Parenting with Digital Devices

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Abstract

Parents have always faced challenges in managing the family environment. Within the past decade, these challenges have increased as digital devices and media have become more ubiquitous in the home. The issues faced by families include the appropriate age for children to interact with these devices, whether children's cognitive and social skills may be negatively impacted by the use of devices, and the role of parents in setting limitations and rules regarding the use of digital devices in the home. The use of digital devices may also have a positive influence on family management. Parents are now able to stay in contact with their children during the day, which helps in managing the time of children and parents. Social interactions with extended family members as well as with other children can be enhanced with digital devices and allows for visual contact with others. Unfortunately, there is little research that helps in advising families on how to manage digital devices in the home and how to accommodate the constant changes that occur in technology. The research itself has antiquated methods for assessing the role of digital devices in the lives of families and children. Thus, newer methods will need to be created in order to track how families are using digital devices to organize and manage their lives. There is a clear demand for more research on how technology is changing the family environment and that will be the challenge for the next decade of research.

INTRODUCTION

Research in family management has generally focused on parents managing their children's behavior and time. In the past two decades, however, the surge in technology found within the home calls for an evolution in the ways we think about family management. Specifically, technology has changed so rapidly within the past 5 years that the home environment, in general, is structured with and around multiple digital devices. Family management now requires a larger investment of time and higher complexity of skills from parents as they must not only manage their children's television viewing but also their use of computers, video games, handheld games, and smartphones. As with television, management of these digital devices is necessary across all age groups, including infants through adolescents. Despite the presence of these digital technologies in the lives of families,

little is known about the consequences of these devices on children's development. Moreover, research on how families should manage children's use of digital devices has lagged behind the constant changes in technology. Owing to the prominence of technology and the Internet in everyday family life, and the inevitable blurring of boundaries between the domains of work, school, and home, it is imperative that we first understand how digital technology influences children's development and family interactions, and, second, investigate how family management needs to evolve in light of the prominent role that digital devices play in families' lives.

FOUNDATIONAL RESEARCH AND RECENT TRENDS ACROSS DEVELOPMENT

To date, the majority of research on the use of technology has focused on how much time children spend in front of the television, how violence in the media influences children's behavior, and how the use of social networking can promote bullying in young children. The limited research on other digital devices suggest that the use of technology has both positive and negative influences on children's physical, cognitive, and social development.

Digital Devices: Infants and Young Children

The first few years of life are the most important for developing early motor skills. One of the most salient developmental milestones that mark the beginning of children's cognitive advancements is when children develop the fine motor skills that allow them to hold a pencil or any small object. Children begin to color pictures and find that their actions can create outcomes. Researchers have found that this milestone is related to changes in children's brain development and the development of more complex thoughts and actions. Neuroimaging demonstrates that advancements in fine motor skills are linked to changes in the brain and the synaptic connections that are made as children begin to manipulate small objects. When children are interacting with digital media and using their fingers to swipe a screen or to touch a specific part of a screen, they are learning to control their fine motor skills. For the youngest children, this development is generally done through interactive play with toys. Now with the increase of digital media these toys are no longer wood and plastic but sophisticated computers.

  A report by the Kaiser Foundation (2006) finds that about 83% of children who are younger than 6 years of age are using some type of media on any typical day. This media is dominated by television but 27% of them are using a computer or handheld device. This report was completed almost a decade

ago and with the changes in technology, it can be expected that the use of handheld devices and computers is much more ubiquitous. Thus, the opportunities for enhancing motor development in young children are even higher. Although this type of play may have a positive function on children's cognitive development similar to drawing on paper or playing board games, the downside of digital media may be in the sedentary nature of the activity.

Researchers are becoming increasingly concerned that children's physical play time is spent sitting and using digital media instead of playing more physical games, which could increase the chance for obesity and negative-health-related outcomes. However, findings from a recent Kaiser Foundation report (2010) suggest that the use of digital media is not displacing physical activity and that the heaviest media users report similar amounts of time exercising or being physically active as nonheavy media users. Thus, for parents, the management of digital media is complex even at the youngest ages. Pediatricians continue to tell parents that "screen" time should be limited for young children and not available at all for children under 2 years of age.

Another common issue with digital media is whether screen time limits children's learning and achievement across time. The issue with television is that children are passive recipients of information and do not interact with television in a way that helps them to learn. Even though shows such as Sesame Street have consistently shown positive effects on children's early vocabulary and counting ability, many children are not exposed to this type of programming and researchers worry about the amount of time spent on television. These issues are compounded now that there are multiple digital devices for children to use to watch favorite shows, and there is almost no location where children do not have access to media. Preliminary research suggests that the use of digital media and the more interactive nature of computer and phone games may have positive effects on children's cognitive ability.

However, it is often difficult for parents to figure out what is the best way to manage children's access to this media. Although the guidelines of the Academy of Pediatrics offer clear rules for use of media, when parents are interacting with others via the computer, phone, and other digital devices—and role modeling their use—it is difficult to restrict their children especially with little to no research on the negative consequence of using digital devices. While the negative relations between television and video viewing and children's outcomes have a richer history, the negative consequences of children's active use of digital media remains to be found.

Perhaps the most controversial issue involving digital media and young children is the negative influence it may have on social development. Children are born ready to interact with others and in this interaction they

develop attachments to their parents and siblings. They also learn important values and rules, such as sharing with others and impulse control when they get angry. If young children are using computers and digital devices to talk to others such as through videoconferencing or other camera devices, they are not getting the type of social interaction that has been the hallmark of social development. Families, however, are more geographically dispersed than any time in our recent history. As a result, families are using digital devices as a way to stay connected. Again, even though it is recognized that this is a different type of interaction than has been available in children's environments in the past, there is little to no research on the potential consequences of this type of social engagement. It is certainly possible that digital devices allow an intimacy of interacting with family members that has not been available previously by the use of phones or written materials. The types of interactions available when using the digital device may allow for much richer engagement and connections across generations that were not viable or possible until now. Thus, parents may not need to restrict these interactions. There are other uses of digital media, however, that may be more problematic for young children, necessitating a great deal of parental management and that is the social networking sites that are now targeting very young children.

Initially, social networking sites were created for the college-age student to interact on campus. Now these sites are available and used by every age cohort including very young children. Programs such as Club Penguin are designed for young children to use to create virtual worlds and interact with other children. Program developers suggest that children learn multiple skills including friendship and social skills by using the website that is set up in a videogame structure. Given the focus on young children, parents need to manage the time that children are using the program and deal with any issues that might come up regarding sharing in a virtual world. They also have to set rules related to how children interact with people who show up as avatars and not as themselves in the program. How these type of virtual friendships and interactions influence the world of young children is not known. How much parents need to manage, monitor, and supervise young children is also unclear and is a fairly new task for parents to deal with in the realm of family management.

DIGITAL DEVICES: SCHOOL-AGE CHILDREN

During middle childhood, digital devices begin to play a more utilitarian role in children's lives; a shift occurs in the use of digital devices from pure entertainment to encompass more educational purposes as children attend formal schooling. Children use a combination of computers, Internet, smartphones,

and applications for a wide range of academic-related activities including writing papers, conducting research, and preparing for standardized tests. Although some schools and teachers have started to integrate technology into their lesson plans and to rely on computer educational programs to help students practice academic skills, relatively little is known about the influence of digital device use on children's educational outcomes, and, in particular, whether they benefit and support children's learning more than traditional forms of instruction. Moreover, given the limited knowledge of which technologies are advantageous for children's learning, it is difficult for parents to effectively manage their children's use of these programs and devices in a way that best supports their learning.

One exception is the emerging body of research investigating the influence of digital devices on children's reading and language development. Preliminary research suggests that enhanced electronic books may not help children with their reading any more than traditional print books. One study of shared book reading, for example, found that while children can recall just as much of the main points of a story, they were less likely to remember details of the story sequence when using an electronic reader versus a print book (Chiong, Ree, & Takeuchi, 2012). Research suggests that parents spend more time instructing and managing their children on the appropriate way to use the electronic device during shared book reading instead of discussing the story. Thus, parents are not only managing the child's time but also managing the device itself. It is also important to note that parents need to be fluent in the use of any device or website that is needed to help children during the schooling years, which relates to how well parents can manage digital devices and media in the home.

Similar to the literature on electronic books, the links between texting and language development varies. With the proliferation of personal electronic devices and texting as the preferred method of communication among youth, there is concern over whether the informal nature of texting, which is often characterized by incorrect use of grammar, a lack of punctuation, and modified words, would hamper students' literacy development. In contrast to these concerns, some researchers have found that texting and instant messaging are positively associated with children's reading ability, spelling, and command of language, which are likely a result of an increased exposure to print (Plester, Wood, & Joshi, 2010; Wood, Jackson, Hart, Plester, & Wilde, 2011). However, researchers who investigated different aspects of texting found that children who reported a higher use of modified words and abbreviations in their texts performed worse on a grammar test than their peers who used fewer word adaptations. On the other hand, children who did not follow capitalization and punctuation rules in their texts,

performed just as well on grammar assessments as their peers who did not engage in those texting shortcuts (Cingel & Sundar, 2012).

In addition, although school children may be using digital devices for more educational purposes during this time period, it is also at the beginning of this phase that children (i.e., ages 6–8) dramatically increase the time they spend playing video games. At present, research on how gaming influences children's educational outcomes is inconclusive. While some studies suggest that video games stimulate children's cerebral cortex and help them to develop spatial cognition (Subrahmanyam & Greenfield, 1994), there is speculation about whether time spent on video games and other types of digital devices hampers time spent on homework and learning. Moreover, given that children are likely to use multiple digital devices while engaging in school work, it is unclear how this multitasking influences their concentration and whether it interferes with their development of attention (Christakis, Zimmerman, DiGuiseppe, & McCarty, 2004).

Digital Devices: Adolescence

As children begin to transition into adolescence, the social interactions that occur through digital devices are arguably one of the most significant issues necessitating an evolution in family management. Previously, parents were able to limit their children's exposure to negative influences by restricting with whom and how much time they spent interacting with peers in unproductive activities. The proliferation of personal devices, however, has made it difficult for parents to monitor their children's activity and censor potentially harmful incoming information. Coupled with the ease with which children's actions can be projected to a wide (and at times unknown) audience and preserved for posterity, the task of managing their children's interactions becomes a much more vital and arduous task requiring an evolution in the ways that parents monitor their children.

On one hand, technological advances have provided parents with more sophisticated tools and information to manage their children. Modern technology has allowed parents to regulate the type of websites their children visit, restrict the type of shows their children watch on television, and track their children's whereabouts using GPS on cell phones. On the other hand, effective use of these technologies requires time and knowledge to set up the appropriate rules and filters. Given the frequency with which new devices, programs, and websites are created and updated, it has become increasingly difficult for parents to be knowledgeable about every program that their child might use and to effectively protect them from harmful content. Moreover, children can easily bypass filters when they know more than their parents about the new technology or program.

Adding to the complexity of managing children's digital use, technological devices and the Internet have made it relatively easy for children to break the law. Although social networking sites protect young children's privacy with age-restriction safeguards (e.g., children have to be at least 13-years-old to get a Facebook account), it is relatively easy for them to circumvent these safeguards by lying about their age. Similarly, it is easy for children to download copyrighted music and watch movies online that have been uploaded illegally. With media and publishing companies choosing to pursue legal action against offending individuals, the importance of monitoring children's technology use magnifies.

Finally, cyber bullying has gained prominence as one of the new ways that technology and constant access to digital devices have created a problem that has to be managed by parents as well as schools. Bullying, which used to be confined primarily by physical boundaries and to some extent was avoidable once the school day was over, now follows the bullied individual outside of school grounds because of the popularity of online social networking communities and widespread Internet access. Of more concern, however, is research suggesting that children who are victims of cyber bullying experience higher levels of depression than those who experience other types of bullying (Wang, Nansel, & Iannotti, 2011). Promising initial evidence finds that higher levels of parental support are associated with a lower probability of being involved in bullying (Wang, Iannotti, & Nansel, 2009). Perhaps the clearest signs of where parents have already had to adjust their management due to digital media use are with this issue. Parents not only spend time discussing appropriate use of technology for social situations but also create rules related to monitoring the use of social networking. For example, it is common for parents to be part of their children's social networks to monitor their interactions or require other relatives are part of these networks. Parental management will continue to be an important part of children's development as it relates to digital media and devices and hopefully future research will address some of the gaps in the current literature on the positive and negative effects of technology in the family environment.

KEY ISSUES FOR FUTURE RESEARCH

We have reviewed some of the literature that exists on the use of digital devices and how this may influence parenting and family management across development. What is clear is that digital devices and media have led to a rapid change in the home environment and there is little research to help families think about ways to manage this technology successfully. Thus, there are many open questions yet to be answered for future research on family management.

First, much of the research we have on family management is based on observing or gathering data on what is available in the home environment. A common scale used for this is the HOME scale developed by Bradley and Caldwell (1984). This scale asks observers to count or observe whether there are books, games, and newspapers in the home. Currently, in many homes all three of these items can be found on handheld devices. As a result, observation alone would not allow researchers to capture the cognitive stimulation in an environment based on these measures. Similarly, given the expense of these devices we would not expect to see them readily available in all homes as we might expect books to be seen, and without counting the amount of downloaded books on a device, for example, we may see lower income homes observed to have more books and a more cognitively stimulating home than their higher income counterparts with more digital books. Hence, methods for collecting data regarding the family environment will need to be adapted to how children and parents are using digital devices. It is possible that observation alone will not allow us to understand the complexity of management and organization among families and we will either need to also collect this data through technology or find other ways to assess the use of this information.

New ways of data collection are also important for understanding the importance of how much digital media is being consumed by a family. In the past we gauged the amount of television watching based on the number of televisions turned on in homes. Currently, however, physical television sets are being used less often for viewing television shows and movies, while most viewing occurs through phones, tablets, and computers. In the future, for researchers to understand the demands placed on parents and families for managing "screen" time they will need to figure out how many screens are available to children and how they are consuming this information.

Determining the amount of time spent using media is just one of the many challenges to trying to understand how families are now managing in the digital age. Another is how many types of activities children are doing and with whom. Using just a smartphone, children can view a television program, text their parents, share pictures with their friends, check their school grades, and listen to their favorite music. At various ages, parents may want to restrict certain types of interactions and encourage others. How will they be able to manage and restrict a device that is capable of so many social and cognitive activities? How can researchers understand and parse these various activities to understand their role in children's behaviors and family dynamics? In the past, we have been able to answer these questions through surveys and questionnaires but gaining information on the websites children use, their social networking, or texting involves getting access to information that is both private to the individual but proprietary to the organizations that provides the

services. For families, perhaps the most important question to answer is not how to monitor the use of each digital media but at what age should children have access to devices with these options. As reviewed previously, the age at which children should use digital media and devices is unclear and so future research will need to address the issue of development and the appropriate timing of digital devices use to inform the debate about whether young children may be impacted negatively through technology use at an early age.

Toward this end, more studies examining how different digital technologies can positively influence children's learning is needed, particularly with nationally representative samples. Given the persistent achievement gap in schools, it is important to understand whether parents with limited resources should prioritize investments in digital devices. For example, does having a digital device or educational program provide a significant advantage for children's achievement? If so, for which students (e.g., race and ethnic background, socioeconomic background, developmental disabilities) and at what developmental period are digital devices most beneficial for academic outcomes? How does the quality of the program versus the time spent on the digital devices differ in relation to children's academic outcomes?

In addition, it is important to note that technology has not only changed the way children use their time and interact with others but it has also changed the way in which family members interact with one another. Parents are constantly connected to their cell phone, the Internet, and work e-mails while they are at home with their families. The repercussions of this overlap between home and work domains on parent–child emotional bonding and parenting have not been fully explored. For example, when mothers text while breastfeeding are they displaying insensitive caregiving? Are parents relying on a digital device to act as a babysitter when they encourage their children to use a digital device (e.g., watch an educational program on television, play on the iPad) or are they providing their children with cognitively stimulating learning experiences? When parents are on their digital devices during family time (e.g., at the dinner table, during a conversation), are they neglecting their children? Research by Susan Turkle (2012) finds that children often feel that they must compete with digital devices for their parent's attention. Why might technology use during parent–child interactions have a different influence on the child than when parents are engaged in chores, such as cooking, while talking to their children? One line of research suggests that mobile devices are more distracting for parents than radio or television because it takes more time for people to refocus their attention. This preliminary finding is worrying because it is common to see parents distracted by their phones while interacting with their children inside and outside the home.

Alternatively, once children are older, technology may bolster communication and foster a stronger parent–child relationship. It is not uncommon, for example, for children to text their parents throughout the day to ask them questions and for parents to respond immediately with advice. What is the repercussion of this constant connection with parents, especially during adolescence, when children are learning to be more independent? How this might impact an individual's ability to solve problems and think independently is unknown.

Given the rapid changes that occur in technology and the limited options parents have to monitor and filter their children's technology use, parents should teach and model appropriate strategies for using technology safely and responsibly. Researchers, who investigate television viewing, have touted the importance of meaningful coviewing which includes discussion of violent or graphic material seen on television. These strategies may be translatable to other types of digital media and technology use, but there is little systematic research investigating which strategies are effective for children's optimal learning and development. With the advent of new technologies available for research (e.g., eye-tracking, brain imaging, daily diaries), research is starting to provide some guidance on what children are capable of learning and how parents should manage digital media. This new research, for example, has demonstrated that young children have difficulty processing video images and thus may not be learning from these images. Although these findings suggest that parents need to manage the use of this technology with young children, they do not answer what is the appropriate age for digital media use.

Finally, as alluded to in prior sections, the use of digital devices in the home and by parents and children may be related to parents' socioeconomic status, and research will have to be very careful in taking this issue of access into account. There are still social class differences in access to computers and so it cannot be assumed that all families are using these devices in similar ways. Thus, having well-represented data that looks across socioeconomic status is important for understanding the role of families and technology. It is possible that the difference in access may be an important component in understanding differences we see in children and families. It is also clear that no one research discipline will be able to answer these questions because the use of technology in the family is an educational, psychological, communication, sociological, economical, and neuroscience question. The answers need to be addressed across disciplines that study families and parenting to fully understand the role of family management and technology in the ever changing landscape of modern family life.

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