

Spring 2016

# Parent Perception of Technology on Children's Language Development

Lindsey E. Hanna

University of New Hampshire, Durham, lek73@wildcats.unh.edu

Follow this and additional works at: <http://scholars.unh.edu/honors>



Part of the [Speech Pathology and Audiology Commons](#)

---

## Recommended Citation

Hanna, Lindsey E., "Parent Perception of Technology on Children's Language Development" (2016). *Honors Theses and Capstones*. 297.

<http://scholars.unh.edu/honors/297>

This Senior Honors Thesis is brought to you for free and open access by the Student Scholarship at University of New Hampshire Scholars' Repository. It has been accepted for inclusion in Honors Theses and Capstones by an authorized administrator of University of New Hampshire Scholars' Repository. For more information, please contact [nicole.hentz@unh.edu](mailto:nicole.hentz@unh.edu).

---

# Parent Perception of Technology on Children's Language Development

## **Subject Categories**

Speech Pathology and Audiology

Parent Perception of Technology on Children's Language Development

Lindsey Hanna

Faculty Advisors: Prof. Jeanne O'Sullivan and Dr. Allan Smith

Senior Honors Thesis 2015-2016

University of New Hampshire

### *Introduction*

In the past few decades, technology continues to develop and improve. Technology, by definition, is “the use of science in industry [and] engineering to invent useful things or to solve problems” (Merriam-Webster’s online dictionary, 2015). In modern-day society, technology has come to typically refer to electronic technology such as televisions, computers, etc. With the rapid rate in technology growth, electronic use has quickly expanded in households. Children are not excluded from this increase in technology usage. In fact, technology advancement and growth has “changed children’s lives and ways of learning” (Hsin et al., 2014) because they are “growing up in a world saturated with electronic technologies...from the time they are born” (Vittrup et al., 2014). Changes in technology that surround children in our society have brought attention to the influence electronic time has on the development and education of children. There is a great divide among professionals and subsequent opinions on the influence of technology in regards to the language and social development of children. Many researchers have tried to shed light upon the “sharp disagreement” of opinions of whether technology use is “harmful or beneficial to young children’s development” (McCarrick & Xiaoming, 2007). Between the ages of 0 and 7, children are at a critical period for learning as they develop cognitive, language, and social skills simultaneously. As such, it is important to understand the potential benefits and detriments advancing technology has on the development of these skills.

Although studies have shown an increase in child electronic screen time, there is limited data as to the perception of parents regarding the use of technology in their households. Parent perceptions of the influence of technology are a determining factor

that has the potential to affect the amount of screen time for children in a household. After all, parents are responsible for the types of technology and the amount of screen time their child has access to on a day-to-day basis. Although there are guidelines regarding the appropriateness of electronic time for young children, “given the media-saturated environment in which we live, parents may find value in these media tools, and this may partly account for their willingness to let their children have access to the technology” (Vittrup et al., 2014).

Modern advances in technology and rapid growth in the electronic industry put a spotlight on child media use. The following study was inspired by the undetermined effects of technology use in the homes of young children. In this study, parents were surveyed about the number of electronic devices in their household, an estimate of their children’s electronic time per day, and their perceptions of their children’s communication and social language skills. Responses indicate a slight correlation between screen time and parents’ perceptions of general communication and social language skills. The results and limitations are discussed, along with recommendations for further research.

### *Literature Review*

Numerous studies have looked at the parent perception of the influence of technology on child development. Most studies aim to identify a correlation between parent perception and child media use. Research has shows both benefits and detriments to technology use during childhood. One study indicated “the influence of technology on children’s learning is conditional... by children’s age, experience, time spent using the technologies, and gender” (Hsin et al., 2014). Children’s experience and time spent using

technology is influenced by a family's lifestyle and living situation. For any person, "working a full-time job, taking care of basic household duties, and being a parent is very time and energy consuming," which can lead parents to "forego their supervisory and regulatory responsibilities by letting screen media entertain their children" (Vittrup et al., 2014). The use of electronics to entertain children can increase the amount of screen time children have per day. One study even found that the "parent's own media use is an important predictor" of child media use (Nikken & Schols, 2015). It makes sense that parent media use would correlate with child media use because children are likely to use media at the same time as parents. The more parents use media, the more comfortable they will be using specific technology. This could effect how parents perceive technology, specifically in relation to their own children. Based on the results from several studies, parents show overall positive attitudes toward technology and child media use.

In one study consisting of 51 parents in Melbourne, Australia, "parents' responses reveal the importance they place on computer use and also their positive attitudes towards using technology" (Hatzigianni & Margetts, 2014). This study found that about half of parents deem computer use appropriate one time per week for children, while the other half of parents in this study believed once per week was not frequent enough. Similarly, another study found that 33 percent of parents believed exposure to media and electronics between the ages of 0 and 3 is important for cognitive development (Vittrup et al., 2014). Additionally, 33 percent also "believed that children [would] fall behind other children academically if their use of technological tools is restricted in early childhood" (Vittrup et al., 2014). More than half of the parents who participated in this particular study did

not agree that children younger than 2 years old should not be exposed to electronics, despite the recommendations from professionals (Vittrup et al., 2014). Instead, parents believe exposure to electronic technology is vital to child development and future success. Across all studies, parents appear to prioritize “educational skills [and] technological skills” as they relate both of these skill sets to future success and essential tools in future careers (Hatzigianni & Margetts, 2014). Parents who believe the use of technology will better prepare children for future success may be more likely to allow more screen time for their children per day.

Parents in the Melbourne, Australia study assessed that educational television programs and computer software assisted children with learning things such as “letters and numbers” (Hatzigianni & Margetts, 2014). However, there are many programs and computer games without educational intent that are created solely for entertainment purposes. For this reason, parents in various studies have indicated that they set restrictions for their children’s technology use. Some parents indicate that they are successfully able to “restrict their children’s access to various technologies” (Vittrup et al., 2014). Restrictions and supervision from parents is beneficial in many ways. It has been suggested that “children [learn] more from using technology when adults [provide] them with a safe climate and [encourage] them to participate in conversation” (Hsin et al., 2014). Children can also benefit from interactions with adults and other family members when electronic technology use is facilitated at home with supervision.

Child media use that is not monitored holds risk for development during a critical period of learning. In the early years of life, “children’s cognitions are still somewhat rudimentary compared to adults’ capacities for abstract thinking and hypothetico-

deductive reasoning,” which results in “cognitive limitations [that] prevent children from being able to critically evaluate more complex uses and meanings of various media technologies” (Vittrup et al., 2014). As a result, children are more vulnerable to negative, and potentially violent, influences of technology.

Although the majority of parents that have participated in surveys cited in this paper have a positive attitude about the influence of technology and maintain that they are able to regulate the content and amount of use, all studies have indicated that parents underestimate child media use, both in terms of quality and quantity. The average electronic time reported from parent responses in one study was 4.84 hours per day (Vittrup et al., 2014). However, previous research has indicated that the amounts are significantly higher. The Kaiser Foundation Report found that school-age children spend an “average of 7 hours and 38 minutes [of] using entertainment media across a typical day [which is] more than 53 hours a week” (Rideout, V. J. et al). This study also found that children “media-multitask” by using multiple media outlets at one time. Due to media-multitasking, it is estimated that children are exposed to a total of 10 hours and 45 minutes worth of media content in those 7 [hours and 38 minutes]” (Rideout, V. J. et al).

A Canadian study found that “infants watch 2.5 hours per day of TV,” 3-5 year olds watch 4.5 hours per day, and school age children watch 6.5 hours per day (Rowan). Most interesting about this finding is the average 2.5 hours per day infants (children two year old and under) spend with screen time, despite the recommendation by professionals and researchers that children two years old and younger should avoid screen time.

Previously, professionals recommended banning screen time for all children under the age of two. However, the American Academy of Pediatrics (AAP) is beginning to update

previous guidelines to “fit with reality circa 2015-2016,” according to James Steyer, the chief executive of Common Sense Media (Reddy, 2015). Dr. Ari Brown believes “the more screen media mimics live interactions, the more educationally valuable it may be” (Reddy, 2015). Dr. Christakis, an author of current AAP guidelines, “recommends interactive media for children under two years is acceptable for [up to] 30 to 60 minutes a day” (Reddy, 2015). Current research suggests that quality of media is an important factor in determining the value, as well as possible detriments, of child media use. However, according to research, many children, especially those under the age of two, are receiving more than the recommended amounts of screen time per day, regardless of the quality.

A plausible explanation for parents’ tendency to underestimate child media use is lack of awareness. Many people lack awareness of the impact of background media. For example, many families have a television on, even when they are not actively watching a show or program. This phenomenon is described as “Passive Screen Time,” which “involves sedentary screen-based activities and/or passively receiving screen-based information” (Sweester et al., 2012). Passive screen time is a common occurrence in homes. About 30 percent of families in the United States “report having the television always on, even when no one is watching” (Rowan). Based on results from various studies, television is the most commonly used media device, however, this does not account for passive screen time. According to Dr. Rachel Barr, “background TV actually disrupts children’s activities—their play, the parent-child interactions, and it’s related to poorer executive functioning...when it is on, play is not as complex, and that’s a really important part of how a child develops” (Reddy, 2015). Reported child screen time is

suggested to be “three times as much time as [children] spend reading books or being read to” (Vittrup et al., 2014). This has led to increased research about the effects of increased screen time on cognitive, social, and language development.”

Despite the increase in technology use at home, as well as positive parent perception, “research evidence has consistently shown there is ambivalence towards the incorporation of new technologies into early literacy education” (Flewitt et al., 2014). In a study about the use of iPads as a learning tool in early education, “all practitioners recognized the potential of new technologies for learning, yet many also voiced concerns about their potential harm” (Flewitt et al., 2014). However, these same practitioners acknowledge an importance “to help prepare children for life in a digital world” and believe “schools should ‘make sure they’re ready for all the other things that are happening so quickly’, ‘keeping a balance’ between learning activities with traditional and new media, and making the most of technology ‘to enhance teaching’” (Flewitt et al., 2014). A similar study suggested that tablets, such as the iPad, are “a viable tool for use with preschool children” (Couse & Chen, 2010).

Some professionals believe technology provides children with tools for self-expression and provides opportunities for social interaction among family members and other children (Hsin et al., 2014). A study found that young preschool age children have awareness of technology use, with or without focusing on the technology “as tools themselves,” which provides evidence of the “development of their expanding sense of self within various contexts” (Vittrup et al., 2014). This is one of the positive influences research has shown of child media use.

Unsurprisingly, the advancements of touch-screen technology have provided new

opportunities in education for children at a young age. Research shows that children between the ages of 3 and 6 have the ability to “quickly learn [how] to use the tablet computer as a medium for representing their ideas and learning (Couse & Chen, 2010). Many companies have capitalized on advancements in technology by developing numerous tablet programs aimed toward young children. One article indicates “a quick search of the Apple app store finds over 5,000 apps targeting toddlers and over 1,000 apps that target newborns” (Ernest et al., 2014). There is conflicting research about the positive and negative influences technology has on child development. One study reports that it may not be technology itself that influences development, so much as the context within which technology is provided as shown below:

“Our findings suggest that, despite the market claims of the producers of technological toys and educational resources, and the assumption of some educators, the experiences of 3- to 5-year-olds are mediated by each family’s distinct sociocultural context and each child’s preferences. The technology did not dominate or drive the children’s experiences; rather their desires and their family culture shaped their forms of engagement” (Stephen et al., 2013).

Further research is needed to determine the true effects of technology on the development of children, specifically language, cognitive, and social development. The following study provides a glimpse into the perspectives of current parents of children 0 to 7 years old. This is further compared to the perspectives of parents of a previous generation of children who are currently 18 to 25 years old. The study aims to identify patterns in

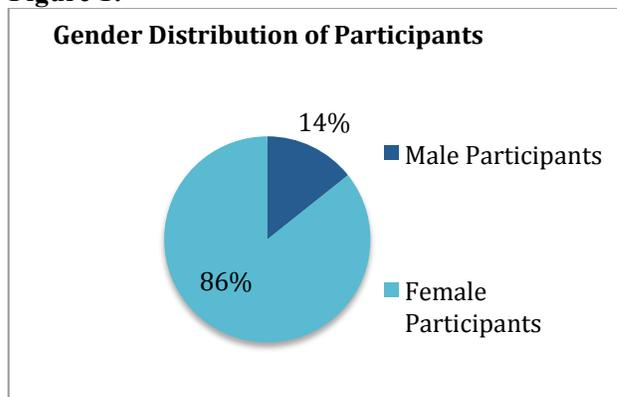
parents' perceptions of technology use and children's language skills, despite differences in technological devices and use between generations.

### *Method*

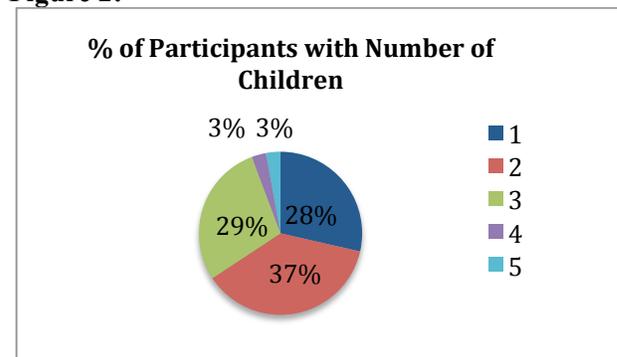
#### **Subjects**

Thirty-five people participated in the following study. All participants were required to be 18 years or older. The participants were separated into two groups. Group 1 consisted of seventeen people with children between the ages of 0 and 7. Group 2 consisted of eighteen participants with children between the ages of 18 and 25. The majority of participants that took part in the study were female, with only 14% of participants male (Figure 1). As indicated in Figure 2, the majority of participants have one to two children. Only 35% of total participants had three to five children. Participants varied in age from 20s to 60s.

**Figure 1:**



**Figure 2:**



**Materials**

A survey approved by the Institution Review Board of the University of New Hampshire was created on Qualtrics. The survey contained both quantitative and qualitative data that may point to technology as an influence over language development and social language. This survey was used to gather data from participants separated into two groups based on age of children. The survey consisted of about 15 questions, including both quantitative and qualitative questions. Questions assessed the presence of electronic devices in households, which electronic devices children used in household, and estimated hours of electronic time per day for children. There were also questions about participants' own experience with technology, both currently and during childhood, how they perceive their children's general communication skills and their children's social language skills, and how they feel about technology use in relation to their children's development (see Appendix A & B for surveys).

**Procedure**

Surveys were distributed to participants via email. The emails contained a description about the research project, a request for participation, and a consent form. Out of a pool of 58 people, a total of 36 people decided to participate. This study received a 62% response rate. The high response rate of this study is most likely a result of the use of a convenience sample. Confidentiality of all participants was guaranteed through the use of coding with random participant numbers. Internet Protocol addresses were not collected from participants. Survey data remained anonymous among participants. Each participant was able to choose the environment or setting in which the survey would take place.

## **Analysis**

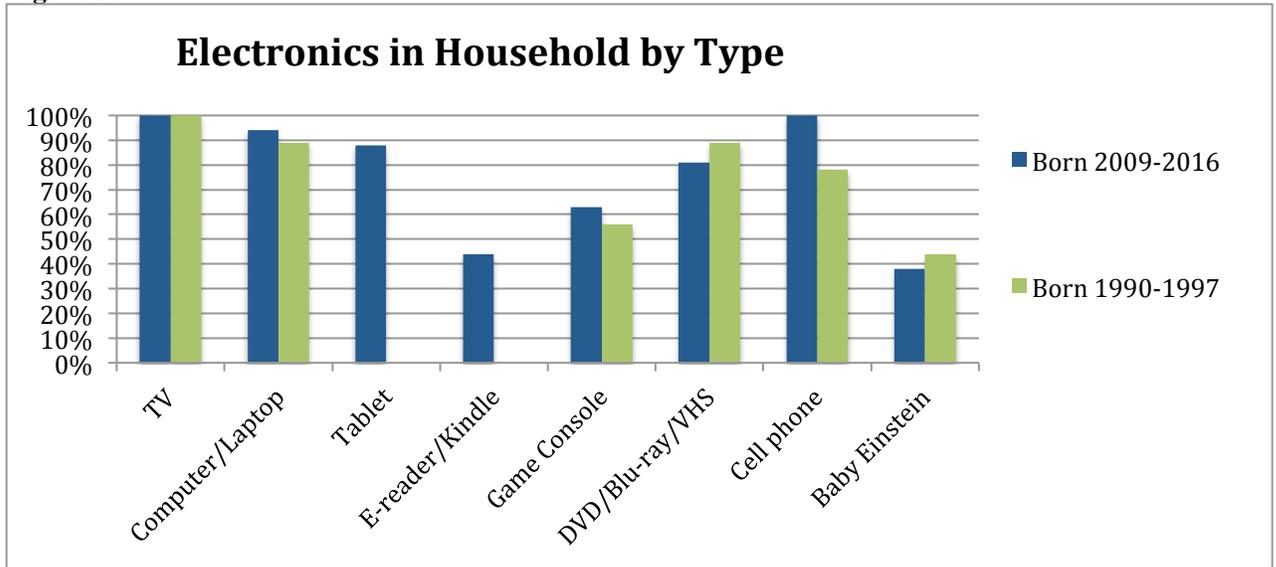
After participant responses were recorded, data was analyzed through Qualtrics. Data was analyzed using averages to compare subgroups of participant responses. The Pearson Product Moment Correlation test was also used to establish correlations between responses in both groups. Only one computer was used to analyze data. This computer is password protected. The researcher and faculty advisors had sole access to the data during and after the project.

## *Results*

### **Parent reports of electronics**

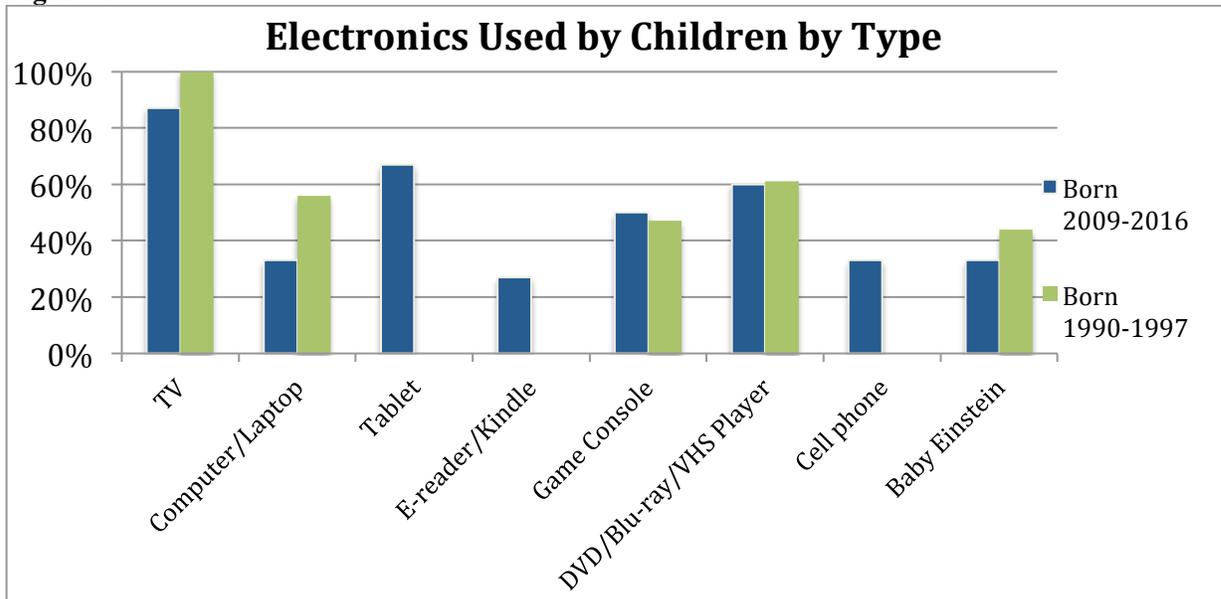
Data from Figure 3 shows the homes of Group 2, i.e. children born 1990-1997, had no access to tablets, e-readers, or cell phones. Comparatively, almost all homes of Group 1, i.e. children born 2009-2016, own all 3 of these devices. There was a greater presence of cell phones in homes of Group 1 than in the homes of Group 2. Although percentage of smart phones was not measured between groups, it is likely most homes in Group 2 did not have smart phones while most homes in Group 1 did own smart phones. Similarly, there was a slightly greater presence of computers and game consoles in the homes of Group 1 compared to Group 2. All homes in both groups owned at least one television.

**Figure 3:**



Based on responses indicating devices used by children in the home (shown in Figure 4), a greater number of children in Group 2 watched TV, used computers, game consoles, DVD/Blu-ray/VHS players, and Baby Einstein devices than children from Group 1. However, children in Group 1 had contact with and used tablets, e-readers, and cell phones, while no children from Group 2 had contact with these devices.

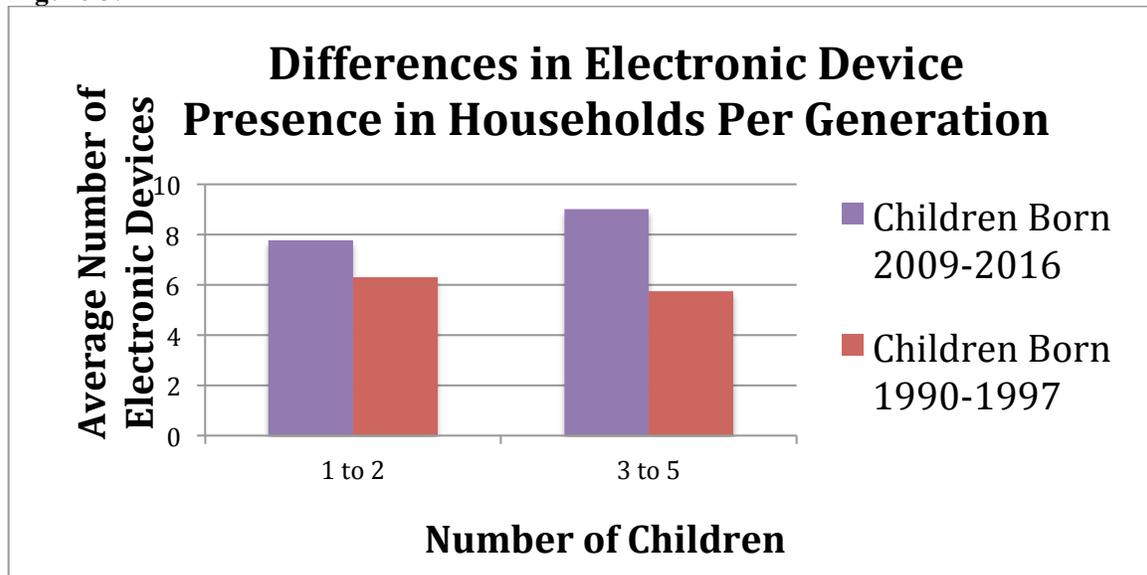
**Figure 4:**



The figures above show a few major differences between Group 1 and Group 2. It is clear although children in Group 2 used TVs, computers, DVD players, and Baby Einstein products more frequently, children in Group 1 had access to a wider variety of electronic devices. For example, children in Group 1 are exposed to cell phones, tablets, and e-readers. These devices are considered newer advances in technology, which accounts for why children in Group 2 did not have access to these devices. When children from Group 2 were between the ages of 0 and 7, cell phones were a new advancement in technology, and smart phones had not yet been produced. Today, there are very few families that do not have at least one smart phone. Touch screen technology is the most significant and noticeable difference between the electronic use of Group 1 and Group 2.

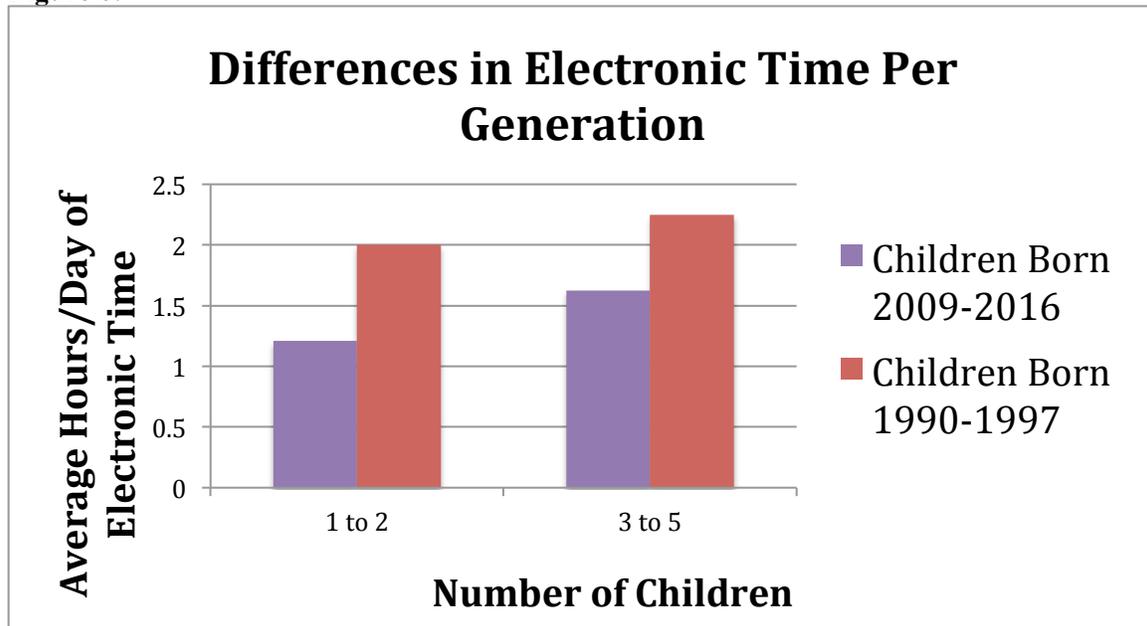
Based on data reported by participants, children from Group 1 live in homes with a greater number of electronic devices (shown in Figure 5). Families in Group 1 with one to two children have an average of approximately eight devices, while families in Group 2 with one to two children have an average of approximately six devices. An even greater discrepancy can be seen in families with three to five children, where Group 1 has an average of about nine devices, Group 2 only averages about six devices. This data reflects the idea that media use is consistent across households. Families with a greater number of children also own a greater number of devices. Homes with a greater number of children and subsequently, a greater number of devices, do not suggest that children in these homes are experiencing more screen time. It is likely that children in these homes are spending similar amounts of time, but do not need to share devices.

Figure 5:



Despite the presence of a greater number of electronic devices in the home for Group 1, parents report lower hours per day of electronic time (shown in Figure 6). In families with one to two children in Group 1, participants report children have screen time for approximately 1.2 hours per day. In contrast, families with one to two children in Group 2 report children average about 2 hours of screen time per day. Although the difference between the two groups is less than an hour of screen time, this time adds up over the course of a week. Similarly, families with three to five children show the same pattern. Group 1 reports an average of approximately 1.6 hours of screen time per day, while Group 2 reports an average of 2.3 hours per day.

Figure 6:



#### Parent perception of communication and social language skills

One hundred percent of participants in Group 2 felt their children have strong or very strong general language and communication skills. However, only 94% of participants in Group 1 felt their children have strong or very strong language skills. 100% of participants in Group 2 also felt their children have strong or very strong social communication skills. In comparison, only 83% of participants in Group 1 felt their children have strong or very strong social communication skills.

Data from Table 1 shows correlations in Group 1 between the parent perceptions of general communication skills, social language skills, number of children in the family, number of devices per household, and the hours of screen time per day. Group 1 had a slight positive correlation of 0.418 between perception of children's general communication skills and children's social language skills. The positive correlation of parent perception of their children's general communication skills and social language skills suggests a trend in which parents who rate children "strong" on general

communication skills are more likely to rate them “strong” for social language skills as well. Although there are no statistically significant results, there are some slight correlations that demonstrate a relationship between parent perceptions of language skills. There is also a minimal correlation of 0.384 between the hours of screen time per day and general communication skills. This would suggest it is likely those with a higher number of hours with electronics per day would be rated higher in general communication skills by parents.

**Table 1:  
Group 1**

	Parent Perception of General Communication Skills	Parent Perception of Social Language Skills	Number of Children	Number of Devices
Parent Perception of Social Language Skills	0.418			
Number of Children	-0.046	0.326		
Number of Devices	0.199	-0.078	-0.055	
Hours/Day	0.384	0.156	0.373	0.320

In Group 2, the correlations are even weaker than those for Group 1 (shown in Table 2). However, Group 2 showed a weak correlation of 0.209 between perception of children’s general communication skills and children’s social language skills. This is similar to the correlation in Group 1 however, the results cannot be considered significant.

**Table 2:  
Group 2**

	Parent Perception of General Communication Skills	Parent Perception of Social Language Skills	Number of Children	Number of Devices
Parent Perception of Social Language Skills	0.209			
Number of Children	-0.223	-0.298		
Number of Devices	0.109	0.034	0.256	
Hours/Day	0.131	0.161	-0.211	-0.009

### *Discussion*

Technology has advanced and changed considerably in the past 20 years. The results of this study coincide with the idea that young children today are “digital natives” who are accustomed to living in a world surrounded by technology (Prensky, M., 2001). Most participants in this study felt that their children had access to more technology than they did as children, and as a result, they were more technologically savvy. However, previous research has found that “50 percent of parents overestimated and 42 percent underestimated their children’s knowledge of at least one type of common technology” (Vittrup et al., 2014). Of these parents, more than half held the belief that children naturally possessed knowledge of technology. It appears many participants from both Group 1 and Group 2 also held the belief that children are born with an innate ability to learn technology. The majority of participants in this study viewed technology as a positive influence on language development. Very few participants indicated negative feelings toward child media use, as most believed any negative effects were controlled by monitoring and time restrictions.

Based on results, it appears that despite an increase in technology presence in the lives of children today, parents are more cautious of the effects of technology than in

previous generations, as children currently spend a smaller average number of hours with electronics per day, according to survey responses. Based on participant comments, most parents of Group 1 are extremely cautious about how much time their children use electronics and monitor closely the types of programs they watch and games they play. As one participant states, they are “able to limit the amount of time spent in front of a screen.” In addition, many participants acknowledged that they only allow their children to watch educational programs. Parents of Group 2 also indicated that their children often watched educational programs, which were described as providing “great lessons...vocabulary building and emotional understanding” for children. Although the majority of participants in Group 2 attributed more negative consequences to young children’s use of technology, survey responses indicated that children in these families spent more time per day using electronics. It is possible that time and long-term observation account for the higher percentage of negative responses from Group 2 participants in reference to child media use. Participants of Group 2 have had more time to observe the long-term impact of technology as their children develop, while Group 1 participants have children who are still in early developmental stages. It is possible that current research has brought more attention to the effects of technology during a critical time of child development, and therefore, parents of young children today are more conscientious of the amount of screen time children have daily.

### **Limitations**

This study cannot be considered unbiased due to the use of a convenience sample to recruit participants. The researcher personally recruited all participants that took part in the survey. As a result, the survey did not consider geographical location, marital status,

educational background, ethnic background, or socioeconomic status of families. These are all factors that could change the results of this study. For example, a single parent is more likely to have less time to spend with children, as they could be working more than one job to support the family. This may also be the case with families of low socioeconomic status. Research has shown that single-parent families, as well as families of low socioeconomic status (including minorities), have fewer resources such as time, energy, and money (Krein & Beller, 1988). Fewer resources suggest an increase in time parents are required to spend working to support the family financially, resulting in less time available to spend with children and monitoring electronic activity.

It must be noted that results of this study can only be based on the answers participants were willing to supply. Although this study involved quantitative data, the data is subjective to what the parents believe. Previous research has shown that parents often underestimate the time children spend with electronic media (Vittrup, B., 2009). It is possible that parents in this study also underestimated the amount of screen time their children had per day. The results of this study only consider parents' perceptions of technology use.

Finally, this was considered a small-scale study. Therefore, the results cannot be generalized to the larger population. As mentioned, participants were not diverse in terms of marital, educational, geographical, ethnic, and socioeconomic status. Most participants were part of a two parent, college educated, middle to upper-middle class family from the Northeast. This is not the profile of the modern Western civilization, nor is the profile of the United States as a whole. For this reason, the results of this study cannot be generalized nationally or globally.

**Suggestions for further research**

Further research is essential to generalize parent perceptions to the larger population. A large-scale study with equal variations of marital, education, geographical, ethnic, and socioeconomic status is essential to determine the parent perceptions of technology use and child development across the nation.

The use of technology in schools and other settings outside of the home should also be taken into account, as this contributes to children's daily engagement with technology. Many parents neglect to consider technology used outside the home, as many are not aware of the technology used in schools. Current literature indicates a lack of communication between schools and homes about child technology use (Siraj-Blatchford, I. & Siraj-Blatchford, J., 2006). This missing link is essential to consider when investigating the potential influence of technology on child language development and social communication skills.

*Conclusions*

The continued increase in the use of technology has lasting impacts on child development. Some research suggests that this increase in technology usage has a negative impact on language development, specifically social language, of children. Previously, it was recommended that a child have no screen time until the age of 2 years old (unless screen time involved human interaction such as video chat). The full impact on screen time at younger ages is unknown, but under research. More recent research has found there are some positive influences technology has on the language development of children. Based on findings of both positive and negative effects, it appears that technology can be beneficial in some ways, but also detrimental in other ways. This

suggests that it is less about technology alone, and more closely related to the amount at which technology is used and the context in which children experience technological media.

Despite the continuous changes in the technology that surround children day today and the reported increase in technology exposure in the homes of Group 1 compared to Group 2, the small population of this study indicated that Group 1 parents are more cautious of the amount of screen time they allow their children to have per day. Participant responses for both groups indicate an overall positive attitude toward the use of technology in the lives of children for both developmental and educational purposes. Preliminary data also showed a favorable trend in parent perception of children's general communication skills and social language skills. However, no statistical significance has been found in the data from the surveys. While there seem to be trends in parent perceptions, this cannot be generalized to the larger population due to the limits of the study. Based on the responses in this study, it appears that parents positively associate child technology use with language development. These results coincide with the results of previous studies.

### *Acknowledgements*

Thank you to Professor Jeanne O'Sullivan for supporting me in this research and advising me with her expertise. I would also like to recognize Dr. Allan Smith for his assistance with data analysis. A special thank you to all participants who took the time to complete the survey, without which, this research would not have been possible. Lastly, I would like to express gratitude to my parents, without whom, I would not have had the opportunity to complete this project.

## References

- Couse, L. J., & Chen, D. W. (2010). A tablet computer for young children? Exploring its viability for early childhood education. *Journal of Research on Technology in Education, 43*(1), 75-96.
- Ernest, J. M., Causey, C., Newton, A. B., Sharkins, K., Summerlin, J., & Albaiz, N. (2014). Extending the global dialogue about media, technology, screen time, and young children. *Childhood Education, 90* (3), 182-191.
- Flewitt, R., Messer, D., & Kucirkova, N. (2014). New directions for early literacy in a digital age: The iPad. *Journal of Early Childhood Literacy, 14*68798414533560.
- Hatzigianni, M., & Margetts, K. (2014). Parents' beliefs and evaluations of young children's computer use. *Australasian Journal of Early Childhood, 39*(4), 114-122.
- Hsin, C. T., Li, M. C., & Tsai, C. C. (2014). The Influence of Young Children's Use of Technology on Their Learning: A Review. *Educational Technology & Society, 17*(4), 85-99.
- Krein, S. F., & Beller, A. H. (1988). Educational attainment of children from single-parent families: Differences by exposure, gender, and race. *Demography, 25*(2), 221-234.
- McCarrick, K., & Xiaoming, (2007). Buried treasure: The impact of computer use on young children's social, cognitive, language development and motivation, *AACE Journal, 15*(1), 73-95.
- Nikken, P., & Schols, M. (2015). How and why parents guide the media use of young children. *Journal of child and family studies, 24*(11), 3423-3435.
- Prensky, M. (2001). Digital natives, digital immigrants part 1. *On the Horizon, 9*(5), 1-6.
- Reddy, S. (2015). Pediatricians rethink screen time policy for children. *Wall Street*

*Journal*. Retrieved May 18, 2016 from [www.wjs.com](http://www.wjs.com).

Rideout, V. J., Foehr, U. G., Roberts, D. F. (2010). Generation M2: Media in the Lives of 8- to 18-year-olds. *The Henry J. Kaiser Family Foundation*.

Siraj-Blatchford, I., & Siraj-Blatchford, J. (2006). A guide to developing the ICT curriculum for early childhood education. *Stoke on Trent: Trentham Books*.

Stephen, C., Stevenson, O., & Adey, C. (2013). Young children engaging with technologies at home: The influence of family context. *Journal of Early Childhood Research*, 1476718X12466215.

Sweetser, P., Johnson, D. M., Ozdowska, A., & Wyeth, P. (2012). Active versus passive screen time for young children. *Australasian Journal of Early Childhood*, 37(4), 94-98.

Technology. (2015). In *Merriam-Webster.com*. Retrieved May 10, 2016, from <http://www.merriam-webster.com/dictionary/technology>

Vittrup, B. (2009). What US parents don't know about their children's television use: discrepancies between parents' and children's reports. *Journal of Children and Media* 3(1), 51-67.

Vittrup, B., Snider, S., Rose, K. K., & Rippy, J. (2014). Parental perceptions of the role of media and technology in their young children's lives. *Journal of Early Childhood Research*, 1476718X14523749.

## Appendix A

**Group 1 Survey**

I am a student in the Communication Sciences and Disorders department at UNH and I am conducting a research project to find out the effects of current technology on the language development of children.

You must be 18 years or older to participate. If you agree to participate in this study, you will be asked to answer questions in the following survey, which will take no longer than 20 minutes. You will not receive any compensation to participate in this project.

Participation in this study is strictly voluntary. If you refuse to participate, you will not experience any penalty or negative consequences. If you agree to participate, you may refuse to answer any question and/or if you change your mind, you may withdraw at any time during the study without penalty or negative consequences.

I seek to maintain the confidentiality of all data and records associated with your participation in this research. There are, however, rare instances when I am required to share personally-identifiable information (e.g., according to policy, contract, regulation). For example, in response to a complaint about the research, officials at the University of New Hampshire, designees of the sponsor(s), and/or regulatory and oversight government agencies may access research data. I am also required by law to report certain information to government and/or law enforcement officials (e.g., child abuse, threatened violence against self or others, communicable diseases).

Please choose a selection below. Thank you for your consideration.

Do you consent?

- Yes
- No

Are you?

- Male
- Female
- Other

What is your current age?

- 18-30
- 31-40
- 41-50
- 51-60
- 61-70

How many children do you have?

What are the ages of your children?

How many electronic devices are currently in your household?

Which devices do you currently own in your household? (Check all that apply.)

- TV
- Computer/Laptop

- Tablet
- E-reader/Kindle/Nook
- Game console (including but not exclusive to Wii, PlayStation, Xbox, GameCube, Sega)
- DVD/Blu-ray player
- Cell phone
- Baby Einstein/Leap Frog etc. products
- Other

Which devices do your children currently use? (Check all that apply.)

- TV
- Computer/laptop
- Tablet
- E-reader/Kindle/Nook
- Game console (including but not exclusive to Wii, PlayStation, Xbox, GameCube, Sega)
- DVD/Blu-ray player
- Cell phone
- Baby Einstein/Leap Frog etc. products
- Other

On average, how many hours of screen time/electronic play does your child have per day?

How do you feel about your child/ren's language/communication skills?

- Very strong
- Strong
- Average
- Poor
- Very poor

How do you feel about your child/ren's language/communication skills while interacting with both other children and adults?

- Very strong
- Strong
- Average
- Poor
- Very poor

Do you feel technology has had an impact on your child/ren's language and social development? If so, what do you see as a positive impact and what do you see as a detriment?

Describe your own experiences with technology as a child.

Describe your current experiences with technology.

## Appendix B

**Group 2 Survey**

I am a student in the Communication Sciences and Disorders department at UNH and I am conducting a research project to find out the effects of current technology on the language development of children.

You must be 18 years or older to participate. If you agree to participate in this study, you will be asked to answer questions in the following survey, which will take no longer than 20 minutes. You will not receive any compensation to participate in this project.

Participation in this study is strictly voluntary. If you refuse to participate, you will not experience any penalty or negative consequences. If you agree to participate, you may refuse to answer any question and/or if you change your mind, you may withdraw at any time during the study without penalty or negative consequences.

I seek to maintain the confidentiality of all data and records associated with your participation in this research. There are, however, rare instances when I am required to share personally-identifiable information (e.g., according to policy, contract, regulation). For example, in response to a complaint about the research, officials at the University of New Hampshire, designees of the sponsor(s), and/or regulatory and oversight government agencies may access research data. I am also required by law to report certain information to government and/or law enforcement officials (e.g., child abuse, threatened violence against self or others, communicable diseases).

Please choose a selection below. Thank you for your consideration.

Do you consent?

- Yes
- No

Are you?

- Male
- Female
- Other

What is your current age?

- 18-30
- 31-40
- 41-50
- 51-60
- 61-70

How many children do you have?

What are the current ages of your children?

Estimate the number of electronic devices in your household when your children were between the ages of 0 and 7.

Which devices did you own in your household when your children were between the ages of 0 and 7?  
(Check all that apply.)

- TV
- Computer/Laptop

- Tablet
- E-reader/Kindle/Nook
- Game console (including but not exclusive to Wii, PlayStation, Xbox, GameCube, Sega)
- DVD/Blu-ray player
- Cell phone
- Baby Einstein/Leap Frog etc. products
- Other

Which devices did your children use between the ages of 0 and 7? (Check all that apply.)

- TV
- Computer/laptop
- Tablet
- E-reader/Kindle/Nook
- Game console (including but not exclusive to Wii, PlayStation, Xbox, GameCube, Sega)
- DVD/Blu-ray player
- Cell phone
- Baby Einstein/Leap Frog etc. products
- Other

On average, how many hours of screen time/electronic play did your child have per day (between the ages of 0 and 7)?

How do you currently feel about your child/ren's language/communication skills?

- Very strong
- Strong
- Average
- Poor
- Very poor

How do you currently feel about your child/ren's language/communication skills while interacting with both other children and adults?

- Very strong
- Strong
- Average
- Poor
- Very poor

Do you feel technology has had an impact on your child/ren's language and social development? If so, what do you see as a positive impact and what do you see as a detriment?

Describe your own experiences with technology as a child.

Describe your current experiences with technology.

Describe your feelings about current child technology use.