lives of infants and toddlers. This concern has risen with the number of media products targeted to this age group (Fenstermacher et al., 2010; Garrison & Christakis, 2005). Many credit the commercial success of *Teletubbies* and *Baby Einstein* in the mid-1990s with the explosion of infant- and toddler-targeted videos and DVDs in the marketplace (Anderson & Pempek, 2005; Christakis, 2008; DeLoache et al., 2010). In 2006 an entire premium cable channel was launched for viewers in diapers; *BabyFirstTV* became the first channel to air round-the-clock programming for children less than 2 years old. The channel became standard fare for families with regular cable subscriptions to Dish Network in 2012.

Most of the video/DVD and television programs available for infants and toddlers carry seductive claims of educational or developmental benefits (Fenstermacher et al., 2010; Garrison & Christakis, 2005). These claims are often displayed on video packaging, product web sites, and in the opening segments of the programs themselves, and may be implicit or directly stated (Fenstermacher et al., 2010). Several large-scale surveys have indicated that parents with young children often believe that television, videos, and other screen media products can be beneficial for infants' and toddlers' development. A study by the Kaiser Family Foundation found that 58% of parents surveyed felt that educational television programs were important for the intellectual development of children less than 6 years old, and 49% felt this way about educational videos (Rideout, Vandewater, & Wartella, 2003). In additional research, more than 70% of parents of 6- and 18-month-olds felt that baby videos had the "potential to stimulate brain development," while more than half felt that baby videos "teach concepts" to their children (Courage, Murphy, Goulding, & Setliff, 2010).

Unfortunately, the existing research does not support the educational marketing claims that accompany these products. In fact, the majority of academic studies that have been conducted in this area to date suggest a *video deficit* effect (Anderson & Pempek, 2005), whereby infants and toddlers do not learn as readily from video sources as they do from live presentations of the same information. This trend has been found across a number of different types of learning, including problem-solving (Richert, 2007; Schmitt & Anderson, 2002), language development (DeLoache et al., 2010; Krcmar, Grela, & Lin, 2007; Kuhl, Tsao, & Liu, 2003), and behavioral imitation (Barr & Hayne, 1999; Hayne, Herbert, & Simcock, 2003).

What is more, several studies have shown that infants' and toddlers' television and video viewing can be associated with a variety of unfavorable outcomes. For example, more time in front of the screen is associated with a later bedtime and less overall time spent sleeping among young children (Evans & Linebarger, 2010; Taveras, Rifas-Shiman, Oken, Gunderson, & Gillman, 2008). Others studies have indicated that young children engage in less overall interaction

Abstract

High rates of infant and toddler screen media use coupled with research indicating no benefit to this viewing have led the American Academy of Pediatrics (AAP) to advise against any screen media use with children less than 2 years old and less than 2 hours per day of entertainment programming for children 2 years and older (AAP, 2011). Our survey of 297 parents with children birth to 3 years old confirms that young children are growing up immersed in media-rich homes, and that most view more than the AAP recommends. Particularly high viewing rates occur among older children (2–3 year olds), children with a bedroom television, and those whose parents believe in various benefits of viewing.

with caregivers and toys when the television set is on, and when they do interact those interactions tend to be of lower quality (Courage et al., 2010; Kirkorian, Pempek, Murphy, Schmidt, & Anderson, 2009; Masur & Flynn, 2008; Nathanson & Rasmussen, 2011).

These trends and findings have caught the attention of pediatricians and other health care professionals. The lack of research indicating benefits of early childhood screen media use, as well the concern that time with media would supplant babies' and toddlers' time spent in other beneficial activities (e.g., playing, reading, and interacting with caregivers), has spurred the American Academy of Pediatrics (AAP) to advise parents against showing their children any screen media before they are 2 years old, and less than 2 hours a day of non-educational media for children 2 years and older (AAP, 2001, 2011). Although a 2004 survey showed that the majority of pediatricians are at least somewhat aware of (78%) and endorse the AAP's policy (96%), only 33% pediatricians "almost always" or "often" discuss the guideline with parents during well-child visits (Gentile et al., 2004).

Patterns of Screen Media Use

This article presents a report of the patterns of screen media use with infants and toddlers among a diverse national sample of U.S. parents with the goal of providing parents and caregivers with a comprehensive set of strategies that would reduce infants' and toddlers' exposure to screen media. We examine the media environments in which the youngest children are currently immersed, the extent of their daily screen media exposure, and the contextual factors related to varying rates in that exposure. Given the range of seductive educational claims accompanying many media products for infants and toddlers, this study also investigates parents' beliefs regarding possible favorable and unfavorable child outcomes associated with screen media use.

The sample on which this article is based includes 297 parents with children 3 years old or younger. These parents represent a subset of parents included in a larger, nationally representative study of 1,550 parents with children from birth to 17 years old. Parents reported on the media in their homes, their beliefs about the effects of media use on young children, and their child's media use during an online survey conducted in Spring 2012.

Description of Respondents

The survey respondents were parents or caregivers of children between birth and 3 years old. The sample was 47.5% female, and their ages varied between 19 and 69 years, with an average of 32.7 years old. Of this sample, 13.1% had a child less than 1 year old, 26.9% had a 1-year-old, 31.6% had a 2-year-old, and 28.3% had a 3-year-old child. Just over half of all children were girls (51.2%). Parents reported an average of 2.1 children less than 18 years old in the home, and 38.4% of the target children[1] in this sample were only children.

Photo: ©iStockphoto.com/ImagesbyBarbara

Parents with young children often believe that television, videos, and other screen media products can be beneficial for infants' and toddlers' development.

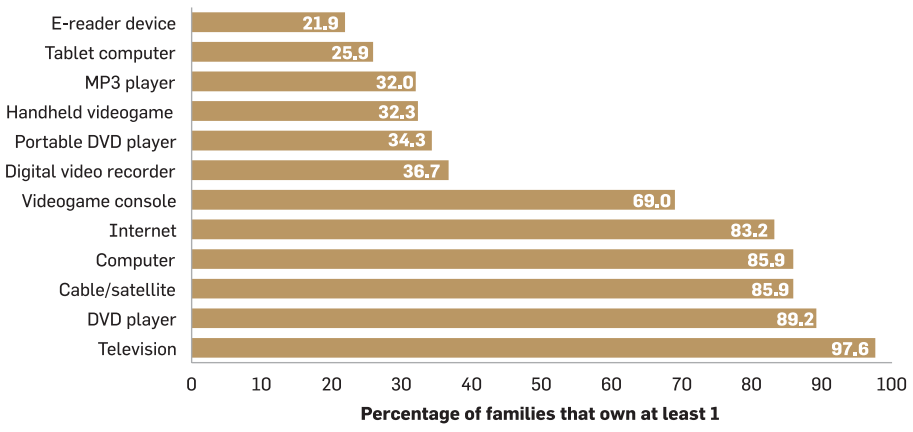
Parents in the sample were quite diverse with regards to their socioeconomic characteristics. Three quarters of parents were White/non-Hispanic (74.1%), nearly 14% were Hispanic (13.8%), 8.1% were Black/non-Hispanic, and the remaining 4% of participants reported a different or mixed race/ethnicity. Just over a quarter had a high school diploma or less education (27.3%), about a third had attended some college or had an associate's degree (32.3%), a quarter had a bachelor's degree (25.3%), and 15.3% had a master's degree or higher. About a quarter of participants reported a total household income within the following ranges, respectively: less than $30,000 (25.3%); $30,000–$59,999 (27.6%); $60,000–$99,999 (23.5%); and $100,000 or more (23.6%). The majority of participants were married or living with a partner (92.6%).

[1] All questions were asked specifically about a "target child" because media behaviors and parents' attitudes may vary from child to child in instances with more than one eligible child per household. The interviewer randomly selected the younger or the older of the two as the target child, or, in the case of three or more children the respondents were asked about the child who had the most recent birthday.

Media in the Homes of Infants and Toddlers

The young children in this sample of families live in homes replete with various media technologies. Figure 1 shows the percentage of families that own at least one of the media devices we queried. Virtually all families have at least one television set in their home (97.6%), and most have cable or satellite

Figure 1. Household Media Technology Access



access as well (85.9%). The vast majority of families also have one or more DVD players (89.2%). Video game consoles are somewhat less ubiquitous, but still present in well over half of all homes (69.0%). Most families also have a laptop or desktop computer (85.9%) as well as internet access (83.2%).

Although not quite as common, newer media technologies can be found in the homes of many infants and toddlers as well. Among the families in this sample, 36.7% have a digital video recorder. More than a third own at least one handheld video game player (32.3%), and about as many own an MP3 player (32%) or a portable DVD player (34.3%). Finally, just over a quarter of parents report access to a tablet computer in their home (25.9%), and more than a fifth have an e-reader device (21.9%).

Infants' and Toddlers' Exposure to Various Screen Media

Despite access to so many diverse media technologies in the home, the majority of infants and toddlers have media diets that consist of mostly television and DVD content.[2] Figure 2 shows the reported daily exposure to videogames, computers, and television content among children less than 2 years old and 2- to 3-year-olds. Although the older children (2- to 3-year-olds) are starting to be exposed to videogames and computers, they spend an average of only 27.6 minutes per day with the computer (*SD* = 116.4) and 4.8 minutes with video games (*SD* = 34.7). Furthermore, 95.7% of children less than 2 years old and 78.3% of 2- and 3-year-olds reportedly use no videogames or computer at all, and 92.2% of those less than 2 years old and 76.6% of 2- and 3-year-olds do not use the computer at all. Because of the low reported rates of non-television media among children in this sample the remaining analyses in this article will focus solely on their television and DVD viewing.

The mean time spent viewing television and DVDs among the children from birth to 3 years old in our sample is 2.23 hours per day (*SD* = 2.65). On average, 2- and 3-year-old children in this sample spend more time watching television/DVDs (*M* = 2.90 hours/day, *SD* = 2.38) than those less than 2 years old (*M* = 1.25 hours/day, *SD* = 2.47). As shown in Figure 3, 43.6% of children less than 2 years old have television/DVD-viewing estimates reflecting the AAP's guidelines for their age group (i.e., no viewing), compared to 41.1% of 2- and 3-year-olds whose viewing diets adhere to the AAP's guidelines (i.e., less than 2 hours per day). Parents in this study were not asked about their familiarity with the AAP's guidelines, therefore it is uncertain whether these parents are knowingly or unwittingly allowing their children to exceed the suggested limits.

Figure 2. Children's Time Spent With Screen Media

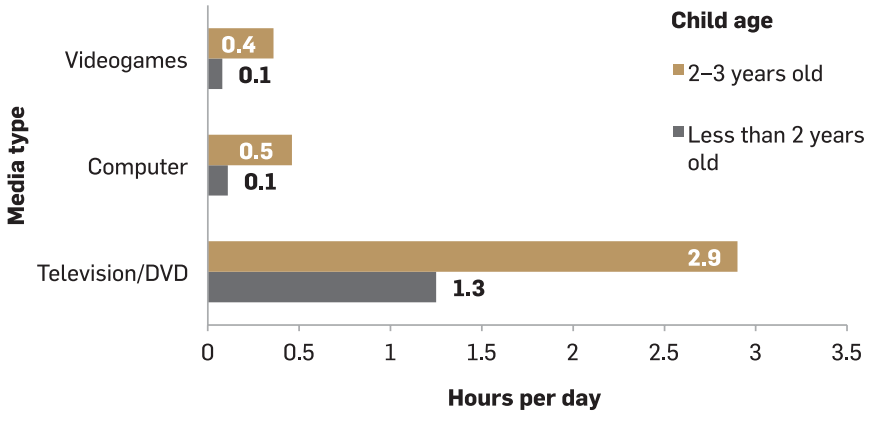
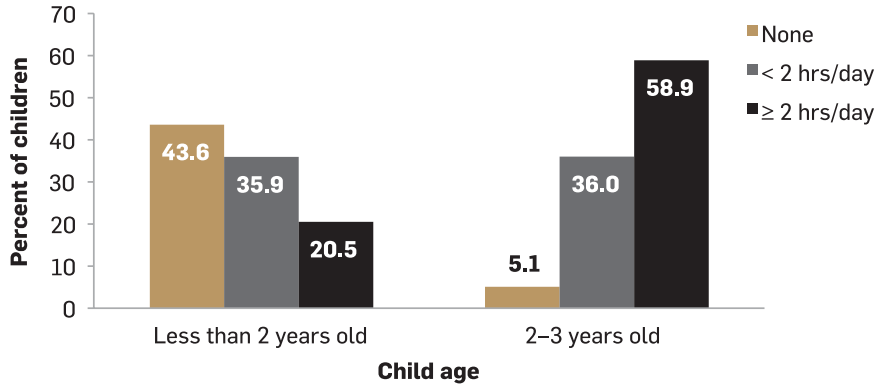


Figure 3. Children's Daily Television/DVD-Viewing by Age



*Note: AAP guidelines recommend that children less than 2 years old watch no television/DVDs, and that children 2 years and older watch less than 2 hours per day.

Television/DVD Viewing Rates Depending on Family-Level Factors

Children's television/DVD viewing estimates were examined for potential differences depending on various family-level characteristics. Trends in the sample suggest that Black/non-Hispanic children spend more time viewing on average (*M* = 3.43 ours/day, *SD* = 3.22) than do their White/non-Hispanic (*M* = 2.12 hours/day, *SD* = 2.56) and Hispanic peers (*M* = 2.56 hours/day, *SD* = 2.67). However, because there is high variability within each of the racial/ethnic groups, the differences between children's viewing by race are not statistically significant. Viewing time among the children in this sample does vary slightly depending on the participating parent's level of education and household income. In particular, children's viewing time declines on average as parental education level increases (*r* = -0.27), and when household income levels are higher(*r* = -0.23). Given that all measures were self-reported by parents, it is not possible to determine whether these are true differences or may reflect a propensity among more educated and affluent parents to under-report their young children's television/DVD viewing. No differences were found on the basis of the number of children in the home or parent's age.

Contexts of Television-Viewing

Parents were asked about numerous contextual factors related to their young child's television/DVD-viewing. In this sample, 22.2% of all children 3 years old and younger have a television set in their bedroom. What is more, about 40% of children watch television/DVDs in the hour before bedtime either "often" (15.5%) or "sometimes" (23.6%). Nearly a fifth (18.5%) live in homes where a television is on "most of the time" even if no one is watching, and 36% live in homes where the television is on "some of the time" when no one is watching. More than 40% of parents reported that the television is on in their home during meals "most of the time" (21.9%) or "some of the

[2] The survey asked parents about their child's viewing of television, movies, and DVDs as one entity, regardless of platform. Specifically, parents were asked about their child's estimated "television viewing" and told "When we say TV we mean TV shows, DVDs, or movies that you watch on a television set or a computer."

time" (20.9%). Finally, just over half of all parents say they "often" watch television/DVDs with their child (i.e., "co-view", 50.5%), compared to 27.3% who sometimes co-view and 21.5% who rarely or never do. As depicted in Figure 4, each of these contextual viewing factors is more common among 2- to 3-year-olds, compared to children less than 2.

Figure 5 shows that each of these contextual factors is associated with more time spent viewing among infants and toddlers. The strongest predictor is bedroom television access; children with no television set in their bedrooms spend less time viewing television each day on average, compared to those with a bedroom television. Similarly, infants and toddlers who "rarely" or "never" watch television in the hour before bed have lower viewing times on average compared to those who "often" or "sometimes" watch television/DVDs before bed. Children who live in a more television-heavy home (i.e., have a television set on in the home "most" or "some" of the time when no one is watching) view television more hours per day on average compared children in less television-heavy homes (i.e., "rarely" or "never" have a television set on in the home when no one is watching). Infants and toddlers whose parents report the television is on during family mealtime "most" or "some" of the time have higher average daily television-viewing times than those whose families have the television on during meals "a little of the time" or "never." Finally, those children whose parents report that they co-view with their children "often" tend to spend more hours per day watching television/DVDs compared with those whose parents do not co-view at all or as often.

Analyses also show a relationship between young children's daily television/DVD viewing and parents' own time spent watching television. Parents' time and their child's time are moderately correlated with one another ($r = 0.59$), indicating that parents who spend more time watching television also tend to have infants and toddlers who spend more time watching. Children of parents in this sample who watch more than 3 hours of television per day are 5.1 times more likely to exceed the AAP's viewing guidelines.

Parents' Beliefs About Television Viewing

We asked parents four questions regarding their beliefs about positive outcomes of young children's television/DVD-viewing (e.g., viewing could increase children's positive social behaviors, or increase knowledge of the world) as well as four questions regarding their beliefs about negative outcomes (e.g., television/DVD viewing could increase children's materialism, or decrease their time spent reading). For each question, parents indicated the extent to which they agreed with each statement along a 5-point scale from "strongly disagree" to "strongly agree." For the present analyses, parents were coded as "agreeing" with a belief if they responded with a 4 ("somewhat agree") or a 5 ("strongly agree").

Figure 4. Contexts of Children's Television/DVD-Viewing

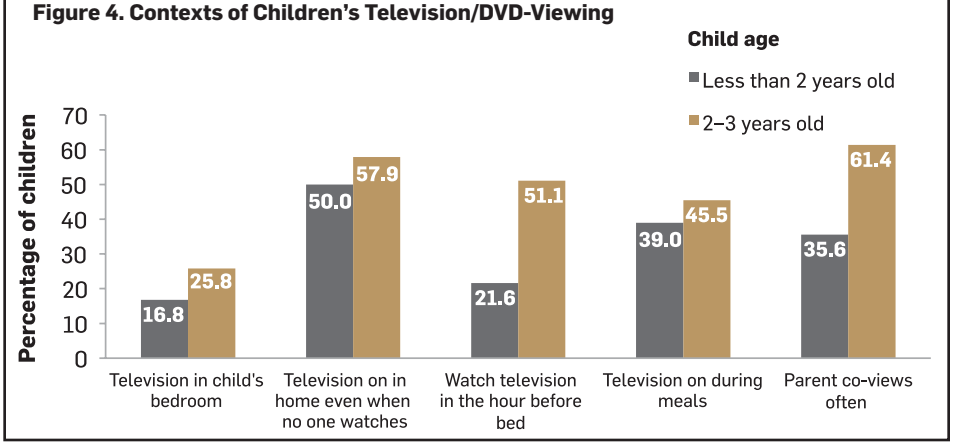


Figure 5. Children's Average Television/DVD-Viewing Based on Contextual Viewing Factors

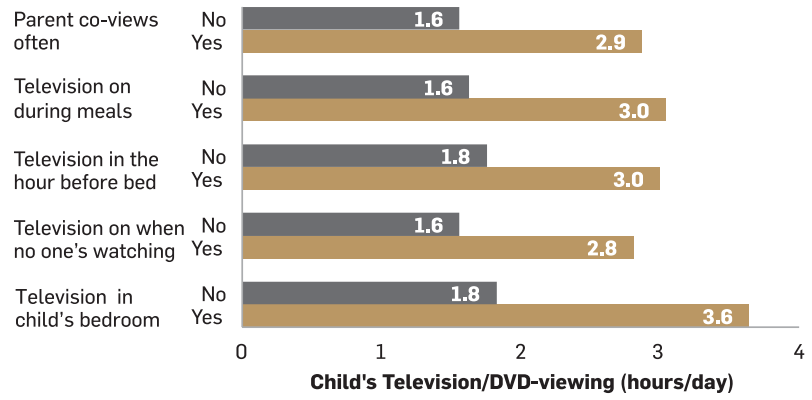
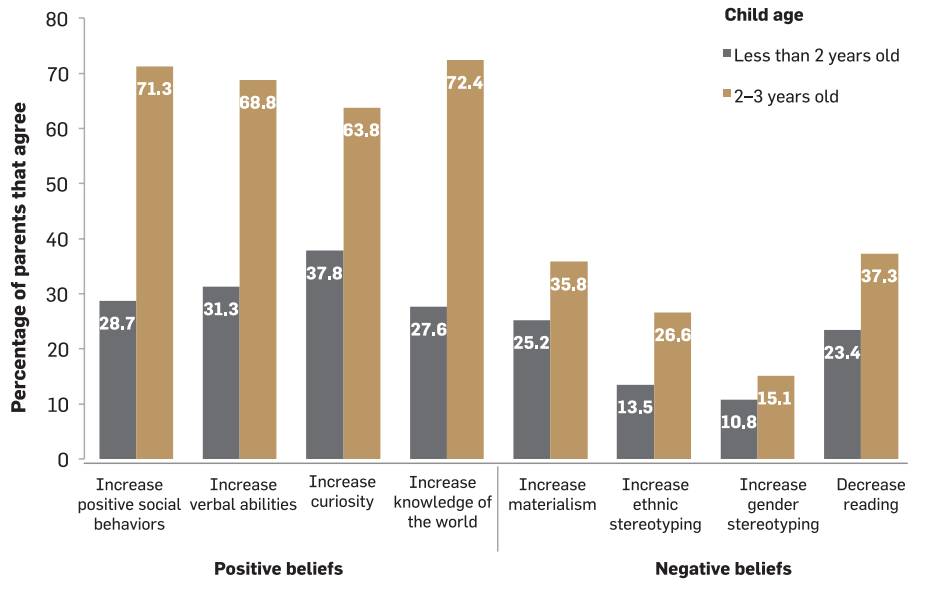


Figure 6. Parental Beliefs About Young Children's Television/DVD-Viewing



As depicted in Figure 6, parents of 2- and 3-year-olds are more likely than parents of children less than 2 years old to perceive both benefits and drawbacks to young children's television/DVD-viewing (i.e., they agree more with positive and negative beliefs). Overall,

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Today's infants and toddlers are growing up immersed in homes in which media are ubiquitous.

parents are more likely to agree with positive beliefs, compared with negative beliefs. This is true regardless of children's age, though it is most pronounced among parents of older children, who were particularly likely to perceive benefits of children's viewing.

Two scales were created from these beliefs to represent the parents' general level of agreement with the positive and negative beliefs, respectively. Each scale was created by taking the average of the appropriate four items, yielding a possible score for each scale between 1 (if a parent disagreed strongly with all 4 beliefs) and 5 (if the parent agreed strongly with all 4 beliefs). Parents were deemed to generally "disagree" with the items if their score on the scale fell below 3, they were considered neutral if their score was at least 3 but not quite 4, and they were coded as agreeing if their score on the scale was 4 or above.

Analyses using these scales showed that parents who largely agree with the positive beliefs about television/DVD-viewing for infants and toddlers have children who generally spend more time viewing (M = 2.88 hours/day, SD = 2.68), compared to children whose parents are neutral (M = 1.62 hours/day, SD = 2.24) or disagree (M = 0.81 hours/day; SD = 0.99). On the other hand, children's time spent viewing television/DVDs does not vary substantially by parents' overall level of agreement with the negative beliefs. Children with parents who agree with the negative beliefs view television/DVDs on average only slightly less (M = 1.94 hours/day, SD = 2.07), compared with children whose parents are neutral (M = 2.35 hours/day, SD = 3.17) or generally disagree with these beliefs (M = 2.35 hours/day, SD = 2.04); a difference that is not statistically significant.

Conclusions

This snapshot of media in the lives of young children indicates that today's infants and toddlers are growing up immersed in homes in which media are ubiquitous. Not only do most children have access to traditional media like television, videos, and videogames; increasingly they live in environments with newer media such as MP3 players, tablet computers, and e-reader devices. Our findings add to others which suggest an infiltration of these cutting-edge technologies into homes (Rideout, 2011). Although our results show that infants and toddlers still devote the bulk their screen time to television and DVD content (i.e., compared to time using videogames or computers), we did not differentiate where or how they viewed this television and DVD content. Future research should explore the extent to which this viewing takes place on newer, mobile technologies. Furthermore, young children's time viewing television/DVDs is substantial and contrary to the guidelines set by the AAP. Although time spent with television/DVDs increases with age, even children less than 2 years old spend on average 90 minutes a day watching television/DVDs.

Although other studies have uncovered differences in young children's television-viewing rates based on demographic factors (e.g., race/ethnicity or education level; Anand & Krosnick, 2005; (Zimmerman, Christakis, & Meltzoff, 2007), our findings suggest the contextual factors associated with children's viewing constitute an additional set of important factors. The presence of a television set in the child's bedroom is the most important contextual predictor of higher viewing estimates among children in this sample. The mere presence of a bedroom television is associated with nearly 2 additional hours of viewing time on average. Children in this sample who more frequently watch television in the hour before bed and during meals also spend more time viewing television each day.

It is notable that half of all parents in this sample reported that they watch television with their children, or "co-view", often. Furthermore, children of parents who co-view with them have higher television-viewing diets on average. This is particularly alarming given the positive emphasis traditionally placed on parent–child co-viewing, which is believed to mediate young children's viewing in helpful ways (Barr, Zack, Garcia, & Muentener, 2008; Lemish & Rice, 1986). The benefits of co-viewing may be washed away if those who co-view most also allow their young children to spend more time with television. As this study relies solely on parent-report, we cannot determine whether some of these parents may be over-reporting their frequency of co-viewing due to social desirability. Furthermore, as we did not measure the actual content of what parents and children typically view we cannot tell from these data whether this co-viewing reflects largely time spent watching child-targeted programming or adult-targeted programming.

The extent to which parents endorse positive beliefs about young children's television-viewing is also predictive of children's average viewing time. This is a particularly important finding in light of the number of parents—particularly those of 2- and 3-year-olds—who believe that television-viewing is beneficial for young children. Parents in this sample are less likely to agree with the negative beliefs about television-viewing, and children's television-viewing is less impacted by parents' perceptions of these possible drawbacks. It may be that there are parental beliefs not captured in our survey that are more applicable for children in this age group and more predictive of their viewing time. For example, parents may have greater concerns about the impact of television use on infants' and toddlers' health and development, such as vision, motor skills, or social skill development, compared to concerns about television's influence on stereotyped or materialistic values. Given the findings regarding parents' positive beliefs and recent controversies regarding the pervasive and seductive educational claims on infant- and toddler-targeted media products, more research is needed to determine how parents make sense of marketing statements

and other messages they encounter regarding young children's media products.

Strategies for Reducing Use of Television

Although the present study offers just a snapshot of the television-viewing context among a national sample of 297 infants and toddlers, the findings point to numerous strategies that practitioners could offer to parents in an effort to reduce young children's time spent viewing television. In particular, parents should be encouraged to:

- Take television sets out of children's bedrooms, or to resist putting them in children's bedrooms to begin with.
- Be aware of their own television-viewing and the extent their children are in the room while they are viewing.
- Turn the television set off when no one is watching.
- Turn the television off during mealtimes.
- Keep the television turned off in the hour before children go to bed.
- Remember that co-viewing with a parent contributes to more television time.
- Stay informed about research findings and recommendations, which largely indicate that television is not beneficial for infants and toddlers.

There is some overlap between the suggestions above and those recommended by the AAP (2001, 2011). In particular, the guideline documents provided by the AAP suggest that pediatricians discuss the value of play and other activities over children's screen time, and recommend that parents keep television sets out of children's bedrooms and limit parents' own viewing time. It is notable that the AAP also advises physicians to encourage parents to "view television programs along with children" (AAP, 2001, p. 424). Our findings suggest that such a prompt should also be accompanied by a reminder that even co-viewed programming should be limited.

Looking Forward

In October 2011, a YouTube video titled "A magazine is an iPad that does not work" was posted and promptly went viral. The video shows an infant as she is seated and interacting with an iPad, then cuts to the same child trying to "swipe" the pictures in a magazine using the motion that had worked so well with the iPad. The content of the video is not merely an adorable example of innocent confusion by a baby; it also demonstrates the ever-increasing number and diversity of media in young children's lives. At nearly the same time this video went viral, the "Vinci" tablet entered the US marketplace. The first tablet computer created solely for infants and toddlers, the Vinci is named for famous artist, inventor, and scientist, Leonardo da Vinci. Its web site declares that the Vinci "taps into Windows of Opportunity" in early childhood education in order "to ensure your children get the best start in life." Paralleling the educational marketing of its television and video programming predecessors, the Vinci's tagline is "Inspire the Genius," and its motto is "Do the best today, to be in the best place for tomorrow."

While research regarding the role and implications of television in the lives and development of infants and toddlers is lacking, it is nearly nonexistent for newer technologies such as smartphones, MP3 players, and tablet computers. One prominent exception is a 2011 report from Common Sense Media which found that many infants, toddlers, and young children have begun using mobile technologies, but in limited time quantities compared to time spent viewing television/DVDs on television screens (Rideout, 2011). This study also suggested the presence of an "app gap" in which young children from higher-income families are much more likely to have access to new mobile technologies and associated "apps" compared to their peers from lower-income families.

Amidst a cacophony of conflicting messages from many diverse sources, parents must decide what constitutes an appropriate "media diet" for their young children—including the amount and content of exposure as well as the type of screen through which it is delivered. Now, more than ever, there is a need for speedy, innovative, and high-quality research which provides more practical information to offer them in this regard.

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Trusting the Tube

Current Information About an Established Technology

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A favorite plaything of many young children today is their parent's smartphone or tablet computer. While the use of new screen devices and educational game applications, or "apps," proliferates, TV still remains children's number one media source. More than 70% of children from birth to 3 years old watch TV daily (Gutnick, Robb, Takeuchi, & Kotler, 2011), despite guidelines from the American Academy of Pediatrics (AAP; AAP, 1999; 2011) recommending that parents not allow children any screen time before they are 2 years old. This discrepancy between expert opinion and parental behavior has persisted across the past decade. There must be a good reason why parents are disregarding pediatricians' warnings about their children's TV watching. As it turns out, there are two reasons.

Why Do Parents Let Their Babies and Toddlers Watch TV?

First, TV and DVDs play an important role in the lives of many families. One mother, interviewed as part of a focus group on families' media habits, offered commonly mentioned, practical reasons for her choice: "Media makes my life easier. We're all happier. He isn't throwing tantrums. I can get some work done." (Henry J. Kaiser Family Foundation [KFF], 2006, p. 4). Science reporter Lisa Guernsey (2007) described her introduction to baby videos when, in a "moment of panic" (p. xi) as a new mother, she was encouraged by a friend to use *Baby Mozart* to soothe her colicky 5-week-old.

With the insertion of every DVD, I felt guilty. With every statement about the videos stimulating my children's brains, I felt I was being taken for a ride. And yet with every minute of quiet, I couldn't help but breathe a sigh of relief (*p. xii*).

Guernsey voiced the ambivalence that many parents feel toward video while continuing to include it as part of their daily routine.

A second reason for parents' failure to heed the AAP's anti-TV message is that the organization is "preaching" to the *Sesame Street* generation. Today's young parents fell in love with Big Bird and learned the "Letter of the Day" on that familiar street. They express a level of trust in screen media. Guernsey's (2007) interviews make it clear that parents' own positive feelings about media directly influence their choices for their children. One mother bluntly stated: "I love reading—and I love television." Guernsey summarized:

I heard from movie buffs, sports nuts, software designers, Web-news junkies and parents of all stripes who revel in well-written television shows that make them think deeply about the world. Nearly all of them grew up watching

Abstract

TV and DVDs serve an important role in the daily life of many families. Parents introduce their infants to video to keep them busy while the adults attend to chores. As members of the "*Sesame Street* Generation," parents also trust TV as a source of learning for their very young children. Research indicates that, in some cases, this trust may be misplaced. However, research also suggests how to maximize learning from screen time while minimizing harm.

Photo: John Russell/Vanderbilt

Children's word learning from video is tested by asking them to put a named object down the chute.

Sesame Street*; nearly all harbored the belief that television can do good (p. 235*).

Many such parents are selective regarding their children's media diet. A mother from the KFF's focus groups stated, "I like my kids to watch PBS because it's more of a learning thing instead of the cartoons. I have no problem with them watching PBS for two hours straight. They have all those good learning shows." (KFF, 2006, p. 23).

The Effect of TV on Family Life and Child Development

Parental instincts to be selective about TV are wise. A TV set that is always on in the background may serve as a distraction that can negatively affect children's development. When infants and children played with toys in a lab playroom with a TV on in the background, they exhibited less focused attention, their parents were more distracted, and both the quantity and quality of parent–child interaction decreased (Kirkorian, Pempek, Murphy, Schmidt, & Anderson, 2009; Schmidt, Pempek, Kirkorian, Lund, & Anderson, 2008; Setliff & Courage, 2011). In an observational study of 2½- to 4-year-old children at home (Christakis et al., 2009), every hour of audible TV to which a child was exposed was associated with less talk by both children and parents—factors known to be related to young children's vocabulary development (Huttenlocher, Haight, Bryk, Seltzer, & Lyons, 1991).

Research has also indicated that being selective is important when choosing programs that children actively watch. Whether TV has a positive or negative effect appears to depend on the program's contents. In early studies, researchers raised concerns of across-the-board harm from TV watching: In large-survey studies, the amount of TV viewing at 1 and 3 years old predicted parents' reports of attention problems at 7 years old (Christakis, Zimmerman, DiGiuseppe, & McCarty, 2004) and the amount of TV viewing before 3 years old was negatively associated with early reading skills at 6 and 7 years old (Zimmerman & Christakis, 2005). Later studies focused on the particular content that children were watching. According to parents, half of the video viewing of infants up to 2 years old consisted of educational programs, and the rest was a combination of children's entertainment TV, baby videos, and grown-up TV (Zimmerman, Christakis, & Meltzoff, 2007b). Watching educational TV before a child was 3 years old was not related to later attentional problems, but watching violent or nonviolent entertainment programming (e.g., cartoons, children's movies, situation comedies) was related (Zimmerman & Christakis, 2007). In another study, for every hour of baby videos that infants (8–16 months old) watched, they understood an average of six to eight fewer words (Zimmerman, Christakis, & Meltzoff, 2007a). In contrast, parents reading and discussing stories with children was related to increases in vocabulary.

The previous studies involved parents' reports of their children's video viewing, vocabulary, and attention problems. Barr, Lauricella, Zack, and Calvert (2010) asked parents to keep 24-hour TV diaries when their children were 1 and 4 years old, but then the researchers directly tested children's school readiness skills at 4 years old. Children who had been exposed to high levels of adult-directed programming showed poorer cognitive outcomes, whereas exposure to child-directed programming had no effect—neither positive nor negative. Other researchers broke children's video exposure into specific genres of child-directed programs: cartoons and Disney movies, baby videos such as *Teletubbies*, interactive programs such as *Dora the Explorer*, and narrative story programs such as *Arthur* and *Dragon Tales* (Linebarger & Walker, 2005). In this analysis, exposure to language-rich, interactive programs and to those with a strong story line was related to better language outcomes, whereas exposure to programs with poor language models (e.g., *Teletubbies*) was related to worse outcomes. Exposure to broad categories of programs such as Disney movies had no measurable effect, positive or negative, in these analyses (probably because of the variety of individual programs within these categories). Thus, the effect of videos and TV on very young viewers was not consistently negative; rather, it depended on program contents.

What about the most influential children's TV program of all time? In the late 1960s, the creators of *Sesame Street* proceeded on the assumption that low-income preschoolers would learn letters and numbers from TV as easily as they learned advertising jingles (Davis, 2008). Research has demonstrated that the program actually worked as planned. Not only did children love the show, but they learned, too. Child development experts at the Children's Television Workshop designed the curriculum from the beginning, and in-house researchers tested what worked and what did not (Davis, 2008; Fisch, Truglio, & Cole, 1999). In several studies, outside researchers found that watching *Sesame Street* promoted school readiness, especially for low-income kids (Bogatz & Ball, 1971; Wright & Huston, 1995). Independent of the parents' education level, children who watched the show tended to have bigger vocabularies (Rice, Huston, Truglio, & Wright, 1990). Tracking the same children over a decade and beyond, researchers found impressive long-term outcomes. Kids who watched *Sesame Street* in preschool had higher grades in English, mathematics, and science in high school. They reported using books more often and having higher academic self-esteem (Anderson, Huston, Schmitt, Linebarger, & White, 2001). This was true across all socioeconomic classes and after accounting for parent involvement and education.

With the success of *Sesame Street*, educational TV became a hit. It makes sense that the "*Sesame Street* Generation" has been eager to embrace new programming for their own children, even for babies and toddlers. One effect of this trust was introducing

increasingly younger children to *Sesame Street*. A surprising result in Linebarger and Walker's (2005) study was that watching broadcasts of *Sesame Street* from birth to 2½years old—when children were younger than the program's original intended target audience of 3 to 5 years—was related to worse language development. The fast pace and magazine-style format (many short clips with separate story lines) evidently was not conducive to toddlers' learning. Around the time that the Nickelodeon cable channel began to broadcast toddler-friendly, "interactive-style" programs such as *Blue's Clues*, Sesame Workshop developed *Elmo's World*, a slow-paced, interactive, and extended segment of *Sesame Street* with a coherent story line.

Another wrinkle in the story was that toddlers who watched episodes of *Sesame Street* over and over (on DVDs or videotapes) had better language outcomes than those who watched the TV broadcast of the program (i.e., saw each episode only once; Linebarger & Vaala, 2010). This study highlighted one way to promote very young children's learning from video—giving repeated experience with the same challenging content. Similar good results of repetition have been found with lab-developed teaching videos (Barr, Muentener, Garcia, Fujimoto, & Chávez, 2007; Strouse & Troseth, 2008). Repeated exposure to the same content gives children multiple opportunities to learn the new information, notice and store more details, and make connections to what they already know (Strouse, O'Doherty, & Troseth, in press).

Photo: John Russell/Vanderbilt

In the lab, a parent watches the storybook video with her child, using dialogic questioning techniques to support her daughter's learning.

What About Baby Videos?

In the mid-1990s, video products for infants began to be advertised and to appear on store shelves. Although they were given names such as *Brainy Baby* and *Baby Einstein* and were originally marketed as educational, the development of these programs was not based on any sort of research. At this point, a substantial body of academic research already suggested that toddlers did not easily learn from video (see Anderson & Pempek, 2005, and Troseth, 2010, for reviews). In 2006, out of concern that corporations such as Disney (owner of *Baby Einstein*) were making misleading educational marketing claims, a consumer group (Campaign for a Commercial-Free Childhood, 2006) filed a complaint with the Federal Trade Commission (FTC). As a result of pressure from the FTC, Disney voluntarily chose to remove educational claims from its Web site and offered refunds to parents (Lewin, 2009). In addition, a recent FTC filing against the video product *Your Baby Can Read* has resulted in a discontinuation of production (FTC, 2012). Nevertheless, media aimed at infants and toddlers remains extremely popular. Researchers have continued to examine whether very young children learn from TV and video.

Some studies have been conducted in labs using self-created videos. For instance, 9-month-olds were repeatedly exposed to a non-native language (Mandarin) by a person who either sat in front of them (in person) or appeared on video to determine whether this experience would prolong infants' sensitivity to nonnative speech sounds (Kuhl, Tsao, & Liu, 2003). After a month's exposure, the infants who watched the DVD showed no evidence of having been exposed to the language; only the infants who listened to the person face-to-face could distinguish the Mandarin sounds. The same difference in learning from real experience and video exposure was found with imitation tasks. Between 14 and 36 months old, young children imitated a behavior (e.g., ringing a bell hidden in a puppet's mitten or assembling a rattle from several parts) much more often if they had watched a person who was present demonstrate the actions (Barr & Hayne, 1999; Hayne, Herbert, & Simcock, 2003). Given the same demonstration on a video, children learned slowly and inefficiently; they needed more repetitions of the demonstration to learn (Barr et al., 2007; Strouse & Troseth, 2008).

Other studies have used commercial video products that children watched at home. Robb, Richert, and Wartella (2009) exposed children 12 to 15 months old to *Baby Wordsworth*, a video designed to teach vocabulary, for 6 weeks. There was no increase in the children's expressive or receptive language beyond that of a control group during that time; rather, the strongest predictor of vocabulary skills was the amount of time adults read to the children. DeLoache et al. (2010) had 12- to 18-month-old children watch a best-selling commercial DVD for infants 12 months and older. The children watched alone or with parents five times a week for a month. Other parents were given a list of words from the DVD instead and were asked to teach the words to their children in any way that came naturally. Only the parent-taught children learned more words than a control group; the children who watched the video did not. More recently, Vandewater (2011) found that, 3 months after a month-long exposure to the video, children demonstrated a significant, although relatively small, increase in receptive vocabulary (i.e., in words they understood). Thus, exposure to a video specifically designed to teach vocabulary was relatively ineffective with young toddlers when compared with learning from their parents, but some learning did occur over time.

The "Video Deficit"

The original AAP recommendation (AAP, 1999) against early TV exposure was released just as a body of research began to accumulate suggesting that video was not an effective teaching medium for toddlers. In the following decade, a consistent pattern of research results documented a "video deficit" in toddler learning, compared with learning from direct experience (Anderson & Pempek, 2005).

As described earlier, infants do not glean information about speech sounds from a person on video the way they learn from a person who is present (Kuhl et al., 2003). They imitate less after watching the demonstration of a person on video compared with a person sitting in front of them (Barr & Hayne, 1999; Hayne et al., 2003; Strouse & Troseth, 2008). In addition, in a study by Suddendorf, Simcock, and Nielsen (2007), children failed to recognize a life-sized live video image of themselves for at least a year after they recognized themselves in a mirror.

Several studies have used a finding game in which children watch on video as a toy is hidden in an adjoining room, and then they are asked to find the toy (Schmitt & Anderson, 2002; Troseth & DeLoache, 1998). Two-year-olds have a great deal of trouble with this task, finding the toy only about 40% of the time. However, if they watch the same hiding event directly through a small window between the rooms, they always find the toy, showing that the game itself is easy for them. The problem seems to be getting information from video.

Children did better at the finding game when the experimenters hid the fact that the information came from video. To accomplish this, they put the TV behind a window and told children that they were watching the hiding event through a window (Troseth & DeLoache, 1998). This result suggests that very young children think of events on TV as separate from their own experiences, which is a good insight to have at an early age! Children's TV often includes events that contradict what children know about the real world (e.g., animals talk and wear clothes, objects violate the law of gravity, and people on screen are not responsive to the viewer). Adults know that some video can represent real events (e.g., the nightly news or a weather report). In another study, giving 2-year-olds experience with video that clearly reflected reality helped them to figure out that video could provide information. Specifically, we had parents connect their video cameras to their TV sets, and children got to watch themselves "live" on the screen. After about an hour's cumulative experience with this new kind of video, children successfully used information from the video in the lab to find the hidden toy (Troseth, 2003). These results support the idea that the video deficit occurs at least in part because children are smart; because of their experiences watching TV, they have deduced that events on TV are disconnected from reality and, therefore, are conservative about applying what is on a TV to the real world. However, given a different experience (with reliable video), they can learn from it.

Social Interaction and Video

Part of the original rationale in the AAP (1999) guidelines against early TV viewing was the concern that time spent watching TV would replace time spent in social interaction with parents, a venue in which much early learning takes place (Baldwin & Moses, 1996; Tomasello, Carpenter, Call, Behne, & Moll, 2005). Recent studies provide evidence that time spent in social interaction around a video or TV program actually is an opportunity for very young children to learn.

A couple of laboratory studies of video involved social interaction. In one study using a closed-circuit video system, a woman on a TV screen talked to parents and played "Simon Says" with their 2-year-old children for 5 minutes. Then she gave the children a verbal cue of where a toy was hidden in an adjoining room (e.g., "Piglet is behind the chair"). The children who had interacted as social partners with the person on video used the cue and found the toy, but children who watched a pretaped video (in which the same person was nonresponsive) did not (Troseth, Saylor, & Archer, 2006). In a different lab, the same kind of result was found with an interactive person on video promoting children's imitation (Nielsen, Simcock, & Jenkins, 2008). One factor that may have improved children's learning was the responsiveness of the person on video; another was the fact that the parent treated the person on video as a social partner.

In other research, as the parent and child watched the video together, the parent directly supported the child's learning from the screen. For instance, 2-year-old children saw a pair of new toys on a video and a woman ("Greta") on the video named one of them. Children did not learn the word, even if they had played with the toys moments before and held them during the video. However, if

Learn More

Web Sites

Vanderbilt Early Development Lab
http://peabody.vanderbilt.edu/departments/psych/research/research_labs/early_development_lab/index.php
https://www.facebook.com/EarlyDevelopmentLab?ref=ts&fref=ts
At the Vanderbilt Early Development Lab, researchers study how very young children first understand and use simple symbolic media such as video images and pictures. Our research has revealed the surprising difficulty very young children have using information from a symbol to solve a problem. Some of our current research focuses on children's learning from video, tablet computer applications, and e-books; how parent–child interaction supports learning from videos; and how children are influenced by both bullying and prosocial actions on TV. The research described here was supported in part by Peabody College at Vanderbilt University and by National Institute for Child Health and Human Developments Grant P30 HD 15052 to the Vanderbilt Kennedy Center for Research on Human Development.

Parent Training Video: Dialogic Questioning With Video Stories
www.youtube.com/watch?v=b6ZJRFwdF3c
This video demonstrates techniques that parents can use to support children's language development and story comprehension from video. This training video was made possible by a Bonsal Education Research Entrepreneurship Award (BEREA) from Peabody College at Vanderbilt University. Supporting research was also funded by a predoctoral training grant from the Institute of Education Sciences.

Fred Rogers Center's Early Learning Environment
http://ele.fredrogerscenter.org/
A Web site offering online and mobile early learning resources free of charge. Families, family child care providers, and teachers can visit the site to access a library of more than 100 e-books, videos, mobile apps, music, and more, all designed to promote early literacy and other learning and development for children from birth to 5 years old.

Joan Ganz Cooney Center at Sesame Workshop
www.joanganzcooneycenter.org/
The Cooney Center is an independent research organization that supports research, development, and investment in digital media to advance children's learning. Joan Ganz Cooney and colleagues developed *Sesame Street* in the 1960s with the goal of using TV to teach disadvantaged preschool children basic skills.

Henry J. Kaiser Family Foundation's Study of Media and Health
www.kff.org/entmedia/index.cfm
The Henry J. Kaiser Family Foundation is a nonprofit foundation that focuses on major health issues in the United States. The Study of Media and Health focuses particularly on children's media use and provides research data to policymakers, journalists, the research community, health care providers, the media industry, and the public.

parents held the toys in front of the screen and commented on the similarity ("Look, these are just like the ones Greta has!...These are the same as the ones on the TV"), children learned the word from Greta (Strouse & Troseth, 2012). In another study, children less than 3 years old failed to learn a verb used several times in a voiceover to describe the repeated actions of a Muppet or person on a *Sesame Beginnings* video; they learned only if the experimenter first labeled the action as she enacted it in person with a puppet or doll and then showed and labeled the action on video (Roseberry, Hirsh-Pasek, Parish-Morris, & Golinkoff, 2009). In all of these studies, live social interaction helped children to learn from video.

In a recent study, a group of parents was trained to use *dialogic reading* techniques while watching video storybooks at home with their 3-year-old children (Strouse et al., in press). The techniques included asking children open-ended questions and gradually, across multiple viewings, encouraging them to tell more and more of the story (Whitehurst et al., 1988). The children of parents who were trained in the dialogic techniques understood the story better and learned more story vocabulary than did children whose parents were entirely untrained or who were asked to sit with their children and simply point out what was going on in the stories. The key for learning was that parents needed to engage in a particular kind of social interaction with their children focused on the video: asking questions and getting children to talk about the story.

In a final condition of this study, the "conversational partner" was an actress on the (pretaped) video who asked viewing children the same kinds of questions at about the same frequency as parents had done. The actress asked simpler questions on a first version of the video (to be played during the first few home viewing sessions), and added more challenging questions on a second version (played during later sessions). Children learned almost as much vocabulary and story content after being questioned by the actress on the video as children in the other group had learned from watching the video with their parents and being questioned by them.

This study has implications for the kind of "co-viewing" of video that helps children learn and for the design of educational video. Merely sitting with children and pointing out events on the screen did not lead to substantial learning; actively questioning children and getting them to talk was necessary. Pausing a video and asking questions about it is not something that parents do spontaneously (parents in the nontrained groups virtually never did so). During the study, parents learned and effectively used dialogic questioning methods. Parents also reported finding themselves using these skills during other daily activities. However, given that a major role of video in the lives of families is to keep children occupied while parents take care of chores, it might be difficult to get parents to engage in this kind of active mediation (Nathanson, 2001), no matter how effective it is.

It is, therefore, of interest that the on-screen actress turned out to be an effective questioner who elicited children's comments and promoted their learning. (To visualize this, imagine the human protagonist of *Blue's Clues* in a picture-in-picture frame, asking questions about a storybook video—similar to the stories from *Reading Rainbow*—while the story image is momentarily paused in the background.) Videos including graduated questioning (from easy to difficult) might both promote young children's learning and teach parents how to use the dialogic questioning method. A possible outcome would be to encourage disadvantaged parents, who traditionally talk less to their children in ways that promote school readiness (Hart & Risley, 1995), to adopt these methods of conversing about stories.

Conclusion

The AAP statements on video (AAP, 1999, 2011) may be the most ignored recommendations ever offered by pediatricians. However, as Vandewater (2011) pointed out, the need for blanket condemnation depends on whether all video watched by very young children has been shown to be harmful (it has not; the content matters) and whether any learning occurs (it does). Research has indicated that young children's learning from video is not very efficient but that watching the same video more than once is helpful (fortunately, something children like to do). Also, parents can support their children's learning by active mediation, such as dialogic questioning. In the same way that reading picture books has traditionally been a shared parent–child activity in middle-class Western culture, watching video together can be an opportunity for interaction. However, that outcome would require a change in parents' thinking about the role of video in their family's life. In addition, video that incorporates a dialogic questioner holds promise to promote very young children's talking, thinking, and learning.

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Toddlers and Touch Screens

Potential for Early Learning?

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Young children spend increasing amounts of time with interactive screen media such as tablet computers and smartphones (Common Sense Media, 2011), and purportedly educational products for toddlers are becoming pervasive (Shuler, Levine, & Ree, 2012). Yet researchers know almost nothing about the potential impact of these newer technologies on children. Research demonstrates that traditional videos are not educationally valuable for children less than 3 years old (Anderson & Hanson, 2010; Barr, 2008, 2010; DeLoache et al., 2010; Troseth, 2010), but some studies have suggested that toddlers can learn from screens when the experience is interactive (Lauricella, Pempek, Barr, & Calvert, 2010). It is possible that touch screen devices have the potential to succeed at benefiting very young children where traditional videos have failed. If interactive games are educationally valuable for toddlers, they may have the same potential to reduce education gaps for at-risk children that educational television programs such as *Sesame Street* have had for older preschoolers by fostering early learning and school readiness (Anderson, Huston, Schmitt, Linebarger, & Wright, 2001; Wright, Huston, Scantlin, & Kotler, 2001). The purpose of this article is to summarize existing research on educational screen media for toddlers, to generate hypotheses about the potential of interactive screens, and to outline immediate needs for future research.

Exposure to Interactive Screen Media

Today a considerable proportion of young children's leisure time is spent with screen media, including television, computers, handheld and console video game players, and interactive mobile devices such as smartphones and tablet computers. One recent national survey commissioned by Common Sense Media (2011) reported that three out of four children birth-8 years old use some form of screen media in a typical day. Those who reportedly use these media do so for more than 3 hours per day on average. Even the youngest children are regular media consumers, with infants less than 1 year old consuming media for nearly 2 hours daily. Although television remains the most commonly used medium for young children, the Common Sense Media survey found that half of children birth-8 years old have access to at least one interactive screen device (e.g., videogame console, tablet computer, smartphone with touchscreen), more than one out of every four parents have downloaded mobile apps for their children, and one quarter of all child screen time is spent with interactive media.

Abstract

As interactive screens (e.g., tablet computers, smartphones) continue to enter the homes of young children, it becomes increasingly important to understand the impact of these technologies on development. Some studies suggest that while traditional television and videos hold little educational value for toddlers, young children may be able to learn from interactive screens. Thus it is possible that touch screen devices have the potential to succeed at benefiting toddlers where traditional videos have failed. This article summarizes existing research on educational screen media for toddlers, generates hypotheses about the potential of interactive screens, and outlines immediate needs for future research.

The increase in young children's use of interactive media is accompanied by a steady increase in interactive media produced for a young audience, in terms of both the number of titles available and the number of publishers developing and distributing these products. The Joan Ganz Cooney Center at Sesame Workshop recently published their second analysis of educational games available in Apple's App Store (Shuler et al., 2012). This report showed tremendous increases in mobile applications targeting young children relative to the first report, published just 3 years earlier (Shuler, 2009). Researchers found that the majority (58%) of apps for education targeted toddlers and preschoolers. Educational apps represented 109 unique publishers, more than a 5-fold increase since the 2009 report. Not only have recent years seen tremendous increases in the number of titles and publishers targeting very young children, they have also seen an increase in the devices that specifically target this audience. For instance, 2011 ushered in VINCI, the first touch screen device developed specifically for babies. Other new products enable infants to use their parents' touch screen devices, such as Fisher-Price's Laugh & Learn Apptivity cases for iPhones, iPods, and iPads. Moreover, at the Consumer Electronics Show held in January 2012, Microsoft and Sesame Workshop (producers of children's programs such as *Sesame Street*) announced that they were partnering to develop the first-ever, truly interactive television show. The interactive *Sesame Street* program capitalizes on Microsoft Xbox Kinect technology that detects viewers' physical movements, allowing on-screen characters to respond to children's actions (e.g., catching objects that children pretend to throw at the screen; Waxman, 2012). No doubt the coming years will continue to introduce innovations for interactive screen media, and if recent media use trends suggest anything about the future, very young children will spend a great deal of time with these devices.

Mixed Messages for Caregivers

Despite the dramatic increase in interactive media targeting young children, researchers know almost nothing about the impact of these media on children (for good or ill). In response to the gap between interactive media production for young children and research on the potential impact of these products, the 2012 Cooney Center report concluded with a call for better standards for products marketed as educational for children and for academic research addressing what they called "digital age learning" (Shuler et al., 2012). Similar calls were made in a recent policy statement from the American Academy of Pediatrics (AAP; 2011) and a joint position statement (2012) between the National Association for the Education of Young Children (NAEYC) and the Fred Rogers Center for Early Learning and Children's Media (FRC).

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Young children spend increasing amounts of time with interactive screen media (e.g., tablet computers, smartphones).

In the absence of research to guide their decisions, parents, teachers, and policymakers are left to make their best guesses regarding the potential impact of interactive screen media. On the one hand, organizations invested in early childhood education take a cautiously optimistic approach to early media use. The recent joint statement from the NAEYC and the FRC (2012) encouraged educators to integrate interactive screen media into the early childhood curriculum. The statement authors recommended that early childhood educators learn the pros and cons of technology in the classroom and make informed decisions about the use of technology in light of their own knowledge of positive child development. Their official position was that interactive media can promote learning and development when they are "used intentionally by early childhood educators, within the framework of developmentally appropriate practice..., to support learning goals established for individual children" (NAEYC & FRC, 2012, p. 5).

On the other hand, the medical community (AAP, 1999, 2011) discourages screen exposure of any kind for children less than 2 years old and recommends only limited amounts of age-appropriate, educational screen media for children older than 2 years. In addition to the apparent lack of educational benefit for very young children (described in the next section), the AAP statements pointed to research on potential effects of early television exposure on sleep disturbances (Thompson & Christakis, 2005), obesity (Nunez-Smith, Wolf, Huang, Emanuel, & Gross, 2008), attention disorders (Christakis, Zimmerman, DiGuiseppe, & McCarty, 2004; Zimmerman & Christakis, 2007), language delays (Linebarger & Walker, 2005; Zimmerman, Christakis, & Meltzoff, 2007), and reductions in focused toy play and parent–child interactions when a television is on in the background (Kirkorian, Pempek, Murphy, Schmidt, & Anderson, 2009; Schmidt, Pempek, Kirkorian, Lund, & Anderson, 2008).

Unfortunately both the cautious discouragement of screen media use by AAP and the conditional encouragement of classroom use by NAEYC and FRC are speculative because of a near absence of rigorous scientific research on the impact of interactive screen media on young children. The authors of the most recent AAP (2011) statement acknowledged that the recommendations addressed only traditional television/video because of a lack of research on newer technologies. Moreover, much of the existing research focused on children more than 2 years old is limited to correlational studies, making it difficult to establish a cause-and-effect relationship between early screen media exposure and later outcomes. For example, while it is possible that early television viewing causes language and attention problems, it is equally plausible that parents use television in an attempt to educate young children who exhibit early language delays or to calm children with preexisting attention problems. Finally, not all studies find a negative

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The vast majority of research on the impact of screen media on young children's learning is limited to traditional, noninteractive media such as television programs and DVDs.

association between early television exposure and negative outcomes, such as the case of attention disorders (Foster & Watkins, 2010; Stevens & Mulsow, 2006), while other studies find that the impact of early television viewing depends on the particular program content viewed (Linebarger & Walker, 2005; Zimmerman & Christakis, 2007). In short, there is no consistent body of evidence to suggest that screen exposure early in life uniformly poses a threat to healthy development; however, it is clear that scientifically rigorous research is greatly needed to inform parents, teachers, and policymakers about the potential impact of newer technologies on development.

Current Research: Traditional Video

In addition to concern over potential negative effects of early screen exposure, there is also concern over the apparent lack of educational benefit for very young children. As with most developmental outcomes, the vast majority of research on the impact of screen media on young children's learning is limited to traditional, noninteractive media such as television programs and DVDs. Though many infant-directed video products claim educational value (Fenstermacher et al., 2010; Garrison & Christakis, 2005), a growing body of research suggests that commercially produced videos do not facilitate learning until a child is about 3 years old. For instance, unlike older children, infants and toddlers learn better from real-life experiences than they do from comparable video experiences, a phenomenon known as the video deficit (Anderson & Pempek, 2005). The video deficit effect, which has been replicated in a number of domains (e.g., imitation, object retrieval, social referencing, word learning, perceptual narrowing), peaks around 15 months old and then declines until about 36 months old, depending on the task (Anderson & Hanson, 2010; Barr, 2008, 2010; DeLoache et al., 2010; Troseth, 2010).

Now that many researchers have established that the video deficit exists, some researchers have turned to trying to understand why it exists. One explanation may be that television precludes the possibility of social interaction. In fact, several studies have indicated that social relevance is an important factor underlying the video deficit. For instance, toddlers may learn better from familiar television characters than from unfamiliar ones (Krcmar, 2010; Lauricella, Gola, & Calvert, 2011). Furthermore, social interaction (such as that established in live video chat) produces greater engagement with, comprehension of, and learning from video material (Neilson, Simcock, & Jenkins, 2008; Roseberry, Hirsch-Pasek, Richie, & Golinkoff, 2011; Troseth, 2003; Troseth, Saylor, & Archer, 2006). It is important to note that this benefit to learning is not observed when on-screen interactions are not truly contingent on the children's behavior (Roseberry et al., 2011; Troseth et al., 2006). In other words, the circumstances under which toddlers learn from screens (i.e., with adaptive, reciprocal social interactions) do not reflect toddlers' real-world experience with supposedly educational, prerecorded video that does not foster true interactivity (Richert, Robb, & Smith, 2011).

Another reason for the video deficit may be an inability of very young children to transfer learning across two-dimensional and three-dimensional displays because of perceptual differences between them. For example, one study found that toddlers were more likely to transfer learning within sources (either 2D-to-2D or 3D-to-3D) than across sources (2D-to-3D or 3D-to-2D; Zack, Barr, Gerhardstein, Dickerson, & Meltzoff, 2009). In other words, young children demonstrated learning from touch screens when they were also tested with touch screens but not when they were asked to transfer that information to a real-life, 3D object. Because of studies like this one, Barr (2010) proposed that the video deficit is in fact a transfer deficit due to representational inflexibility: In order for children to transfer learning from a 2D screen to a 3D object, they must first ignore the perceptual differences and recognize the overlap between the two. Moreover, Barr suggested that the lack of social contingency in most videos may be an important cue for distinguishing between 2D (on-screen) and 3D (in-person) objects, resulting in decreased transfer from screens to real-life problems.

The Potential of Interactive Screen Media

It is reasonable that reciprocal social interaction fosters learning from video as it would in real-life, but this finding has had little potential for application given that true social interactions are nearly impossible to replicate using traditional screen media such as TV and DVDs. However, newer technologies, such as those that incorporate touch screens, do afford the potential for contingently responsive video. Even very young infants are able to detect contingency in both social and nonsocial domains, and contingency influences learning and subsequent behavior (Lohaus, Keller, Lissmann, Ball, Borke, & Lamm, 2005; Rovee & Rovee, 1969; Watson, 1985). It remains to be seen whether contingency in and of itself (i.e., in the absence of adaptive, reciprocal interaction with an on-screen social partner) can foster learning from screens. If so, interactive screen media may revolutionize early learning during toddlerhood in the same way that educational children's television programs have had a positive impact on school readiness in older preschoolers (Kirkorian, Wartella, & Anderson, 2008).

There is some scientific research suggesting that even nonsocial contingency does enable learning from screens during early childhood, allowing children to overcome the video deficit. Three studies are particularly relevant. First, unpublished findings by Kuhl (2009) suggested that infants maintained their ability to perceive speech sounds from non-native-languages that were heard on video only when infants were required to touch the screen to replay the video, not when the video replayed automatically. Second, Zack et al. (2009) demonstrated that toddlers are capable of imitating an experimenter's actions using a touch screen (repeating the experimenter's actions more often than did children without a demonstration). However, it remains unclear whether the same children would be able to learn information presented on the screen alone without demonstration from a real-life experimenter. Finally, Lauricella and colleagues (2010) reported that toddlers performed better at a hide-and-seek task when they played an interactive computer game to see the hiding spots of each object than when they watched a noninteractive, traditional video showing the same hiding spots. Although this task holds promise

for young children's learning from interactive digital media, practical application is limited given very young children's relative difficulty using traditional computer input devices (e.g., keyboard, mouse) without help. Indeed, children in Lauricella and colleagues' study required special training and customized equipment in order to play the computer game successfully.

Integrating findings from these three studies, it seems that touch screens may provide greater opportunity for young children's learning from video given the contingency that touch screens afford and the relative ease with which even very young children can master the direct correspondence between their actions on the screen and changes in screen content. In addition, although there is no published scientific evidence demonstrating that touch screen devices alleviate fine-motor skill obstacles often faced by young children when using computers (e.g., the inability to effectively manipulate a computer mouse), anecdotal evidence from parents suggests that this may be the case. For instance, YouTube videos, blog posts, and news articles on this issue abound, highlighting parents' amazement both at their young children's intense fascination with touch screens and the ease with which they learn to use them. Thus, it is plausible that touch screen devices may prove to be a useful learning tool for infants and toddlers when paired with appropriate educational content. Research is needed to establish whether interactive touch screen devices do in fact facilitate toddlers' learning from screen media. We have only begun to explore these questions in our own research labs, comparing toddlers' learning from traditional, noninteractive video versus video presented on a touch screen that enables children to have some agency over the viewing experience. Preliminary findings suggest that this interactive video may in fact facilitate learning by very young children (Choi & Kirkorian, 2013; Kirkorian, Choi, & Pempek, 2013). However, much more research is needed to establish the educational value of commercially available apps and other digital media products for toddlers.

In addition to understanding whether toddlers can learn from interactive screens, it is also important to understand how toddlers learn. Decades of research on older children's attention to noninteractive video have demonstrated the importance of cognitive processes, such as attention and engagement, during television viewing for comprehension and subsequent learning (Kirkorian & Anderson, 2008). Moreover, the most successful educational television programs for older preschoolers, including *Sesame Street* (Fisch & Truglio, 2001) and *Blue's Clues* (Anderson, 2004), have capitalized on this research to maximize comprehension and learning. If interactive screens do hold potential for early learning, the benefit may be mediated, at least in part, by cognitive processes. It will be imperative to understand how and why young children learn in order to better inform the production of these media to maximize educational benefit.

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Research is needed to establish whether interactive touch screen devices do in fact facilitate toddlers' learning from screen media.

Directions for Future Research

It is clear from the existing literature that interactive touch screen devices may hold potential to be educationally valuable for very young children. However, there are many unknowns, and much research is needed to establish whether and how this new technology has an impact—for good or ill. Drawing from key findings from decades of research on the impact of television on older children, the following list, though not exhaustive, provides some important questions that should be asked by researchers, child care professionals, and parents alike:

- Do interactive screen devices hold potential for toddlers' learning? That is, can toddlers overcome the video deficit when engaging with interactive video? Preliminary findings from our own research labs suggest that the answer may be "yes"; however, more research is needed.
- If toddlers can learn from interactive screens, how flexible and enduring are the benefits? Can toddlers transfer screen-based information to help them solve real-world problems? Is there evidence for any long-term benefit, such as increased school readiness or enthusiasm toward learning?
- How can creators develop interactive touch screen applications that maximize learning? What kinds of information are well-suited for this platform? What features (e.g., game designs, feedback, production features) enable learning?
- How can caregivers and teachers facilitate learning? How, if at all, should touch screen devices be integrated into early childhood curricula?
- Is there any evidence of long-term harm when children use these devices extensively during the first few years of

Learn More

Screen Time: How Electronic Media—from Baby Videos to Educational Software—Affects Your Young Child
L. Guernsey (2012)
New York, NY: Basic Books

Common Sense Media
www.commonsensemedia.org/

Joan Ganz Cooney Center at Sesame Workshop
www.joanganzcooneycenter.org/

Fred Rogers Center for Early Learning and Children's Media at St. Vincent College
http://www.fredrogerscenter.org/

life (e.g., attention disorders, language deficits, health-related outcomes such as obesity or sleep disorders)?

- Are some children more engaged with new technology than with more traditional techniques? For whom are touch screens most beneficial? Do interactive media devices hold unique potential for children with special needs (e.g., autism, ADHD)?
- Current research finds that children in lower-income families are less likely to have access to and spend less time using newer interactive technologies (Common Sense Media, 2011). Does this "app gap" lead to inequities during early childhood? For example, are lower-income children less well prepared to enter school because of limited access to educational technology during early childhood? If so, will school readiness gaps lessen if all children are given equal access to high-quality interactive media?

Conclusion

Very young children are using interactive screen media at increasing rates. Also increasing are the different types of platforms, the number of titles, and the number of publishers targeting this young audience. Yet almost nothing is known about the potential impact of these new media. It is imperative that researchers understand whether and how toddlers learn from interactive screens and whether there are long-term impacts. Some studies have suggested that young children may learn better from interactive video than from traditional, noninteractive video, and it may be that newer technologies will succeed where traditional video has failed to foster early learning with the potential to better prepare children for school. However, scientifically rigorous research is greatly needed to establish whether and how interactive touch screen devices influence development throughout early childhood.

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Tiffany A. Pempek, *PhD, is an assistant professor of psychology at Hollins University. She received an MA in clinical psychology from the University of Dayton and a PhD in developmental psychology from the University of Massachusetts-Amherst. She completed a postdoctoral fellowship at the Children's Digital Media Center at Georgetown University. Dr. Pempek's research interests include the impact of media on infants and toddlers, the development of attentional processes related to the comprehension of media content, and parent–child interaction during media use. Her current research focuses on when and how very young children use interactive media devices and how such devices affect their learning. Her work also investigates the impact of background, or adult-directed, television on early cognitive development.*

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Does Culture Matter in Early Childhood Media Use?

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Abstract

Despite recommendations by the American Academy of Pediatrics for limited media use in childhood, children are watching increasing amounts of television. Ethnically and racially diverse children are watching more TV than their Caucasian peers. While there has been intense debate regarding rates of TV viewing and the concomitant risks or benefits, there has been less discussion about why ethnically and racially diverse children are watching more TV. This article covers some of the theories behind the increase in viewing time overall, and it presents some interesting exploratory findings highlighting similarities and differences in the viewing program choices of preschool-aged children and their families from several racial and ethnic backgrounds. Finally, the article suggests recommendations for researchers, clinicians, educators, and others working with families with young children to make more informed recommendations on early childhood viewing.

Researchers have found many surprising facts about the television exposure of very young children, among them: (a) Babies as young as 9 months are watching up to an hour of TV daily (Zimmerman, Christakis, & Meltzoff, 2007); (b) 65% of children less than 8 years old watch TV every single day; and (c) almost one third of children less than 3 years old have a TV in their bedroom (Rideout & Hamel, 2006). When average viewing time is examined by age group, the numbers show startling increases across infancy and early childhood: every day children from birth to 1 year old watch around 53 minutes of TV, children 2-4 years old watch 2 hours 18 minutes of TV, and children 5-8 years old watch 2 hours 50 minutes of TV (Rideout, 2011).

Placed in the context of everyday life, the average amount of time that a young child spends watching TV is almost 3 times the amount of time spent with other activities including listening to music or reading, and playing computer or video games (Christakis, Ebel, Rivara, & Zimmerman, 2004; Rideout, 2011). Overexposure to TV in early childhood, as well as exposure to programs aimed at adults rather than children, has been a longstanding concern of parents, teachers, clinicians, and child developmental researchers, as increased viewing has been linked to a variety of risk factors including poorer executive functioning, decreased parent–child interaction, impaired sleep, and increased aggression (American Academy of Pediatrics, 1999; Anderson & Evans, 2001; Barr, Lauricella, Zack, & Calvert, 2010).

The data from these recent national studies is not only of concern, but also highlights the growing use of media as an activity consuming young children's waking hours. As these data illustrate, children less than 5 years old have liberal access to multiple types of media technology including TV's, videos/DVDs, computers, and even newer technology such as tablet computers, smartphones, and the like. This breadth of use has encouraged investigation around how young children are interacting with these various forms of media technology. Researchers are just

beginning to address questions like: What specifically are children watching? With whom are they watching? Where are they watching? Who makes the decisions about program choices? Do cultural and gender differences exist in program choices? Is language a consideration in program choices? These are the important questions that will help researchers understand the complex relationship between media use, culture, and developmental outcomes.

Cultural Differences in Media Use

Watching TV or DVDs, playing video games or computer games, and using innumerable other forms of media technology is a part of children's everyday lives, and a part of culture. (Tudge, 2008) Several theories have focused on how children learn from early viewing experiences, through imitation as well as interpreting what they see on screen (Bandura, 1994; Bronfenbrenner & Morris, 1998). Research has shown that children's environments shape their expectations, beliefs, and attitudes. Related work has also shown that culture plays an important role in development and that cultural practices and expectations shape young children's development (Gauvain, 2001; Rogoff, 1998, 2003; Vygotsky, 1978). With the rapid increase in prevalence and amount of media use in early childhood, as well as the diversity of programming options, understanding more about the impact of media on child development is an increasing imperative.

African-American and Latino children have historically been found to watch more TV than do Caucasian children (Comstock, 1991), and recent national studies continue to highlight disparities in early childhood media viewing, with ethnically and racially diverse children consuming more media technology than their Caucasian peers (Anand & Krosnick, 2005; Certain & Kahn, 2002; Gentile & Walsh, 2002; Rideout, Vandewater, & Wartella, 2003). In the United States, African-American children top the list, spending an average of 4 hours 27 minutes daily interacting with media, followed by Latino children, who spend 3 hours and 28 minutes, and Caucasian children who spend 2 hours and 51 minutes per day interacting with media (Rideout, 2011). Although many studies have shown evidence of racial and ethnic disparities in media use, few have begun to address why these disparities exist, especially in light of many years of research on the potential adverse impact of heavy early viewing.

Why Are Kids Watching?

Media use, and more specifically television viewing, in early childhood has always been of interest to those of us working with families

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The average amount of time that a young child spends watching TV is almost 3 times the amount of time spent with other activities.

and young children. Apart from the entertainment value, parents report using TV as a tool "in order to get chores done", "to quiet down their kids", and because of its perceived educational potential (Rideout & Hamel, 2006; Rideout et al., 2003; Zimmerman et al., 2007). Parents or caregivers who are recent immigrants may have other motivations too, such as promoting English learning (Shivers & Barr, 2007).

Studies have also found both consistencies and variability in the TV rules families use, including rules about the amount of TV that can be watched and the specific programs that are allowed. One study on TV viewing in infants 6 to 18 months old (majority Caucasian sample) revealed that, while 56% of parents had rules about the amount of time their infant could spend watching TV and 8% had an explicit no-TV policy, neither of these rules was associated with the actual amount of time that infants spent watching TV. In contrast, 20% of parents had rules about the types of programs their infants could watch (restricting to only child-directed programming or avoiding violent programming), and rules of this sort were associated with infants viewing a higher proportion of child-directed programming (Barr, Danzinger, Hilliard, Andolina, & Ruskis, 2010).

Socioeconomic factors also interact with family TV rules to influence TV use in infancy and young childhood. In a national survey of parents of children 6 months to 6 years old, 67% of parents reported having rules about TV time, and even more (88%) had rules about which programs their children could and could not watch. Parents with higher levels of education were more likely to have either type of rule than parents with lower levels of education, and parents with higher family incomes were more likely to have rules about program content. Children whose families had rules about TV time watched less television than children whose families did not have such rules, and children whose families had rules about TV content watched more TV than children whose families did not have such rules (Vandewater, Park, Huang, & Wartella (2005). Looking specifically at low-income families, parents of children 3–5 years old (majority African-American sample) were more likely to place restrictions on their children's TV use than to watch TV together or explain events happening on-screen. This is consistent with data from parents of other socioeconomic backgrounds, but it is important to note that these rules were tied to parents' attitudes about the negative influence of media in terms of potential exposure to violent or sexual content, rather than a general approach for all children at this age (Warren, 2005).

In fact, the 2011 Common Sense Media survey found low-income children watch more educational TV than their higher-income peers (Rideout, 2011). Parental rules and restrictions on programmatic content, as well as basic demographic factors like age, presence of siblings, and socioeconomic status do matter, as they are all associated with actual outcomes including children watching greater amounts of child-directed programming compared to the amount of time spent watching TV (Barkin et al., 2006; Barr, Danzinger,

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Children whose families had rules about TV time watched less television than children whose families did not have such rules.

et al, 2010; Vandewater et al., 2005). Given that concerns around media use in young childhood include both time spent and content viewed (Friedich-Cofer, Huston-Stein, Kipnis, Susman, & Clewett, 1979; Moses, 2008; Wright, 2001) looking at cultural differences in parents' views about media use in young childhood—including what they think about early TV viewing and the possible benefits of developmentally appropriate, educational, and prosocial viewing—is essential to understanding cultural disparities in actual media consumption. Parental rules and regulations around media use for their young children are influenced by their views toward TV (i.e., whether they believe it is a positive or negative influence on child development; Warren, 2003, 2005). However, very few studies have gone beyond race and ethnicity or socioeconomic status to examine how culture and media intersect in terms of their potential impact on early child development.

What Are Kids Watching?

Research has shown that, although young children watch a great deal of TV, parents can have a positive impact in terms of what they watch. Although there is a robust body of literature highlighting differences in educational versus noneducational viewing or developmentally appropriate versus inappropriate viewing on developmental outcomes, less work has focused on the possibility or impact of young children watching programming that reflects themselves, their families, and their communities (including their languages) versus programming that is a mismatch on any of these factors. Parents do endorse the belief that certain types of TV can be beneficial for early childhood development, but group differences do exist in regards to that belief (Barr, Danzinger, et al., 2010; Njoroge, Elenbaas, Garrison, Myaing, & Christakis, in press; Rideout et al., 2003). More specifically, many parents find viewing diverse programming to be an important introduction to diversity for their children that may not be present in their home communities (Rideout & Hamel, 2006). Furthermore, research has shown that the quality of a child's social relationship with a TV character influences the child's likelihood of learning from an educational program (Richert, Robb, & Smith, 2011), and when a character more closely resembles a viewer, emotional investment with a program increases, and the likelihood that viewers will learn educational content also increases (Fisch, 2004). If children are to benefit from the educational aims of certain programs, it is important to ask not only what the lesson of the program is, but perhaps also, who is teaching it.

Who Are Kids Watching?

Using data from a larger community-based study looking at media viewing in children 3 to 5 years old (*n* for the subset examined here = 600), we explored links between the race and ethnicity of participating children and the racial and ethnic demographics of their chosen TV programs as a way of initially assessing both the racial and ethnic diversity of popular programs and the extent to which the preschoolers in our sample were watching shows with characters who resembled them (at least phenotypically). All parents who participated in the larger study completed a survey that assessed child and family characteristics including: media use, household income, parental education, child's race and ethnicity, number of adults in the household, marital status, number of TV sets in the household, and presence of a TV in target child's bedroom. The families also completed a 1-week media diary by recording daily how much screen time (including TV and DVDs or videos) their child watched and the names of specific programs or films.

When looking at the ethnically and racially diverse children's media diaries, we saw some similarities in the top programs across the groups, which included African-American (*n* = 62), Latino (*n* = 34), and Asian-American/Pacific Islander/Hawaiian children (*n* = 95). Many of the most popular programs (by proportion of the sample who reported watching them during the 1-week media diary recording period) were appropriate for the ages of the children studied (3–5 years old), and many had educational or pro-social aims (e.g., themes or overt lessons about letters, numbers, caring for others, helping). Many of the top programs also had diverse lead characters or a diverse cast. Table 1 presents a list of the top four most popular diverse programs (by proportion of the sample who reported watching them on the 1-week media diary) for the four racial and ethnic groups examined. Diverse programs were defined as those with at least one main character of a racially or ethnically diverse background.

Table 1. Most Popular Diverse Programs in Each Group and Percentage of Group Who Watched

African-American (*n* = 62)	Asian-American/ Pacific Islander/ Hawaiian (*n* = 95)	European-American (*n* = 409)	Latino/a (*n* = 34)
Dora the Explorer (37%)	*Dora the Explorer* (20%)	*Sesame Street* (18%)	*Sesame Street* (29%)
Sesame Street (19%)	*Sesame Street* (18%)	*Dora the Explorer* (15%)	*Dora the Explorer* (18%)
Go, Diego, Go! (18%)	*Ni Hao, Kai-lan* (14%)	*Super Why* (15%)	*Sid the Science Kid* (15%)
Super Why (15%)	*Handy Manny* (9%)	*Sid the Science Kid* (14%)	*Super Why* (15%)

Note: Diverse programs were those with at least one main character of a racial or ethnic minority background.

Both similarities and differences emerged with respect to the program choices that families from different racial and ethnic backgrounds made. Across the four groups, the programs *Sesame Street* and *Dora the Explorer* were consistently the two most popular programs with a diverse cast. *Super Why* also appears on the top-four list for three groups, and *Sid the Science Kid* appears twice. Other popular choices included *Go, Diego, Go!* and *Ni Hao, Kai-lan*.

Figure 1 uses the top 10 most popular programs overall for each group (by proportion of the sample who reported watching them on the 1-week media diary) and presents a count of the number of programs from each group's top-10 list that were diverse in terms of their main characters. Diverse programs were defined again as those with at least one main character of a racially or ethnically diverse background. Because many programs for the preschool age group have animal or other nonhuman main characters, a count of animal-only programs is included as well. Of the top 10 most popular programs for each group, 40–50% were classified as diverse.

Although this data suggests interesting trends, it is important to note secondary to the small numbers of racially and ethnically diverse children included in this sample that these findings while interesting are exploratory. Taken together, they do indicate that young children watch programs with a diverse cast of characters, and the choices that parents make regarding diversity could be a function of intentional choice and availability of programs (e.g., many children's programs have Caucasian main characters, but less have main characters of other races or ethnicities).

Conclusion

Culture matters for early childhood media use. Parents have many reasons for allowing their young children to watch TV, diverse attitudes about the impact of television on child development, and varied rules and regulations around how much TV is too much and which programs are okay to watch. Television use is a part of children's daily lives and a part of culture, and much more research is needed in order to understand the reciprocal influence of TV and culture on child developmental outcomes. The literature reflects parents are extremely concerned regarding the different types of programs their children are watching and that this concern is completely warranted (Vandewater et al., 2005). Research on variability in media use to date has outlined the ways in which media consumption in young childhood varies by race and ethnicity and socioeconomic status, but thus far very little work has examined the reasons for these demographic differences. Research addressing how parents from different racial and ethnic and socioeconomic backgrounds regulate their children's media intake (in terms of time and content) has begun to address the question of why viewing disparities exist, but again, very little work has assessed the reasons that parents make the rules that they do for their young children's TV use. Increasingly, TV is a large part of young children's everyday lives and is incorporated in the customs, habits, and daily decisions of children and families. Although it has not always been viewed as such, TV is a part of culture and therefore susceptible to cultural variability. Examining cultural variability in parents' views about TV use in early childhood and its relation to developmental outcomes may help shed light on observed racial and ethnic and socioeconomic viewing disparities, and answer the questions of why parents make the decisions they do for their young children's TV viewing—both in terms of time and content—and how these decisions influence child developmental outcomes.

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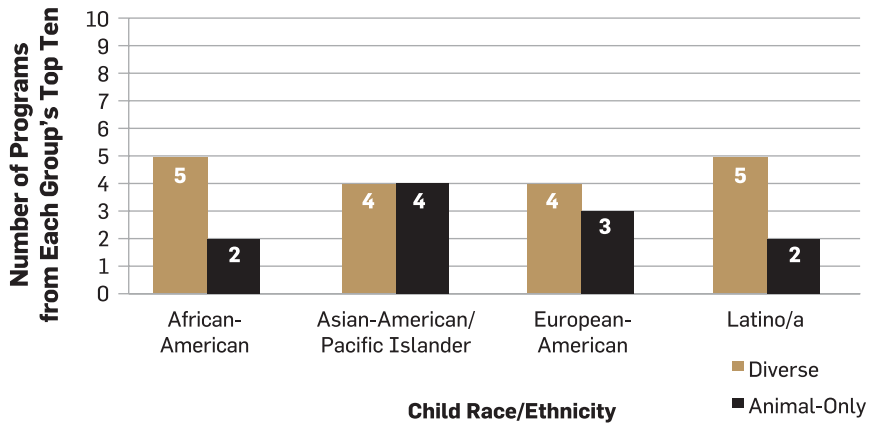
Every day children from birth to 1 year old watch around 53 minutes of TV.

Figure 1. Racial/Ethnic Diversity for Popular Programs



Note: Diverse programs were those with at least one main character of a racila/ethnic minority background. Animal-Only programs were those that had no human main characters.

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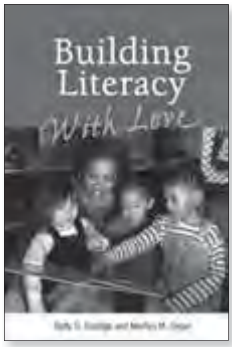

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Investigating the Family Bed

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Jonathan and Samantha researched and explored co-sleeping options in addition to preparing a nursery. The couple had no question that their baby would start out sleeping in their bedroom. This decision was made despite receiving less than enthusiastic responses from the future grandparents. After their infant's birth, Jonathan and Samantha fell into the room-sharing routine with baby Logan, and both parents enjoyed having him close. Logan eventually made the transition into sleeping alongside his parents in their bed, a practice the family happily engaged in until Logan became a toddler.

Tammy, an excited expectant mother, created a nursery space for her upcoming addition. She fully intended on having her baby, Amanda, sleep in her crib from day one. Like Jonathan and Samantha's choice to co-sleep, Tammy's decision to sleep apart from her baby almost went without saying. Tammy nursed her baby at bedtime and would wake whenever she heard Amanda's cries over the monitor to walk across the hall and feed or change her. Tammy appreciated Amanda's independence and ability to self-soothe from an early age, and felt that her support of solitary sleeping contributed to the development of those qualities.

Maurice and Shannon also went through the process of making space for their new baby, Dahlia. Within the first few nights of being home, however, Dahlia was frequently brought to the parents' bed for feedings. Shannon often fell asleep while nursing, only to wake up and feed Dahlia again an hour later. At other times, Dahlia would not go back to sleep in her crib, and the only method that helped her drift off was to sleep on top of Maurice or Shannon. Co-sleeping with Dahlia in their bed soon became customary. This change was difficult for both caregivers, who felt trapped in a sleeping practice that greatly differed from their pre-baby approach to sleep and what they had envisioned life would be like after bringing Dahlia home.

Familial sleeping practices are influenced by personal conceptions regarding sleep, cultural norms and beliefs, and information provided to caregivers through the popular media. The goal of this article is to educate parents and professionals about the historical and cultural perspectives on sleeping approaches for infants and children and thereby present current knowledge on best practices. Families, communities, and cultures around the world exhibit marked heterogeneity of sleeping techniques. On the whole, individuals appear to end up healthy and adjusted in culturally relevant ways, and no harm or benefit has been associated with childhood sleeping practices (Cortesi, Giannotti, Sebastiani, & Vagnoni, 2004; Okami, Weisner, & Olmsted, 2002). Many cultural practices that have transcended generations are at odds with the modern Western discourse. This conflict is fueled by a lack of understanding of the meaning of co-sleeping. By providing a working definition of the practice, taking into account historical and present attitudes, and exploring options for caregivers who engage in co-sleeping, we hope, through this review, to foster practitioners' confidence in helping families navigate sleeping routines.

Abstract

Although it remains a contentious issue, co-sleeping is becoming more popular in Western, industrialized societies. This article explores the practice of co-sleeping in cross-cultural settings, examining the role of culture, the dominant Western discourse regarding sleep, and changes in policy recommendations regarding sleeping approaches. Although debate remains, caregivers appear most comfortable when they proactively choose an approach and implement it consistently, conversely experiencing dissatisfaction when sleeping arrangements are made reactively. On the basis of reviewed findings from historical and current literature, the authors provide recommendations and techniques for practitioners in supporting families around sleep practices.

Finding a Working Definition of Co-Sleep

When people hear the phrase "co-sleep," they often assume it means children and caregivers sharing a bed during nighttime hours. The literature commonly defines it as "infants and young children sharing a bed with their parents for sleep" (Goldberg & Keller, 2007, p. 331; see also Ball, 2002; McKenna & Volpe, 2007; Morelli, Rogoff, Oppenheim, & Goldsmith, 1992). It is interesting to note that the American Academy of Pediatrics (AAP) differentiates between co-sleeping (i.e., child is in the same bed as the caregiver or in the same room and in close proximity to the caregiver bed) and bed sharing (i.e., child and caregiver in a bed together; American Academy of Pediatrics Task Force on Sudden Infant Death Syndrome [SIDS], 2005). In a more general conception of co-sleeping, McKenna (2007) defines it as:

...The many different ways babies sleep in close emotional and physical contact with their parents, usually within arms reach. Whether it is for protection, warmth, food, or comfort, humans and other mammals routinely sleep side by side, generation after generation. ("What is Cosleeping?" section, para. 3).

Clearly, researchers and practitioners are not alone in failing to arrive at a consensus about what defines collective caregiver–child sleeping practices. For the purposes of this article, we will define *co-sleeping* as children and caregivers sleeping in the same room and *bed sharing* as children and caregivers sleeping together in the same bed.

The AAP's Position on Co-Sleeping

As one of the leading voices for safety standards for infants, the AAP is responsible for widely disseminating information to medical professionals, families, child care facilities, and child practitioners about optimal caregiving techniques. Because of the vast amount of research and publications that come from the AAP, their messages fall under the dominant Western medical discourse, often considered the standard against which all caregiving should be held. In providing recommendations related to infant sleeping practices, the AAP has been extremely clear on its stance about sleep position and location. A primary cause of infant death during sleep is SIDS, defined as "the sudden death of an infant under 1 year of age, which remains unexplained after thorough case investigation, including performance of a complete autopsy, examination of the death scene and review of the clinical history" (Willinger, James, & Catz, 1991, p. 681). In 1992, following investigations of unexplained infant deaths in Europe and Australia, the AAP adopted the recommendation that infants be placed only on their backs for sleep (i.e., the supine position; Kattwinkel, Brooks, Myerberg, & the AAP Task Force on Infant Positioning and SIDS, 1992). Since the inception of the "Back to Sleep" campaign put forth by the National Institute of Child Health and Human Development in 1994, the incidence of SIDS has decreased but continues to be one of the leading causes of death for infants less than 1 year old (AAP Task Force on SIDS, 2005).

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Familial sleeping practices are influenced by personal conceptions regarding sleep, cultural norms and beliefs, and information provided to caregivers through the popular media.

In addition to advocating that caregivers place infants in the supine position for sleep, the AAP has consistently recommended that parents refrain from the practice of bed sharing with their infants (AAP Task Force on SIDS, 2005, 2011a, 2011b). More recently, the AAP has cited the occurrence of sudden unexpected infant death (SUID), "a term used to describe any sudden and unexpected death, whether explained or unexplained (including SIDS), that occurs during infancy" (AAP Task Force on SIDS, 2011a, p. 1030). In relation to sleep, they note,

The distinction between SIDS and other SUIDs, particularly those that occur during an observed or unobserved sleep period (sleep-related infant deaths), such as accidental suffocation, is challenging and cannot usually be determined by autopsy alone. Scene investigation and review of the clinical history are also required. A few deaths that are diagnosed as SIDS are found...to be attributable to metabolic disorders or arrhythmia-associated cardiac channelopathies. (AAP Task Force on SIDS, 2011b, p. 1342)

In its newest set of recommendations, the AAP maintained that the optimal approach to sleep in the first year of life entails

The arrangement of room-sharing without bed-sharing, or having the infant sleep in the parents' room but on a separate sleep surface (crib or similar surface) close to the parents' bed...[is] most likely to prevent suffocation, strangulation, and entrapment, which may occur when the infant is sleeping in the adult bed. (AAP Task Force on SIDS, 2011b, p. 1350)

Not only does the AAP advocate for room sharing as a potential safeguard against SIDS, the organization also touts the benefits of room sharing as a method for caregivers to streamline breastfeeding and monitor their baby throughout the night (AAP Task Force on SIDS, 2005).

Examining Sleeping Practices Across Cultures

Although the AAP tends to represent American sentiments regarding sleeping, there is much cultural variance in the United States and elsewhere around the world. Culture is an elusive and difficult construct to define. For the purposes of this article, culture is considered "a complex system of common symbolic actions (or scripts) built up through everyday human interaction by means of which individuals create common meanings and in terms of which they organize behavior" (Edwards, Knoche, Aukrust, Kumru, & Kim, 2005, p. 141). Because everyday interactions are not stagnant, culture is fluid, whereby "adults and children negotiate and re-negotiate

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Some common cultural beliefs indicate that sleeping together or in close proximity is a maladaptive, inappropriate, and forbidden practice.

meanings through social interaction…[which leads]…to unceasing heterogeneity and variability" in how community members understand and instill socialization norms and ideals in younger generations (Edwards et al., 2005, p. 141). Related to the topic of co-sleeping, cultural beliefs dictate familial preferences for bedtime arrangements and can be considered a reflection of implicit, often difficult-to-articulate moral attitudes about child rearing and family relationships (Shweder, Jensen, & Goldstein, 1995).

Despite having a historical, worldwide presence, the child-rearing practice of co-sleeping is an exceptionally controversial topic in some Westernized societies, such as the United States, the United Kingdom, and Western Europe (Goldberg & Keller, 2007; McKenna, 2007; Sobralske & Gruber, 2009). Specifically within the United States, pediatricians are the first source of information for new caregivers. They are responsible for providing parents information about co-sleeping and bed sharing, and are largely influenced by the AAP. Even though the dominant Western medical discourse indicates that bed sharing is dangerous but room sharing is protective, the literature suggests that families from Western, industrialized societies do engage in the practices of co-sleeping and bed sharing (Abbott, 1992; Ball, 2002; Blair & Ball, 2004; Brazelton & Sparrow, 2003; Lindgren, Thompson, Häggblom, & Milerad; 1998; Lozoff, Wolf, & Davis, 1984; McKenna & Volpe, 2007). Brazelton and Sparrow (2003) noted that "co-sleeping is on the rise in the United States [because of] women at work …the cost of living has gone up much faster than wages…and solo parenting….Parents are turning to co-sleeping as an adaptation to these new pressures" as time with their children has been greatly reduced (pp. 64–65). For example, Willinger, Ko, Hoffman, Kessler, and Corwin (2003) surveyed samples of more than 1,000 American caregivers every year between 1993 and 2000 to establish patterns in bed-sharing practices. Rates of reported bed-sharing habits with adults more than doubled from 5.5% to 12.8% over the course of the investigation. In addition, survey results revealed that rates of bed sharing significantly increased in populations of mothers 18 years and older, and with an identified ethnicity as "white or Asian/other," a shift from the beginning of the study (Willinger et al., 2003, p. 45). Caregivers from Southern, Midwestern, and mid-Atlantic states expressed a statistically significant increased rate of bed sharing over the course of the study, and were doing so with infants 8 weeks or older (Willinger et al., 2003). While co-bedding rates were higher for younger mothers with annual incomes less than $20,000, these findings show that caregiver demographics and child characteristics of those who were bed sharing changed. These findings were supported by Lahr, Rosenberg, and Lapidus (2007) in their study of a diverse sample (N = 1,756) that showed bed sharing rates of 23.4% "never", 41.4% "sometimes", 14.7% "almost always", and 20.5% "always" (p. 280). Taken together, more than 76% (N = 1,335) of mothers co-bedded at least sometimes. It is possible that U.S. caregiver reports of co-sleeping rates were lower than actual practices because of the prevailing recommendations put forth by the AAP.

Although the findings presented by Willinger et al. (2003) as well as the AAP's recommendations to room share indicate that the dominant Western discourse related to sleeping techniques is shifting, cultural concerns remain about co-sleeping and bed sharing. Beyond health-related concerns, some common cultural beliefs indicate that sleeping together or in close proximity is a maladaptive, inappropriate, and forbidden practice, filled with the potential to oversexualize and psychologically damage children (Brazelton & Sparrow, 2003; Lozoff et al., 1984; McKenna, 2007; Morelli et al., 1992; Shweder et al., 1995; Sobralske & Gruber, 2009). Shweder and colleagues (1995) indicated that White, middle-class Americans are predominantly "prone to the view that parent–child co-sleeping is pathological and perhaps even criminal" (p. 24) and that caregivers may experience fears about "sexuality, excessive dependency, and the exploitation of children" because of the dominant beliefs in Western societies (p. 25).

Another culturally embedded belief contends that co-sleeping and bed sharing are considered possibly harmful to the quality of caregivers' relationships and marriages. In comparing the practices of U.S. and Highland Mayan mothers, Morelli et al. (1992) found that no participating Americans reported regularly bed sharing with their child and the baby's father, sometimes because of worries about "loss of privacy and associated concerns about sexual intimacy," whereas the Mayan mothers routinely co-bedded with their infants and toddlers (p. 611). In addition, Shweder et al. (1995) compared the sleeping practices and viewpoints of middle class Anglo-Americans and high-caste families in India. When participants were given the task to arrange a hypothetical family of seven into varying room configurations (e.g., one room, two rooms, and up to seven rooms), the way in which Anglo-American families separated the family members aligned with three culturally embedded beliefs: incest avoidance, care for the sacred couple, and autonomy for the children (Shweder et al., 1995). Similar to the findings from Morelli and colleagues (1992), Shweder et al. suggested that "when it comes to co-habiting adults, emotional intimacy, interpersonal commitment, and sexual privacy require that they sleep together and alone" (p. 32), illustrating a cultural belief that honoring the adult bed and instilling independence in the child may be compromised when children sleep alongside their caregivers. Through these examples and via the implicit influential nature of a culture's impact on behaviors and beliefs, it is evident that many caregivers' conceptualizations of "appropriate" familial sleeping arrangements exist within the family's self-identified cultural practices. It is possible that with the

recent evidence of shifting viewpoints in Westernized settings, a similar investigation conducted today may yield different results.

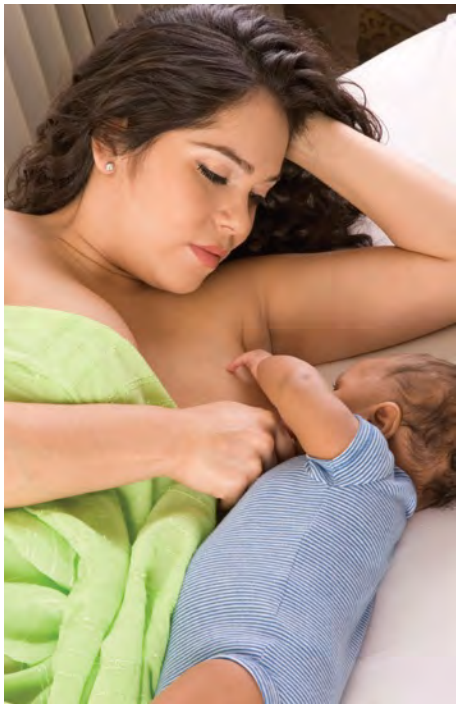
Along with underlying cultural codes stating that parent–child co-sleeping and bed sharing is detrimental and taboo, the literature has raised concerns that these practices will hinder children's independence and autonomy (Germo, Chang, Keller, & Goldberg, 2007; Morelli et al., 1992; Sadeh, Mindell, Luedtke, & Wiegand 2009). Morelli et al. (1992) found that U.S. mothers' choices were rooted in a cultural desire to "train babies to be independent and self-reliant from the first few months of life," as it would be challenging to break an established habit of sleeping together (p. 611). A practice such as solitary sleeping is thought to support an infant in attaining independence, a Western cultural ideal that instills helpful qualities in a child throughout the lifespan (Keller & Goldberg, 2007). Likewise, an exploration of sleeping patterns and parental strategies used by American and Canadian families revealed that when caregivers engaged in consistent preparatory rituals and routines (e.g., singing, nursing, or reading) that encouraged independent behavior, such as solitary sleeping and self-soothing, babies exhibited longer and more concentrated amounts of sleep (Sadeh et al., 2009). In his examination of Western infant sleeping behaviors, St. James-Roberts (2012) discussed the implications of expecting infants to sleep for long durations throughout the nighttime hours. Decreased or absent night wakings by babies around the age of 3 months is actually a result of "the ability to resettle back to sleep by themselves without crying out"; thus, most babies do awaken at night, but may not require the support of their caregivers to settle back into sleep (Chapter 5, Section 2, para 5). As a consequence, some infants may respond to tactics like those initiated by caregivers in Sadeh et al. (2009) better or differently than others, but are most likely not sleeping through the night, a common misconception about infant sleep (St. James-Roberts, 2012). Sleep satisfaction likely drops off when babies "continue to cry out or otherwise 'signal' their parents when they wake at night," rather than demonstrate the ability to independently fall back to sleep (St. James-Roberts, 2012, Chapter 5, Section 2, para. 5). Germo et al. (2007) discovered that in a sample of U.S. mothers and fathers of solitary sleepers, the choice to have their child sleep solitarily was made to increase the development of independence. Caregivers in both samples exhibited similar satisfaction regarding their decision to sleep separately from their baby.

Similar to solitary sleeping, the practice of co-sleeping is influenced by cultural beliefs. Although it is evident that practices are shifting in Western, industrialized societies, it is highly common in other countries and communities for babies and children to room share or bed share with members of their family (Caudill & Plath, 1966; Morelli et al., 1992; Whiting & Edwards, 1988). For example, in 11 of the 12 communities in their longitudinal study spanning the 1950s to 1980s, Whiting and Edwards (1988) observed that infants consistently shared a bed with their parents until they were done nursing. Their sample consisted of numerous communities located in 12 different countries (e.g., Liberia, Kenya, India, Mexico, the Philippines, Japan, and the United States), and the authors studied approximately 20–50 households in each location. The findings revealed that no American families across 24 households co-slept or shared a bed. Similarly, Caudill and Plath (1966) uncovered a high rate of bed sharing in urban Japanese families. In their selection of families across three cities in Japan (N = 323), this custom began in infancy, and participants indicated that they rarely slept alone, a practice carried well into adulthood. Caregivers reported that sleeping with their children was an important precursor for the development of interpersonal relationships, a culturally salient belief. In addition, Morelli et al. (1992) found that all participating Mayan mothers in their study slept alongside their baby throughout the child's first year and well into their second. More than half of the Mayan toddlers also shared a bed with both parents, a practice that Morelli and colleagues attributed to the embedded cultural belief that children should not be left alone.

In a more recent study of 253 families in the United Kingdom, Ball (2002) found that caregivers with higher educations and incomes made a

conscious and pre-planned decision to bedshare … [and] expressed their opinions that this 'family bed' ideology set the tone for a relaxed and intimate family relationship, and reflected a permissive parenting style that some educated and well-off parents in our sample wished to promote (p. 217).

These children were always welcome in their parents' beds, even in the presence of other siblings or pets. McKenna and Volpe (2007) conducted an Internet-based survey study (*N* = 200) of White, middle-class women from the United States, Canada, the United Kingdom, and Australia. Besides indicating that bed sharing was helpful and convenient for nursing, "the respondents … felt strongly that bedsharing enhanced or strengthened the emotional connection with their infant," using such words as "comforting, peaceful, loving, [and] protective, and a mechanism by which those emotions could be sustained and/or enhanced" (McKenna & Volpe, 2007, pp. 367–368). Similar to parents in other investigations (Abbott, 1992; Ball, 2002; Caudill & Plath, 1966), mothers in this inquiry experienced pleasure from bed sharing with their infant, as it "allowed them to compensate for daytime separation by promoting attachment and bonding through nighttime contact and affection" (McKenna & Volpe, 2007, p. 368).



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Commonly cited reasons for co-sleeping and bed sharing include the ease with which parents can promote breastfeeding and respond to their child's sleeping patterns.

In comparing the Western and non-Western literature regarding sleep practices, we find a notable lack of importance placed on incest avoidance and the adult bed as sacred place in non-Western literature. It appears that incest avoidance and the sacred bed are not central to the implicit cultural codes in non-Western societies, and may therefore not be considered by researchers or addressed by participants. This difference in perspective may be a result of space constraints, beliefs in more collectivist practices, or general sentiments that the baby is not an intrusion in the adult space. The findings of Shweder et al. (1995) appear to be an exception, as both American and Indian participants placed the hypothetical family into configurations that adhered to the incest avoidance preference. In an interesting departure from previous practices, obvious shifts away from avoiding co-sleeping are occurring in Western, industrialized settings,

possibly indicating lessened concern or focus on incest avoidance, or the sacred bed, or both. Trends have emerged in more recent research whereby working parents and—especially—affluent caregivers are increasingly likely to include the baby in their room overnight (Ball, 2002; Brazelton & Sparrow, 2003; McKenna & Volpe, 2007).

Co-Sleeping by Choice or Default

Other commonly cited reasons for co-sleeping and bed sharing—beyond cultural customs and the desire to bond—include the ease with which parents can promote breastfeeding, respond to their child's sleeping patterns, and provide close and watchful care for their baby. For example, Ball (2007) examined the link between breastfeeding and bed sharing in 66 mothers from the United Kingdom. Ball determined that, across the entire sample, prevalence of breastfeeding declined with the infant's age and that the proportion of infants bed sharing on a week-by-week basis throughout the 6-month study also decreased. Morelli et al. (1992) found that Mayan mothers commonly cited breastfeeding as a reason to bed share, as it made the process of nursing and sleeping easier for the entire family. In addition, McKenna and Volpe (2007) proposed that sleeping practices are changing because of "the re-emergence of breastfeeding in western societies which is rapidly becoming the new western cultural feeding norm" (p. 364). This change was echoed in the narratives provided by the respondents in their study, many of whom indicated that, although they had initially endorsed solitary sleeping, nursing in the adult bed was easier for the mothers (McKenna & Volpe, 2007). Co-sleeping and bed sharing appear to improve the quality of sleep for families and make the process of consistently feeding an infant more manageable.

When Bed or Room Sharing Is Not a Choice

It is important to address the literature on families stating that bed sharing or room sharing is a reactive approach to their child's sleeping patterns or problems. Reasons for engaging in reactive sleeping practices may be a result of space constraints, separation from the child during the day, child illness, or behavioral issues related to sleep or sleeping solitarily (e.g., inability to remain asleep, occurrence of night terrors). Brazelton and Sparrow (2003) discussed the issue of bed sharing in response to children's sleep problems and parental guilt from being separated while at work:

> *...It is likely that many parents, as worn out as ever or more so, are also suffering because they haven't seen their child all day. When the child wakes up at night, many parents really aren't sure whether they want to put him back to bed or stay up and play with their child.* (*p. 64*)

In a study by Ramos, Youngclarke, and Anderson (2007) exploring parental attitudes of 139 families related to their child's propensity to co-sleep or sleep solitarily, the authors determined that 67% of the 44 reactive co-sleeping families expressed some level of dissatisfaction with their arrangement. Similarly, Ball (2002) reported that of the 47 non-breastfeeding bed sharers in their sample of 253, 26 (55%) did so because of their child's sleep problems. In addition, 18 (69%) of those 26 families reactively engaged in the practice because of their babies' protesting. In the study conducted by Sadeh and colleagues (2009), parents who reported poorer quality of child sleep were also bed sharing as a reactive approach to address their child's sleep problems.

Germo et al. (2007) found similar satisfaction levels for those who made a proactive choice to sleep solitarily or together, rather than reactively. The retrospective questionnaire data obtained from male and female caregivers revealed that "a similar, highly satisfied, stable pattern was apparent for mothers of solitary sleepers and early bed sharers and for fathers of solitary sleepers and early co-sleepers" (p. 451), with satisfaction decreasing only in the case of families with children who stopped and started co-sleeping or bed sharing throughout their early years. This finding corroborates results from Lozoff et al. (1984), who compared the sleeping practices of Euro-American and African American families. The authors suggested that, in their Euro-American sample, it may not have been the act of bed sharing that caused interpersonal discord and dissatisfaction; rather, inconsistent practices may have been the reason for the Euro-American parents' ambivalence toward co-sleeping. In addition, African American families were more likely to proactively engage in bed sharing practices than were their Euro-American counterparts, and they noted higher levels of satisfaction with their sleeping arrangements.

Similarly, Taylor, Donovan, and Leavitt (2008) examined the association between infant sleeping arrangements and the quality of mother–child interactions in a sample of 70 Euro-American infant–mother pairs. The authors found that "mother–infant dyads who experienced consistent sleeping arrangements...at 6 months displayed more positive play behavior at 9 months" (i.e., more sensitive responding in the mothers and more positive play in the infants), when compared with those who engaged in inconsistent, reactive sleeping practices (Taylor et al., 2008, p. 87). For a variety of reasons, it appears that sleep satisfaction levels decrease when bed sharing or room sharing is not a choice.

How to Proceed: Future Directions for Practitioners

The literature we have presented highlights a multifaceted debate of how caregivers should and do approach sleeping practices in their households. Although the Western viewpoint is shifting, there remains a common belief in Western culture that bed sharing is a potentially harmful or taboo practice. Within the Western dominant discourse, both historical and current cultural perceptions related to room sharing or bed sharing suggest concern for the development of a child's independence and autonomy (Germo et al., 2007; Morelli et al., 1992; Sadeh et al., 2009). Similarly, there are Western cultural codes that suggest the adult bedroom is a sacred place with little room for children (Morelli et al., 1992; Shweder et al., 1995). More recently, contributors to the dominant Western medical discourse have recommended that parents should room share with their infants, primarily those younger than 6 months, in an effort to reduce the occurrence of SIDS (AAP Task Force on SIDS, 2011a, 2011b; [UK] Department of Health, 2009).

In contrast, other research implies that caregivers in Western, industrialized countries engage in co-sleeping and bed sharing for a wide range of cultural and practical reasons. In some communities, parents sleep alongside their children to perpetuate implicit cultural ideals that are a normative part of the environment in which they live (Abbott, 1992; Ball, 2002; Caudill & Plath, 1966; Morelli et al., 1992). Other caregivers have articulated the importance of sleeping proximally to their children, indicating that such practices improve closeness, bonding, and time together when parents are gone at work during the day (Ball, 2002; Brazelton & Sparrow, 2003; Lozoff et al., 1984; McKenna & Volpe, 2007), as well as help to streamline the process of nighttime feedings (Ball, 2002, 2007).

Finally, another group of caregivers finds themselves reactively co-sleeping or co-bedding. In many cases, parents experience dissatisfaction when they end up room sharing or bed sharing (Ball, 2002; Germo et al., 2007; Ramos et al., 2007; Sadeh et al., 2009; Taylor et al., 2008). For better or for worse, actively or reactively, many families co-sleep or co-bed with their infant or child. In addition, as highlighted in the research reviewed here, many families are sleeping with their children in some capacity. Although there

is not as much clear support for bed sharing, for the many parents that do, here are suggestions for best practice (adapted from Brazelton & Sparrow, 2003; McKenna, 2007; Sobralske & Gruber, 2009):

- An infant should always be placed in the supine position.
- Sleeping surfaces should not include loose or sagging bedding, and should be free of stuffed animals or toys.
- Mattresses should be firm (i.e., no water beds or sleeping in chairs or couches) with tightly fitting sheets, light blankets, and firm pillows (one per adult).
- Families should not bed share if any member of the family smokes or if the mother smoked during her pregnancy.
- Families should not bed share if any caregiver is significantly overweight or obese.
- The bed should be away from the wall and placed in the center of the room, with the box spring on the floor, in order to avoid any type of infant entrapment between the bed and wall, bed frames, or other close objects, such as dressers or nightstands.
- The bed should also include at least a full or queen-size mattress.
- The bedroom should be kept at a cool temperature during the night (while keeping the baby warm enough with pajamas). Although the exact temperatures at which families should sleep are rarely outlined in the literature, the UK Department of Health (2009) provides a guideline for protection against SIDS: "Babies do not need hot rooms; all-night heating is rarely necessary. Keep the room at a temperature that is conformable for you at night. About...65°F is comfortable" (p. 4).
- Do not bed share if any caregiver has consumed alcohol or taken drugs.
- Do not bed share if any other people or pets in the household may get into the bed where the infant is bed sharing, or if a pet sleeps in the same room as the adult(s) and infant.

After this review of the literature and a consideration of best sleep practices, we can reconsider the implications of the vignettes posed at the outset. Jonathan and Samantha made a proactive decision to room share and then bed share with their baby, Logan, a decision compatible with their household culture and one that brought them much satisfaction. Similarly, Tammy was content with her choice to have Amanda sleep solitarily from the time she brought her home, and was comfortable going to her during the nighttime hours. Maurice and Shannon experienced the most challenging transition to nighttime sleep with a new baby. They made a conscious decision to sleep separately from Dahlia, but often struggled to maintain their intended sleeping approach. As noted previously, reactive approaches often lead to dissatisfaction and poorer sleep quality. Beyond their immediate family, trusted friends, and physicians, many families turn to Web sites, blogs, books, and television programs for information about "best practices" in parenting. Where else can tired and frustrated caregivers, such as Maurice and Shannon, turn?

Child practitioners can support caregivers who may feel anxious or uncertain about sleeping choices. Some caregivers may not think twice about the choice they make regarding sleeping arrangements in their home, and there is no need for them to deconstruct the basis of their decisions. For parents who do experience uncertainty, guidance from their pediatrician or child care practitioner may be beneficial. In order for caregivers to make sense of the differing messages and their own apprehensions, it is imperative that they understand their cultural beliefs and critically analyze the messages they receive from family members, friends, doctors, child practitioners, and the media. It may be helpful to encourage parents to examine their own views, practices, and perceptions about appropriate sleep patterns. This may include reflecting on childhood experiences with sleep, considering what the parents are currently doing for their child, or reflecting, "What would I do as a caregiver of a young child when it comes to sleep?"

Infant and family practitioners can support parents in decision making. Health care providers and community agencies can support parents' decision making by collectively thinking about their team's beliefs regarding sleeping practices, taking time to consider what views of sleep are held within the team or agency, and examining how these viewpoints are shared with families, explicitly or implicitly. Additional questions for agencies to consider:

- How does our agency address the recommendations put forth by the AAP?
- Should the recommendations be part of our team's mission in supporting families?
- Does our team adhere to a larger message of encouraging caregivers to simply abstain from co-bedding rather than provide strategies that make the practice safer for families?
- In considering the suggestions for best practices and safety precautions, how does our team address unsafe co-sleeping practices? How do we make families aware of the safety precautions to take when co-bedding with infants and young children?
- How does our team attempt to understand the values and beliefs, and the subsequent concerns and issues, that families present?

Overall, it may help parents to reflect on their personal values and beliefs, and to come to some consensus about a practice that works and can be sustained over time. This process can be supported by child development agencies that work with caregivers and their infants. Assisting caregivers in questioning whether certain pieces of advice or overarching messages coincide or clash with their personal culture, ideals, and aspirations, in addition to reducing their ambivalence and improving their confidence regarding their choices, will ultimately help them feel empowered in their practices and override uncertainty related to sleep arrangements.

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Reflections of a ZERO TO THREE National Training Institute Neophyte

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The ZERO TO THREE National Training Institute (NTI) has been somewhat of a professional "holy grail" to me for the last 5 years. Each year, as I received a "Save the Date" email I would yearn desperately to attend only to realize sadly that work, financial, and family demands (particularly having two small children of my own during those years) made attending the NTI prohibitive for me on many levels. Fast track to September 2012 when I receive yet another "Save the Date" for the 2012 NTI to be held in sophisticated downtown Los Angeles, CA. I have the wonderful revelation that: 1. I have earned enough professional development funds for my place of employment to help finance my attendance. 2. The themes and topics offered are perfectly matched to my current professional role as an infant mental health specialist which includes the titles of: home visitor, reflective supervisor and consultant, and trainer. 3. My little ones are finally school-aged and big enough to survive for a week in the sole care of their very laid-back father!

Immediately I submit my request to my employer for professional development funds and begin anticipating this coveted opportunity to convene and connect with the foremost cutting-edge experts in infants, toddlers, and families! I relish being a witness to the latest discoveries in policy, research, and practice matters that matter most for this very complex population. After months of such excitement and anticipation, let me just say that the experience was so much more than I could have ever imagined!

My week began in beautiful Redondo Beach, CA, with a 2-day pre-NTI retreat convening a national league of state Infant Mental Health Associations that are intensely committed to the work of implementing Michigan's Infant Mental Health Endorsement (IMH-E®) in their home states. The Michigan Association of Infant Mental Health has been a national leader in building an organized professional development system that recognizes and documents the work, education, learning, and training experiences of the infant and family workforce with emphasis on professional preparation that demonstrates competency in culturally sensitive, relationship-based, high-quality infant mental health service delivery (Michigan Association for Infant Mental Health, 2013). As a brand new endorsement coordinator for my own home state's Infant Mental Health Association, being able to participate in this retreat was like adding an extra dollop of whipped cream to an already delectable slice of pie!

The experience of connecting with like minds, not to mention being in the presence of such wisdom and brilliance felt truly transformative. In the frenetic chaos of daily life, the privilege of taking pause to think more deeply about the work done by those of us in the infant mental health field, and how and why we work the way we do, is a rarity. Those 2 days really set the tone for the mindset I took with me into the NTI. As a group of retreaters, we pondered and debated about the future of our league of states, how modern technology and the advent of social marketing will impact the infant mental health field, the importance of cultivating new leadership to carry the torch into the future, and the growing challenge of operationalizing reflective supervision in measurable terms; while still protecting the integrity of an intimate, transformative experience that yields immeasurable benefits.

We grappled with finding ways to allow the concepts of "knowing for sure" and "not knowing at all" to coexist peacefully within the infant mental health profession with the realization that "sometimes not knowing may be the vehicle to becoming the wisest we can ever be" (Weston, 2012). We asked ourselves and each other in raw, honest ways what we

hoped both our individual and collective work would accomplish for babies, families, and the people who care about them not just nationwide but worldwide. Colleagues felt safe enough to be truly vulnerable in sharing their earliest experiences as young professionals entering a field for which formal schooling had left them ill-prepared. There was consensus among the group that for all we cannot know, what we all know for sure is that there are no "experts" in the infant mental health field; for we are always students with much to learn from our experiences, our colleagues, and, most important, the babies and families who touch our lives. Finally we challenged one another to think about what sort of legacy we want to leave to this still very young, yet rapidly developing field called infant mental health.

It was this experience of thinking deeply aligned with passionate debate and discussion in a safe, warm, trusting environment of kindred spirits that created the mindset I carried into the ZERO TO THREE NTI—one of wonder and curiosity. I checked into the very urbane, sophisticated JW Marriot located at Downtown Live LA and wandered around the conference market place like a wide-eyed child in Wonderland. The images of beautiful, cherubic, young children smiling back at me with pure exuberance and the scores of programs from all over the country each offering their unique insights into what babies need gave me reassurance that I was in exactly the right place!

The Opening/Welcome Plenary featured a warm welcome and introduction by ZERO TO THREE's executive director Matthew Melmed. The one and only Rob Reiner's presentation of the Reiner Award for Advocacy on Behalf of Young Children to Robert Duggar, founder of ReadyNation—a nonprofit organization dedicated to partnerships with the business community on behalf of investing in young children and families—marked a powerful beginning to the next 3 days. The takeaway message was simple and clear: a national investment in the development of very young children and their families is not optional...it is the key to a prosperous society (Dugger, 2012; Reiner, 2012). This notion became my mantra as the days continued to meld into one another. The overarching themes of this year's NTI provoked its participants to think more broadly about the concept of development: that is, the essential

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Matthew Melmed, Robert Duggar, and Rob Reiner (l to r) at the presentation of the Reiner Award for Advocacy on Behalf of Young Children.

ingredients of healthy development, the pain and tragedy inherent in development gone awry, and how we as helpers and healers can calm and regulate ourselves and others when challenging behaviors and dangerous situations are the by-products of compromised development.

I found myself mesmerized when, during his morning science plenary session, Dr. Pat Levitt so simply yet so eloquently asserted that motor development is every bit a relational, transactional process as communication and language development. It is the give-and-take exchange in the caregiver–infant relationship—and the assurance of safety—that provides the contextual environment for rich developmental experiences and optimal early brain architecture (Levitt, 2012). I have heard explanations of early brain development, its importance, and the role of relationships and experiences many times, but Dr. Levitt's style of integrating every aspect of how we become who we will be at a cellular level within the context of the primary relationship left me in awe!

Dr. Alan Sroufe's (2012) keynote presentation on the impact of early relationships and experiences on development reaffirmed for me what I have always so strongly believed: how we become who we are is neither nature nor nurture but rather a complex, intricate interplay of both. Broadening the message and understanding that traumatic experiences like disruptions in attachment, illness, violence, and loss are absorbed into the mind and body long before we develop language or memory holds powerful implications not only for how we make sense of human behavior, but for how we make decisions at the policy level about education, social welfare, and criminal justice. Becoming enlightened with the knowledge that early experience is so very critical to human development at every level can be a frightening revelation when those early experiences are compromising or rife with danger and chronic stress. Yet the role of repair and conviction in its power conveys the message that no matter what happens, healing is always possible.

For many of us who are direct service professionals in the field, developing a sense of one's purpose as that of a "healer" is almost therapeutic in and of itself. Reconstructing an identity as a "healer" rather than a problem solver, teacher, fixer, or expert frees us from the burden of having to know or predict what cannot be known, or to "fill holes that perhaps may never be filled" (Jones-Harden, 2013). As healers we can "be with," "think through," "accept," "contain," and "bear witness" in

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The 2012 NTI accomplished its goal to connect, fortify, and revitalize a nation of people passionately dedicated to making life better for our country's youngest citizens.

a relationship-based context (Lieberman, 2012). In fact it is being "in relationship" that may be the best thing we can do, even if we never fix or solve. An afternoon panel discussion moderated by Rebecca Shamoon-Shanock, and featuring Alicia Lieberman, Cheryl Polk, and Howard C. Stevenson, reminded us how often our world underestimates the value of walking through a turbulent, troubled storm with a "pocket full of calm" (Shamoon-Shanock, 2012). Armed with a pocket full of calm, we are secure in the knowledge that we may not be able to battle the storm, fight it, or end it but we can contain the fears, feelings, and reactions that come with the storm. The panel participants beautifully illustrated in sharing their own stories that carrying a "pocket full of calm" enables deeper thinking about what important messages and emotions underlie behavior, creates the capacity for openness to another's mind and inner life, and sharpens our awareness of the power we have as potential healers to uplift or denigrate the most vulnerable.

It seems to me that the 2012 NTI accomplished its goal to connect, fortify, and revitalize a nation of people passionately dedicated to making life better for our country's youngest citizens, who have no voice or lobbying power in Congress, and for the people who care for them. True there is much work to be done, there always will be. I am inspired and fortified though at how much has been accomplished in a relatively short time in our nation for infants, toddlers, and families. ZERO TO THREE has always been at the forefront of this incredibly important movement and it was such a privilege for me to finally....finally be at the party!

As I conclude my reflections on this amazing experience, I recall economist Rob Grunewald's stunning assertion in his morning policy plenary session that every person in attendance at the NTI needed to change their professional identity and personal mission statement! Those of us who commit ourselves, be it professionally, personally, or both, to caring for and about people at the earliest and most precious time of human life are not simply babysitters, parents, educarers, therapists, doctors, nurses, teachers, researchers, and policymakers; we are the drivers of a future globally competitive, national workforce (Grunewald, 2012).

We are not just raising and working with babies. We are national economic developers; and the outcome of our efforts is essential to business development, job market growth and productivity, and a healthier more humane society. What could be more patriotic?

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Jargon Buster

Given the multidisciplinary nature of our work with infants, toddlers, and families, we often come across words or acronyms that are new or unfamiliar to us. To enhance your reading experience of this issue of *Zero to Three,* we offer a glossary of selected technical words or terms used by the contributing authors in this issue. Please note that these definitions specifically address how these terms are used by the authors in their articles and are not intended to be formal or authoritative definitions.

Phrase	*What it means*
Background and Foreground Television	Background television refers to a television set that is in use when the child's primary activity is something other than watching television, such as playing with toys, eating, or socializing. Foreground television consists of programming that is of interest to toddlers and which may be comprehensible. In general, it consists of programs that are specifically designed for very young children. (Find it in Anderson & Hanson, page 4)
Dialogic Reading Techniques	"Dialogic reading" are techniques used when reading picture books to children to involve them in the story. The techniques include asking children open-ended questions and encouraging them to tell more and more of the story. Research has shown that children of parents who were trained in dialogic techniques understood the story better and learned more story vocabulary than did the children whose parents were entirely untrained or who were asked to sit with their children and simply point out what was going on in the stories. (Find it in Troseth, O'Doherty, & Strouse, page 25)
Sudden Unexpected Infant Death (SUID)	SUID is "a term used to describe any sudden and unexpected death, whether explained or unexplained (including sudden infant death syndrome; SIDS), that occurs during infancy" (American Academy of Pediatrics Task Force on Sudden Infant Death, 2011, p. 1030). SUID can be caused by numerous reasons, such as metabolic disorders, hypothermia or hyperthermia, neglect or abuse, poisoning, or accidental suffocation. Some SUIDs are attributed to SIDS. (Find it in Evenson, page 44)
Video Deficit Effect	The "video deficit" refers to the phenomenon that children learn less from televised demonstrations than they learn from live face-to-face interactions. (Find it in Anderson & Hanson, page 4; Guernsey, page 11)

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UPCOMING ISSUES

May: Early Childhood Mental Health Consultation
July: Stories From the Field—2013
September: Early Brain and Child Development

The Editorial Mission of the *Zero To Three* Journal

To provide a forum for thoughtful discussion of important research, practice, professional development, and policy issues in the multidisciplinary infant, toddler, and family field.

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