YOUNG CHILDREN, PARENTS AND TECHNOLOGY: A CASE STUDY EXPLORING HOW THE PLAY CHOICES OF A 3 YEAR OLD CHILD RELATE TO PARENTAL ATTITUDES AND BEHAVIOURS AROUND TECHNOLOGY

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YOUNG CHILDREN, PARENTS AND TECHNOLOGY: A CASE STUDY EXPLORING HOW THE PLAY CHOICES OF A 3 YEAR OLD CHILD RELATE TO PARENTAL ATTITUDES AND BEHAVIOURS AROUND TECHNOLOGY

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Abstract

Today’s digital landscape is evolving more quickly than existing research about the effects of digital technology on the development, learning and family life of young children, particularly those under the age of five. As research suggests, there is a causal relationship between use of digital technology and the health and well-being of individuals. It is therefore important to come to an understanding of how digital behaviours are developed in the early years, a time of radical growth and learning with long term implications for the young child. Research suggests that the child’s development of attitudes and behaviours related to digital technology may be influenced by parental use of and attitudes about digital media as well as the structuring of the child’s experiences and environment.

The purpose of this qualitative case study was to explore the question of how the play choices of a 3 year old boy relate to the behaviours and beliefs parents demonstrate in the home in regards to digital technology. Data collection included parent and child questionnaires as well as observations and documentation of the child’s play preferences when offered choices from traditional as well as digital materials. Findings were examined using a thematic analysis to determine if a relationship between child choices and parental beliefs and practices is indicated.
Lay Summary

Current research suggests there is a relationship between use of technology and overall health and well-being in young children. It is important to develop an understanding of how digital behaviours are learned in the early years. Existing research suggests that a child’s development of attitudes and behaviours related to digital technology may be influenced by the parent. While this information is significant, it is also important to further understand how these digital behaviours are learned. This case study worked to examine this relationship by studying the play choices of 3 year old boy through interviews and observations in his home. A parent questionnaire provided information around parental beliefs and practices related to digital technology and how it is used in the home. The Findings were discussed to develop an understanding of how child behaviours around digital technology and parental attitudes are related.
Preface

This thesis is an original and unpublished intellectual product of the author, Yvonne Kiefert Adebar. The fieldwork reported in Chapters 4 and 5 was covered by UBC Ethics Certificate number H16-01617.
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Dedication

I would like to dedicate this work to my father Horst Paul Alfred Kiefert.

A World War and his dedication to family kept him from accomplishing his dream of studying to be a teacher but his inspiration helped me to achieve mine; and to Devon his great grandson with hopes that he finds and achieves his dream.
Chapter 1: Introduction

Today’s digital landscape is evolving more quickly than existing research about the effects of digital technology on the development of young children, particularly those under the age of five. Research suggests that the family dynamics of young children and parents engaging with computers, consoles, tablets and smartphones are under-researched (Connell, Lauricella, & Wartella, 2015). The increased access to digital materials for young children (Blanchard & Moore, 2010; Steeves, 2014; Wartella, 2013) has led to a public discussion about the role of digital technology in the lives of young children. One prominent concern is the ways in which childhood is being transformed by technology including anxiety around the impact on the development of children’s cognitive, emotional and social development (Plowman & McPake, 2009). As evidence gathers that overuse of technology has implications for health issues in young children (Berolo, Wells, & Amick, 2011; Dworak, Schierl, Bgruns, & Struder, 2007; Ip, Saw, Rose, Morgen, Kifley & Wang, 2008;; Lillard & Peterson, 2011; Robertson, McAnnaly, & Hancox, 2013) further research into the development of digital behaviours in young children is indicated. As parents are often the most prominent figures in the lives of children under the age of five (Bronfenbrenner, 1979; Bowlby, 1973) they are also one of the most important influences on the development of behaviours including those related to the use of technology (Brito, Fransisco, Dias, & Chaudron, 2017; Lopez, Caspe & Weiss, 2017; Wu, Fowler, Lam, Wong, Wong, & Loke, 2014;). Considering the limited research on pre-schoolers’(0 - 4 years) use of technology in their homes, I believe that studying the children’s choices and actions of such young children along with the parents’ beliefs and behaviours around digital technology to determine what, if any, relationship between the two exists is warranted.
As an early childhood development instructor at the college level and early
interventionist working with parents, I have observed the relationship between young children,
parents and digital media. I have also noted the recent interest on the part of researchers to study
the role parents play in the integration of digital media use in their home (Brito et al., 2017;
Sergi, Gatewood, Elder, & Xui, 2017; Plowman & McPake, 2010) as well as their questions and
concerns about how this is best accomplished (Canadian Paediatric Society, 2016; Digital Task
Force, 2017; Wartella et al., 2013).

Research to date has often focused on the effects of technology on the lifestyle of school
age children including topics such as equity of access, home and school uses and literacy in
context of digital materials as well as pedagogical approaches and effect on learning (Hsin &
Tsai, 2014; Marsh, Hannon, Lewis, & Ritchie, 2008). While this research is important in
developing an understanding of how technology may influence school age children, there is
limited information related to what is happening for pre-school children. It is important to note
this age related distinction, as there are significant differences between early and later childhood
in terms of brain growth, general developmental milestones and the cultivation of healthy
lifestyles. During the early childhood years (birth to three years of age) the cognitive and
functional abilities of pre-school children (three to five years of age) are still in their early stages
of development and easily influenced (Wu et al., 2014; American Academy of Pediatrics, 2015).

In addition to considering primarily school aged (five to 12 years of age) children, much
of the existing literature explores the impact of technology primarily in the form of television
viewing (Lillard & Peterson, 2011; Linebarger & Walker, 2005) and then generalizes broadened
conclusions applying them to all screens (Digital Task Force, 2017). However television is now only one of many digital materials accessed by young children, and is a very different experience from what is currently available to them in terms of portable digital devices and screens.

Finally, the lack of research examining the long term outcomes of digital media use has prompted the application of traditional child development theory by researchers (Edwards, 2013) and early childhood professionals to the use of screens. In an attempt to understand the benefits and challenges presented by repeated digital technology exposure principles of child development such as types of stimulation needed to achieve learning outcomes and learning environments which are conducive to optimum growth can be applied. As parents and educators attempt to determine what is best for young children in terms of developing healthy digital behaviours, more research is needed in order to provide information for evidence based best practices.

1.1 The Purpose of the Study and Research Question

The purpose of this qualitative single case study then, is to add to the limited body of knowledge related to digital technology and pre-school children by addressing the research question of how the play choices of a 3 year old boy relate to the behaviours and beliefs his parents demonstrate in the home with the digital technology accessible to him. Data collection included a parent interview and questionnaire as well as a child questionnaire and recording of the play sessions. These served to document preferences for and beliefs about technology as well as observations and documentation of the child’s play preferences when offered choices from traditional (no batteries, electronics or computer chips) as well as digital materials.
The study examined the preschooler engagement with digital and non-digital materials including time spent with both types of materials, knowledge about digital technology including use and boundaries for use, the role of technology in his life and how he himself used it. Findings are reported both descriptively as well as based on a thematic analysis of the data, and insights from this case study are discussed to guide future research.
Chapter 2: Review of Literature

Overview

As there is currently very little research directly related to my thesis question, this section provides context for the thesis considering the prevalence of digital media today in the lives of young children and why there is a need for further study in this area. Child development theory and why it is used to draw conclusions on what are best practices for structuring environments for young children which include digital media is discussed. An explanation of the need for research related to young children and digital media is followed by identification of studies which serve to provide an understanding of the digital world which the child of today inhabits. Studies of outcomes related to digital media use are then examined considering factors such as health issues and the impact on child learning and development. Research on parental attitudes of digital media use as well as the ways in which they might influence child behaviours is summarized. Children’s voices and perspectives in terms of their importance to data collection and how best to include them are also discussed. Finally existing case study research related to the thesis research question is examined. To conclude, the literature review leads directly to the formation of the thesis question and ensuing study through consideration of the research in terms of what we know and what we still need to know.

2.1 Digital media and child development: What do we know?

There appears to be very little research that considers the use of digital technology by children under the age of five from a developmental theory perspective. In other words, while there are accepted theories of child development for young children in terms of learning,
developmental sequences and what is needed for optimal development to occur, very little has considered the addition of digital technology to the child’s environment (Connell, 2015).

For example, the idea that use of technology can consume the limited cognitive resources that could and should be otherwise used for learning that is critical to the development of the child at this age (Fisch, 2000) leads to one possible assumption that use of digital technology must be limited for this age group. In other words, the cognitive load in the young child must be focused on the areas of maximum importance and need in terms of development. This is significant when considering that infants, toddlers and pre-schoolers possess limited cognitive resources and rely on active experiences for learning (Fisch, 2000) and leads to the question of how much media use is too much for the young child.

The concept that cognitive development is directly related to the experiences in which the child participates has been an underlying principle in child development as far back as the early 20th Century. Piaget (1932) considered active play to be an important contributor to the development of cognitive skills. This could then be applied to the use of digital media in that children should be involved in active three dimensional learning which may be combined with digital experiences, as opposed to two dimensional screen experiences alone for optimal cognitive growth and learning. However further research in this area is needed in order to validate this supposition.

Subsequent literature (Maynard, 2008) incorporating Piaget’s theory has expanded upon this premise of cognitive development through active play to recognize that culture and cultural experiences are also significant to the development of the child’s cognitive processes and the brain. As both Maynard (2008) and Piaget (1932) conclude, child development is a process of construction based on child-environment interactions in various conditions. For the purposes of
this discussion, the most important of these findings is that variations in cognitive development are rooted in the range of activities in which children engage indicating that digital technology should be one of many opportunities for their exploration.

In addition, Maynard (2008) proposes that it is the engagement with the child’s culture and social experiences which form values, thoughts and relationships. In other words, if young children need to be engaged with real people in real life situations in order for optimal development to occur the assumption is that screens alone do not satisfy this need. While there is currently interest in research where the screen is used as a tool with a parent, this is primarily studying the impact on literacy (McNab & Fielding-Barnsely, 2013; Marsh et al., 2017; Strauss & Ganea, 2017). Again, more research is needed in order to develop a better understanding of this process.

Daniel Siegel, a renowned children’s psychiatrist and neuro-biology theorist uses the Findings of brain imaging studies to support and expand upon Piaget’s theory of experiential learning and relate it to brain development. In his book, *The Whole Brain Child* (2008), Siegel states that the brain is significantly shaped by the experiences in which the child engages. He uses the term “neuroplasticity” to describe the way in which neurons make connections to create brain structures. He asserts that what affects our brain development is a combination of our underlying brain architecture and inborn temperament in conjunction with everything that happens to us.

Indeed, Siegel (2012) proposes that while experience activates certain pathways in the brain by strengthening existing connections and creating new ones throughout our lifetimes, it is our early experiences that are crucial in determining how the existing brain structures determined by genetics are expanded and developed. In other words, it is during the early years when the
basic architecture in the brain is laid down, based on the experiences of the child. Consideration of this perspective leads to the question of how the basic architecture of children’s brains might be affected by early interactions with screens, and how this might affect future brain development. Again, there is currently no research related to this question.

Going further, the child’s very biology may play an important role as children are developing neural connections (Young & Richardson, 2007) as well as forming attitudes and learning behaviours. Research suggests that it is the interplay between genetics (Deary, Johnson, & Houlihan, 2009) and early socio-cultural experiences influenced by overall health and well-being which will influence how the child grows and develops. What role use of digital media plays, if any, in this process has not been thoroughly researched and is currently not understood.

Exposure to digital devices directly and indirectly can also be examined from a socio-cultural perspective. Socio-cultural theorists consider child development to be related to participation with others in socio-culturally relevant activities (Robins, 2005). The goal of the socio-cultural approach is to explore the relationship between human mental functioning and the cultural situations in which this occurs. From this approach, it could be supposed that in an environment where the focus is on digital media, for example in the context of home and family, the child would naturally be immersed in this type of culture which could lead to the development of attitudes, skills and behaviours related to digital media. For example, if the parents demonstrate constant use of devices and provide an environment where devices are available to the child who is encouraged to use them, then the expectation is that the child will prefer digital materials over traditional play experiences when given the choice. Conversely, if parents model a more moderate use of digital materials themselves and provide a variety of play experiences and clear digital boundaries, the opposite should occur. While there is currently
limited research exploring the role of parents in this context (Brito et al., 2017; Edwards, 2013) further study is needed to validate this theory.

To summarize, while some existing literature supports the theory that genetic characteristics in the young child are shaped through active exploration with three dimensional materials and relationships with others, there is very little research which considers the impact of digital technology on this process. Therefore further research is indicated as young children today are constantly exposed to digital media at home in their day to day lives.

2.2 The young child in the digital world of today

Research demonstrates that the young child of today is exposed to digital media in the home through active engagement themselves and through observation of family members (O’Hara, 2014; Plowman, McPake & Stephen, 2009). In recent years studies have provided actual numbers measuring the time spent with digital media and what is currently available to children (Blanchard & Moore, 2010; Downey, Hayes & O’Neil, 2004; Wartella, Rideout, Lauricela, & Connell, 2013). This provides a clearer perspective on what the child is experiencing in terms of digital media exposure and leads us to ponder the implications of this including the influence of the home environment on the development of the child’s attitudes and behaviours related to digital media use.

In 2005 the Kaiser Foundation conducted a study of 1,000 middle-income American families in four American cities and found that pre-school children (birth to five) were exposed to a variety of digital media multiple times during the day. The majority of homes had a television (99%), as well as video players (93%) video game consoles (50%) and computers (78%). One in five bedrooms of infants aged birth to one year and one half of the self-contained bedrooms of children aged four to six contained a television.
In addition to direct involvement with media, children under six are also exposed to digital media experiences through the behaviour of older siblings. In 2010 the Kaiser Foundation conducted another study which found that young people aged 10 to 18 years of age spend a total of 10 hours and 45 minutes a day involved in concurrent digital experiences (i.e. watching television and using the computer). Although this number is likely much higher today given the recent increase in the accessibility of mobile digital devices such as tablets and smartphones, these studies are still significant as they provide important data which stimulates discussion on the use of digital media by children at a time when there was not a large body of research related to the topic.

More recently, in 2013 Media Smarts (Steeves, 2014) surveyed 5,436 students in grades four to eleven in all Canadian provinces and three of the territories to investigate children’s experiences with digital media. Findings show that while shared family desktops are still available in the home, the majority of young people access the Internet using portable devices such as laptops, netbooks, tablets and smartphones. Over one quarter of students in the fourth grade and 85% in the eleventh grade have their own mobile phones. While this study deals with older children, the Findings are still significant as indications are that young people are engaged with digital devices to socialize, play games and access information from a variety of locations thereby exposing any younger siblings to this type of behaviour.

The portability of handheld devices means that they are available in the car, during family outings, at the dinner table, and other areas which used to be device free in the past. This is significant as it raises the question of how the use of digital devices by older siblings will impact on the development of attitudes and skills related to digital media of the younger siblings.
Blanchard and Moore (2010) produced a white paper on digital literacy and young children, providing a summary of the plethora of experiences which define the digital world as it relates to children including television, computers, video games and digitized toys. The Kaiser Foundation (2010) expanded the list to include music and audio devices, digital print (e-books) and movies. Downey, Hayes and O’Neill (2004) conducted a study for the Dublin Centre for Social and Educational research which lists the above devices but also includes hand held devices such as game boys.

The data gathered by previous studies does indicate that young children are immersed in digital media in their homes. These media include traditional devices such as televisions, radios, dvd players and also hand held mobile devices, computers, laptops and tablets. Digital cameras, smart phones, and tablets are digital devices which were not considered by previous studies, but have become increasingly accessible to families in recent years. The extent to which pre-school aged children are using devices themselves remains understudied.

2.3 Digital media and young children: Is there cause for concern?

Although a review of the literature has demonstrated that young children are spending a great deal of time exposed to digital media, it is not known at this time if early exposure to screen media actually changes the developing brain or affects child development in other areas. Studies show however that there is concern among parents that spending too much time with digital technology may be unhealthy for young children physically and emotionally in ways that we may not have previously considered. The Canadian Pediatric Survey Findings (Digital Task Force, 2017) indicate that parental concern and questions about how much is too much are prevalent and what if any negative consequences may be the result of digital media overuse.
When examining existing research related to the health and well-being of young children in relation to digital media use, there are indications that parental concern may be valid.

For example, there is a suggestion that electronic stimulation and virtual experiences are contributing to a loss of children’s sensitivity and connection to the natural world (Burgess & Smith, 2011). Some would say that many children today are experiencing a nature-deficit which may result in changes to typical development as well as a wide range of behavioural problems (Louv, 2005). Child engagement in rough and tumble outdoor play and imaginary games allows for the development of adequate social and sensory motor skills required for attention and learning. There is some question as to whether the lack of these experiences is contributing to the increase in issues with child motor and sensory development (Rowan, 2008).

In addition there appears to be a fundamental, genetically based, human need to affiliate with life and lifelike processes called biophilia. Research has shown that children have an affinity with nature even in impoverished urban communities (Kahn, 1997) which leads to a general sense of well-being. There is a suggestion that children who are experiencing symptoms of anxiety and attention issues relax and demonstrate more positive outcomes when provided with the opportunity to spend time outside (Kuo & Taylor, 2004). There are also indications that increased use of screen time may result in attention and hyperactivity issues (Livingstone, 2002; Yip, Levine, Lauricella & Wartella, 2015). It would seem that further research examining the relationship between outdoor play, screen time and issues with ADHD is indicated.

The need for outdoor play is also demonstrated when examining the development of biological systems in young children. A recent study (He, Xiang, Zeng, Mai, Chen, Zhang, & Morgan, 2015) examined the relationship between outdoor play and the development of healthy vision in young children. This resulted from concern regarding the increase in myopia in young
children, which had reached epidemic proportions in parts of East and Southeast Asia. The Findings demonstrated that the addition of one hour of time engaged in outdoor play each day significantly reduced the incidence of myopia over the 3 year period.

There is also a concern that time engaged with screens indoors may displace time which could be used to engage in healthy and necessary outdoor play and interactions with nature as well as other important learning experiences. The National Association for the Education of Young Children (NAYC, 2014) has issued a statement that technology and interactive media have the potential to enhance, but not replace, creative play, exploration, physical activity, outdoor experiences, conversation, and social interactions. The NAYC also states that it is important to keep screen time recommendations for young children (AAP, 2015) in mind which clearly outline the amount of time and types of interactions.

Digital media use may also affect the health and well-being of children by affecting the other biological systems such as sleep (Owens, 2008). Research shows that 10 to 12 hours of sleep are needed at night by the time children are five years old (Galland, Taylor, Elder, & Herbison, 2012). In discussions with parents, many report that they encourage their child to remain in the bedroom and watch a movie or use a mobile device as a part of their self-soothing sleep routine. While parents believe their children (including pre-school aged children), are sleeping through the night, it is unclear whether they may have engaged with some sort of device for extended hours thereby disrupting their sleep. Sleep is crucial for knowledge retention and memory required for learning (Jenni & O’Connor, 2005). Children who are over-tired struggle against going to sleep and have more disrupted sleep (Mindell, Meltzer, Carskadon, & Chervin, 2009) which then leads to emotional, behavioural and obesity problems linked to inadequate
sleep. If unresolved, particularly in the early years, children’s sleep problems can become chronic (Touchette, Petit, Pacquet, Boivin, Jape, Tremblay, & Montplaisir, 2005).

Existing literature suggests that monitoring the amount and the ways in which young children are exposed to digital media is critical for their healthy growth and development. The American Academy of Pediatrics issued a policy statement in 2001 which recommended that children under two years of age should watch no television or videos while those over two years should be limited to two hours of educational programming. This was in direct response to concerns regarding the impact of television viewing on the health of young children. Since these statements were issued, mobile devices have become more prevalent, increasing the potential time that children are engaged with screens.

The American Academy of Pediatrics has recently refined the policy statement on media use providing guidelines for parents on use with young children, recognizing that mobile devices are now an integral part of day to day home life (AAP, 2015). Even so, there is still a caution that parents should limit the amount of time engaged with screens and that co-viewing with infants and toddlers is critical. The academy emphasizes that learning from a live care giver are still key elements in the developmental needs of the child.

As mentioned, indications are that over use of screen time for young children may have a negative impact on their well-being. However a recent study (Bedford, Saez de Urabain, Cheung, Karmiloff-Smith, & Smith, 2016) of toddlers in the UK finds that touchscreen technologies can provide an intuitive and attractive source of sensory and cognitive stimulation for young children. It also suggests that early use of touch screens is significantly associated with fine motor development. Toddlers aged 19-36 months who began using touchscreens from six
months of age demonstrated higher levels of overall fine motor functioning than the normal milestones for their age.

While it is interesting to find a study that sees positive outcomes in one area of development for young children who are using touch technology, the researchers themselves acknowledge that the analysis does not consider how much time each child spent using the touchscreen, and that the amount of time may influence the Findings. In addition, the analysis does not report other aspects of development that may also be associated with early touchscreen use such as eyesight problems (Ip et al., 2008), muscular and skeletal pain and problems due to excessive use (Berolo, Wells & Amick, 2011), sleep problems (Dworak, Schierl, Bgruns, & Struder, 2007), emotional and behavioural problems (Robertson, McAnnaly, & Hancox, 2013) or cognitive development such as attention control and executive function (Lillard & Peterson, 2011), issues which I have also touched upon in the literature review. Again this indicates that more research is needed in order to obtain a more accurate understanding of outcomes related to digital media use by young children.

Researchers (Bedford, Saez de Urabain, Cheung, Karmiloff-Smith, & Smith, 2016) also acknowledge that any discussion on benefits of touchscreen technology on child development must also consider the pedagogical value and age appropriateness of apps. Again this is an area that is currently understudied, in terms of maximum benefit for learning if any at a young age. In 2011, Bedford et al. stated that touch screen use by toddlers is quite prevalent in the UK and only likely to increase making it even more urgent for research to provide evidence in order for us to better understand if screens for toddlers is even appropriate.

It appears that while the American Academy of Pediatrics (2001) believed that screen use should be non-existent for two year olds, there is a suggestion that recommendations for zero
screen time for children under 2 years is out of line with the reality of the current home media environment of most toddlers and difficult to enforce by parents who are themselves conducting more of their lives through such devices (Bedford et al., 2016). In other words, it is difficult for parents to create a screen free environment for their children when they themselves are modelling screen use themselves. This then led to a more realistic statement (AAP, 2015) which still encouraged parents to limit screen use but also counseled parents on how to best use media with their children.

The AAP (2015) recommendations included the notion that any negative effects of digital media use may be moderated by factors such as parenting style, type of content and co-viewing with a parent. Early evidence suggests that interactive media that involves responses from an adult (i.e. reactions to what a child says and does) may help children retain information that was taught by the application. (Courage & Howe, 2010; Radesky, Schumbacher, & Zuckerman, 2015). This parental responsiveness paired with age appropriate content has been demonstrated to improve language skills for 25 month olds.

There are also indications (Strouse & Ganea, 2017) that there can be improved language learning with the use of responsive ebooks over print books, when a parent is actively engaged with the child. In the study by Strouse and Ganea (2017), toddlers who read electronic books often paid more attention, made themselves more available for reading, displayed more positive affect, participated in more page turns and produced more content related comments during reading than those who were read the print versions of the books. The suggestion is that electronic books supported learning by increasing these children’s engagement and attention when used with an adult.
To summarize, research is demonstrating that exposure to digital technology is ongoing for young children today raising concerns regarding the nature and amount of the exposure and long term effects on their health and wellbeing. Further research is needed to develop a better understanding of the overall benefits and negative effects of this exposure on young children and how to ensure that children develop healthy attitudes and behaviours related to digital media use. As studies begin to show that screens may be beneficial to learning in areas such as language learning when content is co-viewed and discussed with a parent or caregiver (Linebarger and Walker, 2005) we must recognize that overall pre-schoolers may learn best from live, direct and dynamic interactions with caring adults (Courage & Setliff, 2010). Therefore it is important to consider the impact of parental attitudes and behaviours on this process as they are usually the most consistent and significant adults in the lives of young children (Neufeld & Mate, 2004).

2.4 The Parent Perspective: The role of the parent in the development of attitudes around digital media in young children

Bronfenbrenner (1979) states that in the early years children are directly influenced by family practices even more than by external societal influences when developing their perception of reality and life-long behavior patterns. It is therefore important to consider the role of parents and family in the development of digital behaviors in young children when examining digital media from a socio-cultural perspective.

During the early years of life the primary role of the parent involves the process of attachment, a key component of a child’s psychological and emotional development (Bowlby, 1973; Crawford & Benoit, 2009; Grossman, Grossman, & Kindler, 2005; Raval, Goldberg, Atkinson, Benoit, & Myhal, 2001; Zeanah, Berlin, & Boris, 2011).
It is because children cannot function on their own that they need to attach to an adult. The attachment process is crucial for emotional and intellectual development of children, but also in terms of education and transmission of culture (Neufeld & Mate, 2004). Attachments are not present at birth. They are developed over time and emerge during the first few years of life and must be nurtured by attentive and available parents (Bowlby, 1973; Crawford and Benoit, 2009; Grossman, Grossman, & Kindler, 2005; Raval, Goldber, Atkinson, Benoit, & Myhal, 2011; Zeanah et al., 2011).

Consequently when a child is attached to a parent, it can be suggested that parenting behaviours will affect the child’s development of healthy digital behaviours through modelling their use, setting up the environment and by engaging in digital activities with the child (O’Hara, 2011; Plowman, McPake & Stephen, 2009; Adebar, 2014). The AAP (2015) also emphasizes the belief that active involvement in the digital experiences of the child by a caring, attentive parent is key in order to create positive developmental outcomes.

Recent studies (Bitmann, Rutherford, Brown, & Unsworth, 2011; Kucirnova & Sakr, 2015; Livingstone, 2007) have examined the role played by parents in children’s engagement with digital technology and have come to the conclusion that highlights the role played by parents in the engagement of digital media by young children. They concluded that this role is important as children at an early age are not autonomous and rely on parents to determine their digital practices and access to digital devices. It is also usually the parents that introduce the children to digital devices shaping their approach as children look to them as examples and role models (Brito et al., 2017).

Parental beliefs on the value of digital media may also have a more direct impact on the child by the way in which parents structure environments and experiences for their children.
Wooldridge (2016) examines the link between parental beliefs and the use of mobile screen devices with infants and toddlers. Findings indicate that parents provide these devices for their children’s use if they believe them to be beneficial in some way. As may be expected, positive parental beliefs have been shown to predict an increase in the amount of child mobile screen device time.

Research (Sergei, Gatewood, Elder, & Xui, 2017) seems to indicate that many parents believe engagement with digital media helps children to learn and develop in ways that are necessary for interactions in today’s world and they support the use of small portable devices (tablets) as entertainment and learning tools. Some parents who allow their young children to engage with such technologies claim improvements in dexterity, memory, attention, and linguistic and mathematical skills, and believe that these devices positively affect children’s cognitive development.

Another study (Wartella et al, 2013) surveyed 2,300 parents with children 8 and under about their attitudes and behaviors related to digital media use in their family. Data was organized into three groups in terms of parenting styles: Media Light, Media Moderate and Media Centric. In the Media Light category, 26% of the parents used digital media less than two hours per day, less than 19% left the television on most of the time, 28% had a television in the child’s bedroom and they allowed their child to use media for 1.39 hours per day. The Media Moderate parents which comprised 47% of those surveyed used digital media approximately 4.42 hours per day. 33% of the parents left the television on most of the time, 33% had television in the child’s bedroom. Their child used screen media 2.53 hours per day. In the Media Centric category, 27% of parents consumed more than 11 hours a day of screen media. 54% left the
television on most of the time. 48% had a television in the child bedroom and their child used 4.29 hours per day of screen media.

This research is important as it provides data on the amount of time spent using digital media for the adults and children as well as a context for the place of media in the home. Of more significance to my study is the relationship between parental use and the child use of digital media. Each category included a measure for the adult and the child in terms of technology use which seemed to indicate that a relationship between the two exists. For example, media light parents spent less than two hours per day while the child used 1.39 per day. Media Moderate parents used 4.42 hours per day and the child used 2.53 hours per day. Finally, Media Centric parents used more than 11 hours per day and the child used 4.29 hours per day. Although the ratios of the increase were not equal, i.e. increase in the parent use for each category was much higher than that of the children, the numbers did increase for both nonetheless.

This is one of the first studies to indicate a relationship between parental use of digital technology and that of the child. However further study is need to further explore the nature and implications of this relationship.

Existing research suggests that young children acquire a wide range of competencies when interacting with technology in the home, but these are developed in ways which are not necessarily the result of direct teaching such as observing parental digital media use (Plowman, et al., 2009). Children’s experiences at home introduce them to the use of technology of communication, self-expression, work related tasks and entertainment through practices which are modelled by the parents.

Other studies examine the kinds of understandings children have related to knowledge and experience or what is known as funds of knowledge (Gonzalez, Moll, & Amanti, 2005;
Moll, Amanti, Neff, & Gonzalez, 1992). Here information, ways of thinking and learning, approaches to learning and practical skills such as meal preparation, use of household appliances and approaches to art, also known as funds of knowledge, are derived from children’s experiences of informal learning (Moll et al., 1992). Hedges (2010), states that funds of knowledge provide a framework for recognizing how children’s interests and inquiries arise and are stimulated by their participation in everyday experiences and activities with others. While Moll et al. (1992) described funds of knowledge at a time when digital media was not yet a significant presence in the lives of young children, the application of this theory appears to be valid when considering the exposure to digital devices informally, through observation of family members in the home. In other words, as Hedges (2010) states, children’s interests in and enquiries about digital media are stimulated by their experiences and activities with others. Again, more research is needed in terms of how this relates to digital media use.

There is some concern that an increasing media presence in the home is displacing quality (face to face) parent-child and family interactions confirming a strong association between parents’ screen time and that of their children (Digital Task Force, 2017). In other words, if parents are busy using screens and not interacting with their children, children then seem to spend more time on screens themselves.

For some parents a recent study reported that they spend more time using mobile technology than they do reading books or even watching television (Radesky, Kistin, Eisenberg, Gross, Block, Zuckerman, & Silverstien, 2016). These parents stated that shifting their attention between family time and screen time can be stressful or tiring, and reduces their ability to interact in the moment with their child. Consequently children may spend less time with their parents, who are often stressed and engaged in digital activities for both work and relaxation
often simultaneously leading to the question of how this will impact the child perspective of digital technology use.

Research has recently begun to examine the relationship between parental use of technology and the impact on their child (McDaniel & Radesky, 2017). The term “technoference” refers to the situation where digital technology interferes with the relationship in this case, between parent and child. In fact there is some evidence that there is a connection between child behaviour problems and technology as children seek attention from parents who are distracted by technology (McDaniel & Radesky, 2017).

Healthy parenting requires a consciousness of attachment in a world of increasing cultural chaos (Neufeld & Mate, 2004). Parents through their role as a model, teacher, advisor, comforter and coach directly impact the development of their child’s behaviours and attitudes in life (Vygotsky, 1978). The review of the literature suggests that this is also true in the digital world of today however more research is needed to determine the relationship between parent attitudes and behaviours regarding digital media and those of their children. Examining the child behaviours and attitudes regarding digital media and listening to the related thoughts and ideas may provide some insight into what is happening for them.

2.5 Children’s Voices: Including the child’s perspective on the role of digital media in his life

As discussed above, existing research suggests that parents play a key role in the development of digital behaviours in young children by structuring their home environment and modelling behaviours and attitudes. When examining the digital behaviours of young children, it is also important to consider the child’s perspective on the role of digital media in his/her/their life and how these attitudes are developed. Data obtained directly from the children themselves
rather than through discussions with parents may provide valuable insights that might not otherwise be obtained.

Researchers who study children’s lives and experiences include drawing, diary-keeping, photography and video-documentary as methods for information gathering from the child’s perspective (Jorgenson & Sullivan, 2010). These task based activities are believed to enhance the child’s ability to communicate his/her/their perspective to the researcher beyond interviewing providing a more authentic understanding of the child’s life (Barker & Weller, 2003; Greene & Hogan, 2005; Kuhn, 2003; Punch, 2002). Perspectives which include the adult researcher and the child as participant positively affect the depth and quality of data leading to more insightful analysis and conclusions.

When including children’s voices in research, it is important to recognize the child’s limitations and abilities related to age and adjust the methods for information gathering accordingly (i.e. keeping a diary, interviews and drawing are definitely affected by the developmental abilities of the child as a two year old may not be able to accurately draw or explain the message he is trying to convey). These methods seek to understand the meaning of children’s present lives through their own descriptions, allowing researchers to actively include children in the research process.

In order for the child to be an active participant in the research process, my study includes developmentally appropriate opportunities for child expression in the research methodology through the interviews, discussions and drawings and/or any other methods the child might choose. His choice of materials and decisions about how the play experience is conducted leads to a richer discussion related to his perspective on the role of digital media in his life and how that is created.
2.6  Case study research: Existing case studies leading to the thesis question

A Canadian study published in 2013 by Teichert and Anderson also included the child perspective when investigating the role of digital media in the life of a five year old girl through drawings and discussions and child choice of activities. Here indications are that the child’s experiences with technology were often mediated by an adult. While the study examined the child’s knowledge and perspectives of technology, such as the devices she used and the role digital media played in her life, the question of what influenced this perspective was not addressed. It was suggested however, that while children are naturally curious about digital media as an exciting tool to investigate the adults play a significant role in socializing children into socially and culturally appropriate practices with digital media (Teichert & Anderson, 2013).

These findings provoked a qualitative single case study in which I explored the play preferences of a young girl when offered choices between digital and traditional materials (Adebar, 2014) during a course related to research and children’s voices. The Findings showed that the child chose to explore a variety of materials which included but were not limited to technology. This supports the work of Teichert and Anderson (2013) which suggests that children are able to engage in digital media alongside traditional childhood activities if given the choice and Downey, Hayes and O’Neill’s research (2004) which concluded that children will choose their own fun when provided the opportunity to do so and such choices do not necessarily involve technology. Similarly Plowman and McPake (2010) found that all of the children in their 24 case study families engaged in a range of non-technological activities. In fact all but one reported going to the park as one of their favorite activities and for many technology was not even mentioned.
This led me to question if the ways in which the home environment parents/caregivers provide and parents/caregivers’ attitudes towards and beliefs about children’s play influence the demonstration of such diverse play behaviours. In order to address this, my study (Adebar, 2014) included a parent questionnaire regarding digital media use in the home. This was jointly filled out by the mother and father and provided insight into the parental beliefs regarding their role in the development of healthy digital behaviours in their child. This questionnaire was also used in this thesis study. The parental responses indicated a commitment to providing clear limits on media use and to becoming role models who are mindful of how and when their own digital media are used while providing a variety of play activity choices for the child and shared experiences with the parents.

2.7 Summary

While the review of the literature resulted in limited research that was specific to my thesis question of how the play choices of a 3 year old child relate to parental attitudes and behaviours around technology, this section provides context for the thesis considering the prevalence of digital media today in the lives of young children and why there is a need for further study in this area. Questions are raised as to the outcomes of digital media use both positive and negative, related to health and well-being as well as overall growth and learning. This indicates a need for more research in order to better understand the role digital media plays in the life of the young child and the ensuing long term outcomes. While indications are that parental involvement may be an important factor in the development of digital behaviours in young children, more research is needed in order to gain a better understanding of this complex process.
2.8 The Present Study

Current research related to young children and digital technology suggests that childrens’ behaviour with technology is shaped by family values (Plowman & McPake, 2010) and that parents play an important role in creating an environment which encourages healthy digital use in children (Brito et al, 2017). Professionals working with young children draw similar conclusions (AAP, 2015; Lerner & Barr, 2014) and support this premise by providing suggestions for parenting strategies. It is interesting to note that these are strategies which were demonstrated by the parents in the two case studies reviewed (Adebar, 2014; Teichert & Anderson, 2013). These include the recommendation that parents be mindful of how they themselves are using media not just how it is used with children, acknowledging the important role they play in structuring their child’s home environment and in modelling healthy digital media us and acting as gate keepers of access and content (Dias, Brito, Ribbens, Daniela, Rubene, Dreier, Gemo, Gioia, & Chaudra, 2016).

While the discussion up to this point has focused on the role of the parent in the development of child attitudes and behaviours concerning digital media, the child perspective must also be considered. Research and theory suggest that parents are key figures in the life of a child in that they model behaviours and structure the home environment however it is by listening to the child perspective that we are able to see how this manifests itself in his world. In other words how do child behaviours and attitudes around digital technology reflect parental attitudes and behaviours? This question leads to my thesis research case study and the methodology discussed in chapter three.
Chapter 3: Methodology

Overview

This chapter provides a review of the case study as a methodology and justification for use in this research. In order to provide context for the data collection and analysis a summary of recruitment, timeline and choice of materials is included. This is followed by an outline of the procedure including data collection and ethical considerations.

3.1 Use of the case study in addressing the research question

Case study methodology lends itself well to answering my research question “How do the play choices of a 3 year old boy relate to the behaviours and beliefs parents demonstrate in the home in regards to digital technology?” for a number of reasons. A case study has been defined as an in-depth description and analysis of a bounded system (Merriam & Tisdell, 2015). Yin (2015) further defines a case study as an empirical inquiry that investigates a contemporary phenomenon within its real life context, usually to answer how or why a phenomenon exists. Similarly, Stake (2006) states that qualitative case study was developed to study the experience of real life cases in real life situations which are captured by the researcher who determines the design of the study with his research question(s). Stake proposes that the most meaningful data gathering methods are interviews, observations and document reviews where the observations of others are considered. Further, considering the definition of a case study, Merriam and Tisdell (2014) state that it is the unit of analysis or bounded system, which determines if a work is indeed a case study.
My thesis research is a qualitative, single case study informed by a socio-cultural perspective. The criteria of both Stake and Yin for using case study as a methodology for research are met when examining the contemporary real life phenomenon of how the play choices of a three year old boy relate to the behaviours and beliefs his parents demonstrate in the home in regards to digital technology.

This research occurs within the context of a singular family, with a focus on the mother and pre-school child, and does not seek to draw conclusions to be generalized to the larger population. The purpose of this study is to observe and gather information in order to add to the evolving body of knowledge, and to facilitate future research on the subject of how play behaviours and attitudes around digital media in pre-school aged children evolve. In other words what choices does a three year old boy make? What reasons does he give for those choices? Finally how do these choices relate to behaviours and beliefs around digital technology. The consideration of all these factors suggests that the choice of case study methodology for this research seems appropriate.

3.2 Recruitment of Participant

When designing the research study, the qualities of the focal child were an important consideration. In the Teichert & Anderson (2013) study the child was a female pre-schooler from a white two parent middle income family. My earlier study (Adebar, 2014) included a female pre-schooler from a Muslim, South Asian low income family where the parents were in their early twenties and still attending post- secondary education. Both of these children had no other siblings. As I was looking to add to the existing body of knowledge I felt it important to search for a child which included different qualities from the previous studies. Primarily I was looking for a male child, three or under from a family with siblings.
The mother of the focal child for my thesis study had heard about my research from a family member and had expressed an interest in the subject. The child (pseudonym Duke) who was part Caucasian and part Japanese met the criteria outlined above. I contacted the mother, a primary school teacher, explained the procedure for the research and asked if she would like to participate in the study. When she agreed I emailed her the consent form which she signed and returned to me during the first visit.

3.3 Timeline

The study took place over a period of approximately 6 weeks with 6 visits to the home of approximately one hour duration. The first visit outlined information related to the study in terms of expectations and procedure. This included an interview where general information about the setting and participants was gathered and the provision of a questionnaire (Appendix B) which was left with the mother to complete by the end of last visit. The following four visits were play sessions where the child was given a choice between digital and non-digital materials. Data collection was completed through video recording, and written documentation. The final visit was with the mother to discuss preliminary Findings and to answer any further questions and receive the completed questionnaire.

3.4 Choice of Materials

When considering the choice of play materials for presentation to the child during the play sessions attempts were made to ensure that play materials were gender neutral. Researchers have found that toys are often viewed as being male or female (Blakemore & Centers, 2005; Rheingold & Cook, 1975). Findings demonstrate that strongly stereotypical male toys are often associated with aggression and violence and promote competition, while stereotypically female toys often focus on appearance and attractiveness, and promote nurturing and the cultivation of
domestic skills. However it was also found that there appeared to be a gender neutral category which included board games, play figures, drawing, using clays, toy animals, Lego, puzzles and musical instruments (Blakemore & Centers, 2005). In other words there appeared to be a distinction between the types of toys children might choose based on gender.

In an effort to limit the influence of gender on the selection of materials by the child, this study presented him with traditionally gender neutral toys which did not include qualities from either the traditionally male or female categories (Blakemore & Centers, 2005). If, for example, the non-digital materials offered as a choice were considered to be female (such as Barbie dolls), this could influence the child’s choice in that he might choose a digital activity rather than a toy he associated with being for females. It would then be difficult to determine if the preference was truly for a digital toy or for a non-female toy.

Research also shows a positive co-relation between branding and the toy choices children make in that they tend to choose toys of a recognized brand over generic materials (Hogan, 2007; Antonio & Flavio, 2011). Attempts were made to minimize brand recognition such as a favorite action hero or cartoon character, for the materials used in this study.

During the conversation in the first visit, the mother had reported that Duke was interested in music (dance parties, piano lessons) and photography (camera, iPad). She had also mentioned that he enjoyed books, construction toys, trains and games. My selection was made from a cross section of the summarized interests in both digital (5 with multiple purposes) and traditional materials (9) (a photo summary of the materials is presented in Appendix A).

3.5 Data Collection

This section will provide a general overview of the procedures for the data collection including the modifications which resulted from the input of the focal child regarding how he
wanted this process to proceed. The data collection took place during six one hour home visits over a period of six weeks. The data was collected during an interview in the first home visit with the mother and from the questionnaire (Appendix B) which she answered stating that the responses represented the beliefs of herself and her husband after the sixth home visit. This family narrative provided a context for the role of digital media in the life of the family. Four active play activities where the child was provided with a choice from traditional and digital play materials were video recorded and transcribed (Appendix E). During the first play session the child was given a photo questionnaire (Appendix C) which provided information regarding his knowledge of digital media. During the fourth play session he was asked to document his favorite play activity to do with friends. He chose to take photos rather than draw them.

3.5.1 Initial Visit in the Home: Interview with the mother

During the initial visit to the home, I discussed with the mother, the purpose of and use for the study including how it would be implemented. At this time we also discussed digital technology in general as well as the family philosophies and practices related to digital technology in the home. Although the purpose of this visit was primarily rapport building, information regarding the family demographic, details about Duke’s interests, schedule and play areas were also shared by the mother.

In this first visit I also explained that I would be presenting the focal child with different materials as play choices during four play sessions, and that these materials were divided into two categories: digital which involved the use of technology and traditional which were non-electronic and did not involve the use of technology. The mother then shared information regarding the interests of the focal child which were instrumental in the selection of materials which were offered to the child during the play sessions in the study (Appendix A).
Towards the end of the first visit to the home, the use of a parent questionnaire (Appendix B) was also discussed. The mother asked for the questionnaire to be emailed so that it could be completed at her convenience. During the conversation, the mother stated that although she would be the one answering the questions, the responses would be reflective of the beliefs and rules around digital media agreed to and enforced by both parents. She also stated that while the father might be present in the home during my visits and was supportive of the process, he chose not to be participate in the study and would therefore not be involved during the visits. At the end of the visit the mother returned the signed consent to me.

3.5.2 The First Play Session: Home Visit #2

When I arrived, the mother greeted me and called for Duke. I was familiar to him as he had seen me at previous events in the community. The mother had prepared him by explaining that I would be coming to play with him and only him, not his brothers and she told me he felt very special and appeared to be quite excited when I arrived. He told me that he wanted to play with me in the secret room (a designated child play space in the home). Mom agreed and reassured him that she would be downstairs with the baby if he needed anything.

When we entered the room, Duke wanted to show me all his toys. Since this was our initial play session, I allowed time to participate in this playtime, where he asked me to tryu his trucks, look at his books and hold his stuffies. I waited until this was done and his attention focused on what was in my toy bag before introducing my materials. I then presented Duke with two toys, one digital and one traditional and asked him which one he wanted to play with. The first choice was documented and he was then given the opportunity to determine the rest of his play experience, namely the choice of another toy from my toy bag, the time he allotted for play, and my involvement. The entire play session was video recorded, using a smart phone.
Towards the end of this initial play session, I presented Duke with a photo questionnaire asking him to identify the photos of digital materials (see Appendix C). The Findings provided information regarding his awareness of digital technology and how it is used with the idea that familiarity with materials might have an impact on his choices of play experiences. This also provided an opportunity to gain an understanding about Duke and his interests related to technology during the conversation that accompanied the questionnaire.

Interestingly, while completing the questionnaire Duke asked if his brothers could come and join us and I agreed that he could do so once he had finished looking at the photos. He completed the questionnaire then went to call his brothers.

3.5.3 The Second Play Session: Home visit #3

When I arrived for the second play session, Duke greeted me at the door and grabbed my hand to take me upstairs to the secret room. Once I had set up the video recorder and we had settled onto the floor Duke told me that he wanted to see all the materials available to him before making his first choice. I adapted my procedure at his request, and Duke was then more willing to participate in the play. As a result of this change, new components of the play experiences were now documented, the materials he was drawn to first (digital or traditional) as well as his subsequent play choices.

A second element of the data collection evolved out of the modifications Duke made to the actual research procedure. Once he determined that he was going to explore everything that I had brought during each visit, it was obvious that some materials kept him engaged for longer periods of time than others. Consequently, I then decided to add this information (duration of play) to the data collection as well as the first play choices, as it provided additional insight into his play preferences. The play session finished when Duke invited his brothers to join him.
3.5.4 The Third Play Session: Home visit #4

On this day, the father was at home but was busy in another area of the house. Duke greeted me and we proceeded upstairs and began the play session. At this time, Duke was shown the choice of digital media for the day, and given the toy bag to explore. His choices were documented as was the amount of time he played with the materials and the play session was video recorded.

Towards the end of the session Duke was asked to choose between drawing a picture and completing a collage (or both if he wanted) to show his favorite activity to do by himself, with his friends, and with his family, in an attempt to understand his areas of interest. Duke decided instead to take pictures with his iPad of what he liked to do. Duke stated that he needed to ask permission to use his iPad outside of the allotted time and ran downstairs to ask his father.

He returned, took the pictures until he decided we were finished then ran downstairs to be with his father.

3.5.5 The Fourth Play Session: Home visit #5

During the fourth play session the same process, the presentation of digital material and exploration of the toy bag with appropriate documentation and video recording of the sessions, was followed. The play session ended when Duke said he wanted to go outside to play with his brothers, who were not interested in coming in to join Duke on this day.

3.5.6 Home Visit #6

During the final visit the mother and I discussed the preliminary Findings of the study. I brought some stickers for her to distribute to the boys as a parting gift. The mother stated that she had not yet finished the questionnaire and would email it to me within the week. While this visit served to bring closure to the study, no additional data per se was collected.
3.6 Data Analysis

In this study, thematic analysis was conducted on the transcripts and video recordings of the four play sessions with Duke as well as the responses of the questionnaires administered to Duke and his mother and the notes taken during the initial interview with the mother. A summary of this data was subjected to qualitative analysis for categories which were contained within the Findings. These were then examined further to identify commonly recurring themes which captured the important aspects of the attitudes and behaviours related to digital technology exhibited by both Duke and his mother. These themes were then analyzed in order to determine if and how they relate to each other.

To begin this process, I reviewed the transcripts and video recordings related to the play sessions as well as the responses of the questionnaires. Notes were made during the reading of the material highlighting the key ideas and how they related to the research question in order to gain a detailed understanding of the research data. Upon review of the notes, it was clear that the Findings could be organized around 7 categories.

1. Preschooler play behaviours with digital materials
2. Preschooler play behaviours with non-digital/traditional materials
3. Preschooler interest in materials related to length of time materials were used.
4. The role of digital technology in the pre-schooler’s life
5. Pre-schooler knowledge about digital technology
6. Pre-schooler use of digital technology

The next stage involved organizing the coded data into these categories, thereby identifying the features of interest and developing themes related to the research question.

(Braun & Clarke, 2006)
An important consideration to address in terms of coding is what counts as a pattern/theme, or what size a theme needs to be in order to be relevant. Ideally there will be a number of instances of the theme across the data set, but more instances do not necessarily mean the theme itself is more crucial. For the purposes of this study, a theme is considered in terms of prevalence across the data set but is not necessarily dependent on quantifiable measures. Rather the inclusion of a theme in the data analysis depends on whether it captures something important in relation to the overall research question (Braun & Clarke, 2016).

Following the coding of the categories the themes within the data set relating to child attitudes and behaviours were identified and cross referenced with the Findings of the parental interview and questionnaire to address the research question of how the play behaviours of a three year old boy relate to the behaviours and beliefs parents demonstrate in regards to digital technology.

An example of my analysis process is illustrated in the following excerpt from the transcripts of the play sessions. The codes/categories are italicized inside brackets near the highlighted text to which the code is associated.

**First Play Session with Duke**
May 9 - 4:00 to 5:00 p.m. Location: In the secret room.
Child behaviour: **Duke chose the iPhone** *(chose digital material as first choice)* when presented with the iPhone and the Train. When I asked him why he said it was because “I like games” *(place of technology in his life-recreation)*. I asked if he had ever played with this one before he said no. He swiped across the menu to access the game and began swiping and aiming the shooter with his finger *(uses digital materials the way they were intended to be used)*. He laughed and remained focused on the game commenting on the action, “look, look the foot is coming again and is going to squash me” *(Uses digital materials socially).*
Second Play Session with Duke
May 16 - 3:30 to 5:00 Location: Secret Room
Child Behaviour:
I want to play with these (chose traditional material) (duplo blocks that make animal shapes). See where does this go?. Is this his bum? Oh Yay. Look I did it. See? I want to take a picture of it. I gave him my phone. (uses digital materials the way they were intended to be used, place of technology in his life—tool). He showed me his picture. (uses digital materials socially).

Once the analysis of the data related to the child behaviours and attitudes was completed categories and themes were then used to analyze the parental responses to the questionnaire and interview to see how they were related to the child Findings.

Parental Questionnaire Response to question 21 – What are your thoughts regarding the use of digital technology for yourself and your child.?
It is super important to teach them how to use it (technology) properly (uses digital materials the way they were intended to be used) and also show a variety of ways to use this tool rather than it always being a toy (place of technology in his life—recreation, as a tool).

When cross referencing the Findings I looked to see if there was evidence of the themes found in the analysis of the child related data in the parent related data. This process was completed throughout the analysis of all the data provided by the child and parent and presented in the Data Analysis Table (Table 4.1) found in the following chapter.
Chapter 4: Findings

Overview

This section begins with a description of the setting and participants to provide context for the findings. A comprehensive summary of the adult interview and questionnaire responses focused on parental beliefs and practices related to digital device use and the child questionnaire responses, play experiences and conversations are also included. These findings provide additional insight to and contextualize the place digital technology has in this home. The findings from the thematic analysis further identify these parental behaviours and attitudes related to digital technology and those of their pre-school child.

4.1 Setting and Participants

This case study took place in the home of a two-parent middle class nuclear family living in a suburban neighbourhood. The parents (Caucasian mother, Japanese/Caucasian father) had been married for 9 years. At the time of this study the mother was a 33 year old elementary school teacher with a master’s degree related to the study of digital media in education. She was at home on maternity leave with a fourth child. The father was a 33 year old project manager. While he is very involved in raising the children when not at work he chose not to be involved with this study. There are four boys in the family. The eldest were twins, aged 5, who were present in the home. They were not participants in the study and were not present during the actual data collection. Duke, the child directly involved in this study, was 2 years 10 months old and is the second youngest of the group. The youngest child was 11 weeks old.

The family is very physically active. The mother coaches softball and plays on a team herself. The older boys play softball and take swimming lessons. They also study piano. There
is extensive support and involvement from the grandmothers, who visit regularly and take turns with child care. The two oldest boys are in school and Duke was attending pre-school three days a week at the time of the study.

The home is very child friendly in that there is a family room filled with games and play materials such as a racetrack, air hockey and building materials. There is also an upstairs playroom known as the “secret room”, a former attic which is accessed by a “secret door” that used to be a closet. It contains a couch and shelves filled with toys that include open ended play materials, such as blocks, Lego, action figures as well as puzzles, books and battery operated toys (helicopter, car). Outside there is a backyard with a trampoline, ride-on toys and a variety of sports materials.

4.2 Findings from the mother’s interview and questionnaire

Based on a descriptive analysis of my discussions with the mother and her questionnaire responses, the Findings reported here provide insights into the place of digital technology in the home life of Duke. The mother reported that Duke was exposed to a variety of digital devices including a lap top, tablet, smart phone, DVD player, blue tooth speakers and video game console in the home. There were no personal computers or hand held video games in this home. Duke had his own iPad with educational games which he was allowed to use on weekends in the morning for extended periods of time until asked to stop. The mother described weekdays as a time when Duke and his brothers were so busy with swimming, piano, soccer, baseball and outdoor play (bike riding and trampoline) that they didn’t even ask about their iPads or television although they were allowed one hour in the in the evening and sometimes in the morning as a motivator to get ready for school. They knew they were allowed more time on the weekends for
screen use and seemed to be accepting of this rule. According to the mother the brothers
including Duke were also encouraged to play in their playroom. She reported that making up
games, building forts or building with Lego were all favorite pastimes and that both parents also
encouraged downtime where the children were asked grab a book and ‘read’ or relax with a quiet
activity (puzzles etc.) when the parents felt it was needed.

The mother stated that the family watched a recorded movie on television for family
night every Friday. They often listened to music as a family and Duke enjoyed a good dance
party. He was permitted to use the parental iPhone to look up weather or music or video chat
with relatives. In terms of gaming, there was an Xbox 360 which Duke occasionally used for
fitness games (the mother reported that he enjoyed games where he used his body as a remote).
According to his mother, Duke enjoyed music, Lego, photography and books.

When the boys did have screen time, a timer was used for watching YouTube videos. The
time was limited to 30 minutes otherwise the mother stated that she felt the boys would continue
watching for extended periods of time. The mother reported that her children particularly
enjoyed watching other children building with Lego in the You Tube videos, then tried to build
something similar with their own blocks.

In terms of adult use of screens, the mother reported that both parents watched shows
together on television only when the boys had gone to bed. The television was not on in the
home very often. She also summarized her uses of digital technology from two to four hours per
day for her work in advertising and website design. She also checked emails often and used
digital media for recreation (Facebook and other social media) and for research on a variety of
topics for teaching as well as parenting issues. She used her phone and tablet to read the news,
text, search for information and do all her calendar/scheduling online.
The mother outlined her belief that adults in general need to model proper use and moderation of screen use for young children however she recognized that adults require more time online than children do as they often use it for work. She stated that there are appropriate times for use of digital technology which include teaching skills and opportunities for learning concepts. She did not believe that this technology should be considered to be a toy. When children were playing, screens should be put away. Finally, she believed that technology had no place at the dinner table.

An interesting observation from this mother was that she noticed there are behaviour differences when her children are using screens. For example on occasion when they were allowed to play with their iPad before school they seemed to have a grumpier day. She also indicated that if the parents got a sense that behaviours have changed to something less than positive overall, they would institute a “cleanse/reset” where there is a 7 to 10 day period without technology. In spite of this the mother stated that:

We can’t get away from tech being part of our children’s upbringing and future however it is super important to teach them how to use it properly and also show a variety of ways to use this tool rather than it always being a toy. If the boys could, they would just watch Netflix all the time on their iPads but we disable the internet on it or set timers and encourage them to play the educational, STEM type games which encourage so many different skill sets that I do find very valuable and appropriate. It is all a matter of moderation and being aware of what your kids are doing and how they are using tech. We couldn’t live without it as I think our kids would fall way too far behind but we also don’t revolve our life around it or notice a dependence on it for the boys. They enjoy their tech-time but they also enjoy being outside and around family. I find often they will put their tech away when they’ve had enough – without prompting- and choose to spend time with each other or with us which, in my opinion is a great skill for them to learn, how to regulate and moderate themselves and make their own choices. (Duke’s Mother, 2017)

This particular quote from the questionnaire responses by the mother summarized the beliefs of these parents related to digital technology very clearly. In this family it is accepted that technology is a part of life and cannot be avoided, therefore it is very important for parents to
teach their children a respect for digital materials and a way to use it properly. The mother presented her belief that it is great the children were able to regulate and moderate their own use of technology and that she worked to create an environment where this was encouraged. This trait included being available to guide learning and behaviour and provide reinforcement for achievements. However she also reported that while both parents were consistent in their approaches, their extended family had a somewhat different perspective at times. This is important to consider as the grandmothers have a significant role in this family as caregivers one or two days a week and as such play a role in determining access to screens in the home environment while they are in charge. As the mother reported:

Their Grammy is all about technology. She always wants them to have the latest and greatest. She sees tech as the way of the future and doesn’t want the boys to be left behind in any way. She can almost be extreme with it though and doesn’t say no enough. The boys get iPads in the car with her driving, in her house they always have the television on and watch more movies than we would allow. They go more extreme with tech when they are with her. The time is still regulated but they are allowed tech far more often with her than with us (the parents). (Duke’s Mother, 2017)

The mother also reported that the other grandmother let them watch movies or play on iPads as well. She usually sat with them while they played or allowed them to play on their own when she was trying to cook dinner or get some down time as the boys are very active. However, the mother reported that the children seemed to understand that this was a unique situation and the normal rules still applied at home when the grandmothers were not present.

4.3 Findings from the Pre-school Child’s Photo Questionnaire and Play Sessions

When presenting Duke with the photo questionnaire (Appendix C) I asked him if he knew what the materials were and for what purpose they were used. His responses, including those given when questions were added during the conversation, such as whether he was able to use his mother’s iPhone and if he had a laptop, are summarized in Appendix D. Duke accurately
identified all the items and provided some type of a description of they were used for and/or what he did with them. These included a digital camera, smart phone, digital keyboard, tablet, hand held Gameboy, video game console and laptop. During our discussion of the photos, he seemed to be very excited by those objects which made music and in taking pictures on his tablet which he identified as his two favorites. When talking about his iPad “Mummy said iPad is only for night time – that’s my favorite” he demonstrated that while this was his favorite thing to do, he understood that there are rules about when this device can be used and he obeyed them.

As he looked through the photos he skipped past the ones which refer to gaming activities. He referred to his tablet when talking about the digital camera seemingly recognizing that while the two devices were very different they performed a similar function. “I take pictures with my iPad. I can’t show you. I can’t use it right now”. With this statement, Duke illustrated his obedience related to the rules set for the use of digital technology. He confirmed his mother’s observation that he loved his dance parties when he identified the devices which make music and showed me how he danced during these parties although there was no music playing. When Duke had identified the last of the photos I asked him more generally about his favorite thing to do when playing with his friends, by himself and what his favorite activity was that we had played together. Finally I asked Duke which of the materials he would like for a present. His responses were that he would want to play in the secret room with his friends and play with Lego when he is by himself. When asked about his favorite activity when we played together he replied “blue”. (The reason for this response is unclear although the mother had reported that his favorite colour was blue during one of our conversations. Perhaps he thought I was asking about his favorite colour). When asked which material he would like for a present he thought for a bit and replied: “Hmmmm the Thomas Train, no no the computer!”
At the end of the third play session I asked Duke if he could draw me a picture of his favorite toy or his favorite thing we did together to gather more information about his preferences and interests related to the traditional toys and digital materials I had presented. He replied, “No. no. But I can show it to you! No I can’t. Well maybe I could ask daddy if it is ok. I’m not supposed to use my iPad right now but maybe I could show you”.

When he returned with his iPad after asking his father for permission he used it to take pictures of all the toys we played with including the Thomas toy and of me. He also decided to show me all the photos he had taken and stored on his iPad and explained who the people were. He was very confident as he worked his way through the various stages of the programs to access the photos, evidence that he frequently engaged in this activity. At one point he put down the iPad on the floor to get another object, hurried back and said “Oh no! Can’t be on the floor.” Picked up the iPad and put it on the couch wiping off the screen as he did so with his shirt demonstrating an understanding of how the equipment is to be treated.

The fact that Duke spent the remainder of our time together demonstrating his tablet and how it can be used was a clear indication of how special this piece of equipment is to him and the important role it plays in his life.

4.4 The Play Sessions

During the four play sessions Duke was given the opportunity to choose from a number of materials which I carried into the secret room in a “toy bag” (Appendix A). Initially I presented him with a choice of two materials one digital and one traditional that he had used before. As previously indicated in Chapter 3 this procedure was modified during the second session as Duke asked to see all the materials before he made a choice. Because he was able to choose from any number of toys and make his own decisions about what he wanted to explore
and the length of time he wished to devote to each material, this modified procedure was deemed
more authentic.

During the four play sessions, Duke chose digital materials first 3 times and chose a
traditional toy first only once. It appeared that the digital materials initially captured his interest
more so than any of the other toys even when all the materials were available to him. What is
noteworthy however, is the amount of time he remained engaged with these materials. In total the
time Duke spent playing with the digital equipment was 40 minutes while the time spent with
traditional (non-digital) toys was 132 minutes. Indeed, on occasion he spent as little as 1 minute
with the digital choice before abandoning it to play with multiple traditional toys. The minimum
time spent with one traditional toy was 15 minutes. A summary of the individual times for each
material is presented in Appendix E (Table E.1).

Duke tended to use both the digital and non-digital materials in a similar way
incorporating descriptions of what was happening, questions to the adult, demonstrations to the
adult and excited exclamations related to success and failure. However, it is interesting to note
that activities which seem to encourage creativity and imaginative, flexible use of materials keep
him engaged for longer periods of time. For example, the toys which kept him engaged the
longest were the toy train and the animal card, 21 and 22 minutes respectively. The longest time
of engagement for a digital material was 10 minutes and involved use of the iPhone to play a
game. By providing opportunities to put materials together in different ways he created elaborate
stories about what was happening, developing plotlines and assigning characters to different
objects. He used different voices for the characters and became totally involved in the world he
was creating while inviting the adult to join him:
Come build with me! See? I am building it all over there. I’m building it all over. And I have lots of cards here that would be perfect. Look at it (the line of domino cards) now. So many over here and so many over there too. It looks like a bear’s giant butt, but you can do whatever you want. Come on let’s play. Look! I made an ‘L’ just like my name! Let’s see if the mum and dad can go and let’s see if it works. (moved to the spinning tops) Watch. You are supposed to be the mum and dad (the big tops). (Duke, 2017a)

He assigned a baby voice to the little top to which he gave the same name as his. He then placed the tops in a truck and moved the truck around the cards as if they were a track. Next using some story books he built a bridge to drive the truck down making lots of truck and crashing sounds.

At one point he picked up his brother’s battery operated helicopter and tried to put it into the truck. He then pointed at my lap top and asked me if I could find one like this holding up the helicopter to my face. This demonstrated how Duke was able to include digital technology in his imaginative play with traditional materials and to flow easily back and forth between the two. This also indicated that he was aware that digital media may be used to research information on the internet, as well as to play games, make music and take photos.

4.5 A comparison of the child’s and mother’s behaviours and beliefs

In order to explore the relationship (if any) between the child’s behaviours and attitudes and those of the parents as related to digital technology, a comparative analysis of emergent themes (See Table 4.1 below) is discussed here. When considering the theme of child’s play with digital media, we see how the parent structured the environment in terms of provision of digital materials, designated time for use, information on how it is to be used and feedback for the child on successes and general use. When examining the actual child behaviours, we see that they related closely to those of the parent when the pre-schooler, Duke, can readily explain how he was using the materials, demonstrating both knowledge of the materials and their function.
Similarly this child’s play with non-digital materials appears related to how this mother had provided materials and structured his environment. Duke engaged with a variety of non-digital materials and demonstrated an interest in a number of different toys and activities. The parent provided materials to explore in a space that was child centered both indoors and outside. Family activities which included participation in sports, outings and extended family events as well as time limitations for technology use, may have provided Duke the opportunity to develop a variety of play behaviours and interests which were non-digital.

When comparing the time spent with digital materials versus non-digital materials during the play sessions, it appeared that while Duke was definitely interested in technology, he preferred to play longer with other toys and materials overall. This time differential is underscored by the fact that Duke was in control of determining the time and materials during the study’s play sessions. When exploring the parental relationship to the time element, we see that the parent imposed time limitations on technology use (30 minute timer for YouTube videos). However, Duke spent well below those specific norms when engaging with the digital materials in the play sessions. That said, perhaps limited use (more generally) has become the norm for Duke which is applied even when he is regulating himself. In addition, the parent ensured that there were always many choices of things for Duke to do other than technology, again allowing Duke the opportunity to develop habits with and for eclectic play both in terms of materials and experiences with them.
### Table 4.1: Thematic analysis of Data

<table>
<thead>
<tr>
<th>Categories and Themes</th>
<th>Child Attitudes &amp; Behaviours</th>
<th>Parental Attitudes &amp; Behaviours (parent report)</th>
</tr>
</thead>
</table>
| **Play behaviours-digital materials:** | - Plays game on the phone and laptop, chatting and explaining to me what he was doing; showing me what was happening, involving me in the play  
- Explores keyboard to make music, thoughtfully pressing the keys and telling me about his piano downstairs  
- Shows music videos on the tablet  
- Takes pictures of his toys, my toys and me, showed them to me and explained excitedly what he was doing  
- Shows me the gallery of his photos on the tablet and explained who his family members were and where the photos were taken. | - Parent provides time for engagement with digital materials  
- Parent provides the digital materials and explain how they are to be used  
- Parent models use of own digital materials (work, entertainment, research)  
- Parent watches music videos with Duke on YouTube  
- Parent is available to provide feedback, information and to be an audience for accomplishments and when the child wants to share information  
- Parent extends learning by asking questions and making suggestions  
- Parent schedules time for family and includes extended family in events (i.e. video chat, face time, skype) |
| **Play Behaviours -non-digital materials:** | - Duke looks at books, builds a bridge with a book, made a road with domino cards, drove the car on the road making sound effects, built the train track and drove the train, telling a story about what was happening  
- Plays with the tops telling a story about the different sized tops as family members using different voices  
- Includes me in the play by asking questions, assigning roles to me | Parent provides a secret playroom complete with a wide variety of play materials  
- Parent places limits on time with digital media and encourages other types of play  
- Parent provides outdoor play space with a variety of materials and instructs them to go out and play at times  
- Parent enrollment of children in sports activities  
- Family activities, baking, canning, hiking, camping, visiting family |
| **Interest in materials: time spent** | During the 4 play sessions Duke spent 40 minutes with digital tools and 132 minutes with non-digital tools. Duke appears to have developed a routine that includes digital technology as a small part of his life.  
10 minutes longest time with digital item  
1 minute shortest time with digital item  
Duke spends only 20% of play session time with digital materials  
132 minutes of the 172 minutes in total are spent playing with non-digital toys  
22 minutes longest time with non-digital toy  
15 minutes shortest time with non-digital toy | - Allows 30 minutes in the morning and 1 hour in the evening on the tablet  
- Allows extended use on weekend mornings regulated by the parents in the moment  
- Friday night family movie nights  
- Movies on weekends and special days  
- Watching sports on television  
- 30 minute rule for YouTube videos |
| **The role of digital technology in his life:** | One of many play choices and interests - used for entertainment (videos, music), research (helicopter, weather), work - Duke’s word (taking photos) | One of many activities and materials provided for the child  
One of many experiences provided for and engaged in with the parents  
- Mother uses technology for work, entertainment and research. |
<table>
<thead>
<tr>
<th>Categories and Themes Continued</th>
<th>Child Attitudes and Behaviours Continued</th>
<th>Parental Attitudes and Behaviours Continued</th>
</tr>
</thead>
</table>
| **Use of digital technology:** | - Primary interest is to take pictures and make music  
- Asks me to look up a video on my tablet and to find a picture of a helicopter on my laptop  
- Plays spatial shape game on the iPhone | Parent models use of technology for research, entertainment and work.  
- Parent is involved in family movie night, dance parties, taking pictures, research, reading and watching YouTube videos with the children  
- Parent encourages the pedagogical aspect of screens, using them for research and ensuring games are educational |
| Pre-schooler uses technology in parent approved ways  
Pre-schooler use appropriate for type of digital tool |  |  |
| **Knowledge about digital technology:** | Identifies all photos in questionnaire and provides examples of how he uses them  
- Duke is very adept at use of the tablet, the smartphone, the CD player and the DVD player. He is not as comfortable exploring the laptop. He does not have access to one.  
- When presented with the digital keyboard he was very hesitant to explore it by banging on keys to see what it could do and stated: “I don’t know how to play music on this”.  
Duke states that iPad is only for night time  
- States that permission is needed to use the tablet during the day  
- Talks about taking care of his iPad, wiping it clean and making sure it was off the floor. | Parent provides a variety of technology in the home and explains how it is to be used and enforces rules for use.  
- Parent has provided children with tablets not lap tops. There is no central family computer  
- Parent has clear rules that their digital keyboard is to be used to practice piano lessons and make music not hung on the keys  
- The older boys are taking piano lessons |
| Pre-schooler knowledge is appropriate for age and environment  
Pre-schooler aware of boundaries and rules around digital technology  
Pre-schooler enforces rules himself (Self-regulation) |  | Parent rule  
- No technology at meal times  
- iPad half hour before bed  
- Parents believe technology is a tool not a toy and teaches respect for the equipment |
|  |  | Parent limits use of technology during the day  
- Mother uses 4 to 5 hours a day, often when the children are away  
- Parent demonstrates interests in other areas, crafts, baking, canning, sports, home renos, games, reading  
- Parent encourages child initiated, child centred play, providing the child with the space to develop self-regulating behaviours, correcting behaviours and reminding about boundaries when appropriate |

### 4.6 Summary of Thematic Analysis

The role of digital media in Duke’s life varies but did not dominate. It did appear to match how his mother used it and how she has taught Duke to use it as well. Duke used technology to watch videos, listen to music, play games, take pictures and do research. The mother used technology for entertainment, to do research and for employment. However, for both Duke and his mother, digital technology was only one of many choices and interests.
When considering the theme of knowledge related to digital media, we see that Duke was able to identify all types of technology in the photo questionnaire and when using digital materials during the play sessions. Duke demonstrated an awareness that technology has a variety of uses and showed an interest in all of them.

Duke explained or demonstrated for what they are used as well as a level of competence and comfort comparable to his at home experiences. For example the parent had provided a tablet not a lap top for use by the child which might explain why Duke was more interested in the tablet and iPhone and not the lap top. His comfort and familiarity with the phone could be explained by the fact that it is an iPhone and very similar in operation to his tablet. Also he was allowed to use the parental iPhone to speak with family on video chats. Likewise, Duke’s behaviours with the digital keyboard in the play sessions reflect the clear boundaries and limits his mother had enforced around how the digital keyboard in the home is to be used. For instance, Duke explained that he did not know how to make music with this (keyboard) and carefully pressed the keys.

The pre-schooler’s awareness of boundaries around technology use was demonstrated when Duke ably stated the rules about when his tablet can be used and how it should be treated. Similarly the care with which he treated the digital keyboard suggested he knew and was applying the rules pertaining to the family’s keyboard. The mother stated that there were very clear rules around technology and that both parents consistently enforced them. It would seem then that Duke’s digital behaviours relate to the parental limits imposed in the home.

A more obscure theme around self-regulation with digital media use related to the way in which Duke monitored his own use and created his own play experiences. He related rules, and made a variety of choices for his own play and regulated his behaviours with and around digital
materials which seemed to be influenced by parental mediation although the parents were not actually present during his play. Although digital materials were his first choice, overall, he did move onto other activities which he structured and developed on his own, including me in the play and giving me instructions. It appears that the way in which I have observed this parent encourage child initiated, child centred play while at the same time correcting his behaviours and reminding about boundaries when appropriate has provided Duke with the space and support to develop self-regulating behaviours.

In conclusion then there seems to be a strong relationship between this pre-schooler’s play behaviours and attitudes related to digital media and those his mother reports to have encouraged through modeling and direct instruction. While digital technology has a definite place in his home life, it is one of many choices and interests which appears to reflect the way the parents have provided materials, structured the environment and modelled their own use of digital media as well as providing the space and opportunity for the Duke to explore the materials on his own and with his siblings.
Chapter 5: Discussion, Implications and Future Research

Overview

This chapter first discusses the theoretical alignment of the findings with socio-cultural perspectives on children’s development. Next the ways in which the findings of this study contribute to the research literature are examined. The chapter concludes with acknowledgement of the limitations of the study, directions for future research and implications for practice.

5.1 Theoretical Perspectives

Family practices regarding digital behaviours in this middle class home appear to influence the child’s behaviours and attitudes regarding digital use. These include strict limits on the amount and type of digital materials with which he is permitted to engage as well as the variety of non-digital activities in which he participates such as art and music, sports, outdoor play and family social events. This study then seems to re-affirm Bronfenbrenner’s (1979) theory which states that children in the early years are directly influenced by family practices when developing their perception of reality and behavior patterns. In fact, a new dimension has been proposed and added to Bronfenbrenner’s model called the ecological techno-subsystem which includes child interaction with communication, information and recreation technologies in environments such as home and school. (Johnson & Puplampu, 2008). This further acknowledges the importance of these environments in influencing young children during the early years in this case from the perspective of involvement with digital technology.

In a similar vein, it appears that in this home the parents were also guiding the child’s choice of activities by modeling moderate use of digital behaviours to assist him in developing a balanced lifestyle which includes but is not driven by technology and digital media. This supports the Vygotskian principle which theorizes that children create knowledge within the
zone of proximal development guided to mastery by more capable human partners (Vygotsky, 1978). The term media mentors (Lopez, Caspe, & Weiss, 2017) currently found in the literature, describes the role of the more capable individuals, in this case the parents, when referring to the development of skills with digital technology. In my thesis study, the parents were guiding the child as he discovers the place digital technology has in his life and how it can be used.

This supports the work by Edwards (2011) which also cites Vygotsky’s theory (1978) when exploring the play of young children today. By proposing that contemporary digital culture provides opportunities for play which reflect the child’s everyday experiences, she suggests that in today’s world, digital technology is one of many artifacts (books, traditional toys, household items) of the popular culture of children. This is supported by the Findings of my study as seen when Duke chose play experiences which incorporated both digital and traditional materials and speaks about the roles each play in his life.

The importance of the parental role in the development of digital behaviours has been explored in my thesis study. This supports the work by Plowman and McPake (2010) which also suggests that children’s behaviour is shaped by family practices and parental histories. Parents in both studies reported the need to balance the amount of time their children spent on different pursuits including an even distribution of indoor and outdoor activities as well as solo and social activities.

Finally, the Findings of my study demonstrated the parental role in scaffolding the child’s learning about digital media use. I myself was asked to take on this role by Duke when he asked me why his button on the tablet wasn’t working when he pressed it and if I could help him. This supports the research by Lopez, Caspe, & Weiss (2017) which proposes that the parents play a
key role in their child’s development of attitudes related to digital media as “media mentors” guiding behaviours and teaching skills to their child.

5.2 The Child

Beyond the theoretical connections we see in this case, I next discuss the contributions of this study to the growing knowledge base concerning the use of digital technology by young children. This includes child involvement in the methods design process, as well as the play behaviours including digital and traditional materials.

Allowing Duke the opportunity to participate in the design check for the data collection process provided important Findings which might not have otherwise be obtained. The question of which materials keep the child engaged the longest is an important one that was not originally a part of the research question but evolved out of his participation in the process. As suggested in the literature review, including Duke as an active participant in the research added to the depth and quality of the research leading to more insightful analysis (Barker & Weller, 2003; Greene & Hogan, 2005; Kuhn, 2003).

The fact that Duke chose to play with a variety of activities from both digital and non-digital categories supports earlier research which found similar Findings. In fact studies show that the two types of play overlap at times (Teichert & Anderson, 2014; Adebar, 2014). These Findings are supported by my study as the child moved easily between both types of activities, including technology as a part of his world and one of many choices which he integrated with other toys and activities. This was demonstrated when Duke used the camera to take pictures of the toys he was playing with and of me. He also used the phone and the tablet to play music and demonstrate his dancing. In other words, the child moved easily between both types of activities,
including technology as a part of his world as one of many choices which he integrated with other toys and activities.

This supports the work by Edwards (2013) who proposes that traditional play and converged play are interrelated. Edwards defines converged play as play that is related to children’s popular culture and artifacts and texts including digital media. In other words, converged play may lead to explorative and imaginative play as demonstrated by Duke when he used the tablet to take pictures of our play sessions. By taking pictures of me as well as the structure he had built and the toys he enjoyed, he was demonstrating the concept of converged play, as he blended digital technology with traditional play experiences. In a similar vein this also supports the work by Marsh (2017) which suggests that young children’s play increasingly connects digital and non-digital domains often using a variety of complex methods.

5.3 The Parent

As digital devices and content become part of the everyday life of families with young children, a growing body of research examines how parents can shape their children's development in this evolving digital context. Findings from my study support this research as it pertains to parental structuring of the environment as well as parental attitudes about play and digital media.

When considering the home environment of the family in this study, it can be said that it is a media moderate family (5 hours total of screen a day) rather than a media centric (11 hours total of screen a day) or media light (1.48 hours total of screen a day). According to Wartell’s definition (2014) the families in the media moderate category prefer engaging in outdoor activities together to watching television. The children in media moderate families spend just under three hours a day with screen media on average. The Findings of my thesis study
demonstrate that while screens and digital media are integrated into the life of this family, shared by both parents, grandparents and children, they are not the only or most important activity. These Findings are consistent with the description of media moderate families found in the work by Wartell (2014).

Further examination of the home environment as reported by the family demonstrates a style of parent mediation related to the use of technology. This appears to be the authoritative style where parents set clear rules and explain them in order to foster the development of a child's responsible behaviour and self-regulation. This supports the work by Brito et al. (2017) which relates parental mediation of digital technologies to overall parenting styles. Of the four styles authoritative (as mentioned above), authoritarian (parents set rules without explanations and expect obedience), permissive (parents do not set explicit limits but monitor occasionally, rarely guiding or teaching) and laissez-faire (parents do not control or engage with their children or interfere at all) authoritative was found to be the most common in a study which researched the styles of 10 families in each of 12 different countries.

My study also supports the work by Brito et al. (2017) when examining how parents may move to a different mediation style depending on the situation. In this family the mother would instigate a 7-10 day “tech-cleanse” when she found that the children seemed to be overusing technology and were demonstrating what she felt to be inappropriate behaviours. This is consistent with Brito et al. (2017) who found that parents moved to a more authoritarian style when a problematic situation related to use of technology was identified.

Wooldridge (2016) theorizes that parental beliefs play a role in how the child’s life is structured in relation to digital media use. In other words parents will provide digital devices to children if they believe them to be beneficial in some way. My study supports this premise as
demonstrated by Duke’s mother who structured an environment in the home which included digital technology as one of many choices for the child. This reflected her stated opinion that while there is value in acquiring digital skills in today’s world she also believed that screens should not be a priority in the child’s day to day life. Her belief that screens should be viewed as a tool not a toy is reflected in the rules around the use of the tablet and how they were enforced. Again, this supports the work by Wooldridge (2016) as the mother’s beliefs created the environment in the home and the role digital media has in the life of her child.

In a similar vein my study supports the work by Plowman and McPake (2010) which demonstrates the connection between parental belief and practice. Here the majority of families in their study agreed with the statement that children are missing out on more important activities when playing with new technologies and stated that their solution was to balance the amount of time spent on different pursuits with the time spent with digital technology. Again this is reflective of way in which the mother in my study had created the environment for her children.

Both the mother and father in this home provided consistent indirect messaging through their own attitudes and behaviours related to digital media which were observed by the child. Duke demonstrated an understanding about the role of digital technology in his life as well as how it can be used. This supports the work by Plowman, McPake and Stephen (2009) which suggests that young children acquire a wide range of competencies when interacting with digital technology in the home which are not only learned by direct parental instruction and O’Hara (2011) who suggests that children also make sense of their digital world through observation and imitation of parental behaviours.

The idea that children may be immersed in a wide range of activities in their lives at home which include but are not limited to digital media and include engagement and scaffolding
by the adults is put forth by my study. This supports the work by Marsh et al. (2017) which also suggests that children develop understanding about digital literacy from the first months of life from family interactions and that family practices are instrumental in forming the child perspective.

5.4 Limitations of the Study and Directions for Future Research

While this case provides an in depth study of one family’s attitudes and practices related to digital technology it is only a valuable snapshot of this family but not sufficient to draw extensive conclusions to the general population. Rather the intent is to generate questions and further study and to add to the existing body of knowledge related to the topic. It is acknowledged that more research is needed in order to develop a better understanding of the relationship between technology and the development of young children particularly as it relates to parental attitudes and behaviours. For example, while this study has focused on one young child and his behaviours there is no indication that these Findings remain consistent once this child (or other children) is more exposed to external influences outside of the family boundaries. In other words further study is needed to determine if these early learned behaviours remain constant over time providing children with the ability to engage in healthy digital behaviours as school age children, adolescents and adults or if there is need for continued monitoring of environments and behaviours throughout life?

While the question of gender impact has been raised in this study, more research is needed to understand how gender affects the development of digital play and skills in young children. The case studies discussed in the literature review (Teichert & Anderson, 2013; Adebar, 2014) as well as the thesis case study have indicated that when gender neutral materials (Blakemore & Centers, 2005; Rheingold & Cook, 1975) are presented to both females and a male
in a middle class two parent family living in an urban area, technology becomes one of many play choices for the child in an environment where parents have structured a balanced play environment with clear limits. It is unclear at this point how the manipulation of any of these variables might impact the Findings. More research is needed.

In addition, family contexts which are linked with but not dependent on socio-economic status may have a bearing on parental perspectives and the use of technology by young children (Plowman & McPake, 2010). For example there is evidence that the socio economic status of families may play a role in the development of digital behaviours in children (Stephen et al., 2013). Parents with an annual income of approximately $45,000.00 appear to create a media centric home environment while those with an annual income of $62,000.00 and $65,000.00 fall into the media-moderate and media-light categories respectively (Wartel, 2014). On the other hand, there is also evidence that there is no apparent divide in attitudes towards the use of digital technology in the home between those where economically advantaged and those who were disadvantaged (Plowman & McPake, 2010). In fact there is evidence that parental decisions regarding purchasing and use of technologies as well as the balance between use of technological and traditional toys and activities were influenced more by family values and education than by income (Plowman & McPake, 2010). Additional research which includes participants from a variety of income ranges considering also socio-cultural demographics would provide a broader information base from which to draw conclusions regarding the impact of these characteristics on the use of digital technology in the home. Gathering data from the various groups using the parent questionnaire developed for this study and comparing the Findings might be one method for pursuing further research.
Another aspect related to family context which merits investigation is the role of parental history around use of technology and how this influences the behaviours and attitudes they exhibit in their own home. Many parents today did not experience today’s accessibility of technology in their own childhood. This lack of a model to guide this aspect of their parenting may explain the uncertainty some parents are feeling around the role of technology in the lives of their own children and their search for information related to best practices (Plowman & McPake, 2010).

Additional influences on parental use of technology include their experiences of using technology for work, study and for recreation as well as educational background. This is particularly important as existing literature suggests that it is prudent for parents with young children to monitor their own use of digital devices (AAP, 2015; O’Hara, 2017) as indirect involvement with digital media through observation may be a significant factor in how children develop their own digital behaviours. Further study into the information parents might require related to young children and technology and how best to provide that for them is indicated.

The question of intergenerational influences by the grandparents is also touched upon but not explored in my study and merits future research. Older family members such as grandparents can play a significant role in offering meaningful choices for digital literacy practices (Plowman & McPake, 2010) particularly if they are immersed in digital technology themselves. On the other hand they may also play a role in providing a variety of non-technological experiences if technology is not an area of interest or ability for them. This merits further study particularly as grandparents often take on a significant role as caregivers for many of today’s families (Cochran & Nelson, 2003).
5.5 Implications for Practice

The findings of this thesis research study appear to indicate that there is a relationship between the child’s attitudes and behaviours related to digital media and those of the parent. If this is the case then it seems prudent that parents develop an understanding of why it is important to monitor the use of digital technology by young children and how their own behaviours and attitudes related to digital technology impact their children in the home.

As an early intervention practitioner who regularly speaks to parents, child care providers and other professionals about issues related to child development, many of the questions I am asked relate to this topic. Research (Brito et al., 2017) also indicates that parents are often uncertain about what is best for their child in terms of digital technology use. It is my experience that they look to pediatricians, child care providers, home visitors, other service providers in the community and the Internet for guidance.

One implication for practice then, is for service providers and professionals to familiarize themselves with current research and recommendations for best practice related to digital technology use in the home. While workshops, parent education evenings and professional development are useful methods for the dissemination of information, it is important that this is evidence based and realistic for families and is effectively distributed in a way that meets the needs of the targeted groups (i.e. social media, journal articles, presentations).

A recent publication by Zero to Three (2018) has summarized research and presented the information in a user friendly manner that would be helpful for parents and professionals in developing an understanding of the importance of this topic for young children. Also included are practical strategies for implementation of suggested methods by parents in a manner which
considers the needs of the families of young children. These include monitoring parental digital use, providing alternative activities and co-viewing with children when using digital technology.

5.6 Conclusion

Today’s digital world provides a constant bombardment of stimuli to the young child, yet there is a lack of research related to how young children develop digital behaviors including their preference for and behaviours with technology. Yet, the development of a healthy lifestyle for the young child may be impacted by the amount of time he spends engaged with digital media. Indications are that there could be issues related to sleep, obesity, mental health, maladaptive attachment and other developmental concerns. (Brito et al., 2017) As such it is important for young children to develop healthy digital behaviours, through engaging in, and observing others engaging in a healthy variety of behaviours and activities. As gate keepers and guides parents are key to the provision of these opportunities.

In this study, technology in the home is readily accessible and is valued by immediate and extended family members for the opportunities it brings for learning, entertainment and work. However this was also a home where the parents provided clear limits regarding the use of technology in terms of when it can be used, for how long and what is considered appropriate content on devices. The parents were mindful of modeling appropriate use of technology providing a variety of experiences in which the family participated including creative, physical and social activities which do not involve technology. In essence they were media mentors helping to shape the next generation of media users and seemed to recognize the importance of that role.
For this boy, technology was one of many types of activities available during his free play time. In this family Duke was very comfortable and skilled with technology and enjoyed playing games, watching music videos, taking pictures and watching movies with screens. He recognized a variety of digital tools and was able to explain how they are used in his home. Although it seemed to be his preference as a first choice when offered a variety of materials, he soon moved to include other options which often kept him engaged for longer periods of time. He was also aware of and compliant with restrictions even when the opportunity to contravene them was presented. Although the questionnaire and interview readily captured the parental attitudes regarding the use of digital media for young children, it was the observations of the behaviours and attitudes of the pre-school child that pointed us towards the influence of the parents on those behaviors.

To conclude then the Findings of this study lend support to the notion that digital media does not have to be the only or even the main interest in the child’s life. It is possible for children to develop diverse interests which include digital media as one of many play choices. And, it appears that parental involvement in the form of modeling behaviours, setting limits and providing experiences and shared digital activities for the child are a key contributing factor in determining the child’s attitudes and behaviours related to technology. It seems appropriate to end with the words of Duke’s mother when discussing the role of technology in the lives of her children as she has been instrumental in creating the environment within which this has developed:

They enjoy their tech-time but they also enjoy being outside and around family. I find often they will put their tech away when they’ve had enough – without prompting- and choose to spend time with each other or with us which, in my opinion is a great skill for them to learn, how to regulate and moderate themselves and make their own choices. (Duke’s Mother, 2017)
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Appendices

Appendix A: Materials offered as play choices during the play sessions.

### A.1 Digital Materials

<table>
<thead>
<tr>
<th>Tablet</th>
<th>Phone (Camera and Game)</th>
<th>Keyboard</th>
<th>Laptop</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Music videos)</td>
<td>(Assorted Games)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### A.2 Non-Digital Materials

<table>
<thead>
<tr>
<th>Blocks</th>
<th>Dominoes</th>
<th>Flannel Story</th>
<th>Books</th>
<th>Puzzles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Spin Top</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Viewmaster</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Pegboard</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Train</td>
</tr>
</tbody>
</table>
Appendix B

Parent Questionnaire.

1. Do you have a personal computer?
2. Do you have a lap top?
3. Do you have a smart phone?
4. Do you have a tablet?
5. Do you have a television?
6. Do you have a DVD player?
7. Do you have an audio player?
8. Do you have a video game console?
9. Do you have a hand held video game?
10. Do you have an electronic musical instrument?
11. Do you have a digital video recording device?
12. Does your child use any of these? If yes for what purpose?
13. How much time do you spend using screens where your child can see you?
14. Are you mindful of the use of technology you model for your child?
15. What do you use digital media for?
16. How much time do you spend using digital media at home?
17. Do you regulate how much time your child spends in front of a screen/using technology?
18. If yes, then how much time is allotted and what is your strategy for regulating screen/digital time?
19. Are there other types of activities you encourage your child to participate in?
20. If yes what are they?
21. What are your thoughts regarding the use of digital media/technology for yourself and your child? (Some examples: it is educational, teaches skills, is not beneficial, is necessary, is a time waster, can’t live without it etc.)
22. Are both parents consistent in their approaches regarding digital media use?
23. Do you think there is cause for concern regarding the use of digital media with young children?
24. Do you believe that the age and developmental level of the child should be considered when determining how much exposure to digital use is optimal?
25. Can you talk about the role of extended family in the use of digital media with your children?
26. Can you please tell me: Your age and the age of your husband, how long you have been married, the ages of your children, your occupations, who are the caregivers of the children, hobbies and activities in which the children participate, and if you have close contact and support with extended family.
Appendix C

Child Photo Questionnaire
### Appendix D
"Table D.1: Photo Questionnaire Summary of Responses"

<table>
<thead>
<tr>
<th>Item</th>
<th>Child’s Reaction</th>
<th>Additional Questions</th>
<th>Child’s Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital camera</td>
<td>Take a picture of mommy and write I love her</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smart Phone</td>
<td>Mummy’s phone</td>
<td>Do you get to use it?</td>
<td>No</td>
</tr>
<tr>
<td>Digital Keyboard</td>
<td>Thing that you push the buttons up and down</td>
<td>A keyboard?</td>
<td>Yeah! Yeah! A keyboard</td>
</tr>
<tr>
<td>Tablet</td>
<td>Mum’s Computer, kinda my iPad. Mummy said iPad is only for night time. That’s my favorite</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand held game</td>
<td>Computer thing, the game</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Video game controls</td>
<td>Remote controls, for the game</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PC</td>
<td>Keyboard</td>
<td>Do you have one of these?</td>
<td>Nope</td>
</tr>
<tr>
<td>My personal laptop</td>
<td>Hey. Yours. Watching your iPad</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVD Player</td>
<td>Watch on it</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discman with headphones</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Radio/cassette/cd player</td>
<td>In the kitchen for dance parties. My favorite, I’m going to write my name on it (he writes his name on the photo sheet)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E books/online stories</td>
<td>Oh! Story that I write my name on</td>
<td>-What’s your favorite (I point to the pictures). (He has often mentioned that his favorite colour is blue. Perhaps he thought that was my question.) -Which one would you want for a present? -What is your favorite thing to do with your friends? -What is your favorite thing to do when you are by yourself?</td>
<td>Blue</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Thomas train…no. no. computer!</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Play in the secret room.</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Play Lego.</td>
</tr>
</tbody>
</table>
### Appendix E

“Table E.1: Play Session Summary”

<table>
<thead>
<tr>
<th>Session</th>
<th>The toy/activity</th>
<th>Choice</th>
<th>Duration of Play</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Day One</td>
<td>iPhone and Thomas train set</td>
<td>iPhone first choice</td>
<td>15 minutes</td>
<td>“Why did you choose the phone?” “Because I like to play games”</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Thomas train set second choice</td>
<td>19 minutes</td>
<td>He decided when he was done with the game on the phone and then chose the train on his own</td>
</tr>
<tr>
<td>Day Two</td>
<td>Tablet and Thomas train</td>
<td>Thomas train first choice</td>
<td>20 minutes</td>
<td>On this day he realized that there were toys in the bag and that the iphone was in my purse. He told me that he wanted to see all the materials before he decided which one he wanted to play with. This changed the format for the ensuing sessions.</td>
</tr>
<tr>
<td></td>
<td>iPhone</td>
<td>Second choice</td>
<td>10 minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Duplo animal shapes</td>
<td>Third choice</td>
<td>20 minutes</td>
<td></td>
</tr>
<tr>
<td>Day Three</td>
<td>keyboard</td>
<td>First choice</td>
<td>8 minutes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>iPhone</td>
<td>Second choice</td>
<td>2 minutes</td>
<td>He took pictures of the keyboard</td>
</tr>
<tr>
<td></td>
<td>Domino animal cards</td>
<td>Third choice</td>
<td>21 minutes</td>
<td>He determined the length of time of play</td>
</tr>
<tr>
<td></td>
<td>Spinning tops</td>
<td>Fourth choice</td>
<td>15 minutes</td>
<td></td>
</tr>
<tr>
<td>Day Four</td>
<td>View master</td>
<td>First Choice- brother’s electric helicopter. First choice from my bag 3rd choice 4th choice 5th choice</td>
<td>10 minutes 15 minutes 1 minute 22 minutes 5 minutes</td>
<td>Left there by accident by his older brother therefore very exciting -walked past my laptop, keyboard and phone to choose it</td>
</tr>
<tr>
<td></td>
<td>Laptop Game</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thomas Train</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>iPhone (Camera)</td>
<td></td>
<td></td>
<td>He stated that his favorite thing to do with friends was his Lego and he asked his dad if he could take pictures of it with his iPad.</td>
</tr>
</tbody>
</table>