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6-22-2015

## Answering Your Question: The Electronics Effect

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### Recommended Citation

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## Answering Your Question: The Electronics Effect

### Abstract

"I am curious to read if there is any data on neurological/developmental effects of early exposure to certain forms of technology."

Posting about the effects of technology on young children from *In All Things* - an online hub committed to the claim that the life, death, and resurrection of Jesus Christ has implications for the entire world.

<http://inallthings.org/answering-your-question-the-electronics-effect/>

### Keywords

In All Things, children, parenting, technology

### Disciplines

Family, Life Course, and Society

### Comments

*In All Things* is a publication of the [Andreas Center for Reformed Scholarship and Service at Dordt College](#).

# Answering Your Question: The Electronics Effect

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 [inallthings.org/answering-your-question-the-electronics-effect/](https://inallthings.org/answering-your-question-the-electronics-effect/)

Kari Sandouka

*I am curious to read if there is any data on neurological/developmental effects of early exposure to certain forms of technology. [tweet](#)*

Scott

The story of *Goldilocks and the Three Bears* is a tale of trial and error. Goldilocks tries things over and over until it is “just right”. When it comes down to deciding what is the appropriate use and time for technology, especially when children are involved, we are constantly asking “how much is enough, or what is just right?” At best, the research is conflicting. Once a prediction or recommendation is made, things change. In 1965, Gordon Moore made a prediction that has estimated with relative accuracy the pace of the digital revolution: “over the history of computing hardware, the number of transistors in a dense integrated circuit has doubled approximately every two years.”<sup>1</sup> The pace of technological advances impacts our society and daily routines. As children observe the adults in their lives using different technologies, they become more interested in learning about those technologies.

It is important to look at how technology is being used in addition to the effects that may occur from its use. *Zero to Eight*<sup>2</sup> is a report released in 2013 that documents the results of a survey looking into how American children (ages 0-8) use electronic media. The report compares survey results from 2011 and 2013. Between the two years, the amount of time watching TV or DVDs has decreased, however, time spent consuming media on mobile devices has increased.

**Table 1: Time Spent With Media, By Age, 2013**

Time spent using media in a typical day:

	Child age			
	Among all	0-1	2-4	5-8
Watching TV	:57	:44 <sup>a</sup>	1:04 <sup>b</sup>	:58 <sup>ab</sup>
Reading/being read to	:28	:19 <sup>a</sup>	:29 <sup>ab</sup>	:32 <sup>b</sup>
Watching DVDs	:22	:11 <sup>a</sup>	:26 <sup>b</sup>	:25 <sup>b</sup>
Listening to music	:20	:34 <sup>a</sup>	:18 <sup>b</sup>	:15 <sup>b</sup>
Playing games on a mobile device <sup>+</sup>	:08	:01 <sup>a</sup>	:07 <sup>b</sup>	:12 <sup>ab</sup>
Playing console video games	:06	* <sup>a</sup>	:02 <sup>b</sup>	:12 <sup>c</sup>
Playing computer games	:05	* <sup>a</sup>	:03 <sup>b</sup>	:09 <sup>c</sup>
Watching TV/video on a mobile device <sup>+</sup>	:05	:01 <sup>a</sup>	:06 <sup>b</sup>	:05 <sup>ab</sup>
Playing handheld video games <sup>++</sup>	:04	:00 <sup>a</sup>	:02 <sup>a</sup>	:08 <sup>b</sup>
Watching TV/videos on a computer	:03	* <sup>a</sup>	:02 <sup>ab</sup>	:04 <sup>b</sup>
Using other apps on a mobile device <sup>+</sup>	:02	*	:03	:03
Using educational software on a computer	:02	:01	:03	:02
Doing homework on a computer	:01	:00 <sup>a</sup>	:00 <sup>a</sup>	:02 <sup>b</sup>
Doing anything else on a computer <sup>+++</sup>	*	*	*	:01
<b>Total screen media</b>	<b>1:55</b>	<b>:58</b>	<b>1:58</b>	<b>2:21</b>

+ Such as a smartphone or tablet ++ On a device such as a Game Boy, PSP, or DS +++ Such as photos, graphics, or social networking

\* Less than 1 minute but more than 0.

Television is dominate for media use by children eight and under even though the avenue in which television is watched has changed. Shows are now available through on-demand streaming platforms rather than just through a television set. The parents that participated in the survey report 61% of children watch education shows, 52% watch children's entertainment shows, 11% watch general audience shows, and 7% often watch adult shows.

Understanding that as technology improves and other media avenues are increasingly available, the study also looked at the use of mobile media and apps. The most common activity is playing games: 43% reported playing educational games, 42% just for fun, and 38% creative apps (drawing, music, photo manipulation). Reading was the least common type of activity with 30% of parents reporting that their children read e-books on a mobile device.

Based on the Zero to Eight report, as well as similar reports, the American Academy of Pediatrics released recommendations for parents: "limit the amount of total entertainment screen time to less than 1 to 2 hours per day; discourage screen media exposure for children less than 2 years of age; keep the TV set and Internet-connected electronic devices out of the child's bedroom; monitor what media children are using and accessing; co-view TV, movies and videos with teenagers and children; and model active parenting by establishing a family home use plan for all media."<sup>3</sup> These recommendations were made in response to concerns about the effects of

**Table 9: Ownership of Mobile Media Platforms, over Time**

Among 0- to 8-year-olds, percent with each of the following in the home:

	2011	2013
Smartphone	41% <sup>a</sup>	63% <sup>b</sup>
Tablet	8% <sup>a</sup>	40% <sup>b</sup>
iPod Touch/similar	21% <sup>a</sup>	27% <sup>b</sup>
<b>Any mobile device</b>	<b>52%<sup>a</sup></b>	<b>75%<sup>b</sup></b>

technology. These concerns relate to: obesity, irregular sleep, behavior problems (specifically bullying), impaired academic performance and violence. In the short span of time researching the effect of technology on children, I found little data representing what neurological or developmental effects certain technologies have on children.

The linkage between the recommendations and the effect of technology comes from the fact that habits are formed early on. Almost all of the literature I read included statement similar to this: activities of children need to be monitored to ensure a healthy development for all focal aspects: cognitive, social, emotional, physical, and linguistic.

**Table 10: Use of Mobile Media for Specific Activities, over Time**

Among 0- to 8-year-olds, percent who have ever used a smartphone, iPod Touch, or tablet device to:

	2011	2013
Play games	33% <sup>a</sup>	63% <sup>b</sup>
Use apps	16% <sup>a</sup>	50% <sup>b</sup>
Watch video	20% <sup>a</sup>	47% <sup>b</sup>
Watch TV/movies	11% <sup>a</sup>	38% <sup>b</sup>
Read books	4% <sup>a</sup>	30% <sup>b</sup>
<b>Any of these activities</b>	<b>38%<sup>a</sup></b>	<b>72%<sup>b</sup></b>

As much as research can tell us about the effects, the end the result is the same: conflicting – there will always be negative and positive effects. As parents and adult role models, the course of action will be similar to Goldilocks. We can take the recommendations of pediatricians and other early childhood experts, but we must also take into account our own impressions and observations, as we know our children best. In January of 2012, The National association for the Education of Young Children (NAEYC) and the Fred Rogers Center for Early Learning and Children’s Media at Saint Vincent College released a position statement regarding the technology and interactive media as tools in early childhood programs.<sup>4</sup> Beyond my own judgment as a parent, I feel this position statement has some of the best guidance to what is “just right” in regards to screen time. The ideas in this position statement address include:

**Technology and interactive media are here to stay.**

Our society, including the educational system, will continually be influenced by technological advances. The interactive media outlets will only increase with time. Children will not be able to hide from it, nor will parents be able to completely abstain from introducing their children to the technology. Access to technology tools and interactive media should not exclude, diminish or interfere with children’s health, communication, social interactions, play and other developmentally appropriate activities. It should also be noted, that some interactive media have led to similar play and social interactions in virtual worlds as it does in reality. Children need room to grow, whether that is in the virtual or the real world, they still need to be monitored.

**All screens are not created equal.**

The proliferation of digital devices means that educators and parents have to make better informed decisions of what is appropriate. Technology can enhance learning, at any age, but it must not be a replacement for creative play, real-life exploration, physical activities, outdoor activities, conversation and other social interactions. The use of technology is also context specific. Therefore it is a trial and error period of deciding what technology best serves healthy development, learning, creativity, interactions with others and relationships.

**The appeal of technology can lead to inappropriate uses in early childhood settings.**

Research conducted in Korea with 179 five-year old children looked at the use of computers in school and home environments. The children with higher scores on the Internet Addiction Scale for Young Children (IASYC) had three factors in common: a) introduced to the computer at a very young age; b) played mostly computer games on the computer; c) had unsupervised or less supervised sessions on the computer.<sup>5</sup> Educators and parents need to keep in mind that children need to move and connect with living things. Technology can enhance learning and other relationships, but should not be the solid foundation for those activities. Instead it should be used as supplemental with careful guidelines of how to use it.

## **Technology and media can enhance children's cognitive and social abilities**

The active, appropriate use of technology can extend and support traditional materials. For example, Infante *et al* (2010) found that a video game, which was designed for multiple players to use one computer screen and several input devices, encouraged kindergarteners to collaborate and communicate in order to complete the game tasks.<sup>6</sup> Technologies used at home can facilitate adult-child interaction and maintain family relationships. Young children can work with adults to achieve a shared goal: a child can teach a grandparent how to play a computer game or app. The child can provide instruction to the grandparent on how to use the technology and the grandparent can provide linguistic and cultural knowledge.

## **Digital Citizenship is an important part of digital literacy for young children**

Adults have a responsibility to protect and empower children. Protecting children includes introducing them to technology but with an air of caution. Children will ultimately need to protect themselves as they grow, but they will always fall back on the foundation that the adult in their lives have built. Help children to ask the right questions about the use, and possible misuse of technology, as well as methods of communication.

My colleague wrote this statement in an article published earlier this month<sup>7</sup>

*Living well with technology cannot involve either mindless acceptance or mindless rejection, but rather requires mindful evaluation.*

It is obvious more research needs to be completed with detailed accounts of the effect of technology. At best it is the same game that Goldilocks played. The situation may dictate if technology is appropriate, as well as what type of technology is appropriate. As my colleague wrote, we need to have mindful evaluation when it comes to deciding what technology or how much technology is appropriate for our children. The research with exact details of the effect of technology on childhood development is just not there. It may come, but for now we have to trust our own judgment and make a decision for ourselves.

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## **Footnotes**

1. Moore's Law (n.d.). In Wikipedia. Retrieved June 16, 2015, from [https://en.wikipedia.org/wiki/Moore's\\_Law](https://en.wikipedia.org/wiki/Moore's_Law) ↵
2. Zero to Eight (n.d.) In Common Sense Media. Retrieved June 10, 2015, from <https://www.commonsensemedia.org/research/zero-to-eight-childrens-media-use-in-america-2013> ↵
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6. Hsin, Ching-Ting; Li, Ming-Chaun, Tsai, Chin-Chung (2014). The Influence of Young Children's Use of Technology on Their Learning: A Review. *Educational Technology & Society*, 17 (4), 85-99. [↩](#)
7. Breems, Nick. [Technology and Mindful Evaluation](#). In All Things. Retrieved June 16, 2015. [↩](#)