AN EXAMINATION OF YOUNG CHILDREN'S DIGITAL LITERACY PRACTICES IN THE HOME BEFORE AND DURING THE TRANSITION TO KINDERGARTEN

Laura Ann Teichert

Dip.Ed. Deakin University, 2007

M.Ed. The University of Western Ontario, 2010

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submitted by	Laura Ann Teichert	in partial fulfillment of the requirements for	
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Examining Committee:

Dr. Jim Anderson

Supervisor

Dr. Marlene Asselin

Supervisory Committee Member

Dr. Nancy Perry

Supervisory Committee Member

Dr. Lee Gunderson

University Examiner

Dr. Cay Holbrook

University Examiner

Abstract

Many young children in western societies become literate in a world that relies heavily on digital technology. However, in early childhood education, play-based learning is typically the focus of curriculum and increased digital engagement by young children has caused concern among parents, educators and other key stakeholders. These concerns emanate from a belief that other activities (e.g., reading) are more constructive for young children. The purpose of this study was to describe young children's digital tool use and engagement in digital literacy activities in the context of family life before, and as they transitioned into, kindergarten. Drawing from sociocultural theory, this case study of young children and their parents focused on two families' digital literacy events in the context of their home over one year. Observed digital literacy events were analyzed using "literacy as a social practice" (Barton & Hamilton, 2000) to frame the social situations in which the children were developing their digital literacy. The findings indicate that these children engaged in digital activities and non-digital activities in a balanced manner and that they were active meaning makers while engaged with digital technology. Children moved fluidly between digital and non-digital spaces during their play, particularly during narrative play. Parents mediated and supported their children's uses of digital media; however, rules governed which devices and content children could access, and for what length of time. Parents' mediation styles concerning digital media did not change as children transitioned into kindergarten; however, peers influenced the children's digital interests once they entered kindergarten. Parents were not frequent users of digital media and did not characterize engagement with digital tools as play, which led to tensions for mothers about whether to permit their young children to use digital media. This study provides an example of how three children accessed and used digital tools at home before as they transitioned to, kindergarten. It adds to

evidence that screens do not dominate children's lives. Policy makers and practitioners can use the insights from this study to recognize the ways that children and parents use digital tools in their homes as they consider curriculum, pedagogy, and policy.

Lay Summary

This study focused on how frequently three young children used digital technology in their homes before and as they started kindergarten. The study also documented how parents helped these children learn to use digital technology and the restrictions these parents placed on their children's usage. The three children in this study led balanced lives in terms of digital and non-digital play. They often interacted with non-digital toys while simultaneously viewing or using digital devices. The parents experienced tension in making decisions about how long children should use screens, how often children should use screens, and expressed a preference for children to engage in non-digital activities. This study offers an example of how three children and their parents used digital technology in their homes.

Preface

This dissertation is an original intellectual product of the author, L. Teichert. The fieldwork reported in Chapters 4-6 was covered by UBC Ethics Certificate number H14-00634.

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Dedication

I dedicate this dissertation to Keegan, Cohen and Adam Teichert. Keegan, you took a risk when you joined me on a cross-country adventure so I could follow a dream. Words cannot fully express my appreciation for your patience and understanding throughout this journey. Thank you for reminding me of the big picture and I look forward to our next adventure.

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Chapter One: Introduction to the Study

Rationale

The proliferation of digital technology in society has resulted in an evolution of the concept of literacy and its definitions. As children increasingly partake in the digital world, educators from kindergarten to post-secondary school are, to some degree, reconceptualizing what it means to be "literate". In our modern western world, being literate includes *digital literacy*. I understand digital literacy as being bound by social, cultural and ideological contexts. People become digitally literate by interacting with other members of their community and using relevant digital devices (or *digital tools*) within digital networks. Operational skills are necessary in order to successfully use a variety of digital tools (e.g., computer, iPad, streaming TV, or smartphone), navigate networked screens (e.g., Cloud technologies) and use social media (e.g., Facebook). Digital literacy encompasses more than a list of skills associated with operating technology; it includes a mindset to negotiate meaning from a variety of digital contexts and use a variety of digital devices. For example, a digitally literate person may be able to log in and access Facebook (i.e., operational skill), but also understand the social context of their voice within this particular social media space (i.e., a personal, business or professional page). I use the term *digital tools* as an umbrella term which encapsulates the many different digital technologies used in society. In line with Marsh's (2004) characterization of "techno-literacy" (p. 52), I include both new technologies and older technologies in this term. Therefore, I refer to digital tools as devices that require computerized technology to operate. Digital tools may require Internet/WIFI connection or cellular data to operate, such as the smartphone or tablet. As well, digital tools encompass devices that do not need Internet connection but use computer technology, for

example Vtech[1] electronic learning toys. Digital tools may be used passively (e.g., TV) or may involve interactive technology (e.g., Skype, FaceTime). I recognize digital devices differ in newness and understand different devices operate with different technologies (e.g., TV programming is different than smartphones), but use digital tools to simplify descriptions for the reader. It is worth noting that many older technologies, such as TV, constantly evolve and are updated using newer technologies. For example, TV is no longer limited to analog technology and now includes sophisticated streaming capabilities. For this reason, *digital tools* as a conceptual term is not easily agreed upon (L. Chang, personal communication, September 27, 2018).

Adults' beliefs about the appropriateness of digital technology for children influence the environments they create for young children and potentially influence children's exposure to, and interactions with, digital tools. Researchers (e.g., Heath, 1983; Purcell-Gates, 1995; Taylor, 1983) have observed and documented young children's and families' digital literacy practices, much like earlier researchers documented the home literacy practices of families. Findings from these studies indicate that while some parents limited their children's digital usage (e.g., Dias et al., 2016; Ozturk & Ohi, 2018; Vittrup, Snider, Rose, & Rippy, 2014), other parents encouraged and valued their children's early digital engagement (Aubrey & Dahl, 2014; Connell, Lauricella, & Wartella, 2015; O'Hara, 2011; Schlembach & Johnson, 2014). Research in "techno-literacy practices" (Marsh, 2004) has focused on: families' and parental uses of digital devices (e.g., TV, computer games, mobile phones, etc.); parents' inclusion of children in using digital tools such

[1] Vtech is a global supplier of electronic learning products from infancy to preschool and the world's largest manufacturer of cordless phones. Based in Hong Kong, Vtech produces interactive learning toys for all age ranges, including infants, toddlers, and preschool aged children.

as tablets (Marsh, Hannon, Lewis, & Ritchie, 2017a); "appropriateness and readiness" (O'Hara, 2011, p. 228) of children using particular information and communication technology (ICT); explicit instruction parents or older siblings provided young children (Davidson, 2012; McPherson, 2011; Stephen, Stevenson, & Adey, 2013; Zaman, Nouwen, Vanattenhoven, de Ferrerre, & Van Looy, 2016); and how children implicitly learned about digital tools by watching adults, siblings, and peers using them (Chaudron, 2015; Plowman, McPake, & Stephen, 2008). Overall, these studies suggest that young children are socialized into digital practices by observing and interacting with adults, peers, and siblings who use digital tools (Marsh, 2004; Marsh et al., 2017a; McPherson, 2011; O'Mara & Laidlaw, 2011; Ozturk & Ohi, 2018) and that children move seamlessly between print-based and digital-based texts in their search for information during learning.

Many parents emphasized the learning that occurred while children used digital tools in the home and were proud of their children's digital learning (O'Hara, 2011). Research has described children's abilities to read pictorial symbols and icons on the screen and therefore operate computer and tablet programs independently (Laidlaw & Wong, 2016; Levy, 2009; O'Hara, 2011). Children develop early literacy and early numeracy skills by playing digital games (Davison, 2010; O'Hara, 2011). Levy (2009) described children's "transferable literacy" (p. 84) whereby children transfer the operational skills developed using a familiar digital tool to unfamiliar digital tools and use these new tools with relative ease. Children also learn about and acquire knowledge on a range of topics through informational search practices (Davidson, 2009; O'Hara, 2011; Wong, 2015). In addition, research shows the learning that occurs when children use digital tools in early childhood and kindergarten classrooms including story and narrative building (Roberts-Holmes, 2014; Wohlwend, 2013), informational search practices (Harwood et

al., 2015; Spink, Danby, Mallan, & Butler, 2010), and phonemic awareness skills (McLean, 2017; Northrop & Killeen, 2013). In British Columbia, the recently revised New Curriculum (2016) emphasizes 21st century learning through "a concept-based approach to learning" which focuses on the "development of competencies, to foster deeper, more transferable learning" (n.p.). Learning with digital tools is entrenched in the curriculum and teachers are expected to instruct using digital tools and to provide opportunities for students from kindergarten to grade 12 to use digital tools to develop digital literacy skills.

Concerns About Digital Technology in the Early Years

Despite studies indicating that many young children observe significant others using digital tools regularly at home and, in many cases, have access to them, several organizations have raised concerns about young children's exposure to technology. For example, the American Academy of Pediatrics (AAP) (2016) expressed concern about young children's increased engagement with digital technology and espoused the position that young children need "hands-on exploration and social interaction with trusted caregivers to develop their cognitive, language, motor, and social-emotional skills" (p.1). The AAP claimed young children have difficulty transferring knowledge attained from screen media to their three-dimensional experiences, citing Barr's (2013) literature review on memory and "transfer deficit" (p. 206). In her literature review, Barr noted that infant learning from two-dimensional objects (i.e., drawings or TV screens) was cognitively complex and not easily transferred to three-dimensional objects of the same word (i.e., giraffe on a TV was not easily transferred to understanding the same animal at the zoo). The Canadian Paediatric Society (CPS) (2017) also issued a position statement recommending minimal screen use for children under five years of age and emphasized that "face-to-face interaction" was how "children learn best" (p. 462). The CPS cited

research connecting young children's TV watching to language delays (Chonchaiya & Pruksananonda, 2008; AAP, 2016) and argued for no screen time for children under two-years and no more than one hour per day for children between the ages of two- and five-years.

These recommendations, particularly those put forward by the AAP (2001; 2011; 2016), appear to have strongly influenced the fields of pediatric neurology, psychology, and early childhood education. Institutions and organizations who emphasized the negative effects of digital technology use on young children often cited the AAP's policy statements. For example, in 2012 the National Association for the Education of Young Children (NAEYC) re-issued their policy statement on young children's access to digital media, aligning it more closely to that of the AAP marking a change from an earlier statement advocating for the use of technology in early childhood classrooms (e.g., NAEYC, 1996). This change was important as the NAEYC influences children's librarians, early childhood educators and parents and its perspectives are often reflected in early years' "best practices" policies. For example, the NAEYC's (1998) policy statement, *Learning to read and write: Developmentally appropriate practices for young children*, influenced the KidsFirst Huron Perth, Ontario initiative, "Read to Baby". These policy statements carry considerable weight among their constituencies and may influence parents' and caregivers' beliefs about the appropriateness and value of digital media in young children's lives.

It was from this context ─ young children regularly using technology and digital media at home in spite of the recommendations of influential organizations regarding minimal screen time─ that I framed this study. Although research examining emergent digital literacy is a growing field, to date, no study (yet) has documented children's digital tool use for changes in digital literacy practices during the transition into kindergarten. Rachael Levy (2009) documented 12 three-to-six-year-old children's uses of digital technology during their transition

into formal schooling. However, her focus was on children's perceptions of themselves as readers and the role digital technology played in their perceptions and not changes in digital literacy practices.

The preschool period, particularly the year immediately before formal schooling begins, is a time when changes take place in the home (Son & Morrison, 2010). As preschool children approach school entry, families tend to place greater emphasis on academic or educational goals and practices (Pianta & Cox, 1999; Pianta & Walsh, 1996; Purcell-Gates, 1996; Stevenson, Lee, Stigler, Hsu, & Kitamura, 1990) including learning about print (Purcell-Gates, 1996; Son, 2006). Given the ubiquity of digital technology in homes and communities and the expectation that children will be using technology as learning tools in school, it is important to document and understand any changes in the use of digital tools at this important juncture in children's lives (Marsh, 2013). In the next section, I define the purpose of the study and present the research questions that guided data collection and data analysis.

Purpose and Research Questions

Purpose

The purpose of this case study was to document and describe young children's digital tool use and engagement in digital literacy activities in the context of family life before, and as they transitioned into, kindergarten. My goal was to document how children used digital tools in their regular lives and I was particularly interested in whether these digital literacy practices changed as they entered kindergarten, and more generally, if they changed over the course of my one-year study. Three pre-school-aged children (one set of twins and an only child) and their parents living in an urban community in western Canada participated in this study. The focus of

data collection was on digital events occurring in the context of participants' homes and the analysis on what I could infer about digital literacy practices from these events.

Research Questions

The following questions framed the data collection and analysis of this study:

1. What digital tools are the four and five-year-old children in this study using in their homes? b) What digital tools can they access?
2. How do the parents mediate or support of digital tool use in these children's homes? b) What is the nature of this support or mediation (i.e., is digital tool use connected to developing digital literacy in young children)? c) And, what attitudes and/or beliefs inform parents' structuring of the home digital environment?
3. How do the children use digital tools in their home? b) Do they incorporate digital tools into their play and, if so, how and for what purposes (e.g., creating narratives, creating a visual display, etc.)? c) Do the children use digital tools specifically to help them acquire knowledge?
4. Do the children's uses of digital tools change as they prepare for entry to kindergarten? b) Do their parents use digital tools to support their children's preparation for formal schooling (i.e., for learning purposes), and if so, how?

Significance

To reiterate, I found no research that documented children's access to and use of digital tools during their transition into kindergarten for changes in digital literacy practices (to date). It was important to conduct this study because society has increasingly embraced digital tools in both daily and professional life and this shift has altered what skills are considered necessary for

successful participation in society. Many educators regard digital literacy skills as necessary and not isolated to upper years of elementary school and secondary school. As Marsh et al. (2017b) stated: "If children do not have opportunities to gain online experience, they are disadvantaged in terms of the range of digital literacy skills and experience they do not have opportunities to develop" (p. 37). In British Columbia, the revised curriculum incorporates digital technology, reflecting 21st century learning principles. BC's New Curriculum (2016) states:

> Today we live in a state of constant change. It is a technology-rich world, where communication is instant and information is immediately accessible. The way we interact with each other personally, socially, and at work has changed forever. Knowledge is growing and information is changing extremely quickly, creating new possibilities. This is the world our students are entering (n.p.).

In 2001, then British Columbia premier, Gordon Campbell, set in motion steps to develop a knowledge-based economy for the province, which included revisions to the BC curriculum (Teichert, 2014). The Ministry of Education, in conjunction with stakeholders, reviewed the education system and created *BC's Education Plan* (2011). This document (and online forum) provided the stepping stones for the current BC Curriculum (2016). The new curriculum emphasizes digital literacy skills and knowledge for all learners, including kindergarten, while technology skills and coding are explicitly taught in many primary classrooms and promoted by the provincial government (Silcoff, 2016). A revised Early Learning Framework (2018) was designed as a companion for the BC Curriculum (2016) and focused on children birth through age eight (i.e., grade three). This document shares its inquiry-based learning philosophy with the BC Curriculum and it connects to the core competencies (i.e., communication, thinking, personal and social, literacy and numeracy) outlined in the new BC Curriculum. The Early Learning

Framework is intended to be used by early childhood educators, kindergarten and primary teachers, and other early years practitioners. It aligns with the BC Curriculum and emphasizes "inclusive pedagogies through discovery and inquiry" (p. 13) and acknowledges digital technology's role in inquiry-based learning.

Given the importance afforded digital literacy in British Columbia's new curriculum and Early Learning Framework, this study, in part, examines whether families used digital tools as one way to support children's development and learning as the children prepared for kindergarten. As noted, previous research indicated that families increased literacy activities in their homes as children approached entry to kindergarten. For instance, Purcell-Gates (1996) found that parents from lower-SES homes felt that the onset of formal schooling was an appropriate time to begin or increase their involvement in children's literacy learning and they began the "explicit teaching of letters and words" (p. 426). The current study probes whether digital technology was included, along with traditional early literacy resources (e.g., storybook reading, flashcards, board games) in parents' toolkit as they prepared their children for kindergarten.

This study will contribute to research investigating children's uses of digital tools and digital technology in their homes. As well, this study will provide more evidence of the ways parents and significant others mediate this digital tool use and potentially assist in their children's emergent digital literacy development. How parents' and significant others mediate young children's use of digital tools is an under-researched area. Jackie Marsh (2013), a leading international scholar in young children's use of digital tools, identified a pressing need to document what occurs as children make the transition to more formal schooling, arguing for

engaged pedagogies that do not exactly replicate home experiences, but draw on and build upon these experiences in meaningful and authentic ways.

Outline of the Dissertation

This dissertation describes digital events and digital literacy practices in three children, from two families, before and as they transitioned into kindergarten. These events took place over the course of one calendar year. Six chapters follow this introductory chapter. In Chapter 2, I situate my research within sociocultural theory and views of literacy as a social practice. I begin by identifying the theoretical constructs that shape my understanding of learning, play, and literacy in homes. I then review the empirical research related to young children's digital tool access, digital tool use, and parents' perspectives on young children's digital technology use. I describe the research methodology of the study in Chapter 3, presenting the research design and providing a rationale for employing qualitative methodology. I then describe data collection methods and the data analysis process. As well, I discuss my role as researcher and describe how I attempted to ensure the trustworthiness of the study. In Chapter 4, I describe the digital context of the children's homes and the access the children had to digital tools (Research Question 1). As well, I describe the parents' support and mediation of young children's technology and digital tool use and document the tensions mothers reported regarding their children's use of digital technology (Research Question 2). In Chapter 5, I describe the digital events I observed in the home before and after the children began kindergarten (Research Question 3). I also describe the unintended consequences of using my iPhone as a data collection tool. I highlight changes in the children's digital technology use in Chapter 6 and report on how the children referenced digital technology in their talk (Research Question 4). In Chapter 7, the final chapter, I highlight insights from the

study and the implications for practice and research. Finally, I discuss the limitations of the current study and suggest areas for future research.

Chapter Two: Theoretical Framework and Literature Review

This chapter has two main sections. In the first section, I situate the study within theory and the related literature on young children's access to and engagement with digital tools. I begin by identifying sociocultural theory as guiding the study, specifically introducing perspectives on the social nature of learning and development (Vygotsky, 1978) and literacy as a social practice (Barton & Hamilton, 2000; Heath, 1983; Street, 1984). I then focus on how I conducted the research within the tradition of the New Literacy Studies, particularly in relation to digital literacy. I conclude by highlighting theories of play as an additional construct of sociocultural theory. In the second section, I review empirical research related to children's digital tool access, children's digital tool use, and parents' perspectives on young children's digital technology use.

Theoretical Perspectives

Sociocultural Theory

I situate this study in sociocultural theory. Sociocultural perspectives of learning and development emphasize the role of social contexts and purposes of activities and events in meaning making (Hassett, 2006). They recognize language use changes according to context (Bakhtin, 1986), and the relationship between language use and power (Bourdieu, 1991). Sociocultural research has investigated the ways people use literacy in their everyday lives (Perry, 2012). I particularly drew from Vygotsky's (1978) sociocultural theory of learning and development because of the relevance his work has to early childhood development, language development, and play-based learning.

Vygotsky (1978) regarded learning and development as interrelated, but not coinciding with one another. He argued that learning is a necessary and universal aspect of humans and is the "process of developing culturally organized, specifically human, psychological function[s]" (p. 90). The developmental process lags behind learning and, in order for children's development to mature, they learn through social interactions with adults and more competent peers from their local communities in their everyday lives. New knowledge is based on previous experiences and socially rooted attitudes and values. Adults, therefore, do not transmit knowledge to children; rather, children acquire "valid and meaningful knowledge if they are able to transform the information offered to them into something personal" (Kuiper & Volman, 2008, p. 244). Vygotsky characterized this process as occurring within the Zone of Proximal Development (ZPD): the distance between a child's actual developmental level (determined by independent problem solving) and what the child can accomplish with the assistance of adults or more capable peers. Learning, therefore, "awakens a variety of internal developmental processes" (Vygotsky, 1978, p. 90) that operate when the child is interacting with more capable people. Once internalized, these processes can be considered part of the child's independent developmental achievement. Thus, children grow into the intellectual life of those around them.

According to Vygotsky (1978), the signs, symbols and cultural artifacts and tools of the local community mediate learning. He argued that there is not "a single organically predetermined internal system of activity that exists for each psychological function" (p. 55) and that the "internalization of socially rooted and historically developed activities is the distinguishing feature of human psychology" (p. 57). Signs, symbols, and tools mediate activity. Children internalize sign systems while tools are external "conductors of human influence on the object of activity" (p. 55) and all are interconnected by the culture of the community. Children's

cultural development appears first as an action between people, that is, on an interpsychological (social) level. The next step in development occurs inside the child, at an intrapsychological (individual) level (Vygotsky, 1978). Different generations alter and repurpose tools to suit their particular purposes (Razfar & Yang, 2010), but these alterations are based on prior knowledge and experiences learned from within their local communities. By observing and imitating adults and more competent peers, children learn to use tools appropriately to solve problems, participate in social activities and engage in "embodied meaning making" (Razfar & Yang, 2010, p. 114). However, the ways in which different communities use cultural tools and teach neophytes how to use them vary (Heath, 1983; Rogoff, 2003).

New Literacy Studies

As with sociocultural theories of learning and development, The New London Group (1996) emphasized the local, cultural, and social nature of literacy development as part of New Literacy Studies. New Literacy Studies extend Vygotsky's sociocultural theory by viewing literacy as not simply the acquisition of a set of individual skills, but by contesting what counts as literacy (Street, 2003). Scholars drawing on a New Literacy Studies framework regard literacy as a social practice and distinguish between "autonomous" and "ideological" models of literacy (Street, 1984). Street (1984) defined the autonomous model of literacy as a belief that literacy is a "technical and neutral skill" (p. 77) and, if neutral, can possess universal qualities, which, as he suggested, "disguises the cultural and ideological assumptions that underpin [literacy]" (p. 77). Street argued that literacy is embedded in socially constructed epistemological principles, that is, "[i]t is about knowledge: the ways in which people address reading and writing are themselves rooted in conceptions of knowledge, identity, and being" (p. 77-78). In other words, literacy is ideological and technical. The ideological underpinnings of literacy are situated in the cultural

context and reflected in the cultural tools used within communities, for example, whether oral aspects of language are more highly valued (e.g., storytelling) over print-based literacy practices (e.g., bedtime reading). In modern society, ideological underpinnings of literacy now extend to digital technology, for example, smartphones and social networking websites. Multiple languages and multiple modes of meaning making, or multiliteracies (New London Group, 1996) are valued and recognized as important in the literate development of individuals.

Within a "literacy as social practice" framework, the study of children's early literacy development is best understood "in relation to the contexts in which those practices are culturally, historically, and ideologically situated" (Razfar & Gutiérrez, 2003, p. 35). This perspective allows researchers to consider the social situations in which individuals come to literacy. Since forms of literacy are embedded within ideologies, the focus should be on "identifying the specific social practices of reading and writing and recognizing the ideologically and culturally embedded nature of these practices" (Street, 1984, p. 2). Literacy is understood as a set of social practices, which can be inferred from events mediated by texts (Barton & Hamilton, 2000). In the 21st century, texts are no longer limited to printed texts, such as novels, magazines or newspapers, but are broadened to include websites, e-books, Twitter, and so forth. I understand *practices* as "the 'doings', 'sayings' and 'relatings'" (Merchant, 2012, p. 772) that constitute the social actions of everyday life. Practices are the ways people interact with or incorporate objects and actions into their everyday life and are influenced by social and cultural worldviews. *Literacy practices* are purposeful and are embedded in broader social goals and cultural practices. More generally, literacy practices are the cultural ways in which people use written language, either through print-based or digitally-based texts, in their everyday lives. Literacy events are descriptive and, without knowledge of the literacy practice, are difficult to

derive meaning from. Street (1993, 2000) contended that literacy practices are unobservable as units of behaviour since they involve attitudes, feelings, values, and social relationships. Literacy practices are identifiable in the ways people construct and talk about literacy and exist in the social relationships we form with people and in groups and communities. These social relationships are shaped by social rules and power which relate to who may have access to texts, who may produce them, and who may distribute them.

What researchers can observe are literacy events, which are observable episodes that arise from practices and are shaped by them (Barton & Hamilton, 2000). Street (2000) explained the "events and patterns of activity around literacy" (p. 21) are linked to "something broader of a cultural and social kind" (p. 21). Heath (1983) characterized a literacy event in her ethnographic study, as "any occasion in which a piece of writing [was] integral to the nature of the participants' interactions and their interpretative processes" (p. 350). Literacy events include using the directions to assemble furniture from Ikea, reading a poem, playing a video game on a game console, or writing down a recipe. For many, literacy events are regular activities that are done routinely and are expected in social institutions such as schools, work places, and recreational centres. Literacy events are often a mixture of written and spoken language where people use written language in integrated ways, such as musical notations, photographs, and visual media (Barton & Hamilton, 2000). These texts are assigned a function (or multiple functions) as people appropriate them for their own purposes in the context of their social meaning. Barton and Hamilton's notions of literacy events and literacy practice are transferable to examinations of children's digital engagement, whereby digital events are observable interactions and digital practices may be inferred based on children's and adults' attitudes, beliefs, and values towards digital tools and digital media. Marsh (2004) uses the term, "techno-

literacies" to describe literacy practices and events that are "mediated by new technologies" (p. 52) as well as practices and events that are affixed to older technologies that are continuously updated, such as the TV. In this context, a digital literacy event may include a person reading Twitter while riding on the bus or viewing a recipe on a tablet while cooking in the kitchen. Crucial to being digitally literate are skills associated with: evaluating digital content (e.g., app-based game) and web-based content (e.g., a website); an understanding of audience and critically evaluating to whom the digital content is aimed (e.g., social context); and finally, understanding who is disseminating digital content and for what purposes (i.e., who is the creator attempting to appeal to and for what reasons). Technical abilities are also necessary in order to access information from multiple formats, and more recently, multiple interfaces (e.g., Internet browsers, cloud technology) and digital platforms (e.g., smartphones, tablets, laptops).

Emergent digital literacy. Emergent literacy conceptualizes literacy development along a continuum in which literacy development begins at birth and develops throughout the lifespan (Clay, 1966). Research in this field has led to a richer understanding of how some young children engage with print literacy from birth and throughout their literacy development. From this perspective, literacy development includes "budding literacy-like behaviours" (Roskos & Christie, 2001, p. 60), such as pretend reading and writing, and acknowledges these behaviours as legitimate and contributory to children's literacy learning and their development of "concepts about print" (Clay, 1989; 1993). In addition to print literacy, some young children routinely encounter digital media and live in a world full of digital media and new technologies (Kabali et al., 2015; Wohlwend & Rowsell, 2017). An emergent digital literacy perspective follows from the print-centric notion of concepts about print (Clay, 1989; 1993) and recognizes the budding digital behaviours of young children as well as the conceptual aspects of digital technology

children will need to learn. The advent of touchscreen media produced new digital skills, such as swipe and voice control, which require new understandings and dispositions towards literacy. Merchant (2014; 2015) acknowledged touchscreen technology constituted a "nexus of activity" (2014, p. 137) with traditional print-based texts and suggested, "touchscreens may integrate into existing social practices or transform them" (2014, p. 136). It can be argued that technological developments have made it easy for children to use technology and, perhaps, advance children's literacy development. Wohlwend (2017a) describes these new digital skills as, "concepts beyond print" (Wohlwend, 2017a, p.65) and argued that reading practices now include non-print ways of reading. She offered as an example children's interactions with tablets, stating, "as children handle tablets, they learn that finger taps, pinches, and stretches on touchscreens activate icons that symbolize literate action" (p. 65). Buckingham (2008) proposed four conceptual aspects of digital media that children need to learn: representation, language, production, and audience. Representation focuses on how digital media represents the world and which interpretations the media have provided and which values and/or ideologies are presented. Language concerns the ability to use language and understand the grammar, codes and conventions of the language system. Production involves the understanding of who is communicating to whom and why. And finally, audience involves the awareness of one's own position as an audience (i.e., reader or user) and how media targets audiences. As such, emergent digital literacy skills are not isolated to children learning to operate digital tools (e.g., computers or smartphones) but also include children's developing understandings of the social purposes associated with differing digital tools.

Additional Theoretical Construct within Sociocultural Theory

Play. To understand how children learn through play, particularly with digital tools, I draw from constructs of play theory from a sociocultural perspective. A central tenet of Vygotsky's (1978) sociocultural theory of learning and development is that play is one of the stimuli for the child's internal development processes. Play provides children with learning opportunities by allowing them to explore cultural symbol systems, including reading and writing. Vygotsky (1978) contended, that it is through play that "the child achieves a functional definition of concepts or objects" (p. 99). For example, a child uses a toy smartphone and imitates the behaviours of adults using the device in the real world. This may include pretend phone calls or pretend text messaging. Play creates a Zone of Proximal Development (ZPD) because the child "always behaves beyond his average age" (Vygotsky, 1978, p.101). When engaged in the ZPD, children learn complex concepts and develop psychological functions. Vygotsky categorized imagination as a psychological function, integral to children's learning and noted the importance of play in engaging children's imagination. Edwards (2011) expressed imagination as, "a way of interacting with the social and cultural world" (p. 198). Imagination is not fantasy. Imagination is a function that supports children's connection with reality, not something that is "fundamentally abstracted from reality" (Edwards, 2011, p. 198). Imagination provides children with "something to play *with* and *about*" (Edwards, 2011, p. 200, emphasis in original). Children use their imagination to act on their ideas in play and use everyday objects as "pivots" (Vygotsky, 1978) and detach the actual meaning from the object, for example, using a banana to represent a telephone. In play, children develop understandings and competencies of the important cultural tools in their society. Wohlwend (2011a) argued that play is a literacy because children are "creating and coordinating a live-action text among multiple players that

invests materials with pretend meanings and slips the constraints of here-and-now realities" (p. 2). That is, multiple children work in coordination with in-the-moment texts and use pivots to remove the constraints of their current reality to invent new worlds. Wohlwend (2017b), therefore, suggested play is a "printless literacy" that relies on "bodies, toys, props, and scenery rather than written with print on paper" (p. 66) and not only printed text. She described children's worlds as "storied worlds" with texts filled with "vibrant dialogue, characters, and storylines" (Wohlwend, 2013, p. vii). Children make imaginary versions of "real-life or fantasy worlds", but on their own terms, which allows them to "remake stories to fit their needs" (2013, p. vii). They "mediate print texts for themselves" and produce signs and "material objects or actions that represent and communicate ideas" (Wohlwend, 2011a, p. 13).

Today, children's play environments, or the "reality with which children might commonly engage" (Edwards, 2011, p. 204) are a "complex series of interactions between consumption, digital media and meaning making" (Edwards, 2011, p. 204). Rather than dismissing children's experiences, Edwards contended that play involving technology sits beside traditional play and is not inferior to it. Edwards (2013) used the term "converged play" to refer to play that is related to children's popular cultural artifacts and texts and argued traditional and converged play are not oppositional, rather, they are interrelated. Converged play also leads to imaginative play and supports children's connection with reality, which provides children with learning opportunities to make meaning from relevant cultural tools in their local communities. Similarly, Marsh, Plowman, Yamada-Rice, Bishop, and Scott (2016) adapted Hughes' (2002) definitions of play type to reflect contemporary children's digital realities and defined digital play using Hughes' traditional play types. For example, Hughes described symbolic play as, "when children use an object to stand for another object, [such as] a stick becomes a horse" (p.

246). Marsh et al. extended this definition into the digital sphere by defining symbolic play as, "when children use a virtual object to stand for another object [such as] an avatar's shoe becomes a wand" (p. 246). In total, Marsh et al. redefined 16 types of play to include digital activities. They also argued that contemporary children now navigate between online and offline spaces, and although the tools used in some play activities changed, the type of play children engage in remains the same.

In this section, I highlighted the main tenets of sociocultural theories of learning and development, New Literacy Studies, and play. From these perspectives, I view literacy as ideological and socially and culturally bound, meaning it cannot be removed from the social and cultural contexts of the communities. Literacy events are observable actions that arise from literacy practices which reflect the attitudes, values, and beliefs of communities. Children learn by observing more competent adults and peers and imitate the behaviours in their play. Play allows children to engage in imagination and, as Vygotsky (1978) asserted, play is a zone of proximal development since, through play, children engage in activities above their current level of ability. In contemporary society, children's play and learning now include digital tools, and the uses of these tools are tied to the social and cultural practices of the communities in which children live. In the next section, I review empirical research related to three aspects of familial literacy and digital practice: research on children's access to digital tools, research on children's uses of digital tools, and research on parents' perspectives of, and beliefs about young children using digital technology.

Review of Research

In this review, I focus on research in young children's digital tool use in their homes. I limit the review to studies involving preschool and kindergarten children between the ages of three years and six years. I also highlight research focused on parents' mediation and support of their children's digital tool use as well as parents' beliefs about the appropriateness of digital technology in young children's lives.

Digital Tool Access

Early research into children's digital media use focused on what digital tools children had access to in their homes. In the early 2000s, large-scale surveys were conducted in the United States of America and England. Rideout, Vandewater, and Wartella (2003) conducted a nationally representative, random-digit-dial telephone survey of 1,065 families with children between the ages of six months and six years living in the United States. The survey asked questions about what electronic media children accessed and how long they used this media. Findings indicated that many young children's lives were media-rich and that children were developing a wide-range of skills, knowledge, and understanding of media from birth. The survey was repeated in the fall of 2005, this time surveying 1,051 families with children of the same age group. In addition, the researchers conducted eight focus groups in four locations across the United States to ask parents about their children's media use. This iteration of the study found that children between the ages of six months and six-years had a substantial amount of experience with electronic media, with more young children engaging with newer media platforms (of the time), such as video game consoles and handheld video games (Rideout & Hamel, 2006). In a typical day, the authors reported, "83% of children [use] some form of screen media, including 75% who watch TV, 32% who watch videos or DVDs, 16% who use a

computer, 11% who play either console or handheld video games" (p.7). Around the same time in England, Marsh et al. (2005) surveyed 1,852 parents and childcare workers about children's access to digital media and adults' attitudes towards children's digital media use. Their findings were similar to the American study, in that, children between birth and six-years were living media-rich childhoods.

More recent studies continued to track what digital tools children access but have also documented changes in media environments and media behaviours. Common Sense Media (2011, 2013) conducted two nationally-representative telephone surveys in the United States. These surveys expanded the target participants' age to eight-years. They noted a dramatic increase in young children's access to mobile media devices (e.g., iPads) between 2011 and 2013. For example, in 2011 only 8% of families surveyed accessed an iPad, but by 2013 40% of families used iPad technology. Although traditional screen time (e.g., TV, DVD) for children between birth and eight-years declined, mobile screen time use saw a threefold increase in the two-year period. The iPhone was released in 2007, but the high cost of the device kept many people from owning one. However, the arrival of the iPad in April, 2010 substantively changed the digital landscape. It had the relatively inexpensive price tag of $499 USD and by the end of 2010, 15 million devices were sold, with that number continuing to climb (Nations, 2017). The iPad's interface was less cumbersome than traditional computers and laptops, and therefore more accessible to young children, which likely contributed to its popularity. However, these large-scale surveys only identified what devices were in homes and how frequently children accessed them. They did not determine how children used digital tools in their homes. The rapid increase of digital consumption by young children seemed to lead to the issuance of policy statements and recommendations by institutions like the AAP (2011; 2013), who often cited the Common Sense

Media studies. The concerns outlined by the AAP and others focused on the health and cognitive development of young children. The quick development of many digital tools, coupled with a lack of research specifically examining the role of these devices in young children's healthy development, was a likely reason for the issuance of multiple policy statements over a short time period.

Researchers have continued to track young children's digital access and digital consumptions. For example, Kabali, et al. (2015) surveyed 350 parents attending a medical centre in a low-income, minority community in Philadelphia, Pennsylvania. Parents with children between the ages of six months and four years were invited to complete the survey while waiting to see a health care provider. The researchers found that 97% of homes had TV, 83% had tablets, and 77% owned smartphones. More than half the homes also contained video game consoles (56%), computers (58%), and Internet access (59%). Overall, 96.6% of parents reported their children had used a mobile device. As children got older, ownership of digital devices increased. Starting at two years, "ownership of mobile devices surpassed that of TV" (p. 1046). By four years, half of the 350 children surveyed had their own TV and "nearly three-fourths [owned] their own mobile device" (p. 1046). Tablets remained the most popular item for children, with two-thirds of four-year-old children owning their own. Most children watched TV daily and children as young as one year were using mobile devices regularly to play games. By two years, children were using mobile devices daily and spending similar amounts of screen time on TV. Most three- and four-year-old children used mobile devices without help and one-in-three engaged in media multitasking (i.e., using an iPad to play a game while watching TV). This study modelled its design on the Common Sense Media studies with a sample concentrated in one city. Kabali et al.'s findings echoed Common Sense Media's and contributed to the literature

documenting young children's access to digital tools. Kurcirkova, Littleton and Kyparissiadis (2018) surveyed 709 British parents on their children's (ages birth to eight-years) digital reading habits. They found parents of boys and parents of children aged birth to two-years were most concerned about potential negative health effects of digital technology use. In line with previous research, the authors also found parents strongly believed children needed a balance between digital and non-digital activities.

Digital Tool Use

Large-scale surveys, such as those just reviewed, allow researchers to identify what digital tools young children access in their everyday lives; however, these studies do not provide a clear picture of how children are using digital technology (i.e., for what purposes). Following on the work done by early researchers observing and documenting families' home literacy practices (Heath, 1983; Purcell-Gates, 1995; Taylor, 1983), researchers began documenting the varying ways digital tools and digital media were becoming daily parts of life in many western homes and how children were introduced to digital technology and its uses. In her widely-cited work, Marsh (2004) defined "techno-literacy" as literacy events and literacy practices mediated by digital technology. Marsh argued literacy skills were no longer limited to paper-based activities and that children accessed texts from multiple modes and highlighted the "importance of visual, aural, and corporeal ways of meaning-making" (p. 52), not just print. She used a questionnaire and interviews to ask parents about their children's literacy practices in the home in relation to a variety of media: books and comics, environmental print, TV and film, computer games, mobile phones, and music. From participants' answers, Marsh outlined children's emergent techno-literacy practices and the role(s) parents (and other significant adults) played in scaffolding children in learning to use these technological devices. She found that parents

supported and encouraged young children's techno-literacy practices and these practices played a role in families' relationships in the home. For example, the area around the TV was often set up for "celebrating and extending the children's relationship with the screen" (p. 58), such as keeping dress up clothes or toys nearby so children could easily access these props when re-enacting screen content. She also noted that children were not simply passive viewers but played with narratives and images viewed on the screen through re-imagined story lines and imitation of on-screen behaviour. As well, she found that 14 of the 26 families in her study owned a video game console and in those 14 homes, men introduced children to video games and supported children's learning of both the game and devices (e.g., operation of a joystick). Men were more likely to collaborate with children in video game play whereas women were more likely to participate in print-literacy activities (e.g., read a storybook).

Since Marsh's seminal work, research in the field of young children's digital tool use has increased exponentially, leading to a better understanding of what digital tools young children are using, how children are using them, and how parents mediate these uses. The preponderance of this research came from a group of scholars in Scotland (McPake, Plowman, & Stephen, 2013; McPake, Stephen, Plowman, Sime, & Downey, 2005; Plowman et al., 2008) who conducted three large-scale studies. The first study, *Interplay: Play, learning and ICT in pre-school education*, began in 2003 and focused on children's ICT experiences in the home and in pre-school settings and sought to investigate concepts of advantage and disadvantage with regards to ICT in the home. A questionnaire was distributed to families with three- to five-year-old children attending one of eight local nurseries in Scotland. Parents were asked what digital tools were in their homes and whether their children accessed these devices, either independently or under the supervision of a parent. All 204 families reported owning TVs, VCRs, and CD or cassette

players and four-fifths owned mobile phones and computers. From survey respondents, 16 case families were chosen for in-home observation. Eight families were considered economically disadvantaged (i.e., earned less than or equal to 60 per cent of the average national wage) while the other eight families were economically advantaged. Findings from the case studies showed children developed three types of competence in the home: technical, cultural and learning. Technical competence referred "to the ability to switch items on and off, and conduct other necessary operations for the desired activity" (McPake et al., 2005, p.6). Cultural competence involved the children's understanding of the social roles of ICT and the cultural purposes, such as communication, work or entertainment. Learning stemmed from cultural competence, but the researchers noted, "ICT was being used at home to support early literacy and numeracy, communication and musical skills, and also had a role to play in helping children learn how to learn" (McPake et al., 2005, p. 6). They acknowledged the difficulty in establishing the impact of socioeconomic disadvantage on children's developing competencies; however, they noted that socioeconomic status influenced the number of and quality of digital tools in the home. They also noted the amount of time children spent with ICT in the home varied across families and that there appeared to be gender differences as the boys spent more time engaged with ICT than the girls.

The second large-scale study, *Entering e-Society: Young children's development of e-literacy* (Plowman et al., 2008; Plowman, McPake, & Stephen, 2010), investigated children's access to digital tools and how their learning with these tools was supported in the home, specifically asking how family practices contributed to children's digital learning. The study began with a survey distributed to families with three- to four-year-old children, identified by the preschool they attended, living in diverse locations across Scotland (i.e., rural, semi-rural and

urban locations) and produced 346 responses. The survey asked, "attitudinal questions" and "initial exploration of parents' views" (Plowman et al., 2008, p. 306) and allowed researchers to acquire demographic data and to select 24 case study families from the 346 survey respondents (74 who expressed interest in the case study) to represent different socioeconomic status (Plowman, et al., 2008). Case study families were categorized as having an advantaged socioeconomic status (i.e., income of £20, 000 or more per annum) and disadvantaged socioeconomic status (i.e., income of less than £20,000 per annum). Based on the number of devices in the home, families were categorized as either "low technology" or "high technology" (Plowman et al., 2010). Low technology families had fewer of these items, but the range of technologies was not principally determined by economic factors; that is, low technology families did not necessarily come from lower household incomes. However, Internet access was unequally distributed, with 82% of the more economically advantaged families having access to the Internet compared to only 56% of the less advantaged families. Most of the children lived in homes with mobile phones (98%), interactive TV (75%) and a computer with Internet access (69%) (Plowman et al., 2010). Sixty-four percent of the 346 families reported that their three- and four-year-old children surfed websites with adult supervision, and 10% of these children did so on their own. Forty-eight percent of parents also indicated their children could operate a mobile phone with adult assistance (Plowman et al., 2010). Children enjoyed using technology in their homes and were acquiring a range of technical competencies with a variety of digital devices (Stephen, McPake, Plowman, & Berch-Heyman, 2008). New technology was a favoured source of entertainment, but children continued to engage with traditional toys and enjoyed outdoor physical activity (Stephen et al., 2008).

The third longitudinal study by the Scottish research group, *Young children learning with toys and technology* (McPake et al., 2013; Plowman, Stevenson, Stephen, & McPake, 2012), developed in-depth case studies of 14 families with three-year-old children. All families spoke English as a first language and seven families were categorized as low socioeconomic status. This study took place over three years and involved a minimum of nine visits to participants' homes. Data collection included observations of families in their homes, mobile phone diaries kept by parents, and semi-structured interviews with parents and children (audio recorded and transcribed). The study found that by the time children entered kindergarten they had encountered a variety of digital devices, such as mobile phones, TVs, video game consoles, DVD and MP3 music players (Plowman et al., 2012). Children were described as "encountering technologies in the home" (Plowman et al., 2012, p. 33) because encounters were unplanned or fleeting and not predictable patterns. High cost items, such as mobile phones, were less accessible to preschoolers because parents worried about the cost of replacing them if children damaged them (Plowman et al., 2012). The researchers noted that children viewed digital technology as part of their "everyday environment and understood their [the device's] purposes" (McPake et al., 2013, p.426). Children drew from digital technology in play activities, such as dressing up like their favourite character or re-enacting scenes (Plowman & McPake, 2013) or using old and discarded digital tools (e.g., computers, supermarket scanners, or laptops) in their homes as play props during imaginative play and games (McPake et al., 2013). As well, digital technology provided young children opportunities to engage in relevant communicative practices before being able to write or type, for example, sending an emoji or photograph to family members on a mobile phone (McPake et al., 2013; Plowman & McPake, 2013).

The work conducted by the Scottish research team (e.g., McPake et al., 2005; Plowman et al., 2008; Plowman et al., 2012) extended the field of research by documenting children's uses of digital tools and providing evidence of how children engaged with digital technology in their homes. Studies suggest that children use digital media in unplanned ways and understand digital tools' purposes in the context of their everyday lives, and yet digital media does not supplant more traditional childhood activities (e.g., non-digital toys and outdoor play). This finding counters fears expressed by the AAP (2011) and NAEYC (2012) that digital media consumed children's lives and replaced more valuable learning and play opportunities. Recently, Marsh et al.'s (2015) examination of children under five years contradicted the AAP's concerns, as they found children incorporated digital tools into their offline, traditional play activities, for example, by bringing a tablet inside a pillow fort. This research informed the current study by laying the groundwork for further investigation into children's learning and play opportunities in digital contexts and what access parents permit young children. My study builds on this work by examining young children and digital media in a Canadian context and considers children's transitions into formal school, an area of study unexplored by Marsh et al. (2015) and others.

In addition to these large scale, and well-known studies, other researchers explored young children's uses of digital media in their homes. In an effort to shed light on the home ICT experiences of four- and five-year-old children, O'Hara (2011) surveyed parents about their roles in providing "opportunities, recognition, interaction and models of ICT practice" (p. 220) in their homes. Fifty-five Caucasian parents from socially diverse backgrounds responded to the survey and reported that digital tools, such as radio, TV, CDs and DVDs, computers, and mobile phones, were available for their children. Parents noted children could: operate personal computers (PCs) and various video game consoles; operate two or three remote controls in

conjunction with one another; use zoom, widescreen and fast forward options on DVD players (skipping segments of videos they found boring); turn on PC monitors and properly shut down computer systems; locate desired games on the PC; navigate children's websites; and drag and drop files accurately. Families with boys more frequently reported having access to programmable toys, game consoles, and scanners. Access did not necessarily mean use and for example, although 20 of the boys had scanners in their homes, only four parents reported their boys having any experience with them.

McPherson (2011) examined five-year-old children's learning and teaching when using new Information Communication Technologies (ICTs) in their homes. Over 15 weeks, five Canadian middle-class families documented their five-year-old child's engagement with ICT in the home through video recordings. McPherson also conducted semi-structured interviews and video-elicited interviews with the families. He found children learned to use new ICTs from parents, siblings, peers and, in some cases, the ICT itself. The mediation strategies used by participants included "just in time mentoring" (p. 170); child-centred instruction that was playful, unstructured and ultimately encouraged the child's independence; instruction used multiple communication modes; and instruction that allowed the child to become flexible and adaptable to change.

To gauge children's familiarity and knowledge with different digital tools, Aubrey and Dahl (2014) interviewed 50 preschool aged children in 11 small groups (i.e., maximum six children per group; how children were grouped for interviews was unreported). The researchers used an electronic toy as an elicitation device. "Marvin", a "visiting alien" discovered a number of "gadgets" (p.99) and needed the children's assistance identifying them and learning about

their functions. The items assembled were a laptop, portable HiFi, optical mouse (wired), digital camera, mini DV camcorder, *Digital Blue* movie creator, remote control, *Bee-Bot* (programmable toy), and *Digital Blue* computer microscope. Aubrey and Dahl reported that "in every group, children recognized and were confident" (p. 99) using laptops, portable HiFi, optical mouse, digital camera, mini DV camcorder, and remote control. However, whether this finding applied to all children in each group or just to a majority of children in each group was not reported. Every child interviewed indicated they had used a computer or laptop with a mouse in their homes and most commonly reported game play on these devices. CD players were less common, although children in nine of the eleven groups said a CD player was in their home (again, reported by groups, not number of children). Three groups of children had video cameras in their homes and three groups of children recognized and were confident using the *Digital Blue Movie Creator* and *Bee-Bot* programmable toy. Only one group was familiar with the *Digital Blue Computer Microscope*. One child interviewed reported owning his own camera.

The literature just reviewed showed that children lead media-rich lives from very young ages and that parents often introduced digital tools to their children. Homes contained varying levels of digital technology and socioeconomic status did not necessarily predict whether a home was high or low technology in terms of availability or usage. I will now turn my focus to research documenting children's learning with digital tools in the home.

Learning with Digital Tools

In addition to documenting the digital tools children accessed and used in their homes, researchers in Scotland (Plowman et al., 2008; Plowman et al., 2012) identified levels of competencies in four main areas of learning with technology within the home: operational learning; extending knowledge and understanding of the world; developing dispositions to learn;

and understanding the role of technology in everyday life. In this section, I describe each learning area and provide an example of this learning from studies examining children in both home and school settings. I organize these studies by the four main areas of learning, as described by Plowman et al. (2008; 2012).

Operational learning encompasses learning how to control and use devices and getting the technology to do the things you want it to do, (e.g., loading the correct web browser or operating a mouse). Davidson's (2010) conversation analysis of a brother and sister, playing a CD-ROM game, *A Day with the Wiggles*, is an example of children's operational learning of computer practices. Davidson documented how the four-year old brother and six- year old sister played the game and found that the game's repetitive structure oriented family members to assist the children without actively playing the game alongside them. The parents attended to their children when requested and assisted immediately without having to watch the children play. Family members used previous knowledge to talk about the game with the children. From a sociocultural perspective, the gestures and talk by the father and older sister scaffolded the four-year old boy's understanding of the game and helped him navigate the game. Through social interaction, he learned to read symbols in certain ways and to act on these symbols.

Extending knowledge and understanding of the world described the role of technology in finding out about people, places, and the natural world. In a study with different participants, Davidson (2009) described six-year-old Matthew's informational search practices with a computer in his home. In one episode, Matthew, with the help of his father, used Google to search for lizards. His father supported Matthew's searching practices by guiding him (entering keywords into search engine), using gesture (pointing at images on the screen), and verbally

(asking questions, replying and/or reinforcing Matthew's comments, praising Matthew's knowledge), a process Vygotsky (1978) referred to as operating within the ZPD. Interestingly, Matthew did not rely solely on Google for acquiring information about lizards. He combined his Google search with a print-book about reptiles. His mother assisted him in locating the name of the lizard, the green basilisk lizard, in his book. On his own, he copied the words from his book into the Google search bar. By using both digital and print tools, Matthew was able to accomplish his task and, in so doing, extend his knowledge of lizards.

The phrase "dispositions to learn" describes children showing greater concentration and persistence and gaining self-confidence while becoming more competent users of digital media. Levy (2009) documented 12 three- to six-year old children using a variety of texts (digital and non-digital) in both their home and school settings in order to examine how children read digital texts and how this compared to reading paper-based texts. She found that, before entering formal schooling, the children acquired "transferable literacy" (p. 84); that is, the children developed skills that allowed them to "operate unfamiliar technologies with fluency" (p. 84). For example, one participant, Shaun, had little contact with PCs at home. Although he mostly played games with TV, mobile phones and hand-held game consoles, he transferred those skills to the computers at school. His teacher reported that with little instruction, Shaun could, "do loads on the computer" (p. 84), such as play games and search computer files. Levy also described how many of the children in her study could apply their previous knowledge of computers to a new screen context and, with little help, "access a range of texts with independence" (p. 85), such as transferring the knowledge of a desktop mouse to a laptop trackpad.

Understanding the role of technology in everyday life considers how children develop a "cultural awareness" (Plowman et al., 2008, p. 309) of digital technology's role in their family life. Children may demonstrate this awareness by asking to send family members who live at a distance a text message or picture, or by using vocabulary related to digital tools, such as "load Internet" or iPhone (Plowman et al., 2008). Children come to understand the role of digital technology in everyday life through both observation of adults and through adult scaffolding (Bruner, 1983, 1986). In her study, Wong (2015) described how five-year-old Andrew used the iPad and could independently take photographs, enter passwords and spell "Lego" when using search engines. While at childcare, Andrew used the iPad to video record his play with friends. At home, the iPad contributed to Andrew's motivation and independent learning as he simultaneously engaged with Lego instructions, print books, and YouTube videos reviewing Lego. Despite his limited traditional reading and writing skills, the iPad allowed Andrew to produce and design literacy texts. For example, Andrew, with the help of his father, planned, rehearsed, recorded and uploaded his own Lego review to YouTube. His engagement with the Lego reviewer community on YouTube inspired and motivated him to create his own Lego review and the iPad allowed him to accomplish this task.

Play and Digital Tools

Sociocultural perspectives of play acknowledge the learning opportunities play affords children in exploring cultural symbol systems and appropriate use of cultural tools to solve problems and participate in the social activities of their communities. Play activity offers children experiences and opportunities to use language and literacy as they see it practiced (Roskos & Christie, 2001). Descriptions of play typically identify five characteristics (Bruner, 1983):

- provides a reduction in the seriousness of the consequences of errors and setbacks;
- allows a very loose linkage between means and ends;
- follows a scenario and is rarely random;
- is a projection of interior life onto the world in opposition to learning through which we interiorize the exterior world and make it part of ourselves; and
- gives pleasure.

The reduction of seriousness in play allows children to experiment with their surroundings to solve problems and is integral in "shaping children's relationships to their bodies, tools, communities, surroundings, and knowledge" (Jenkins, 2006, p. 22). In play, children try on roles, experiment with cultural processes, manipulate resources and explore their worlds (Jenkins, 2006). In contemporary society, children engage in play activities that incorporate adult-world digital tools and "pretend their way into [digital] literacies by 'playing at' using computers, iPads, or cellphones as they try on technologically savvy user identities" (Wohlwend, 2010, p. 145). Huh (2015) noted that children pretended to be their favourite digital game characters while engaged in non-digital play. For example, one of the children in her study, Chan, pretended to be a "super strong …" (p. 164) robot, a character from his favourite digital game, while he used a plastic squirt gun to water his mother's tomato plant. He also recreated scenes from this game while playing with his friends in rough and tumble play, climbing on the couch while pretending to be characters from the game. Huh found that the girls in her study sought out games that mimicked behaviours of their mothers, such as "taking care of pets, feeding others, and cleaning their room" (p. 165). The girls were described as "serious and hard-working while

playing these games, using voices and gestures to mimic their mothers' behaviors" (p.165). Four-year-old Kelly, in Stephen et al.'s (2013) study, used her *Puppy Grows & Knows Your Name* electronic toy dog in imaginative and creative play. Kelly constructed an evolving story of "a family of toys going to a ballet class" (p. 159). Two other notable examples of children pretend playing with digital tools come from researcher Karen Wohlwend's observations of children in kindergarten and grade one classrooms. Wohlwend (2009a) described how a kindergarten boy cut and pasted paper to create his own iPod that included headphones and an "LCD screen display" (p. 126) so that he could read and view "*Thomas and Friends*" (p. 126) with his classroom peers. In the other example, Wohlwend described two first grade boys engaging in a paper-based game they invented based on their favourite videogame, *Digimon Rumble Arena*. On a single sheet of paper, the boys created a "screen" view, including a "life bar", to gauge the health of each of their characters, as they took turns "attacking" one another until completion of the game (p.128).

Virtual world play. Much of the research examining children's experiences with technology focused on how children incorporated digital devices into their play activities. Some research has focused on the play children engage in as they use digital tools, specifically, children's literacy practices and play opportunities inside virtual worlds, such as *Club Penguin* and *Webkinz*. Although this research mostly occurred in school settings with older children (e.g., eight years and older), it is a burgeoning field of scholarship and worth discussing in relation to the current study.

Marsh (2010) found that virtual worlds allowed five- to 11-year-old children to experiment with the defining characteristics of socio-dramatic play: imitative role play, make-

believe with objects, make-believe with actions and situations, interaction, persistence, and verbal communication with other players in the virtual world. She surveyed 175 white, working class children between the ages of five and eleven years in their primary school. Of the 175 survey respondents, 38 were between five and seven years of age. Marsh conducted 20 semi-structured interviews at the primary school. Ten participants were six or seven years of age, while the other 10 children were 10 and 11 years of age. She asked the children questions about their use of virtual worlds and found many virtual worlds (e.g., *Barbie Girls*, *Club Penguin*) allowed children to create avatars, dress the avatar, decorate homes, purchase and care for pets, and play games to earn money so more items could be purchased for their avatars. Through these avatars, children engaged in fantasy play, socio-dramatic play, ritualized play, games with rules, and online versions of rough and tumble play. Although Marsh showed evidence that children engaged in sociodramatic play, what is unknown is how this virtual sociodramatic play develops children's imagination, which is what Vygotsky (1978) argued is necessary for children's cognitive development. Many elements of virtual worlds are pre-planned by software engineers and computer programmers which may limit the development of children's imagination when they are engaged in virtual play. More research is needed to draw stronger conclusions.

Other studies showed children sometimes engaged in parallel play while using these worlds by sitting side-by-side in computer labs or at home (Marsh, 2011; Wohlwend, Vander Zanden, Husbye, & Kuby, 2011). Wohlwend et al. (2011) also found virtual worlds provided school-aged children a space outside of school to interact and socialize with peers during times when they would typically be unable to do so, such as afterschool and evenings. This was an important finding, given the emphasis on social development and building secure relationships

by organizations, such as the AAP and CPS. Again, further research is needed, but children's use of virtual worlds and on-line games is possibly not as isolating as originally believed.

Researchers have documented the ways children draw from digital technology in their play, such as recreating favourite video games on paper. Children also use non-digital objects to represent digital tools, such as smartphones, in their non-digital play activities. As well, researchers noted traditional categories of play, such as fantasy, rough and tumble, nurturer, and so forth, are apparent in virtual world play. Some researchers, like Jackie Marsh and Karen Wohlwend, advocated for digital play to be valued as strongly as traditional play and indeed, do not view these play activities separately, but rather, as part of children's overall repertoire of meaning making. As well, the amount of information available online, young children's uses with digital tools, particularly in the presence of a parent or caregiver, presents children with another tool to acquire knowledge before entering formal schooling. Parents and caregivers have a critical role to play in building productive digital learning and digital play environments. In the next section I will focus on parents and the role their beliefs and attitudes about children learning with technology play in shaping the digital literacy practices in the home for their children.

Parents' Digital Literacy Practices and their Beliefs about Young Children's Digital Engagement

In addition to what digital tools young children engaged with, researchers documented families' digital practices and parents' perceptions of technology in the home. Parent beliefs were influenced by media discussions of young children using technology, parents' educational backgrounds, and their prior experiences of using technology for work, study or leisure (Plowman et al. 2008, 2010). Research focused on questions concerning: families' uses of digital

devices, such as TV, computer games, mobile phones (Gillen et al., 2018; Marsh et al., 2017b; Ozturk & Ohi, 2018; Plowman et al., 2008, 2010; Wong, 2015); how children implicitly learned about digital tools seeing adults and others use these tools for various purposes in their daily lives (Plowman et al., 2008); parents' perceptions about appropriateness and the readiness of their children to engage with digital media (O'Hara, 2011); and the mediation strategies parents provided children who are using digital tools (Davidson, 2009; 2012; Gillen et al., Marsh, 2004; Ozturk & Ohi, 2018; Stephen et al., 2013)

Families' uses of digital devices. In order to understand children's digital uses, researchers observed how parents and other family members used digital media and technology in their homes. As reported earlier, Plowman et al. (2012) noted differences between low and high technology homes, the types of digital tools children were using, and how families introduced new electronic toys and video games to children. They found that parents believed the "complexity of the interface" (p. 33) could frustrate their children so games or devices requiring plenty of reading were limited to joint play-time (e.g., playing with an older sibling or parent), an example of using Vygotsky's (1978) ZPD. As well, parents sought to protect their children from becoming "socially isolated" (p. 35) by limiting digital media usage. Parents attempted to strike a balance between "solo and shared, educational and playful, and screen and non-screen activities for their children" (p. 35). Plowman et al. also noted that parents limited children's autonomous use of digital devices because they worried that children would damage costly items (e.g., computers or mobile phones) or they believed a device was too complicated for a child to use without becoming frustrated. Similarly, Wong (2015) found that, although the 10 families (four Australian, six Canadian) with children aged three to five years in her study had a range of digital tools (e.g., TV, computers, video game consoles, DVD players, digital camera, and

mobile touchscreen devices), some families owned many digital tools while others did not. Wong (2015) characterized families into three groups: new digital disposition; new and old dispositions; and traditional literacy disposition and willing to explore new digital tools. New disposition families allowed a wide range of technology into the home and were enthusiastic and competent users. These families rarely monitored screen time. New and old disposition families held mixed values towards traditional literacies and new technology. Families shared devices, with some parent supervision of technology use and monitoring of screen time. Traditional literacy disposition families' homes contained one computer, one TV and one smartphone. These families held a willingness to explore with new digital tools, but did not allow children to freely use technology without parent supervision. These parents were guarded about technology and worried about their children's safety on the Internet. Wong (2016) anticipated differences in digital use between Australian and Canadian families but found the families were similar in home digital literacy practices. However, she reported differences among families living in urban centres and those living in rural locations. For example, families living in urban communities accessed faster Internet and more frequently downloaded movies and TV programs online. In contrast, she found rural families with slower bandwidth speed, "abandoned or avoided downloading videos from the Internet" (p. 178). However, Wong noted children in rural communities expressed interest in similar popular culture items (e.g., *Minecraft* and *Club Penguin*) as children living in urban communities.

Connell et al. (2015) conducted an online, nationally representative survey of 2,326 parents with a child (or children) aged eight years or younger in the United States. They sought to determine whether parent-level and child-level demographics predicted parent-child co-use of six different types of media technologies. Connell et al. (2015) found that parents co-used books,

computers, smartphones, tablets and video games with their children. Books were most frequently co-used, with 92% of respondents reporting they engaged in this practice "all or most of the time" or "some of the time" (p. 12). Computers were reported by 89% of respondents, although 70% of those surveyed stated "some of the time", not "all or most of the time". Sixty-three percent of respondents reported co-using the smartphone with their children, while 64% of respondents co-used tablets "all or most of the time". Finally, 53% of survey participants reported co-using video games "all or most of the time" with their children. Wolfe and Flewitt (2010) similarly noted in their case study of 10 ethnically and socially diverse families with three- and four-year-old children, that parents and other significant adults often shared in children's technology and screen-related activities, such as "watching TV and using a computer, and also shared in traditional literacy activities, such as reading books" (p. 392).

In terms of adult level and child level determinants of co-usage, Connell et al. (2015) found that parents who spent more time at home with their children (e.g., stay-at-home parents or part-time employees) more frequently co-used media with them. Mothers were "significantly more likely to co-use [print] books" (p.13) and "fathers were significantly more likely to co-use video games with their child" (p. 13), a finding consistent with that of Marsh (2004). In addition to parent gender, the researchers found that the child's gender played a role in the type of media co-used with the parent. Parents were more likely to co-use computers with boys and watch TV with girls. Age was the strongest predictor of co-use, with parents more likely to share their children's experiences with media if the children were younger; that is, as children aged, parents felt it was less necessary to supervise their digital media consumption. As well, parents were more likely to co-use books, TV, tablets, computers, and video games if they themselves used those media devices. The amount of time parents spent using smartphones for their own purposes

did not predict whether they used a smartphone with their child. However, Plowman et al. (2010) found a strong link between parents' personal uses of digital technology and the digital opportunities they afforded their children. Given the discrepant results, further research on parents' personal use of digital technology is warranted, particularly in light of the AAP's (2016) and CPS's (2017) documented concern of parents' personal media habits in their policy recommendation statements.

Parental judgement about the appropriateness of technology and their children's readiness to use technology. Parents make judgements about the appropriateness of various digital tools for their children and about their children's readiness to interact with and learn from these various digital tools. In addition to querying parents' personal digital use, O'Hara (2011) surveyed them about their beliefs and attitudes towards children's "appropriateness and readiness" (p. 228) to use digital technology. The beliefs of the 55 parents surveyed fell along a continuum between positive and negative perceptions of young children's use of digital technology. O'Hara found that parents' criteria for making these judgements were often based on "social and cultural [beliefs] rather than cognitive or developmental origins" (p. 228). The parents who positively viewed digital technology for children modeled and scaffolded their children's uses of digital media, while parents who negatively viewed digital technology restricted and limited their children's access and use. Earlier research described similar findings and for example, while Marsh (2005) found some parents held positive attitudes towards TV as a tool for both entertainment and learning, Wolfe and Flewitt (2010) found parents negatively viewed digital technology and restricted children's access. Parents indicated that they did so because of concerns about the "effects of screen-based activities on children's overall development" (Wolfe & Flewitt, 2010, p. 392). These findings suggested that different parents

value different activities for their children and that attitudes toward technology influence the home environment they provide for their children. This has implications for 21st century learning and development as school curricula continue to emphasize the need for 21st century skills. As an example of the shift in curriculum to a 21st century model, the new British Columbia Curriculum, *BC's New Curriculum* (2016), has acknowledged that:

> [t]oday we live in a state of constant change. It is a technology-rich world, where communication is instant and information is immediately accessible. The way we interact with each other personally, socially, and at work has changed forever. Knowledge is growing and information is changing extremely quickly, creating new possibilities. This is the world our students are entering. British Columbia's curriculum is being modernized to respond to this demanding world (n.p.).

Children from homes where parents value non-digital play and learning activities and eschew digital technology will enter school with few experiences with digital technology and will likely need more support in learning activities that require the use of these tools.

Many researchers have been interested in understanding parental perceptions of the role of technology in children's lives. Vittrup et al. (2014) interviewed 101 middle class parents of children between the ages of two-years and seven-years and interviewed 39 children between the ages of three-years and six-years (M= 4.6 years) from a large metropolitan area in southwestern USA. Although the majority of their survey respondents were Caucasian (83%), parents identifying themselves as one of Hispanic (8%), American Indian (3%), Black (3%) and Asian (2%) also completed the survey. The survey focused on parents' perceptions of children's knowledge and children's practice with various media tools and interviewed the children to understand their perceptions of their own knowledge and experience with media tools. Vittrup et

al. (2014), found that parents tended to underestimate the amount of time children spent with media and assumed children accessed mostly positive content. In a similar vein, Dodge, Husain, and Duke (2011) found contrasts between what the 37 parents they interviewed believed that their children could do on the Internet and what the children could actually do. For example, 50% of parents believed their children could independently navigate websites, while only 41% of the children could actually navigate websites independently and 54% of parents believed their children could operate a search engine unassisted while in actuality only 17% of the children could operate a search engine.

TV was the most commonly used digital tool identified by parents and children in Vittrup et al.'s (2014) study. Fifty-three percent of parents reported restricting their children's access to technology, but restrictions were to digital tools in children's bedrooms. Ninety-eight percent of children had their own educational technology toys such as Leap Pads. An intriguing finding was that 33% of parents felt media exposure for children three-years of age and younger was important for brain development, which contrasts with the American Academy of Pediatrics (2013) recommendation to "discourage screen media exposure for children <2 years of age" (p. 959). These parents felt their children could fall behind academically if they did not expose them to technology in their early years. Sixty-two percent of parents believed preschool aged children naturally understood how to use computers and related technology and felt that technology introduced early in their children's lives prepared them for the future work force.

In the study mentioned earlier, Aubrey and Dahl (2014) found that parents believed technology contributed to a child's learning and development and felt technology was required for life in today's society. The parents lived within a range of areas of northern England and the

Midlands in rural, urban, and suburban locations and were a mixture of low to high socioeconomic families. Of the 39 parents interviewed, eight felt information and communications technology (ICT) helped children develop basic skills, like letters, numbers and colour recognition. They also believed that using the mouse helped develop hand-eye coordination. Although parents acknowledged the importance of ICT as a learning tool, they stressed computer use was for skill development and appeared not to have considered "the important mediating role of adults in enhancing learning" (p. 100). Most of the parents believed their children were competent ICT users; however, four parents said their children did not use technology at home. Similarly, Schlembach and Johnson (2014) examined parents' views of screen media and noted parents felt screen media was an important learning tool for children. However, parents did not report that they actually used digital technology for the purpose of teaching their children. Parents felt it was important to watch TV and DVDs with their children and that parents "often or most of the time intentionally watch[ed] programs with their children" (p. 98). Co-viewing was not regarded as necessary for some parents as they allowed children to watch screen media independently so that they could complete household chores efficiently.

In their study of 40 families with six- or seven-year old children from Belgium, Portugal, Latvia, and Germany, Dias et al. (2016) found that parents played the role of "gatekeepers" (p. 417), both facilitating and constraining access and use of digital media. Parent mediation was shaped by their perceptions of digital technology and by tensions between parents, as mothers and fathers did not always hold the same view towards digital media. Mothers tended to be more restrictive in general and controlling of content, while fathers were more flexible and less strict. Fathers shared digital gaming sessions with their children, especially if they were (currently or when younger) gamers themselves. Parents limited children's time engaged in screen-based

activities based on their intuitions of when children had played long enough. Parents' perceptions of the digital media as "responsible entertainment" (Dias et al., 2016, p. 418) and as "educational tools" (p. 418) influenced what they made available to their children at home. Dias et al. found most parents' perceptions towards children's uses of digital media were ambivalent. Many of the parents saw educational value in digital technologies and described them as "indispensable tools for the future" (p.419), highlighting skills children developed while using technology, such as problem-solving, collaborating, or hand-eye coordination. Yet, parents expressed nostalgia for their own childhood, preferring children "engage in physical or outdoor activities" (p. 420) and feared excessive use of digital media would result in a lack of physical activity, poor sleeping habits, social isolation, and negative psychosocial consequences. The latter concern may reflect the concerns articulated by organizations such as the AAP.

The studies reviewed in this section tend to show that parents' beliefs about children's uses of digital technology fall on a continuum, rather than simply being positive or negative. Parents exposed children to technological play and digital educational resources in their homes, while also being skeptical about the learning value of technology and technological toys (Stephens et al., 2013). For example, Stephens et al. (2013) reported one mother who was happy to have her daughter play with the *FurReal* puppy, but held no expectations that the toy would "support learning and would not have purchased the toy" (p. 157). Mandy, a mother in Wolfe and Flewitt's (2010) study, felt confident in her ability to use the Internet to find information and resources and allowed her twin daughters to join her; however, she did not allow her daughters unfettered access.

Overall, the studies suggested that parents value digital technology as a learning tool, even if they did not specifically use digital tools for this purpose. Socioeconomic status does not

appear to influence whether a home is low-technology or high-technology. Mothers and fathers, sometimes in the same household, can hold differing attitudes towards their children's digital media use. What is common between women and men is their underestimation of their children's digital abilities, as parents appear not to be as familiar with their children's digital skills as they believe they are.

Parents' scaffolding and explicit instruction. The literature suggests that regardless of parents' attitudes towards young children's digital engagement, when children use digital tools, parents support them. Bruner (1983, 1986) used the metaphor of scaffolding to describe adults' teaching of skills to children. Parents provided more support, or more scaffolding, when the child was first learning, and slowly removed levels of support as the child's competence grew. However, as the studies reported below show, parents were not always aware of their scaffolding in the home. For example, although three-quarters of the parents who participated in Plowman et al.'s *Entering e-Society* study (2008) expressed the view that children learn to use digital technology in the home by "just picking it up" (p.311), the researchers found that parents played a much more explicit role in their children's digital learning. Parents believed they were not directly involved in their children's digital learning because they did not explicitly tutor their children; however, the ways children were learning were not necessarily visible and parents underestimated their own roles. Parents guided their children by explaining and demonstrating technical skills and by reading rules and instructions. Parents demonstrated how to use digital technology on a daily basis without realizing they were doing so, which led them to believe children's digital learning was effortless. Parents' demonstrations of technology were motivated by a desire to encourage children's independent use (e.g., turn the TV on by themselves), or in "response to a direct request for help" (p. 314); they did not view this as teaching and did not

realize how much modelling they were doing. However, Plowman and McPake (2013) noted that, even when parents provided purposeful and direct instruction, such as explaining how to scroll down a webpage, they viewed support as unintentional and, when asked, continued to report that children just "picked it up". Plowman and McPake highlighted that parents guided children's digital media interactions by "showing interest, asking questions, or making suggestions" (p.28).

As an extension to the *Young Children Learning with Toys and Technology Study*, Stephen et al. (2013) introduced four new technology toys into the homes of four economically advantaged families already participating in the larger study. The children selected one of: *Nintendo Wii* video game console, *Leap Frog Tag* reading system, or a technological "pet", such as *FurReal Lil Patter Pup*. Parents video recorded their children using these digital tools over a one-week period. Stephen et al. found that parents contributed to young children's engagement with new technology by using a variety of actions. These actions included: verbal and non-verbal responses and interventions, physical actions, cognitive activity in the form of reading, and socio-emotional behaviours. Parents "gave instructions; explained, praised and monitored scores; modelled engagement and prompted actions and answers" (p.160). This repertoire of interactions was common across the four participant families. Parents also offered help to young children to overcome the emotional and behavioural consequences of the children's frustrations while engaged with digital media.

In this section, I highlighted key findings in three strands of empirical research related to the study of how young children use digital tools in their homes and their emerging digital literacy practices before and during their transition to kindergarten. In addition to the theoretical

constructs I described above, the following findings from empirical research shaped my research questions, guided my data collection, and informed my understanding of the data I collected. For many children in western countries, such as Canada:

- their lives are media-rich from birth;
- they possess a wide-range of skills, knowledge and understanding about digital technology by the time they enter kindergarten;
- they are introduced to technology and supported by parents in its use;
- they learn operational skills, extend their knowledge and understanding of the world, develop dispositions to learn, and understand the role of technology in their everyday lives through their use of digital technology;
- they incorporate aspects of digital technology into their non-digital play;
- they engage in non-digital play while using digital media; and
- parents make judgements about the appropriateness of various technologies for their children and about their children's readiness to interact with and learn from various technologies.

Furthermore, based on a literature search and the review of research on young children's use of digital technology, I conclude there is no known research that considers children's transitions into kindergarten.

Summary

In this chapter, I presented the conceptual framework guiding this study. Specifically, I described constructs from Sociocultural Theory (Vygotsky, 1978), the New Literacy Studies

(Barton & Hamilton, 2000; Knobel & Lankshear, 2007; Marsh, 2004; New London Group, 1996; Street, 1984, 2003), and Play (Vygotsky, 1978; Wohlwend, 2011). As well, I described findings from empirical research about: (a) young children's digital technology access and use; and (b) findings from research on parents' perspectives of young children's digital technology use. These shaped my research questions, guided my data collection, and informed my analysis of the data I collected. In the next chapter, I describe the research methodology used in this study.

Chapter Three: Research Methodology

In this chapter, I describe the research methodology of the study. I begin by presenting the rationale for selecting qualitative methods in the research design. Then, I discuss data gathering and data analysis methods. Finally, I describe my role in the research and discuss issues of trustworthiness.

The Research Design

Rationale for Research Design

I chose to carry out a case study with the boundaries of the case drawn around focal children's entry to kindergarten (Yin, 1994). I investigated these children's digital tool use in their homes both before, and as they transitioned into, kindergarten. Specifically, I documented the digital tool use of three children in two families living within an urban area in western Canada. Although there is research documenting preschool children's experiences with digital media (Chaudron, 2015; Connell et al., 2015; Marsh et al., 2017b; Ozturk & Ohi, 2018; Plowman et al., 2013; Stephen et al., 2013), there is no known research that examines digital literacy practices as children transition into formal schooling. Purcell-Gates (1996) noted that parents felt that the beginning of formal schooling, and therefore formal literacy instruction, was an "appropriate time *to begin or increase* their involvement in their children's literacy learning" (p. 426, emphasis in original), signaling the influence of schooling on families' activities in their homes. As well, Marsh (2013) identified a need for researchers to begin documenting children's digital engagement during their transition to more formal schooling.

As stated in Chapter 1, the following questions framed the data collection and analysis for this study:

1. What digital tools are the four and five-year-old children in this study using in their homes? b) What digital tools can they access?
2. How do the parents mediate or support digital tool use in these children's homes? b) What is the nature of this support or mediation (i.e., is digital tool use connected to developing digital literacy in young children)? c) And, what attitudes and/or beliefs inform parents' structuring of the home digital environment?
3. How do the children use digital tools in their home? b) Do they incorporate digital tools into their play and, if so, how and for what purposes (e.g., creating narratives, creating a visual display, etc.)? c) Do the children use digital tools specifically to help them acquire knowledge?
4. Do the children's uses of digital tools change as they prepare for entry to kindergarten? b) Do their parents use digital tools to support their children's preparation for formal schooling (i.e., for learning purposes), and if so, how?

Given my interest in families' digital literacy practices in their homes, I needed a research methodology suited to naturalistic inquiry and that considered time and place. The research methodology also needed to provide space for considering how different parents' attitudes, values, and beliefs about digital technology (their digital literacy practices) influenced their young children's access to and use of digital tools. A case study seemed most appropriate in allowing me to achieve my goals. Merriam (1988) suggested that the end product of a case study is a "rich, 'thick' description of the phenomenon under study" (p. 11). Yin (1994) described case study research as, "an empirical inquiry that investigates a contemporary phenomenon within its

real-life context" (Yin, 1994, p.13). Creswell (2007) added that case study research seeks to understand phenomena with a "case as a specific illustration" (p.73). The interpretative nature of my research questions lent itself to a qualitative research design. I focused on multiple interpretations of a single event (Merriam & Tisdell, 2015) and acknowledged meaning was constructed, not discovered or found (Dyson & Genishi, 2005; Merriam, 1998). Merriam (1998) described case study as, "a single thing, a single entity, a unit around which there are boundaries. I can 'fence in' what I am going to study" (p. 27). This bounded structure is the key distinction between case study and other types of qualitative research. The current study was bounded by time, in that it documented digital literacy practices of families during their children's entry to kindergarten, but was also bound by two family units. Since my research questions focused on the digital literacy practices of families, I bounded each case to their home and immediate family. The focal children's time at school and with peers was not observed and therefore not bounded within the case study.

I drew data from interviews with the two mothers (one at the beginning of the study, the other to close the study), informal conversations with the children and the mothers, observations of digital literacy events in the homes documented through fieldnotes, audio records of children and/or parents during digital events, and photographs of digital tools in the home and of children (and parents) engaging in digital events. My goal was to document how children used digital tools in their regular lives over prolonged engagement with the focal families and these tools were appropriate for this purpose.

Selection of Participants

The selection of participants was purposive rather than random, in that I sought families with an eldest child entering kindergarten in September 2015. Families were drawn from an urban area in western Canada. My reason for selecting first born children was that one of the research questions aimed to answer whether children's and families' digital literacy practices changed during the transition to formal schooling. I felt that families with a child already in school could be receiving implicit and explicit messages from the elementary school which would inform literacy routines for their younger child(ren). Given the position statements of the AAP and NAEYC and their possible influence on teachers' beliefs about young children using digital tools, I did not want to recruit families who may have received messaging about digital tools directly from their child's elementary school. Following ethics approval in October 2014, I used third party recruitment and sought out families by talking with acquaintances who knew families with children in the target age-group. Once connected with eligible families, I gave parents who indicated that they might be interested in participating in the study a letter of introduction and provided my contact information. The mothers contacted me and agreed to participate in the study. They also gave consent for me to involve their children in a process of assent to make sure the children were willing participants in my study. Prior to the first semi-structured interview, I gave each mother a consent form and pointed out that participants had the right to withdraw from the study at any time. I also assured them that confidentiality would be maintained throughout all phases of the study using pseudonyms. I explained that I would ask their child(ren) for permission to participate in the study through the process of assent. Once the mothers provided consent, I began the first semi-structured interview, and once the interview was completed, we arranged an appropriate time for me to visit their homes and meet with the

children. Assent with each focal child occurred during the first observation, approximately 30 minutes into my visit to their home. I wanted to give children time to meet me and talk to me before explaining my research study. I explained that I wanted to visit them in their homes to learn about how they played and learned. I told them I was interested in what types of digital technology they used and that I would ask them questions about their favourite devices and digital activities, as well as their favourite non-digital activities. I also explained that sometimes I would take photographs of them and that they could decide whether I took photographs at particular moments. As well, I explained they could tell me they did not want me to visit any more and that that was alright. To conclude the assent process, children selected their own pseudonyms. The information letters and consent/assent forms are included in Appendix A.

Participants

The two families who participated in my study were Caucasian, middle-class families living in a large urban area in British Columbia. The parents did not divulge income levels (and I did not ask for this information), but I categorize them as middle-class based on the neighbourhoods where they lived (Statistics Canada, 2016 Census of Population) and the educational attainment levels of all three parents (i.e., all parents have earned a Bachelor degree). The case study, therefore, was bounded by both time (i.e., children's entry to kindergarten) and by family unit. The first family unit participating in this study was a mother, father, and their twin children- a male and a female living together in a single detached house. I was introduced to this family by a colleague and spoke on the telephone once with the mother (**Sarah**[2]) before meeting in person for the first semi-structured interview. The second family unit was a single-

[2] All names are pseudonyms. Children's names are self-selected while I selected the parents' names.

mother and daughter living in a one-bedroom apartment. I was acquainted with this family as we lived in the same community and frequently spoke to one another as we went about our daily lives there. On one of these occasions, I described my study to the mother and she expressed an interest in participating. Both mothers were the primary adult participants in the study. In both families, the mother was the main caregiver in the home (in the case of the single-mother, the only caregiver in the home) and was therefore most suitable for the study. The father in the first family unit worked fulltime and the mother most frequently organized my in-home visits during his working hours. When he was available for the study, it was typically before he left home for work, or after he returned at the end of the day.

Skywalker family. Sarah and I spoke once on the telephone before I conducted the semi-structured interview. During our telephone conversation, I described my study to her and what being a participant would entail. She agreed to meet with me in-person for an interview. We met at a nearby community centre, and I again described my study. I gave Sarah a consent form to review which she signed before we began the semi-structured interview.

Sarah and her husband, **Craig**, owned a single, detached two-bedroom home in which they lived with their twin children, a male and a female. The basement of their home was renovated into a two-bedroom apartment, which they rented out to young professionals. The family used the upstairs area, which consisted of a large living room that led to the kitchen. The living room was sectioned into two distinct areas. The couch served as a wall separating the sitting room (e.g., couch, chairs, and coffee table) from an open play space for the children. The play space contained shelving (for storing craft/art supplies, toys and games), a child-sized table with two small chairs, and a duel-sided easel. One side of the easel was a white board and the other side had a clip for pinning paper. Bedrooms were located to the left, down a hallway, with

the bathroom separating the bedrooms. When the study began, the children shared a bed located in their parents' bedroom. Sarah explained this was because the children slept through the night this way. The other bedroom served as a playroom for the children and was where their Lego table was housed.

Craig was a software developer and worked outside the home in an office downtown. Craig worked Monday to Friday and was gone from breakfast until dinner. Sarah was a fitness instructor and personal trainer, which allowed her to work part-time and schedule her own hours. Since the twins' birth, Sarah was the primary caregiver, while Craig worked outside the home. Sarah's adaptable work schedule meant she scheduled her classes and training sessions around the children's structured activities, such as preschool. The children attended play-based preschool four days a week for three hours each day. The program emphasized physical, social-emotional, and intellectual skill development, including a structured phonics program and letter of the week.

Luke was five-years old when the study commenced. He and his twin sister, Leia, celebrated their fifth birthday one week before the study began. Luke was interested in digital technology, but was limited to infrequent, short periods of use. Luke liked rough and tumble physical play with his sister and peers and spent much of his unstructured time building with Lego at his Lego table. Luke enjoyed books and listening to someone read and played board and card games with his family.

Leia was less interested in digital technology than Luke was. She preferred to colour in colouring books and draw on paper or her whiteboard easel. Leia also enjoyed books and reading stories and playing board and card games with her brother and parents. She particularly enjoyed

dramatic play and enacting narratives with her stuffed animals, *PlayMobil* figures, brother, and peers.

As noted previously, on my first visit to the home, I obtained assent from each child to participate in the study after Luke and Leia had an opportunity to get to know me. I explained that I would visit their home about once a month to talk to them and watch them play. I also explained that I would sometimes talk about their play with others and they would therefore need a different name for me to use. They eagerly selected their own pseudonyms for this study.

Gaston family. Lindsay was an acquaintance I met in the community where I lived. She agreed to participate in the study when I mentioned I was looking for families with an eldest child entering kindergarten in the fall. Lindsay invited me to her home to conduct the first semi-structured interview. I explained the nature of my study to her and answered her questions about my study. Lindsay signed the consent form and I conducted the semi-structured interview.

Lindsay was a single mother with one female child. She and her daughter lived in a rented one-bedroom apartment in an urban area. Lindsay's daughter slept and played in the lone bedroom while Lindsay's bed was in the living room. Lindsay had arranged the furniture to separate her sleeping space from the living space, facing the couch away from the bed, towards the wall that separated the kitchen and living room.

Lindsay worked fulltime in the culinary industry, which meant she worked outside the home Monday-to-Friday. Her work was located in a neighboring suburb and required her to commute approximately 30 minutes each day before and after work. Her daughter attended a licensed childcare centre during her mother's working hours. Prior to her culinary career, Lindsay completed a degree in visual design.

Belle, an only child, was four-years old when the study commenced; she celebrated her birthday in June 2015. From the age of 12 months, Belle attended childcare five days a week while her mother worked. The childcare centre followed a play-based curriculum that focused on different themes throughout the year. The centre fostered academic development through activities such as circle time, shared book reading or read alouds, and learning the letters of the alphabet. Belle was interested in digital technology and used digital tools as Lindsay allowed. She also enjoyed reading stories and reenacting narratives from her books. She engaged in dramatic play with her stuffed animals and Disney princess dolls and an assortment of kitchen and restaurant dramatic play toys (e.g., tea party set, grocery set, etc.). I obtained Belle's assent to participate when I visited her home to conduct a semi-structured interview with Lindsay. I explained to Belle that I would visit her home about once a month to talk with her and to watch her play. Belle agreed to participate and selected her own pseudonym.

Data Collection

I used qualitative research procedures grounded in the ethnographic tradition of Hymes (1972) and Heath (1983), while also using newer technology in an attempt to construct a more complete portrait of each focal child's and his/her families' digital engagement in everyday life (Plowman & Stevenson, 2012). To reiterate, my aim was to document and describe young children's digital tool use and engagement in digital literacy activities in the context of family life before and as they transitioned into kindergarten. Data collection included semi-structured interviews with the mothers (one conducted at the start of my study and one conducted at the end of the study), participant-observations in the children's homes, informal, *in the moment* interviews and conversations with parents and children during observations, photographs taken

during observations, and photographs sent to me via text message by the mothers. Data collection took place over a period of 12 months. A summary of the data collection methods and how they relate to the research questions is presented in Table 3.1. As summary of total amount of data collected by data collection method is presented in Table 3.2.

Table 3.1. Summary of Research Questions and Data Collection Methods

Research Question	Entrance and Exit interviews	Observations	Digital Tool Inventory	Informal Interviews	Photographs/ Artifact collection	Media Capture Function
1.What digital tools are the four and five-year-old children in this study using in their homes? What digital tools can they access?	√	√	√			√
2a. How do the parents or significant adults mediate or support of digital tool use in these children's homes?	√	√		√	√	√
2b. What is the nature of this support or mediation (i.e., is digital tool use connected to developing digital literacy in young children)?	√	√		√		
2c. What attitudes and/or beliefs inform parents' structuring of the home digital environment?	√	√		√		

Research Question	Entrance and Exit interviews	Observations	Digital Tool Inventory	Informal Interviews	Photographs/ Artifact collection	Media Capture Function
3a. How do the children use digital tools in their home?		√		√	√	√
3b. Do they incorporate digital tools into their play and, if so, how and for what purposes (e.g., creating narratives, creating a visual display, etc.)?		√		√	√	√
3c. Do the children use digital tools specifically to help them acquire knowledge?		√		√		
4a. Do the children's uses of digital tools change as they prepare for entry to kindergarten?	√	√		√		
4b. Do their parents and significant others use digital tools to support their children's preparation for formal schooling (i.e., for learning purposes), and if so, how?	√	√		√		

Table 3.2 Summary of Total Amount of Data Collected by Data Collection Method

	Length of first semi-structured interview	Length of exit semi-structured interview	Total number of observations	Average length of each observation	Total number of photographs collected in the home	Total number of Media Capture Function images
Skywalker family	36:21	40:56	10	1:49.52	115	2
Gaston family	32:24	39:27	10	2:00.03	58*	0

*The difference in total photographs in each home is due to there being two focal children in the Skywalker home and one in the Gaston home.

Data Collection Tools

Given the age of the children, I knew I would be unable to simply sit and record observations in a notebook. I expected the children to involve me in their play while I was in their homes to conduct observations. As a means of recording conversations, I wore an audio recorder around my neck and transcribed the recordings after my home visits (approximately one month after each visit). I then combined data from these transcripts with my fieldnotes to create as full an account as possible of "what went on" during my visit. I maintained a reflexive journal where I recorded inferences, questions, or comments in relation to my observations. I wrote fieldnotes immediately after in-home observations in a notebook; they focused on observations that I could not document by audio recordings alone, such as where the parent and child were sitting or standing during a digital event. I also used my iPhone to take photographs of the objects and activities I observed in the home. The use of smartphones and mobile media in qualitative research is a new phenomenon, but the benefits of using these devices for research purposes were discussed in the literature (e.g., García, Welford, & Smith, 2016; Moylan, Derr &

Lindhorst, 2015; Plowman & Stevenson, 2012). The iPhone also helped me establish rapport with the children. At the time of data collection, I owned a pet rabbit, Marshmallow, which provided me with a topic to discuss with the children as they got to know me. I stored photographs of Marshmallow on my iPhone and shared these with the children at the beginning of observations. This led to children often asking me if I had "new pictures" (e.g., Luke, informal conversation, July 29, 2015) of Marshmallow during each in-home visit.

Phase 1: Data Collection before Kindergarten

Phase 1, or data collection before the children began kindergarten, took place between March 2015 and September 8, 2015 (the children's first day of kindergarten). During this phase, I conducted one semi-structured interview with each mother and conducted five in-home observations (approximately two hours each) of the children and their parents. I also introduced the media capture function data collection method to the mothers in June, 2015. I considered June, 2015 to November 4, 2015 as the transitional period of the children's entrance to kindergarten as this time period marked both the children getting ready to enter kindergarten and their first two months of kindergarten. I next describe each data collection protocol during this phase.

Semi-structured interviews. I conducted one semi-structured interview (Appendix B) with each focal mother before conducting any in-home observations. I designed the semi-structured interview to contextualize my initial observations. I allowed each mother to choose the location for the interview so that she would be in a comfortable space. Sarah asked me to meet her at a local community centre near her children's preschool. Lindsay asked me to conduct the interview in her home. Each interview lasted approximately 30 minutes and was audio recorded, which I then transcribed within a week of the interview. Before beginning each interview, I

provided the parents with a Letter of Information (Appendix A) about my study and obtained consent. Interview questions focused on what digital tools were in the home and how parents used them, for example, asking Sarah what digital tools she owned and whether the children watched Craig use his laptop for work. I also asked questions pertaining to their beliefs and attitudes towards digital technology (e.g., do you have strong opinions about introducing technology to the children?), what digital tools children were permitted to use, how frequently children used digital tools in the homes (e.g., do [the children] ever have access on their own or is it always with you?) (Appendix B).

Observations. When designing this study, I decided to categorize my observations as "participant observations". I recognized that the ages of the focal children would not permit me to remain an isolated bystander in their activities and play. I therefore took measures to collect data while interacting with the children in their play. The protocol I typically followed for participant observations was as follows: (a) I entered each home with my smartphone and audio recorder. I wore the audio recorder around my neck or tucked away in my pocket. My smartphone was also stored in my pocket and brought out to take photographs of digital events as children and/or parents engaged in them, and (b) I engaged in activities with children and parents only when invited or directed to do so by the initiator of the event. For example, during one observation, I photographed digital tools in the home and Luke asked me to take a picture of him building at the Lego table. He asked to view the photograph and then directed me to take another picture of him building at the Lego table, this time while holding another position. This sequence continued periodically for the remainder of the observation. Each observation began once I arrived and concluded after about two hours, as agreed to by each mother. In some instances, observations ended when mothers began to organize their child(ren) to leave for a pre-planned

event or activity. For example, an observation with Luke and Leia concluded when Sarah asked the children to tidy up their toys and get their jackets and shoes on so they could leave the home for a play date with friends.

During my first in-home observation in each home, I conducted a Digital Tool Inventory. In order to do this, I asked the children to take me on a tour of their homes and I recorded all digital tools that were present in each room of the house. I confirmed each digital tool with the focal mothers to ensure I did not miss any that may have been out of sight. I observed children's activities in their homes and made note of general types of play I observed, such as dramatic play, rough and tumble play, or fantasy play. I also noted whether a digital tool was used during this activity (which I classified as a digital event). After observations, I recorded fieldnotes in my fieldnote book. In my fieldnotes, I recorded connections I noticed between what I observed in the home and constructs from theory and/or relevant literature. I also transcribed the audio recordings collected during participant observations. Each participant observation informed the next in-home observation as I could then use what I had observed in concert with constructs from the literature and theory to narrow and refine what I focused on during subsequent visits. For example, after a number of in-home observations of Lindsay and Belle's interactions with digital tools, I categorized Lindsay's disposition as "co-use" (Nikken & Jansz, 2014). I then began asking targeted questions about how Lindsay introduced digital tools and digital games to Belle.

Informal interviews (in-the-moment conversations). During participant observations, I carried out a series of informal interviews (in-the-moment conversations) with the mothers and children. The purpose of these informal interviews was to clarify observed behaviour. These interviews were not scheduled and occurred naturally during every observation. In some instances, the parents initiated the conversation. For example, Sarah, on one occasion clarified

how frequently she allowed Luke and Leia to use digital tools. In other instances, I initiated the conversation by asking the parent or child a direct question, for example, asking Belle how frequently she played a particular game on the iPad. Questions asked pertained to digital events observed during that participant observation or the last in-home visit I made.

Photographs. To assist my case record of what I observed, I photographed the children's toys, games, print books, and digital tools in the homes. I also photographed parent/child interactions with one another and with digital and non-digital tools. I photographed the children in their homes during each observation. I utilized the photographs in conjunction with fieldnotes and transcripts and they acted as a visual representation of the descriptions outlined in fieldnotes.

Media capture function. In June 2015, I asked each mother to begin sending me one media captured image (in a text or as an email attachment; see Plowman & Stevenson, 2012) between in-home visits. I planned this data collection method as a way to understand better the focal families' use of digital technology in their everyday lives in the absence of the researcher. I used Plowman and Stevenson's (2012) mobile phone diaries to inform this data collection method. Plowman and Stevenson used the media capture functionality of mobile phones to document families' activities on Saturdays. In May 2015, as I concluded that session's participant observation, I asked both mothers to use their mobile phones to capture any moment of their children's use of digital tools they felt would be of interest to me. I told the mothers they could send me an image via text message or by email (and provided my email address). I provided a few examples of the types of images they could send me, such as special moments at home, typical behaviour with digital devices, or a new game/app the child was playing. I was purposefully vague about what I hoped would be captured so that I would not overly influence the types of images parents would send me. I hoped the photo capture activity would help answer

my research questions pertaining to what digital tools children used and the parents' roles in using digital tools with their children. However, unlike Plowman and Stevenson (2012), I did not indicate that I would send them reminders about the media capture. Plowman and Stevenson sent six prompts in an eight-hour period but I felt this would be an intrusion on the participants' family time. In retrospect, sending one or two prompts may have increased the number of images the participants sent me.

Like Plowman and Stevenson (2012), I sought to document children's encounters with digital technology in their everyday lives through the parents' points of view. I originally intended to collect eight images (with accompanying comment that explained the image) between observations. I decided on eight images because: a) I did not want to introduce this data collection method until families felt a measure of comfort with me; and b) I believed eight images would provide me with a variety of instances of each family's everyday life without my presence in the home. As well, I would visit each home eight more times between June and the end of data collection and hoped the media capture data collection method would become routine for the parents over that time.

However, the media captured images proved to be difficult to obtain from both mothers. Only Sarah sent images to my mobile phone and did so irregularly. Sarah sent two photographed images (with clarifying text) once, one image of each child, on one occasion. The other times Sarah sent text messages in which she only described activities and did not share a photograph (e.g., text messaging me to describe a science experiment completed on the weekend). Lindsay sent five text messages to me over the course of the study, none of which included an image. I ultimately concluded neither mother used photographs frequently with their mobile phones, a point I discuss further in the concluding chapter.

Phase 2: Data Collection after Kindergarten

September 8, 2015 marked the children's entrance to formal schooling and the beginning of Phase 2 of data collection. During this phase, I continued participant-observations in the homes, conducting informal interviews and engaging in conversations with participants as needed. Phase 2 data collection concluded with a second semi-structured interview with each mother in March 2016.

Observations. The observation protocol during Phase 2 was the same as observation protocol in Phase 1. I continued to bring an audio recorder to each in-home visit and either wore it around my neck or tucked it into a pocket. I took photographs to document artifacts in each home (e.g., toys, drawings, digital tools) and digital events I observed. Although I completed a second Digital Tool Inventory on my first visit to each home after the children began kindergarten, I continued to track changes in the digital environment of the homes until my final in-home observation. After the children began kindergarten, I relied on constructs from theory and the literature to frame my observations. I drew from Marsh et al.'s (2016) types of digital play to frame digital events I observed and applied their definitions to my data (e.g., I used their description of digital role-play to categorize children's video game play). I also drew from Plowman et al. (2012) to categorize children's learning with and about digital technology (i.e., operational skills, extending knowledge and understanding of the world, dispositions to learn, and understanding the role of technology in everyday life). I used Nikken and Jansz (2014) and Nikken and Schols (2015) as a lens for the parents' dispositions towards their children's engagement with digital technology and Plowman and Stephen's (2007) constructs of "proximal" and "distal" dimensions of parent-child interaction.

Informal interviews (in-the-moment conversations). I continued to conduct informal interviews or in-the-moment conversations with parents and children during participant observations. As described previously, these conversations were not scheduled and occurred when I sought to clarify observed behaviour.

Photographs. I continued to take photographs during participant observations with my iPhone after the children began kindergarten. I followed the same protocol outlined earlier in this chapter.

Semi-structured interview. I conducted a second semi-structured interview (Appendix B) with each mother after all participant observations were completed. The purpose of this interview was to assess any changes in parents' attitudes towards their own use of digital tools and their attitudes towards their children's uses of digital tools. The questions were similar to those asked in the first interview, but emphasized whether the mother felt any changes had occurred. For example, I asked Sarah if she used digital tools to support the children's language development in French now that they were enrolled in a French immersion program. Similarly, I asked Lindsay if she used the iPad to help Belle acquire knowledge on topics of Belle's interest. I also sought to probe what may have provoked any change in attitude and/or feelings towards their own and their children's digital tool use. The semi-structured interviews were conducted at the mothers' homes, per Sarah's and Lindsay's request, and were audio recorded and transcribed by me.

Role of the Researcher

I entered into this research as a doctoral student working in the field of early literacy and brought with me a wide range of experiences that undoubtedly influenced my interpretations. I

grew up in a white, middle-class home with both my father and mother working outside the home. I am the older of two children. I was a "good" student who enjoyed school. I graduated from a Canadian university with a Bachelor of Arts before completing a Graduate Diploma in Education in Australia. My early teaching experiences occurred at the local Children's Aid Society. I then became an Early Literacy Specialist and completed a Masters of Education degree during this time. Throughout my doctoral studies, I worked at a private school as an enrichment teacher, delivering enrichment courses to small groups of primary aged students. I also worked as a tutor for elementary students, through the private school, and independently with a secondary school student and an adult English language learner. These experiences have undeniably shaped my interpretations.

I am aware that my presence in the homes potentially influenced the participants, although I consciously attempted to reduce my influence on the children while I observed them in their homes. For example, I refrained from directing children's play or entering their play activities unless they invited me. I attempted to sit in areas close to the child to observe, but away from the child's immediate play space. Again, once invited, I moved into the child's play space and engaged as a participant observer. I also acknowledge that having an audio recorder present was a new experience for the children. All three children asked about the device and I showed them how it worked (e.g., allowed the children to record their speech into the digital audio recorder and played the sound clip back for them to hear). This digital tool was new to all three children at the start of the study, but all became accustomed to it quickly and questions about the device ceased after my third visit to their homes.

Data Analysis

Simultaneous Data Analysis

I drew extensively from Merriam (1998) in analyzing the data. Merriam (1998) described qualitative case study research as "not a linear, step-by-step process" (p.151) and that a "qualitative design is emergent" (p.155). Thus, qualitative case study research is an iterative and interactive process with data collection and data analysis occurring simultaneously, beginning with the first interview or observation. Qualitative case studies use "emerging insights, hunches, and tentative hypotheses" (p.151) to inform the next phase of data collection and refine research questions. Once data collection concludes, the analysis process intensifies, as all information about the case is brought together and organized so that details are easily retrievable in a case record. The researcher builds a case record from raw data and brings together all the major information that will inform case analysis and the final case study. The researcher edits the case record for redundancies and organizes it either "chronologically and/or topically" (p. 194). From the case record, the data are analyzed into descriptive categories and subcategories in order to report on the phenomenon of study.

Data analysis began on the first day and continued throughout the study as I looked for recurring themes and emerging patterns in the digital literacy practices of the participant families. I developed insights through my prolonged engagement in the homes and persistent observation of and conversation with the participants, as well as from constructs identified in the literature informed my interpretations.

Creating the Case Record

After the data collection phase, I "tidied up" (LeCompte & Schensul, 1999, p. 43) the data by cataloguing the photographs, media captured images (with text), and photographs I had

taken during participant observations. I read and re-read each audio recording transcript, fieldnotes, and semi-structured interview transcript. I organized and integrated all the data to create a case record for each family. In each case record, I collated all of the data into a "comprehensive resource package" (Merriam, 1988, p. 126), organized so that I could easily retrieve information during data analysis. I organized the data included in each case record chronologically so that I could easily locate specific data during analysis. I included all semi-structured interview transcripts, participant observation audio recording transcripts, and fieldnotes in each case record. I included photographs that documented a digital tool in the home (e.g., an iPad) or documented a digital event (e.g., a child using an iPad). I excluded photographs that documented non-digital toys and artifacts children had given me that did not relate to my research questions. I stored case record documents in folders on my computer and labeled items according to date and source. Each document file became the case record for each family. Once I completed the case records, I began generating categories to synthesize my data. In the next section, I detail how I coded the data.

Generation of Data Analysis Codes

I used both inductive and analytic strategies to analyze the data. As a first step, I drew on my research questions to guide the initial generation of descriptive categories, or codes. I used Barton and Hamilton's (2000) notion of literacy event to frame my observations, transferring the concept to digital technology in the form of *digital event*. This allowed me to categorize my observations and fieldnotes into two codes, "digital event" and "non-digital event" throughout the data collection process.

Once data were categorized into "digital event" and "non-digital event" I looked for emergent themes and patterns. The initial themes I developed allowed me to categorize the

digital events I observed broadly into “play”, “learning/acquiring knowledge”, and “entertainment.” These categories were derived from a general understanding of the literature and child development. Subcategories were developed from other research, such as categorizing the children’s play under Marsh et al.’s (2016) definitions of digital play.

I developed analytic codes from a number of scholars, which helped me develop a framework I could use to organize, manage, and analyze the data. Table 3.3 describes the codes and categories I developed to organize the data in the initial stage of data analysis. I gave each code a definition, which helped me identify the appropriate code for the data, and the source of the code (e.g., whether the code was drawn from the literature or from the data).

Table 3.3. Initial Data Analysis Codes

Coding Categories	Definitions	Sources	Research Question (RQ)
Digital event	Any observation or reported event that involved a digital tool or referenced a digital tool	Barton & Hamilton, 2000	RQ 1-4
Digital event- play	Any observation or reported event that involved a digital tool/referenced a digital tool that occurred as the child engaged in play	Marsh et al., 2016	RQ 3 & 4
Digital event- learning	Any observation or reported event that involved a digital tool/referenced a digital tool as children learned something	Plowman et al., 2012	RQ 3 &4

Coding Categories	Definitions	Sources	Research Question (RQ)
Transmediation	Any observation or reported event that involved children moving digital play from the digital world to non-digital activities and from non-digital play into the digital world.	Suhor, 1984; Wohlwend, 2011, 2013	RQ 3& 4
Digital access	Any time a parent or child mentioned how much time children were permitted to use digital tools or mentioned limiting digital tool use.	Inductive category, derived from data.	RQ 1
Before kindergarten	Observations, semi-structured interviews, or informal conversations occurring before the children entered kindergarten	Inductive category, derived from data.	RQ 1-4
After kindergarten	Observations, semi-structured interviews, or informal conversations occurring after the children entered kindergarten	Inductive category, derived from data.	RQ 1-4
Literacy event- play	Any observation or reported literacy activity (e.g., parent or child told me about a play activity or game) that did not involve technology or digital media. This was a broad code that	Barton & Hamilton, 2000; Heath, 1982 Hughes, 2002	RQ 3 & 4

Coding Categories	Definitions	Sources	Research Question (RQ)
	resulted in sub-codes describing the play activity (e.g., dramatic play, rough and tumble play, etc.)		
Literacy event- reading	Any observation or reported event that involved print-based reading	Barton & Hamilton, 2000; Heath, 1982	RQ 3 & 4
Literacy event- creative/artistic/writing	Any observation or reported event that involved non-digital writing tools	Barton & Hamilton, 2000; Heath, 1982	RQ 3 & 4
Literacy event- building narrative	Any observation or reported event that involved a non-digital narrative creation and/or story telling	Barton & Hamilton, 2000; Heath, 1982	RQ 3 & 4
Parent mediation- nature of support	Any observation or reported event where the parent mediated their child's use of a digital tool	Vygotsky, 1978 Bruner 1983, 1986	RQ 2
Parent mediation-role with digital tool	An observation or description of how the parent used a digital tool with a child	Inductive category, derived from data.	RQ 2
Parent-child interactions with digital tool	Physical proximity of the parent to the child during the observed digital event or reported event, including parent-child verbal interactions and gestures.	Plowman & Stephen, 2007	RQ 2

Coding Categories	Definitions	Sources	Research Question (RQ)
Parent dispositions- digital	Observations, semi-structured interviews, or informal conversations that expressed an attitude, value or belief about children using digital tools	Nikken & Jansz, 2014	RQ 2

Play. I drew from Marsh et al.'s (2016) adaptation of Hughes' (2002) taxonomy of play to categorize the types of play I observed the children engaged in while in their homes. Marsh et al. revised Hughes' definitions of play to reflect the "technological transformations in the digital age" (p. 242). They then used these definitions for the data analysis in a study describing how successfully apps foster young children's play and creativity. Using Marsh et al.'s definitions, I could concretely define the play activity. For example, I categorized my observation of Belle playing *Cat Hotel* as "socio-dramatic play." As I refined my initial codes, I began noting whether the digital event was an independent activity or a joint event (and who was with the focal child in a joint event).

Learning/acquiring knowledge. I drew from Plowman et al.'s (2008; 2012) four main areas of learning with technology within the home to categorize data related to learning with digital tools: operational learning; extending knowledge and understanding of the world; developing dispositions to learn; and understanding the role of technology in everyday life. I applied these learning areas to my data to categorize the participants' learning in the home. For example, I coded Luke accessing a science website with Sarah to find a science experiment to try as "extending knowledge" and "developing dispositions to learn."

Entertainment. I developed this code inductively through repeated examinations of my data. Digital events categorized as "entertainment" sometimes included elements of play and/or learning but entertainment was the dominant purpose. This analysis of my data allowed me to begin understanding the children's purposes for using digital tools in their homes (i.e., Research Question 3).

In addition to coding digital events for children's purposes of using digital tools (e.g., Research Question 3), I noted whether parents participated in the digital event, and, if they did, where the parent was sitting/standing in relation to the child and the parent's role in the digital event (e.g., "reading instructions"). I used Plowman and Stephen's (2007) definition of guided interaction to categorize parents' support and mediation strategies with digital technology with their children. Guided interaction describes the ways adults can support children's digital technology interactions. Plowman and Stephen (2007) categorized these interactions as having proximal and distal dimensions. Proximal interactions are face-to-face moments between adult and child that directly influence learning while distal interactions refer to guided interaction that occurs at a distance and has an indirect influence on learning. Nikken and Jansz (2014) provided a framework for analysing parents' dispositions towards mediation of digital technology. They defined parent mediation in four ways:

1. Restrictive mediation in general: exercising control over the amount of time children spent on media and the content children could access.
2. Active mediation: instructive and normative mediation that extends to sharing critical comments and explanations of complex content
3. Co-use: adults and children watching or playing together in order to share the child's media usage together whereby both adult and child are entertained or educated.

4. Supervision: parents multi-task household activities with supervising the child's digital media use, that is, the digital tool is in sight of the parent but the child is granted some personal responsibility for their media use.

This analysis provided examples of how parents mediated or supported their children's digital tool use (i.e., Research Question 2). Tables 3.4 and 3.5 illustrate how I used these codes to analyze Sarah and Lindsay's mediation strategies.

Table 3.4 Parent Mediation Coded Data: Sarah

When	Digital tool	Who	Digital event	Parent mediation
March 31, 2015 Semi-structured interview	Screen use	Sarah	"… it probably wasn't until after a year that I started introducing really basic stuff. I think when they were two they started getting into *Curious George* the movie, you know, which was about one-hour long. They could watch some of those, like *Dora the Explorer*, and things like that. But again, I tried to limit it, really limit it.	Restrictive mediation
March 31, 2015 Semi-structured interview	Screen use	Sarah	"I find that if they get into a habit of watching it [Netflix] more regularly … let's say I do it five-times a week, where I let them watch an hour of television or an hour and a half if it is a movie … if I let that happen three times a week that is kind of stretching it for me. To the point where they are expecting and asking more for it. If it gets to five times a week, that's kind of, okay, red flags. They now want it every day and they are asking for it a lot and I'm not comfortable with that much time"	Restrictive mediation
April 15, 2015 Fieldnote	iPad science website	Sarah Luke	Luke asked Sarah if he could look at a science website. Sarah obliged and Luke got the iPad from the kitchen and brought it to the living room. He sat down on the	Proximal support Co-use

When	Digital tool	Who	Digital event	Parent mediation
			floor and Sarah sat beside him. She set the iPad on the couch and Luke tapped the Safari icon to open a web browser. Luke accessed the drop-down menu to find the website he wanted to visit. With Sarah's assistance (i.e., she read content), he scrolled through the website and pointed to images and content he found interesting	

Table 3.5 Parent Mediation Coded Data: Lindsay

When	Digital Tool	Who	Digital Event	Parent Mediation
March 19, 2015 Semi-structured interview	Digital tool use	Lindsay	**Laura:** These digital devices, do you use them with [Belle]? Or are there digital devices only you use? **Lindsay:** Mostly we both use the devices. I don't use the laptop much, just once and awhile, so [Belle] doesn't really use that, I guess. But we use the iPad together and watch videos. I usually put the TV on for her or will start the DVD. She uses the iPad to watch shows on Netflix.	Co-use
March 29, 2015 Fieldnote	Disney *Rapunzel* DVD	Lindsay Belle	**Belle:** You can't forget Rapunzel. She had really long hair, like 50 more hairs than you. **Lindsay:** It was 70 feet long. I asked about the old version of *Rapunzel*, the one from my childhood, where Rapunzel is saved from the tower by throwing down her hair. Lindsay explained that Disney made a newer version called *Tangled* where Rapunzel, "Took more action for her life. She had a goal." I laughed and said Disney movies were not so progressive when I was a child. Lindsay also laughed, but indicated the newer movies were better, "Like	Co-use

When	Digital Tool	Who	Digital Event	Parent Mediation
			the Tianna one [*The Frog Prince*] because she was an entrepreneur."	

After I organized digital events as outlined above, I began to look more closely at the data for evidence of changes in digital literacy practices in the home as the children transitioned into kindergarten. I organized the data chronologically and noted all digital events that I observed before September, 2015. I then organized all digital events I observed from October 2015 to March 2016. I compared the data and made note of the digital interests and activities expressed both before and after kindergarten entry (e.g., Luke and Leia's continued interest in *Star Wars*) and highlighted all digital interests and activities that I observed for the first time after kindergarten entry (e.g., Leia's description of *Pet Nail Salon*). This allowed me to track the changes in digital literacy practices of both the children and parents in the home as the children transitioned into kindergarten (Research Question 4).

Further Analysis

As indicated, I coded the fieldnotes, interview transcripts and photographs between March 2016 and January 2017, with each round of coded analysis becoming more fine-grained. As I coded each case record, I generated tables using Microsoft Word software. These tables displayed quotations and descriptions as evidence of specific codes. The first round of coding distinguished digital events and non-digital events in the data. Digital events were defined as observations that involved a digital tool (e.g., a child uses an iPad) or referenced a digital tool (e.g., a child uses *Minecraft* vocabulary and characters in Lego play). Once I had identified all digital events, I coded them for the following: digital tool, who was with the child, digital event, and digital form (e.g., educational game). I differentiated between times when the child or parent

referenced a digital event and when the child or parent brought a digital tool into non-digital play. Table 3.6 shows an example of the categorization of a digital event involving Luke. It included the digital tool used, who participated in the digital event with the child (no one), a description of the digital event from my fieldnotes, the digital form of the event, and the meaning I assigned to the digital event. This process resulted in data display tables being created for each research question and sub-questions.

Table 3.6. Coded Fieldnote for Luke

When	Digital tool	Who with	Digital event (what was the child doing)	Digital form	Meaning assigned
April 9, 2015	iPhone	Laura	Luke asks: "Do you have any video games on your phone?" I say I don't and ask if he has video games on his phone. Luke explains he doesn't, but his dad does on his phone.	Video game/app game	Request signals interest
April 9, 2015	Talk, Video game App: Sleepy Hollow	Laura	**Laura:** "Do you ever go catch frogs by the pond? **Luke:** "Catch frogs?! We go fishing! But there is a good fishing place … in … um … in … Sleepy Hollow Chapter Two. Because I got to Chapter Two.	Video game/app game	Connecting non-digital to digital

In each round of coding, I focused the data analysis on answering one of the research questions and reviewed digital events by looking for evidence related to the research questions. For example, my first research questions, "What digital tools do four and five-year-old children use in their homes?" and "What digital tools are children allowed access to?" required that I review each case record for instances when a digital tool was recorded as present in the home. I also reviewed each case record for data related to children's access, such as quotations

describing how much time a child spent using a digital tool on any given day in their home or observations recording the length of time I watched a child use a digital tool. I followed this pattern and created display tables that provided answers to, and evidence for, each of my research questions. The next section explains how I interpreted the display tables.

Interpretation of Display Tables

Once I established codes, I created display tables for each of the research questions. Each display table created allowed me to review all digital events. Display tables allowed me to understand the digital event and the context in which it occurred. Since the focus of data analysis was on what digital events occurred in the home and the purpose(s) of the digital tool in these events, I identified the participant(s), the type of activity, and the purpose of the device(s) in the activity. Tables 3.7 and 3.8 are example of coded fieldnotes categorizing a focal child's digital play.

Table 3.7. Coded Fieldnote: Leia's Digital Play

When	What tool	Who with	Description of event	Purpose of tool	Play genre
May 13, 2015	iPhone (video function	Laura & Luke	Leia and Luke played at their Lego table. They built separate items. I took pictures while they constructed their buildings. Leia instructed me to take a picture of her. She then changed her mind and asked to make a video. On Leia's direction, I video record her using a Lego microphone to introduce the nightly CBC news cast. In the video, Leia held the Lego microphone to her mouth and stated, "This is CBC news". She ended the video with that statement.	To authentic-ate role play of a TV news anchor	Spontaneous, Symbolic play, Role play

Table 3.8. Coded Fieldnote: Luke's Digital Play

When	What tool	Who with	Description of event	Purpose of tool	Play genre
June 25, 2015	Paper	Solo	Sarah told me they were taking the summer off from videogames. To compensate for no videogames, Luke created blueprints for his own video games using paper and markers. He created one fantasy (quest) game that continued on three pages (3 levels). He also created a soccer videogame. Luke sat on the living room carpet with his collection of papers. The papers are held together by tape (landscape orientation, on the top of the paper). Luke did not say anything but hummed to himself as Sarah told me the papers are video game blueprints. Luke allowed me to look at the papers while he silently traced his finger over a continuous line he drew on the page. The line roves up and down, like a pathway. Leia explained that each page was a new game. Luke called out "Slide, jump! Slide, jump!" as he slid and jumped his finger on the page.	Mimic video games he plays on the iPhone.	Imaginative play

By identifying the digital events and the context in which they arose, in conjunction with comments made during semi-structured interviews and informal conversations, I inferred the digital literacy practices of the focal parents and children participating in the study. For example, Sarah's limited personal use of digital technology, along with her restrictive mediation of digital technology for her children (10 minutes every other day) coupled with her decision that the children would not play with digital tools during the summer of 2015, suggested to me a concern about digital technology, particularly for her young children. Once I inferred a practice, I could follow up with Sarah in an informal conversation to probe for why she was concerned about digital technology in Luke and Leia's lives.

Interpretation of Findings

From my field notes and transcriptions of the semi-structured interview, I attached preliminary meaning and significance to the emerging patterns of the digital use within each family unit. Throughout the data collection phase, as a method of clarifying my observations, I discussed my observations with the mothers during my visits in the home. I included this information in my fieldnotes and in my reflections. I drew from these notes as a way to interpret and verify my findings.

Trustworthiness of the Study

Trustworthiness refers to the "degree of confidence in the data, interpretation, and methods used to ensure the quality of the study" (Connelly, 2016, p. 435). It requires a transparency of the "conduct of the study" (Connelly, 2016, p. 435) and is crucial in validating the findings of the study. Trustworthiness, or rigor of the study, is supported by a "chain of evidence" (Marshall, 1985, p. 354) and addressed by researchers through the design of their study and by outlining procedures for managing and controlling their data (Marshall, 1985). Researchers can establish trustworthiness by maintaining a reflexive journal, by establishing credibility, and by carrying out member checks (Lincoln & Guba, 1985). In this section, I begin by explaining how researchers establish trustworthiness within a study and describe how I addressed it in my study. I then describe how I addressed the issues of confirmability, credibility, transferability, and application in the study.

Trustworthiness in qualitative research details the validity of the study (Williams & Morrow, 2009), in other words, how valid are the researcher's interpretations of the data.

Trustworthiness is how a researcher can justify to the research community that he or she has done "due diligence" (Williams & Morrow, 2009, p. 576) in collecting and analyzing data.

In accordance with Lincoln and Guba (1985), I used a reflexive journal as a tool to establish trustworthiness throughout the course of my inquiry. Reflexive journals can contain three types of information: a log of day-to-day activities, a personal log containing reflexive and introspective entries, and a methodological log detailing methodological decisions.

As well, my prolonged engagement in the field helped me to build the trust of the participants. Prolonged engagement also allowed for persistent observation, which provided depth to the study by allowing me to identify the characteristics that were more relevant to the research questions.

To ensure that interpretations were not a reflection of my own experiences and biases, I carried out triangulation of the data sources (Mathison, 1988). I used multiple data collection tools to examine the social phenomenon of this study: I conducted semi-structured interviews, carried out participant observations and wrote fieldnotes, utilized media capture functionality of mobile phones, and took photographs. I triangulated data gathered through these tools by using more than one person as the data source and by visiting homes on different days of the week and at different times of the day. For example, I scheduled participant observations for different days of the week, on both weekdays and weekends, and at differing times of the days, such as early morning, mid-morning and afternoon visits.

I conducted member checks throughout the study by taking data, analyses and interpretations back to the participants (Creswell, 2007) in an effort to "reflect the participants' intended meaning" (Kornbluh, 2015, p. 397). For example, I asked participants to provide feedback on the accuracy and credibility of statements I documented; that is, I asked participants

to react to the way I represented an event or practice as I observed it or as they described it in terms of how things typically work in their house. I made changes to descriptions as participants deemed necessary. These member checks included the three children. Care was taken to ensure member checks with the children were conducted using age appropriate language and, when available, photographs to help assist their memory.

Once I had completed the case records, I again visited each family to present my findings and confirm the validity of my observations, fieldnotes and transcriptions. In order to conduct this final member check, I provided the mothers with the case records to review. The mothers read the record and we discussed it during a follow-up meeting. The children were also present during this meeting and clarified inaccurate information or approved my interpretations of the data. The member check process allowed me to become aware of any erroneous information and interpretations both during data collection and during the final member check and allowed me to correct these errors and create a better reflection of each family's digital literacy practices in their homes.

Confirmability

Confirmability refers to the ability of others to corroborate or confirm the results of the study. Essentially, confirmability is a researcher's ability to prove the rigor of the study and that interpretations of the data are based on evidence, not researcher bias (Merriam, 1988, 1998). To ensure my interpretations were informed by the data and not my own biases, I triangulated data from different sources. I carried out semi-structured interviews, observations, and informal conversation to learn of the digital literacy practices within each home. Rather than rely solely on what the adults said they and their children did, I observed what the children did with digital tools in their homes. As well, the informal conversations with the adults and children allowed

them to verify my observations and my interpretations of what I was seeing. I used photographs taken from previous in-home visits as a visual representation of my observations and as an elicitation device to clarify my interpretations of my fieldnotes. In addition to triangulating data, I recorded preliminary findings, or hunches, about what I was observing and seeing in the data in my reflexive journal as the study progressed. I checked my hunches and impressions in subsequent visits to each research site to confirm with the parents and/or children my observations and any eliminate misinterpretations that I may have been bringing to my interpretations. I also used the journal to record my impressions of individual visits in terms of my role in individual digital literacy events and the methodological considerations this presented (e.g., the impact my iPhone had on Luke and Leia and their digital literacy practices while I collected data in accordance with the protocol approved by the University's Research Ethics Committee).

Credibility

Credibility of a study means the results are believable (Lincoln & Guba, 1985). Connelly (2016) likened credibility as, "analogous to the internal validity of a quantitative study" (p. 435). To help establish credibility in this study, in addition to triangulation, I gathered data during a period of prolonged engagement and through persistent observation. Data collection began in March 2015 and carried through until March 2016. During this time, I completed 10, two-hour visits to each of the families' homes. In addition, I conducted member checks throughout the study by allowing the participants to review the raw data (e.g., summary of interviews) for errors of fact or omissions. During the final phase, the mothers reviewed the case record, my interpretations of the case record, and my conclusions. The mothers and I scheduled a long meeting to which I brought both a summary of my findings, interview transcripts, and the data

analysis charts I developed during the analysis. I gave the mothers the documents for review and I spoke with the children while the mothers reviewed the documents. I uploaded photographs and videos I collected in the homes to my iPhone and asked the children to review the images and videos and to comment on my analysis of these artifacts. The mothers and I discussed my conclusions and they offered their thoughts on my analysis. The mothers agreed with my conclusions and for example, Sarah elaborated that my conclusion of "parental tension" was an appropriate phrase for what she experienced.

Transferability

Lincoln and Guba (1985) stated that researchers working in the qualitative tradition cannot specify the external validity of an inquiry. They can only provide the reader with the database "that makes transferability judgments possible" (p. 316) and that researchers do not necessarily seek to generalize their findings. To help investigate how two families used digital tools in their home and to increase confidence in the findings, I collected data from families who differed in terms of composition. Throughout this dissertation, I described characteristics of the focal families and their homes and included thick description of the findings in order for readers to assess the potential transferability to other settings. Finally, throughout the discussions, I connected my findings with prior research and with theory. However, the uniqueness of these families and their home contexts where I collected the data, in addition to the small number of participants involved, make conclusions presented in Chapter 7 specific to these homes.

Application

It is my hope that educators, early years' practitioners, children's librarians, parents and researchers will benefit from insights generated by this study. Practitioners and children's librarians may use the findings from this study to understand the ways parents and children

engage with digital tools in their homes and the nuanced ways parents make decisions about digital tools for their children and for themselves. Parents may draw on the findings to have a better understanding of their role in scaffolding and mediating their children's digital tool use, as well as to feel confident in the choices they are making about their children's digital media use. Researchers will benefit from the insights of this study by acknowledging the nuanced ways parents make decisions regarding their young children's uses of digital technology. As well, researchers can begin to identify the myriad ways families within one socioeconomic demographic may approach young children's access and use of digital technology. Although I do not seek to generalize my findings, consistencies between my data and data from past research examining middle-class families' digital literacy practices indicates some degree of transferability and application (e.g., Marsh et al., 2017a; Ozturk & Ohi, 2018; Plowman et al., 2008; Plowman et al., 2010; Stephen et al., 2008; Wong, 2015)

Summary

In this chapter, I described the methodology of my study. I have provided a detailed description of the design of the study and my rationale for carrying it out. I outlined how I selected the research context and the selection of focal participants. I included a description of the data collection, organization, and analysis. Finally, I have discussed the quality of my study in terms of its trustworthiness. In the next three chapters, I present the findings. Findings are organized chronologically and provide evidence in relation to each research question.

Chapter Four: The Parents' Digital Literacy Practices and Mediation of Digital Tool Use

The purpose of this chapter is to describe the digital context for the three children participating in this study, including: (a) Digital tools in their homes, (b) children's access to digital tools, and (c) the parents' mediation and support of their children's digital tool use and the nature of their support. As noted in Chapter 2, the study is informed by sociocultural theories of learning and development. This perspective emphasizes the role of social contexts and social purposes of activities and events in meaning making (Hassett, 2006). Children learn through their social interactions with significant adults in their homes and communities in their everyday lives. The parents' values and beliefs regarding digital technology influence the digital tools available for young children in their homes and the access granted to them (Dias et al., 2016; Marsh et al., 2017a; Plowman et al., 2010; Wong, 2015). In this chapter I address the following research questions:

1. What digital tools are the four and five-year-old children in this study using in their homes? b) What digital tools can they access?
2. How do the parents or support digital tool use in these children's homes? b) What is the nature of this support or mediation (i.e., is digital tool use connected to developing digital literacy in young children)? c) And, what attitudes and/or beliefs inform parents' structuring of the home digital environment?

Digital Tools and Digital Access in the Homes

In Chapter 1, I defined digital literacy as entailing ideological decisions about using technology in the home that are based on attitudes, values, and beliefs, as well as acquiring skills to operate technological devices. I conceptualized digital literacy as a mindset to negotiate meaning from a variety of digital contexts which are bound by social, cultural and ideological contexts. Operational skills are necessary in order to access and operate technological devices, and to solve problems associated with their use (e.g., connect to the Internet, successfully operate laptops, computers, tablets). Digital tools were specified as potentially involving passive technology (e.g., TV) or interactive technology (e.g., Skype) and included any devices that contain digital technology (i.e., battery-operated technology or Internet connected). In Chapter 3, I described the two focal families and the three focal children. Luke and Leia were five-year old fraternal twins who lived with their mother, Sarah, and father, Craig. Belle was a four-year old only child who lived with her mother, a single parent. All three children lived in a middle-class neighborhood in a large urban area in the lower mainland of British Columbia.

Digital tools in Luke and Leia's Home

Luke and Leia celebrated their fifth birthday shortly before my first observation. They lived with their parents in a two-bedroom detached house and shared a bedroom, which also doubled as their playroom. At the commencement of the study, the twins attended preschool Monday to Thursday for three hours. Sarah, their mother, was a personal trainer and fitness instructor and worked part-time. The flexibility of her working schedule allowed for her to book clients and classes during times the twins' father, Craig, would be home to look after Luke and Leia. The digital devices in the home included a flat screen TV, an iPad, and a laptop. The family subscribed to Netflix, which was streamed through the iPad or laptop and displayed on the flat

screen. In general, Sarah used the iPad while Craig used the laptop for work and shuttled the device back and forth between home and his downtown office. Both parents owned smartphones and used them for work and for personal communications; Craig used an Apple iPhone and Sarah, a Samsung Android. Their home did not have a landline telephone.

Sarah and Craig chose to limit and restrict their children's time and access to digital technology, but Luke and Leia had recently begun playing video games[3] with Craig on his iPhone. Luke's and Leia's digital tool use was restricted to 10 minutes every other day. Sarah expressed concerns about the children becoming "addicted" (Semi-structured interview, March 31, 2015), particularly Luke. As well, Sarah described her understanding of child development as, "Kids really need to be hands-on, like learning through their senses and they need to move around" (Semi-structured interview, March 31, 2015). From Luke and Leia's infancy, Sarah sought to limit their digital tool use. Leia characterized her regulated digital use as, "A deal. So, one day on, one day off" (Informal conversation, May 13, 2015). The home did not have cable TV so all TV and movie programming were streamed through Netflix. Sarah limited the frequency with which Luke and Leia were allowed to watch TV shows or movies. She preferred to think of these activities as, "a weekly treat" (Semi-structured interview, March 31, 2015) and not something that was done regularly. When Luke and Leia watched TV programming, they were permitted up to 60 minutes in one sitting (i.e., three 20 minute episodes) or 90 minutes if they were watching a movie. There were rare exceptions to these regulations. For example, when Luke and Leia were younger, Sarah and Craig allowed them to use the iPad when they were out for dinner to keep entertained while they waited for food:

[3] Luke, Leia and family characterized iPhone apps/applications as "video games".

> "When we go to a restaurant sometimes it comes in handy. You know, so there isn't that 45 minutes or one hour of waiting for food where you don't know what to do and it's difficult for them to stay in their seats. So, when they were starting to move around a lot, like at a year-and-a-half to about probably three years old, we would always bring an iPad, but we didn't go out to restaurants a lot because it just wasn't a lot of fun because they just wanted to move. But if we did go out to eat, let's say family from out of town wanted to do something like that then we would bring an iPad and let them watch something so they would stay still" (Semi-structured interview, March 31, 2015).

However, now that Luke and Leia were older and could sit patiently for longer stretches of time, "We are finding they are okay in a restaurant [without the iPad]" (Semi-structured interview, March 31, 2015). The other exception was in the car during long drives:

> "In the car, we went to a family retreat that was about a day's drive away in the Kootenays. And the iPad was just invaluable. Just having…I mean I tried to delay using it for as long as possible because you can't watch TV all morning and afternoon while you are driving. And the kids would get restless too. So, we did other things like I Spy and talking and we'd let them sleep in the car. But it was handy to have. I think one movie in the morning and one in the afternoon while we drove" (Semi-structured interview, March 31, 2015).

Digital Tools in Belle's Home

Belle was four years old when the study began. She celebrated her fifth birthday in June 2015. Her home contained a number of digital tools: TV with cable and a DVD player, Leap Pad

2 Mini[4], iPad, Leap Frog Me Reader[5], Leap Frog Violet[6] (toy dog), audiobooks, a laptop, and "Naya", Belle's battery-operated horse. Lindsay owned a Blackberry smartphone and a landline telephone. Lindsay did not regulate Belle's digital technology use to the extent that Sarah did with Luke and Leia, but she did not particularly encourage it either. Belle was allowed to use all devices in the home under Lindsay's supervision, but Lindsay encouraged other activities before giving Belle digital tools. For example, Lindsay described a beading craft they had begun doing together (a children's kit which provided beads and accessories for necklaces and/or bracelets) (Fieldnote, March 29, 2015) or cooking together (Fieldnote, September 6, 2015). Lindsay placed an emphasis on physical activity and, as I will describe in further detail later in this chapter, was concerned Belle did not get enough exercise during the week. Since Lindsay wanted Belle to be physically active, when she and Belle were home, rather than promote activities using a digital tool, Lindsay promoted physical activity, such as going to the park or swimming pool. She also enrolled Belle in ballet, a once-a-week class that lasted 45 minutes. Although Lindsay liked ballet, she was disappointed the class was less active than she imagined when she registered Belle. She felt the program did not spend enough time on skills. She acknowledged it was "cute", but felt that in a 45-minute program, the instructors did not need to spend time reading stories or dress the children in tutus: "I don't mind a bit of it, I guess

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[4] Leap Pad devices are similar to handheld video game consoles. The device allows users to interchange cartridges to play different games and activities. Each cartridge is based on a story, which the reader can read at his/her own pace, or a child can listen to a narration of the story. A pen allows the user to touch the screen to identify and assist the child decoding the unknown word (i.e., slowly reads each syllable in the word). Leap Pad allows the user to touch the screen to complete objectives in games and activities.

[5] Me Reader is an audiobook collection. Each book comes with a CD so that users may read along with while the audiobook is playing.

[6] Leap Frog Violet is a battery-operated dog that comes with five books. The title of each book identifies the skill developed in each book: *Pattern*, *Narrative*, *Concept*, *Rhyming*, and *Learn About*. Violet, the stuffed dog, has a number of buttons on its face and paws which are to be pushed as the book is read. Violet reads the book and asks comprehension questions, which prompt the user to touch particular buttons on Violet.

it's trying to keep it fun, or whatever. But she doesn't know the steps. It's great that she can put on an outfit, but …You know what I mean?" (Lindsay, Informal conversation, March 29, 2015). Before ballet, Lindsay enrolled Belle in gymnastics because she wanted Belle to gain flexibility; however, due to the popularity of the sport and the limited number of spaces, she was only able to register Belle for lessons during the summer months. Lindsay also enrolled Belle in swimming lessons "but not in the winter" due to the weather (Informal conversation, March 29, 2015).

It was within these contexts I came to visit each home and observed each family engage in digital events. I will now describe the parents' mediation and support of digital tool use in the home. First though, I offer a caveat. Although Sarah and Craig both influenced the digital context of the home, Sarah features most heavily in the study. This was because Sarah scheduled all in-home visits and the majority of these visits occurred while Craig was away from the home and at work. Therefore, my understanding of Craig's role in Luke's and Leia's digital tool use was derived from what either Sarah or the children reported to me.

Parent Mediation and Support of Digital Tool Use in the Home

As noted previously, sociocultural theories of learning and development highlight the social contexts of learning and recognize that new knowledge is based on previous experience and socially rooted in attitudes and values. Adults do not transmit knowledge to children; rather, children learn by transforming information offered to them by adults into something personal (Kuiper & Volman, 2008). Vygotsky (1978) characterized the process of knowledge development as occurring within the Zone of Proximal Development (ZPD) and defined the ZPD as the distance between a child's actual development level and the level of what the child can accomplish with assistance of adults or more capable peers. Furthermore, I understood literacy as

a social practice and literacy events to be shaped by the values, attitudes, and beliefs of the culture. I used Barton and Hamilton's (2001) notion of literacy event and literacy practice to guide my observations by applying these concepts to digital technology. That is, I documented observed digital events and inferred digital literacy practices from these observed digital events. I defined digital events as any observation or reported event that involved a digital tool or referenced a digital tool. I inferred digital literacy practices, or the attitudes, values and beliefs held about digital tools, from the observed digital events. As I described in Chapter 3, I conducted a semi-structured interview with both mothers before conducting the 10 in-home visits between March 2015 and March 2016. After observations concluded, I conducted a second semi-structured interview with both mothers. The following analyses are informed by data from my fieldnotes, audio recorded observations, informal conversations with the mothers in their homes, and both semi-structured interviews.

Parents' Mediation Dispositions

Parents play a large role in deciding what digital tools are brought into the home, what digital tools children are allowed access to, and how children's access to digital tools is regulated. In homes, children learn from their parents through direct help and support and through observation and imitation (Marsh et al., 2017a; Plowman et al., 2008). Therefore, homes with parents who frequently use digital technology present more opportunities for children to observe the purpose of digital devices in everyday life. Parents who encourage digital technology use for their children will also provide more opportunities for children to use digital tools in their homes, and in contrast, parents who do not advocate for digital tool use by young children, will limit these opportunities.

Sarah's home. As I described in Chapter 3, Sarah, Luke and Leia's mother, worked part-time as a fitness instructor and personal trainer. Once Luke and Leia entered kindergarten, Sarah returned to fulltime hours in her work. The flexibility of Sarah's work schedule allowed her to care for the children at home and meant Luke and Leia did not attend childcare. However, Luke and Leia did attend a preschool four times a week starting at four years of age. Sarah's personal digital technology uses were low; she used digital tools daily, but to a limited extent. As mentioned, she owned an Android smartphone and used it for, "… work calls … I'll do a little bit of texting or check my emails on my phone" (Semi-structured interview, March 31, 2015). She acknowledged that her personal TV and movie use "… had become almost non-existent … less of a priority [after the children were born]" (Semi-structured interview, March 31, 2015). She felt she needed to prioritize other tasks in her life over TV programming or movies on Netflix. As well, the energy needed to parent left Sarah and her husband Craig tired at the end of the day and uninterested in watching programs or playing digital games:

> "In the evenings Craig and I, before the kids were born, would watch a movie a couple of times a week, instead of watching tv- we didn't have cable. But now we find that, trying to take care of the kids and to have careers, that you are just so tired, so I just go to bed when the kids go to bed. Or he does. That's our time to just go to bed when we would have stayed up" (Semi-structured interview, March 31, 2015).

Sarah did not view herself as a digital user. Often, she clarified statements about digital technology as, "I'm not a techie" (Informal conversation, May 13, 2015). Her mediation of digital technology with her children was restrictive and supervisory (Nikken & Jansz, 2014). Sarah limited the amount of time Luke and Leia could spend with digital tools and she limited

the content that they were permitted to access. When the children were younger, she used technical restrictions (Nikken & Schols, 2015) on Netflix in order to block depictions of fighting in the programming Luke and Leia might watch. However, Sarah realized that the settings were quite narrow and appropriate programming, such as the movie *Cloudy with a Chance of Meatballs*, was unavailable. As a result, Sarah lifted the restrictions. Referring to the controls restricting access, she told me, "Now it's just kids" rather than toddlers, and the children knew "they can't watch fighting or violent shows" (Semi-structured interview, March 2, 2016).

Although Sarah and her husband used digital technology with their children, their disposition did not fit the Nikken and Jansz (2014) definition of "co-use." According to Nikken and Jansz (2014), co-use is a deliberate strategy that incorporates adult watching and playing with children in a mutual amusement of sharing media. Sarah enjoyed watching films during family night, but generally, when she sat with Luke and Leia to use digital tools, she supervised their use, rather than mutually engaging in a game or watching a program. As the children became older, she allowed some independent use because, as she explained, there might be chores to complete:

> "It's a conscious decision when the kids get to watch a show on Netflix or movie with us. Or a movie together, the two of them. Sometimes it depends too, on like I have to go out to do some work and Craig has to do some stuff at home to finish up work, and then it's like, okay you guys can watch a show or movie so that we can get our work done" (Semi-structured interview, March 2, 2016).

Overwhelmingly though, Sarah's strategy for mediating her children's digital media use centred on restricting Luke and Leia's time with digital tools and the content they could engage

with. She recognized the children would naturally observe and learn about digital technology, but that at this stage in their lives, she did not feel it was the most necessary tool in their lives:

> "They [Luke and Leia] are going to see him [their father] using the cellphone- the iPhone, using the computer. And they'll see me using it [digital technology]. So, it's just going to happen naturally. And right now, at this age, I don't see a big need to have just the right app or whatever" (Semi-structured interview, March 31, 2015).

As indicated earlier, Sarah's understanding of child development for young children focused on the need for hands-on exploration and physical activity and aligned with the position statements of the American Pediatric Association and the Canadian Pediatric Association discussed in Chapter 1. She did not see how time with digital tools could fulfill this need and her statement below reflects the discourse of these organizations:

> "So, the information I've received from media or from interactions from other parents or caregivers, is just that kids really need to be hands-on, like learning through their senses and that they need to move around" (Semi-structured interview, March 31, 2015).

Lindsay's home. In Chapter 3, I introduced Lindsay as a single mother working fulltime. This situation required that Belle attend a childcare centre Monday to Friday. Like Sarah, Lindsay encouraged physical activity and worried that Belle did not get enough exercise during the week. At her childcare, Belle only had one hour of daily physical activity and, much to Lindsay's displeasure, the staff at the center still allowed Belle to nap during the afternoon. She complained, "I want to encourage activity. Belle only has one hour at daycare- and they still let her nap!" (Semi-structured interview, March 19, 2015). Lindsay expressed concern that Belle

"… watched TV too much," but acknowledged, "Sometimes it's just easier, so I can get stuff done" (Semi-structured interview, March 19, 2015). However, Lindsay did not quantify exactly how much time Belle spent watching TV, but, because of this concern, Lindsay took steps on the weekend to limit their screen time and tried, "To keep it [weekends] more active" (Informal conversation, March 29, 2015). When the weather was nice, Lindsay and Belle would spend Saturday outside at parks, beaches or swimming pools. In the winter, when ski hills offered half-priced lift tickets, Lindsay would take Belle to the mountains to ski. On Sundays, "We usually do something local. We try, but if it's rainy. We water our plants and organize stuff in the house. Or we'll go to, like, [redacted] Island. She really wants to go to the science museum again" (Informal conversation, March 29, 2015). As was the case with Sarah, Lindsey's concern with screen time replacing physical activity aligned with APA and CPA position statements. Of course, these concerns may have emanated from the parents' general knowledge of the importance of physical activity and may not be traceable, or attributable to these position statements in a Foucauldian sense (e.g., Foucault, 1989).

Lindsay did not use digital media frequently in her personal life. She owned a Blackberry smartphone but relied on a landline telephone for the majority of her communication with friends and family. She found her digital literacy practices changed after Belle's birth. Lindsay found after Belle was born, she began buying digital tools she previously never owned. For example, she said that she, "Didn't even start buying DVDs until Belle was born" but she also noticed a decrease in other digital engagement. She had not, "Bought any music in forever … I used to download and put it on my phone and play it in the car, wherever" but no longer engaged in this practice (Semi-structured interview, March 19, 2015). Lindsay had an active mediation disposition (Nikken & Jansz, 2014) towards digital media use with Belle. Her mediation was

instructive; she taught Belle how to play *Blossom Blast* on the iPad and, as Belle told me, "Mommy showed me how to find bigger flowers so the blast is even bigger!" (Informal conversation, March 6, 2016). As Belle gained competence with the technology or program Lindsay provided less instruction and once Belle was capable of using the digital tool independently, Lindsay switched her role to supervising Belle's use so that she could complete chores. Lindsay often reviewed TV and game content before Belle used it; however, sometimes Lindsay simply co-viewed material with Belle and observed Belle's reactions to gauge whether Belle could handle the material. For example, Lindsay told me, "Belle watched a movie that I thought was a bit scary, but she asked to watch it again" (Informal conversation, January 17, 2016). Lindsay preferred to know what content Belle was going to view, but that was not always practical. In this instance, Lindsay monitored Belle's reactions and was satisfied Belle was ready to watch something scarier than Lindsay originally believed her capable of handling. Lindsay's disposition towards Belle's use of technology and digital tools was also one of co-use (Nikken & Jansz, 2014). She availed of digital tools to entertain and educate herself and Belle and they often played or viewed digital material together, such as *Mia and Me* on Netflix.

Social media. Both Sarah and Lindsay had Facebook accounts; however, neither accessed nor posted material frequently on the social networking site. Sarah told me:

> "I'm on Facebook, but I rarely look at it. I just don't have the time. You get on it and before you know it, it's like 'ohmigod I just spent an hour'. So, I nixed that pretty early on. I just use it more for like those people I need to reach out [to in] that way …" (Semi-structured interview, March 31, 2015).

She posted a few pictures when the children were young, "like trips we had taken" and then she "just stopped" (Semi-structured interview, March 31, 2015). Sarah felt:

"I'd rather have more privacy. I just found that, like, you get friend requests from people that you haven't, that you don't even almost know.

Laura: You knew 15 years ago in high school

Sarah: Yeah exactly. That's what I'm thinking of too. So, to put your pictures out there for anybody you barely know to see or whatever, I'm just not into it. Those are our pictures. It's personal right." (Semi-structured interview, March 31, 2015).

Lindsay echoed Sarah's sentiments when she talked about Facebook. Lindsay was an early adopter of Facebook and her account was about ten years old. However, she now felt it revealed:

"Too much information. And it's not like it's too personal, but anybody can find out. Initially I thought it was really cool- social network[ing]- then I felt like I wanted to choose what I put on there. And then I didn't know. To post every little moment ... I don't even take pictures that much anymore." (Semi-structured interview, March 6, 2016).

Neither mother held accounts on other social networking sites. Sarah told me she did not use Pinterest because it was easy to lose track of time using the app:

Laura: Do you have Pinterest?

Sarah: I know there is Pinterest and it has lots of good ideas. But you know what, it's [Pinterest] just a time suck too (Semi-structured interview, March 2, 2016).

Sarah told me Craig had a Twitter and Facebook account, but did not elaborate on his use of either social networking site: "My husband is on Twitter and is probably a little bit quicker with

Facebook than I am" (Semi-structured interview, March 31, 2015). Sarah told me Craig posted pictures of Luke and Leia "… once in while" on Facebook, but that was it (Semi-structured interview, March 31, 2015).

Media capture function. I used Plowman and Stevenson's (2012) mobile phone diaries to inform this data collection strategy. They employed it to produce an account of "children's interactions with leisure and work technologies, including technological toys, at home" (p. 539). I sought to use the text message and photograph capabilities of smartphones (i.e., media capture functionality) to document children's encounters with digital technology in their everyday lives when I was not observing in their homes. I asked the mothers to send me one image with an explanatory text message between participant observations. Prior to starting the study, I envisioned receiving eight media capture function images; one image between each in-home observation, with the first image anticipated in June 2015. However, neither mother provided many media capture function images. Sarah engaged with this data collection method, but only provided one image of both children: a photograph of each child (one of Luke and one of Leia) in their Halloween costumes.

My initial purpose for obtaining data through media capture function was to gain insight into the ways digital tools were used during everyday life in their homes in my absence. Although I received few images, I contend this was an important finding for this study. I recognize sending reminders, as Plowman and Stevenson (2012) did, may have increased the number of images I received, however the lack of images sent to me by Sarah and Lindsay was consistent with my observations that they tended to use mobile phones infrequently in the home. Sarah relied on her Android smartphone for work communication and used it to call her parents and siblings living outside British Columbia. We arranged interviews and home visits via text

message, but rarely shared images through messages. Lindsay owned a Blackberry smartphone, but we always communicated in-person or through her landline telephone.

Lindsay's lack of using digital media was apparent during one observation. Belle drew a picture on her chalkboard and Lindsay commented, "It's really good, too bad you didn't do it on paper" (Fieldnote, September 6, 2015). Lindsay wanted to retain a copy of this drawing so I offered to take a photograph on my iPhone and text it to Lindsay, which I did. This action did not lead to further image sharing between us. In total, Lindsay sent five text messages over the course of 12 months; the messages were sent to let me know she and Belle were out of the house and running late and this only occurred on two occasions. Simply put, it was not her preferred method of communication and therefore not a reliable data collection method for this study. When Lindsay shared images of Belle with me, they were photographs she stored on her iPad that she showed me when I was in her home for an observation. During observations, I rarely saw either mother use their smartphones. I occasionally observed Sarah pick up her smartphone while standing in the kitchen, but her interactions with the smartphone were short and infrequent. On one occasion, Sarah asked Luke to retrieve her smartphone from the kitchen when she heard the text message notification sound:

> Sarah sat on the couch with her legs stretched out in front of her and placed two bags of ice on her knees (one on each knee). Her Android made a noise from the kitchen and she asked Luke, "Can you get that for me, please?" Luke walked to the kitchen to get the phone (Fieldnote, January 26, 2016).

Typically, during my visits, Sarah was in the kitchen preparing food for the children. I never observed Lindsay use her smartphone during my visits to her home. Lindsay often participated in activities with Belle during my visits (e.g., the three of us played a board game

together), occasionally stepping away from the immediate vicinity to quickly complete a task, such as to get Belle a glass of milk. The mothers' dispositions towards digital technology informed their role in engaging with digital tools with their children and influenced how, or if, they could support their children's digital tool use. To reiterate, Sarah and Craig were generally restrictive and supervisory (Nikken & Jansz, 2014) of their children's digital tool use which limited the children's access to and use of digital tools, while Lindsay used active mediation and co-used digital tools with her daughter (Nikken & Jansz, 2014) which provided more opportunities for Belle to use and engage with digital tools.

My experiences using the media capture functionality contrast with Plowman and Stevenson (2012). In their study, 11 of their 14 participants shared six images with accompanying text messages on three separate Saturdays, for a total of 190 images with text, or a 96% response rate. Although my participants did not consistently use this method, I still believe this data gathering technique is valuable, but possibly better suited for families who are frequent users of digital technology, particularly social media.

Parents' Roles in Digital Tool Use with Children

As discussed earlier, Plowman and Stephen (2007) describe guided interaction as the ways adults can support children's digital technology interactions. They categorized these interactions along two dimensions: proximal and distal. Proximal interactions are the face-to-face moments between adult and child that directly influence learning. Distal refers to guided interaction that occurs at a distance and has an indirect influence on learning, for example, a child watching their parent use a smartphone while seated across the room. I analyzed the data by categorizing parents' roles in digital events as proximal or distal interactions; parents' mediation strategy (i.e., verbal cue, gestural cue, cognitive activity of reading/typing/etc.) and the

nature of support (i.e., connected developing operational use). I also analyzed the type of guidance or support parents provided such as parent monitoring, modelling, scaffolding, and so forth. Next, I describe the parents' roles in mediating and supporting their children's digital technology use.

Sarah

Sarah mostly employed proximal interactions to guide her children's digital technology engagement. Luke and Leia were only permitted to use with digital tools when a parent was present, as Sarah stated, "It's always with me or my husband" (Semi-structured interview, March 31, 2015). Typically, digital events occurred with the children sitting side-by-side on the couch with a parent and Sarah's or Craig's role during these digital events was mostly supervisory. Sarah or Craig controlled the content the children were exposed to but also supported their game play when asked. For example, when Luke was learning a new video game, he held the digital tool and employed a trial and error strategy to navigate the game. Luke decided what path to take or what actions to employ in the game with little or no direction from the supervising parent. Sarah's or Craig's role was to read instructions and other relevant text in the game (backstory of the game, character names, etc.), but they did not physically model how to play the game for the children. Sarah and Craig gestured as a means of reinforcing verbal instruction, for example, pointing to icons or actions on the screen:

> As Sarah and Luke watched the illusionist [on the website from Luke's magic trick kit], Sarah pointed to the illusionist's prop on the screen (a large metal ring) and told Luke to "watch this" (Fieldnote, January 11, 2016).

Sarah described this process by outlining how the children used a search engine:

> "[Luke and Leia] are learning the alphabet in preschool. Every week they take a new letter and they practice drawing something that starts with that letter and drawing the letter itself. So, they like looking at the keyboard and they even know how to … if they want to look up, for their birthday cake, … a *Star Wars* Lego theme. They punch in the search engine line, they ask, how do you spell and I'll tell them how to spell it or I'll just write it on a paper. And they can spell it out in that search engine. So, they do that sometimes when they are curious about something. They will ask me for help. It's always with me. So, I have started knowing how to search" (Semi-structured interview, March 31, 2015).

The children also referenced their parents' role in digital events as primarily reading. When I asked Luke and Leia to explain *The Legend of Sleepy Hollow: Jar of Marbles III* to me they told me it was hard and Craig read information for them:

> Laura: Do you play it [*The Legend of Sleepy Hollow: Jar of Marbles III*] with Dad all the time?
>
> Luke: It's hard
>
> Leia: Dad needs to read (Informal conversation, May 13, 2015).

Luke told me Sarah read instructions to him in *Minecraft*, "Mommy reads things and I play" (Informal conversation, November 4, 2015). I observed Luke request his mother's assistance by asking, "Mommy, can you read this?" (Fieldnote, July 29, 2015). When Luke wanted to listen to a particular song on iTunes, he distinguished artists by the iTunes icon that represented an album cover and used this visual cue to decide what music he wanted to hear. However, the song list associated with each album was represented as text and Luke could not independently read print, so he needed his mother's assistance in order to select a specific song. Otherwise, Luke simply

tapped the album cover and selected the first song listed and listened to the full set of songs on an album.

Sarah and Craig made a conscious decision to take turns engaging with digital media with the children. Sarah reflected on this in our second semi-structured interview:

> "Luke has been associating Craig with video games and it's something he just loves, like, if somebody asks him, "What do you like about your daddy?" it's "He gives me video games." I remember last year, for Father's Day, from preschool, it was, "What do you like about your daddy?" "he gives me video games". Ugh! And I said to Craig, I don't think it's fair that you get this from Luke, because he doesn't get that from Leia, but that's the number one thing. So, I said I think it's time that I became more involved, it's not always you who does the 10 minutes with them every second day, it's sometimes me as well." (Semi-structured interview, March 2, 2016).

As a result of this decision, Sarah assisted Luke with his initial forays into *Minecraft*. As reported earlier, Sarah did not characterize herself as someone who used digital technology. Because of this, she struggled when Luke played a new game she was unfamiliar with, such as *Minecraft*[7]. Luke learned about *Minecraft* at school through a friend's older brother and therefore understood certain aspects of the game through word-of-mouth descriptions, but he was unfamiliar with the game design and how to navigate within it. While learning to play *Minecraft*,

---

[7] *Minecraft* is a sandbox video game that allows players to build constructions from "textured cubes in a 3D procedurally generated world" (Wikipedia). The game allows for exploration, resource gathering, crafting, combat, and solo or multiplayer game modes. As well, multiple gameplay modes are available: survival (player acquires resources to build the world and maintain health), creative (players have unlimited resources to build with and can fly), adventure (players fly and can clip through blocks but cannot build or destroy anything) (Wikipedia).

Luke asked his mother to assist him, such as asking Sarah where building materials were hidden in the game and how to build objects. Sarah's lack of familiarity with the game led to frustration for Luke because she could not give him the answers he wanted. Luke's frustration continued outside of active game play, as evident by the following exchange between Luke, Leia and Sarah documented in my fieldnotes:

> Sarah: Well they are building. I think you can also shoot too, on some, right?
>
> Laura: Yeah, I think so.
>
> Luke: Not on the one! Not on the one you said I should get!
>
> Sarah: I know, because I didn't want the shooting one, right Luke?
>
> Laura: You have to learn how to build the stuff first, right?
>
> Sarah: Yeah.
>
> Leia: First you have to dig. Then you have to build a house. You don't just start building.
>
> Luke: No, I do start building.
>
> Leia: You just … you dig and then you start building.
>
> Luke: NO.
>
> Leia: You have to dig a hole.
>
> Luke: NO I DON'T!
>
> Leia: Luke you have to, that's how it works. You don't understand.
>
> Luke: No. I. Don't. Have. To. Dig. A. Hole!
>
> Sarah: Leia, I think some of them you start with a hole and some of them you can start on the ground.
>
> Leia: Like [friend's]. I think he had to dig … but I don't know (Fieldnote, November 4, 2015).

Sarah shared in Luke's frustration, as she later described to me during our second semi-structured interview:

"Well, sometimes Luke, see Luke's the one who is interested, Leia doesn't care. So, Luke has come up to me a couple of times and said 'this is the game my friend at school wants to play, can you get it for me?'. So, I spend 20 minutes with him and get nowhere. Because it's a game that I don't know how to play and he doesn't know how to play and we can't figure it out together. So, like even something like *Minecraft,* we tried to figure that out one day on my phone and I was like, I don't know how to do this. You know, it's more complicated.

Laura: Yeah. I only know that kids love it. And boys in particular.

Sarah: Yeah. It's complicated. There are no instructions.

Laura: Oh, you just dive in and go.

Sarah: You just go. You can buy books on it. It's a world. And Luke's, 'but you are supposed to be able to get a certain tool, where is it?' And I'm like, 'I don't know where that tool is'. It ended up with him being frustrated" (Semi-structured interview, March 2, 2016).

As seen from the examples above, Sarah and Craig employed proximal interactions when the children engaged directly with digital tools. Through a conscious decision, they chose to sit with their children as the children explored digital tools. Although Sarah and Craig sat with the children, they did not model the game before the children played; rather, they allowed the children to employ a trial-and-error strategy to navigate the game. Sarah or Craig (whichever parent was sitting with the child), read instructions and pointed to icons on the screen to assist the children's navigation. They also unwittingly used distal guided interaction in the home. Plowman and Stephen (2007) categorize distal interactions as those taking "place at a distance

from the specific leaning interaction" (p. 18) and that have an "indirect influence on learning" (p. 18). Sarah and Craig occasionally used their digital tools to engage in work related activities in the home, which the children observed and so these influenced their learning of digital tools. For example, Sarah uploaded music to her smartphone while preparing for a fitness class:

> Luke played with two small dinosaurs on the living room floor while Leia coloured in an activity book at the small table and chairs. Sarah sat on a chair in the living room and opened the laptop. She told me she was uploading music to her smartphone for a fitness class she was teaching later that evening. Sarah told me she had certain playlists she liked to use (Fieldnote, April 9, 2015).

Although Sarah was not explicitly teaching Luke and Leia about the laptop and the smartphone in this moment, the children observed her open the laptop and upload music to her smartphone. Sarah told me this was a regular digital activity for her and that the children knew she used this music while she taught fitness classes. Thus, Luke and Leia were indirectly learning that music can be moved from one digital tool to another and one purpose for using digital music (i.e., work-related purposes).

These observations led me to conclude, that in the case of Sarah, she wanted to support her children's uses of digital tools. However, her characterization of herself as "not a techie" and her lack of familiarity with video games at times impeded her ability to assist them effectively, particularly Luke. Sarah's initial support was intended to be supervisory─ she wanted to know what Luke and Leia were playing (e.g., content), but when digital interests became more complex, such as *Minecraft*, she was unable to support him in the ways he wanted her to. She then deferred to Craig to help Luke and Leia explore digital tools. As noted earlier in this chapter, Sarah reported Craig's role in the children's digital literacy skill development. He

selected apps and downloaded these to his iPhone. He then sat with the children during their initial attempts at playing the programs and assisted them by reading instructions, pointing to icons to assist navigation of the game, or explaining more complex aspects of the games (e.g., needing to pass a chapter in the *Legend of Sleepy Hollow: Jar of Marbles III* before accessing the next level).

Lindsay

Lindsay's proximal guidance of Belle's digital tool use followed a pattern that closely aligned with Vygotsky's (1978) concept of ZPD in that she heavily supported Belle's initial interactions with digital tools and slowly removed direct instruction as Belle gained proficiency with the digital tool or in the digital game. First, Lindsay would play the digital game or use the digital tool while Belle watched, so Lindsay would model the game for her. An example from my fieldnotes illustrates this pattern:

> Belle closed an app displayed on the iPad screen. Lindsay was playing a game of *Spider Solitaire*. She explained to me she "just downloaded it today," so she had not taught Belle to play, but introduced it to her. Lindsay further explained that "[Belle] watched me play," but Belle did not play herself (Fieldnote, March 6, 2016)

Next, once introduced to a digital tool, Belle would use it with Lindsay sitting beside her. Lindsay would read content, point to icons or objects on the screen, and remind Belle of instructions. I recorded an example of this in my fieldnotes:

> Belle placed the iPad on the kitchen table. Lindsay sat beside Belle, on her left (I sat to her right). Lindsay read the printed instructions that appeared on the screen for Belle. Belle then used her right index finger to tap the "groom" icon. She

> tapped the brush icon and selected the brush she wanted to use. She used a slide motion to brush (groom) her cat client. Belle then tapped the "sparkle" icon and made the cat "shiny". A new cat arrived at the hotel and Lindsay reminded Belle she had to "check in the cat" and "remember, you need to give new cats a checkup". A checkup involved a visit to the veterinarian room for medicine and shots (Fieldnote, January 17, 2016).

In this example, Lindsay proximally supported Belle's play of *Cat Hotel* on the iPad. She read instructions for Belle, reminding her of the necessary steps to check a new cat into the hotel. I noted later in the fieldnote that, "when Belle encountered difficulty with a task in the game, she attempted to solve the problem by herself three times before she asked her mother for help" (Fieldnote, January 17, 2016). As can be seen, as Belle became more confident in playing the digital game, Lindsay allowed her to troubleshoot the game in her own way. On another occasion when Belle played the game, *Clumsy Ninja* on the iPad, Lindsay momentarily stood behind Belle and then walked three steps into the kitchen to prepare something for dinner. Lindsay periodically looked over Belle's shoulder at the game. When Belle incorrectly swiped the iPad, Lindsay offered assistance without request:

> Belle was imprecise with her swipe movement on the iPad screen while playing *Clumsy Ninja*. She used her right-hand pointer finger to swipe her ninja avatar but she over-swiped and accidentally hit the "x" icon and exited the game. This returned her to the game's main menu screen. Lindsay stood behind Belle and leaned over Belle's shoulder. She tapped the game icon and returned Belle to the game screen (Fieldnote, November 15, 2015).

Lindsay continued to provide support when requested, for example, when advertisements popped up on the screen:

> An advertisement popped up on the screen of *Clumsy Ninja*. Belle called to her mother and Lindsay walked from the kitchen and stood behind Belle's chair. Lindsay touched the "X" hidden in the top right corner of the screen to exit the advertisement. She then touched the game icon to return Belle to her game (Fieldnote, November 15, 2015).

Once Belle was a proficient user of the digital tool or digital game, Lindsay's support shifted to supervision of Belle's digital tool use. For example, Lindsay allowed Belle to access, select and watch TV or movie programs on Netflix while Lindsay completed chores or other tasks in another room or area of the apartment. Figure 4.1 shows Belle sitting on the couch watching Netflix as I arrived for my observation.

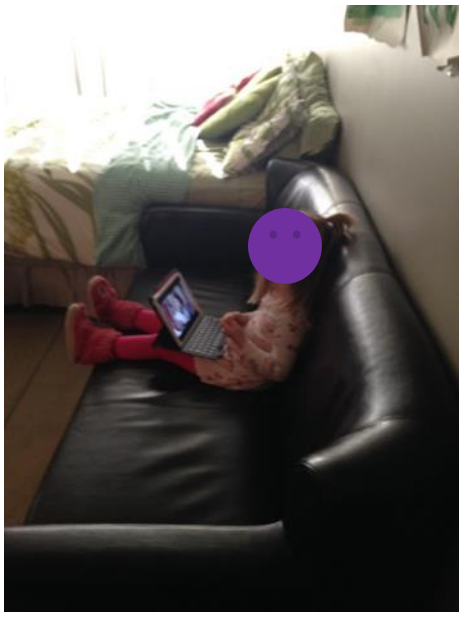

Figure 4.1. Belle Watching Netflix

I also observed Lindsay operate within Belle's ZPD (Vygotsky, 1978) with her guided instruction strategies in her support and mediation of music. For instance, while listening to a CD of instrumental music, Lindsay instructed Belle to "tell me when you hear it [the digeridoo]" (Fieldnote, September 6, 2015) and expressly pointed out the flute sound when it played. Over the course of the study, Lindsay began teaching Belle to play the piano. When Belle started a new arrangement, Lindsay sat beside her at the keyboard and called out each note to be played while pointing at the notes on the music sheet, as shown in Figure 4.2.

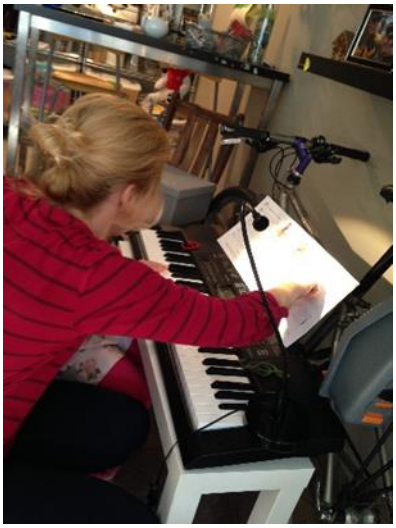

Figure 4.2. Lindsay Assisting Belle at the Keyboard.

Lindsay explained:

> "Belle can read music, and will correct me when I'm wrong, but she needs the notes read when she learns a new song because she is looking at the piano keys to place her fingers" (Informal conversation, November 15, 2015).

As Belle became more proficient playing the song, Lindsay provided less guidance, eventually encouraging Belle to play by herself at the electric keyboard.

Reading written texts followed a similar pattern. At the beginning of the study, Belle was still learning to decode print, so the initial print literacy events I observed involved Lindsay reading a text to Belle. Just as I observed with the electric keyboard, Lindsay and Belle sat side-by-side during these events. As Belle gained proficiency, she read text to her mother, with Lindsay reading difficult words for Belle and Belle repeating those words before continuing the book. However, there were two differences in Lindsay's guided interaction during reading events compared to digital events. The first was the position of Lindsay during reading events. Once Belle could independently play the piano, Lindsay no longer sat beside her; rather, she would move around the apartment while Belle played. However, even when Belle could confidently read a text alone, Lindsay sat with Belle (e.g., on the couch, on her bed, on the kitchen chairs, etc.) and listen, for example:

> Belle sat on the carpet and read a short board book, *Shapes with Ocean Animals* by Mélanie Watt. Lindsay came from the kitchen and sat on a chair near Belle and leaned forward to see the page over Belle's shoulder and to listen. Belle read each page and then lifted the book to show her mother and me the illustrations. Belle independently read each page. When she finished, Lindsay got up from the chair and returned to the kitchen (Fieldnote, August 23, 2015).

The second difference between Lindsay's guided instruction of digital tools and reading was the way Lindsay continued to challenge Belle with more difficult reading material. For example, six months into kindergarten, Belle was able to read above her grade level[8], but Lindsay continued

[8] The BC Kindergarten Language Arts curriculum expects students to "mak[e] meaning using predictions and connections; mak[e] meaning from story using pictures, patterns, memory, and prior knowledge; [retell] some elements of story; and recogniz[e] familiar words/names and environmental print (e.g., street signs, food packaging)" by the end of Kindergarten. *Alice in Wonderland* is a text above expectation for a kindergarten student.

to encourage Belle to read more challenging material. At this time, Belle was reading *Alice in Wonderland* and wanted to show me how she could read a chapter book:

> Belle ran to her room to grab her chapter book. When she returned to the living room she displayed the book cover to me. She was holding *Alice in Wonderland*. Belle sat on the couch, placed the book on her lap and opened to the first page. As Belle began reading, Lindsay left the kitchen and sat down beside Belle on the couch. When Belle stumbled on a word Lindsay corrected her. Belle read one page of the book for me (Fieldnote, March 6, 2016).

Lindsay did not introduce games based on difficulty and she did not try to find more challenging games. Rather, she and Belle selected games for the iPad based on interest in the content, such as Belle wanting to play *Cat Hotel* because she, "Like[d] taking care of animals" (Informal conversation, January 17, 2016). This is an interesting finding, and one I infer means Lindsay more strongly valued the practice of reading and viewed it as a skill that could be improved on, while iPad apps were merely for entertainment and not necessarily selected for their educational value or challenging nature. The exception to this was the electric piano. Although a digital device, Lindsay introduced Belle to more challenging music and promoted Belle's musicality. This was largely because Lindsay seemed to view the electric keyboard as a practical piano for the size of their home (i.e., a regular piano would have been too large for a one-bedroom apartment).

Although Lindsay was not a regular user of digital technology in her personal life, she took an active role in supporting Belle's digital literacy development. She employed proximal interactions and explicitly taught Belle how to use digital tools and play games on the iPad. I did not observe Belle attempt games by herself, nor did Lindsay report that Belle did this. Despite

Lindsay's reservations about Belle's engagement with digital technology, she recognized it as an activity Belle enjoyed and thus supported Belle's operational learning of digital tools. Digital tool use became a shared activity and something they engaged in together. As well, once Belle was able to use a digital tool independently, it provided Lindsay time to complete chores more efficiently in the home.

I now turn attention to the tension both mothers felt about their children using digital technology.

Tension Toward Children's Digital Engagement

As I analyzed each case record, I recognized the recurring theme of the mothers' tension about using digital technology with their children in the data. Both mothers struggled with how much digital engagement to allow, what digital tools children should be permitted to access, and what digital content to permit. They recognized that digital tools were necessary in modern life, but also wanted their children to experience non-digital activities. This finding is consistent with other research suggesting parents strive for a balance between digital tools and more traditional childhood activities in their children's lives (Dias et al., 2016; Marsh et al, 2017a; Ozturk & Ohi, 2018; Plowman & McPake, 2012; Teichert & Anderson, 2014). There appeared to be several sources of the tension that Lindsey and Sarah reported, including the following.

"So many apps"

The sheer number of apps and games available for downloading presented a tension for Sarah and Lindsay. Sarah said, "There are so many apps" (Semi-structured interview, March 2, 2016) and a lack of information for parents about these apps to guide them in selecting appropriate content. As Sarah described it, "I'm just not someone who knows how [to select appropriate materials]. I don't even know what's [what apps are] out there" (Semi-structured

interview, March 2, 2016). Lindsay told me, "I haven't really bought any games yet. I don't know them enough." She further explained, "We usually use [the iPad] for Internet and shows. She [Belle] wants more games, but I just haven't … I don't know what I'm getting so it's hard to want to spend … it's not super educational or anything. It's maybe a little matching, a little strategy, but not much" (Semi-structured interview, March 6, 2016). Despite not considering herself a "techie", Sarah acknowledged that, "In terms of other educational stuff, I know there is a lot out there, so I would be curious about it." However, she did not know where to access information and reviews of games and apps (Semi-structured interview, March 2, 2016).

When Luke and Leia first began playing games on the iPhone, Sarah relied on Craig to determine the quality of apps selected for Luke and Leia to use. Craig was a software developer and, "From talking to people", he made decisions about, "What might be a good app, so he picked a few. Nothing huge, nothing we've gotten into" (Semi-structured interview, March 31, 2015). However, over the course of the study, Sarah believed that she needed to take a more active role in the children's use of games. There were two reasons for this. The first reason arose because Craig selected a game that was not appropriate for Leia. Sarah reflected on this during our second semi-structured interview:

> "Craig introduced them to some stuff where I was like, 'this doesn't look good.' You know, I kind of peer over their shoulders. And it was the Headless Horseman. It was waaaay too scary for Leia. She has bad dreams sometimes and I was able to narrow it down to that one [game]. [It] was giving her bad dreams. I don't think they played that one for very long, but I said they can't do that. It was not allowed and then I started making some rules around it" (Semi-structured interview, March 2, 2016).

With her realization, Sarah began setting limits on video game and app content:

> "I started making some rules around it. At first, I was like, Craig, use your best judgement about video games. And then I … well, maybe you are not recognizing, soooo, you know, he's not horrible at it, he limits a lot of stuff. But I think he was a little bit too open to what they can handle, especially Leia. So, we have to … Luke can handle a lot more and Leia can handle very little so we have to be careful because when one has one game the other one looks over the shoulder" (Semi-structured interview, March 2, 2016).

Lack of Understanding of the Game

In some instances, the design of the game presented issues for the mothers. In Lindsay's case, she chose to play games first so she could model the game's concept for Belle before Belle tried the game herself, for example, playing *Spider Solitaire* and explaining to Belle how the game worked (as described earlier in this chapter). Furthermore, although Lindsay did not always understand the appeal of a game for Belle, she did not necessarily prevent Belle from playing it. For example, when Belle showed me *Cat Hotel*, Lindsay told me, "I don't understand the appeal of the game. I think it's b-o-r-i-n-g." Since Belle enjoyed the game, Lindsay allowed her to continue to play the game (Informal conversation, January 17, 2016).

The games Belle and Leia played were less complicated than *Minecraft*. This meant that when Belle and Lindsay or Sarah and Leia used digital tools together, there was less frustration for the mothers and daughters than when Sarah and Luke attempted to play *Minecraft*. However, as described earlier in this chapter, when Luke learned about *Minecraft*, the complicated nature of the game led to plenty of frustration for both him and Sarah. They commented on their initial attempt at *Minecraft* and the difficulty they had playing the game:

Sarah: I tried looking at it [*Minecraft*] with Luke yesterday. We tried getting the app for it. I really didn't know how to do it, did I Luke?

Luke: Not at all.

Sarah: So, that is why Leia is saying Luke didn't know how to do it [play *Minecraft*] because I didn't know how to do it [play *Minecraft*] (Informal conversation, November 4, 2015).

In these instances, even though Sarah wanted to be involved in Luke and Leia's digital game play, she deferred to Craig when she was unsure of the game:

Laura: So, it's [*Minecraft*] is not a video game kind of thing? That you have to buy- you just download the app?

Sarah: Well … I don't know. I'm going to let Craig do it with him (Informal conversation, November 4, 2015).

Sarah's inexperience with *Minecraft* and unfamiliarity with the structure of the game meant she was unable to assist Luke's learning about the game. That left Luke frustrated as he eagerly wished to play the game but was unable to do so due to Sarah's lack of understanding of the game.

Criticism of Digital Media Interface and Digital Content

In addition to their lack of understanding of the games their children wanted to play, Lindsay was critical of digital media interface and both Sarah and Lindsay were critical of digital content.

Digital media interface. Lindsay critiqued the interface design of mobile and tablet technology; however, this was not an issue raised by Sarah. The user-friendly nature of the iPad was an issue for Lindsay. She wished Belle had to pause and consider how the internal system of

the device worked and that the systems were less intuitive so she had to learn how the technology worked:

> Lindsay: I think the issue is that it's so user friendly. That there is no- how does it work? There is a little bit …
>
> Laura: But she just kind of picks it up and uses it?
>
> Lindsay: Yeah. It is so basic in the user-friendly part that there's not much thinking to it. Like, do you know what I mean, it's kind of, like, obvious. So, in that sense its like, there is no ... I remember before computers you used to have to put all the programming into the computer to make it—the game—work. Do you know what I mean? Where now we don't have to do that. So, she [Belle] can just pick it up when she sees it and it's like nothing (Semi-structured interview, March 19, 2015).

Lindsay locked the iPad with a password, but that did not stop Belle from accessing the device:

> Laura: Do you ever change the password on the iPad and Belle can't get in?
>
> Lindsay: No, not yet anyway. I keep it the same. I should change it, but I don't. Belle figured it … I didn't even tell her what it was! She watched and figured it.
>
> Laura So Belle can come in and use the iPad whenever she wants?
>
> Lindsay Pretty much (Semi-structured interview, March 6, 2016).

This presented a contradiction as Lindsay did not change the password and allowed Belle to use the iPad as she wished. Lindsay never elaborated on why she felt she should change the password, but more vaguely suggested that she, "Should change it" (Semi-structured interview, March 6, 2016). Lindsay was also critical of some of the content and for example, while she felt that the iPad app, *Garage Band*, was great, she believed it could use improvement. She liked that she could, "Record Belle's singing and add instruments to it" and basically create a song. However, she was critical of one interface component: "The downside is that once her voice is recorded and changed, you can't return to the original singing voice" (Informal conversation, March 29, 2015). Lindsay wanted digital tools and games to challenge Belle. She felt modern technology was too user-friendly and did not require Belle to think about why digital interfaces or apps operated the way they did. I took this to mean Lindsay felt Belle's digital literacy learning was limited by the interface of digital tools and apps.

Digital content. Sarah and Lindsay both expressed criticisms with the digital content they and their children consumed. Generally, Sarah or Craig approved the programs Luke or Leia could watch on Netflix. Occasionally, Sarah allowed the children to select the program, and she would listen, "To hear what they've picked", but she noted, "They also have some parameters from me about which programs they've tried and I haven't liked, for the type of humour that's used or fighting. They know those are out of limits" (Semi-structured interview, March 31, 2015). Lindsay disliked the advertising displayed on free app games available on iTunes. I documented an example of her concern in my fieldnotes:

> An advertisement appeared on the screen of *Cat Hotel*. While Belle waited for the 30 second commercial to end so she could resume game play, Lindsay expressed dismay that, although *Cat Hotel* was intended for a younger audience,

> advertisements may be of a mature or sophisticated nature. Lindsay gave examples of advertisements for a game that included battles and violence and a game that showed two women kissing in a sexually explicit manner. Lindsay found *Cat Hotel* in the Apple App Store. She doesn't like the advertisements and explained she wanted to know the game before buying it (Fieldnote, January 17, 2016).

Since advertisements occurred infrequently during *Cat Hotel* and Belle thoroughly enjoyed the game, Lindsay allowed Belle to continue to play. Once Lindsay felt a game was worth purchasing, she would pay money to remove advertisements from the game (Fieldnote, January 17, 2016).

Sarah described her concern when searching and viewing music videos on YouTube:

> "[Luke and Leia] will say, 'can we hear some songs?' And I'll be like, 'okay'. And then it's some pop songs, and I have to try and think, okay, what would be appropriate? But then you don't always remember what that video is like. And if they really like it and I don't really like that one, then you've got to be away from [the iPad or Android]" (Semi-structured interview, March 2, 2016).

Lindsay critiqued the age categories designated for Belle's Leap Pad Mini 2 games. She felt the broad age spectrum misrepresented how challenging, or unchallenging a game was. For example, Belle received a new Leap Pad Mini 2 game for her fifth birthday, a *My Little Pony* story game. Lindsay told me that Belle, "Finished it in three days. It says five to eight- years old, but I have a hard time believing that because she's finished it already" (Informal conversation, June 28, 2015). Lindsay acknowledged other games were better and more challenging:

> Lindsay: The other ones are a little bit …

Laura: More challenging?

Lindsay: Yeah. The *Brave* one is really good. And so is the Sophia one- *Sophia the First* one. It's good. It's a reading one. Same with the *Tangled* one…They are all kind of, some of them are more dexterity. She doesn't like those ones as much because I don't think she is quite there yet.

Laura: A little harder?

Lindsay: Well … her coordination is a little … still working on it (Informal conversation, June 28, 2015).

Some of the storylines expressed in Leia's favoured TV shows frustrated Sarah, particularly *My Little Pony*. Sarah felt the program was, "Not always the best" and was not, "Super keen on it because they are always, 'I don't like that person and now we are all friends again', and it's like, 'Ugh!" (Semi-structured interview, March 2, 2016). However, she believed that many girls experience difficulties amongst friends and felt that was a reason girls were drawn towards these shows:

> "So that kind of thing, I think, happens a little bit with girls, I've noticed. So, I think maybe they are interested in shows like that because that's what they experience, without even watching" (Semi-structured interview, March 2, 2016).

Lindsay also disliked the way many app-based games, particularly those developed by King[9] Digital Entertainment plc. (e.g., *Blossom Blast*), allowed players to interact with each other. The

[9] King Digital Entertainment plc. is a social games development company. King develops games for web, mobile and social media (i.e., Facebook) and gained fame after releasing *Candy Crush Saga* in 2012.

game developers created a program that allowed players to see each other's' profile pictures and embedded incentives in the game for players to connect through Facebook profiles (e.g., more game playing lives, bonus points, etc.). Even without a Facebook profile, players could send and request lives[10] from each other. As well, players' scores were ranked after successful completion of a level (i.e., scores ranked one through 20). Lindsay explained she would tell Belle, "Don't click on that!", that is, do not click on the profiles of other players. She lamented, "That's the other thing, the people you can connect to, you can message and interact with" (Semi-structured interview, March 6, 2016).

Both mothers seemed to teeter on not wanting their children to consume digital content they disliked, but continued to allow their children to engage with the content because they recognized the enjoyment their children found in the content. Although neither explained it as such, it seemed as though both recognized they could not control all aspect of their children's digital tool use and reconciled this by voicing their dislike to me (and possibly other adults).

A Feeling that Children Could be Using their Time Better

Both Lindsay and Sarah strongly believed that children should engage in activities beyond digital media. Sarah subscribed to parenting websites (e.g., babycenter.com) and talked to other mothers to gain information about parenting (Lareau, 1987). From these sources, she learned that, "Kids really need to be hands-on, learning through their senses and that they need to move around. So as much as possible, in those early months and years, try not to have that stuff [digital technology] around" (Semi-structured interview, March 31, 2015). Sarah further explained that:

[10] App players are able to send each other extra playing opportunities, or lives in the game.

> "I don't think I really got into it [digital technology] with them. I don't know if it was after they were a year, year-and-a-half or two years, you know infancy. I remember a friend of mine would put on *Baby Einstein*, or something like that, and I just wasn't into that. So that would have been the infant months. It probably wasn't until after a year that I started introducing really basic stuff. I think when they were two they started getting into *Curious George* the movie, which was about one-hour long. They could watch some of those, like *Dora the Explorer*, and things like that. But again, I tried to limit it, really limit it" (Semi-structured interview, March 31, 2015).

Lindsay also talked about limiting Belle's exposure to screens when she was young, "I didn't expose her to tons of TV when she was little, and we didn't have the iPad back then. Maybe a little bit of *Baby Mozart*[11]"(Semi-structured interview, March 6, 2016).

Sarah limited digital technology more strictly than Lindsay. Sarah referenced Netflix and how she viewed digital technology as a treat:

> "We've had Netflix for a few years so that is where we get that programming, we don't have cable. We can watch Netflix on our tv screen or the iPad. That [watching Netflix on tv screen or iPad] might be once and awhile, but not very often. There might be time periods where it happens a little more frequently and there will be time periods where it just doesn't happen at all. I find that if they get into a habit of watching it more regularly, or, now we've started in that last six

[11] *Baby Mozart* is part of the *Baby Einstein* line of multimedia products. The *Baby Mozart* DVDs combine real life images and puppet show visuals with Wolfgang Amadeus Mozart's classical works. The product markets to parents with children ages birth to three.

> months having like a movie night on the weekend or something. So that's kind of a treat. But if it's a regular thing … if I let that happen like three times a week that is kind of stretching it for me. To the point where they are expecting and asking more for it. If it gets to five times a week, that's kind of like, okay, red flags. They now want it every day and they are asking for it a lot and I'm not comfortable with that much time. So, I prefer, one movie night a week, where it is contained and it's, I don't know, more quality programming too, that we can pick out" (Semi-structured interview, March 31, 2015).

In our second semi-structured interview, I asked Sarah if she allowed Luke and Leia to take pictures on her Android phone, she told me, "Yup, they do. But, I mean, we don't take pictures a ton, but yup. They know how to take pictures and sometimes they ask to take the picture". Sarah further qualified this reply with:

> "But I kind of don't want, as soon as I bring out my phone then it's like, before you know it, half-an-hour is gone, right, with the phone. I kind of want them to just play in their room. Or come out and play in another area. Or … you know just kind of move around and do stuff and move from one activity to the next and learn what it's like to become slightly bored and think about 'what do I want to do next.' Right. I think it's a really good thing to have to kind of figure out, 'I've got time right now.' And then I can help them and bring out new things when they need new things. And I can get things for them that they are interested in doing" (Semi-structured interview, March 2, 2016).

Later in the interview Sarah referenced her dislike of technology as a shared activity between her and her children, preferring to engage in other joint activities:

> "As someone who works while the kids are in school and, you know, sometimes a few hours a week when they are outside of school, and then having to do all the things you have to do in the home, and then play with them- which is really important to me, to spend time doing stuff with them, it's like … I don't want to go towards the time … the ones that really suck us into using the iPad and things like that to look things up. I'll look something up quick … So, it's like what you said, technology is really great, but it's also not … and I'd often rather have them playing without it, to be honest" (Semi-structured interview, March 2, 2016).

Lindsay referred to digital technology as a bad habit, but justified her use of it:

> "After school I usually … it's bad habits, but it's 'cause we are usually running from there, to here and dinner and piano that she wants to have down time. So, I let her watch a show, usually, not always. Sometimes it's piano and bed. But if she's not wound down … but even that doesn't always calm her down. Sometimes we read a book, but even that- it's sometimes, I want another book" (Semi-structured interview, March 6, 2016).

When I arrived at Belle and Lindsay's apartment for an observation, Belle was eating dinner and watching a program on Netflix. Lindsay asked Belle to, "Pause this because Laura is here." Lindsay then qualified the use of the iPad with, "We don't normally watch this while we are eating, but we're just … I'm going to turn it off. Because we are eating we usually don't, but sometimes we do, she was so hungry and she started watching it and she loves that show."

Lindsay then turned the iPad off and placed it on a shelf away from the dinner table (Informal conversation, September 6, 2015).

This finding echoes the discourse of the AAP and CPS about limiting young children's access to screens because children need hands-on learning experiences. Both mothers expressed a desire for their children to engage in non-digital activities over digital ones, and in the case of Sarah, actively restricted her children's access to and use of digital tools. This finding is consistent with Plowman et al.'s (2012) participant, Catherine Searl, a middle-class mother. Like Sarah, Catherine Searl preferred traditional, non-digital learning and play activities for her children, such as dramatic play, drawing and colouring, and alphabet flashcards. Laureau (1987) noted that many middle-class parents share information about children's learning and schooling. It may be that middle-class parents are internalizing the discourse of the AAP and CPS without citing these particular organizations. That is, the messages about limiting screen time and the possible negative consequences of young children using digital technology are shaping their attitudes, beliefs, and values.

Digital Tool Addiction

A main reason Sarah limited the amount of time Luke and Leia could spend using digital technology was her concern Luke would become addicted to them. When asked why she thought Luke was drawn to video games she replied:

> "Um … he kind of has an addictive personality, if that's the word for it. He's always gotten, gets, really fixated on something and then just talks about it, talks about it, talks about it until it happens. So, if there is something that he likes, that's just … it's just his personality" (Semi-structured interview, March 2, 2016).

By chance, Luke and Leia's introduction to digital games on their father's iPhone coincided with the beginning of the study. Sarah commented:

> "It's interesting. When you and I first talked about doing this study, they had no regular video games. They might have tried something here and there, but we didn't that on a regular basis. And then Craig, without even knowing that I had arranged this study with you, he introduced them to this *Sleepy Hollow* [*The Legend of Sleepy Hollow: Jar of Marbles III*] game one day, because he is more of a techie, right. And then it was, like, boom, they are addicted—instant like that. And [I] was 'uhhh' I just got finished telling you we didn't do this kind of stuff that much" (Informal conversation, May 13, 2015).

Sarah removed the children's access to digital tools during the summer of 2015. She rationalized her decision by explaining digital tools were, "Kind of like sugar for [Luke], so we are taking a break for the summer" (Informal conversation, June 25, 2015).

Sarah also struggled with the way she sometimes framed digital technology as a reward or punishment for Luke and Leia. On one occasion, Sarah described a recent incident in which Luke and Leia engaged in bad behaviour:

> Sarah explained to me that on the weekend, while she was doing a number of chores around the house, Luke and Leia were in their playroom. When Sarah came to see what they were doing, she noticed they had ripped a foam mattress into three pieces, essentially ruining it, and Sarah threw it in the garbage. Luke and Leia also played outside on the weekend with paint- three big jugs, half full- that they used in the backyard. Luke and Leia dumped all the paint on the grass,

> emptying the containers and wasting the paint. Sarah was upset because this was out of character behaviour and was two bad behaviour incidents. As punishment, she took TV and video games away from Luke and Leia for one week (Fieldnote, May 13, 2015).

Sarah was not happy that digital technology was framed as a reward for good behaviour and removed as a punishment; however, two bad behaviour activities in one weekend was out of character for the twins and Sarah was, "Beside myself". Her exasperation was evident as she reflected on the incident:

> "I don't know. I was thinking … what to do sometimes when they don't have good behaviour and its major like that--I don't want to see that, you've wasted things and destroyed things. So, I … okay, they really love having that [digital] as a treat, so I took away their game. But in terms of using media that way, I don't know. Are there guidelines for parents, like should you come up with other sources of reward--punishment?" (Informal conversation, May 13, 2015).

Both Sarah and Lindsay shared a belief that digital technology was not the most important element in their children's lives and neither woman used digital tools frequently in their own lives. Sarah characterized herself as "not a techie", while Lindsay tended to highlight other hobbies she enjoyed in her life that took greater precedence in how she spent her limited free time. Both women shared tensions they felt about their children using digital tools and outlined their reasons for these tensions. The biggest difference between the mothers was in how each approached her child(ren)'s engagement with digital technology. Sarah was guarded about her children's digital tool use and controlled their access by limiting how long they could play

digital games and how often they could play. She or Craig directly supervised their time with digital tools and did not permit the twins to engage with digital media independently. Lindsay, on the other hand, allowed Belle to use digital tools independently and often encouraged it by scaffolding Belle's learning of digital devices and digital games.

Summary

In this chapter, I described the parents' support and mediation of technology and digital tools in their homes. I first described the digital context of each home; specifically, what digital tools were in the homes and how much and what kinds of access parents gave the focal children. I then described the parents' dispositions towards both their digital technology use and that of their children. Neither mother considered herself to be a frequent user of digital technology. Sarah restricted and supervised her children's uses of digital technology, while Lindsay actively mediated and co-used digital tools with her daughter. I then described the guided instruction strategies used in both homes by the parents. Parents generally supervised their children's digital tool use and assisted with reading when requested. Lindsay in particular followed Vygotsky's (1978) ZPD model of scaffolding when assisting her daughter with digital tools. I also described the parents' attitudes and beliefs about digital technology and how these beliefs were characterized as tensions about whether to allow or disallow their children to use digital technology. Tensions arose around the quantity of apps targeted at children and how to determine the quality of these apps. Other tensions included difficulty with, or a lack of understanding about, the digital games their children used and an overall feeling that children's time would be better spent engaged in other activities.

In the next chapter I shift the focus to the children and how they took up digital tools in their homes. I describe the digital events I observed or that the children and mothers reported to me before and after the children entered kindergarten. The focus in Chapter Five is on how children used digital tools in their unstructured play.

Chapter Five: Children's Use of Digital Tools in the Home

In order to understand how the children used digital technology in their everyday lives, I documented children's digital events. To reiterate, I understand literacy as a social practice and that literacy is embedded in social goals and cultural practices. I transferred Barton and Hamilton's (2000) notion of literacy event and literacy practice to digital event and digital literacy practice, whereby digital events are observable activities shaped by digital literacy practice. This chapter addresses Research Question 3 of my study:

3. How do children use digital tools in their home? b) Do children incorporate digital tools into their play and, if so, how and for what purposes (e.g., creating narratives, creating a visual display, etc.)? c) And, do children use digital tools specifically to help them acquire knowledge?

I draw on data from fieldnotes, audio recorded participant observations in the homes, and informal conversations with focal mothers and focal children. I describe the digital events I observed the children engaged in while in their homes. The description and analyses in this chapter will focus on the children's purposes for using digital tools in their homes. I conclude the chapter by describing how my use of an iPhone may have affected digital literacy activities in Luke and Leia's home in unintended and unanticipated ways.

The Children's Purpose for Using Digital Tools

Frequency of Digital Tool Use

What surprised me the most throughout data collection was the infrequency of digital tool use I observed the children engaged in, given the assertions about digital natives (Prensky, 2001) and the ubiquity of technology in young children's lives (Marsh et al., 2017a; Plowman & McPake, 2013; Plowman et al., 2010) in the literature. Throughout the data collection phase, I observed families' actions and noted digital events (i.e., moments when participants used or referenced digital technology). I observed all three children use digital tools; however, these moments occurred much less frequently than I anticipated, especially in Luke and Leia's home. I documented the frequency of each child's digital tool use and what digital tools I observed each child using. I created a table for each child that displayed which digital tools I observed him/her use during the 12-month data collection phase. I also noted how often I observed each child use the digital tool during data collection (Tables 5.1-5.3). I acknowledge that with the relatively small number of events observed throughout the study that it is somewhat problematic to quantify the digital events before and after kindergarten. However, given my interest in the children's transition to kindergarten, it is appropriate to highlight which digital events were observed before kindergarten and those that were observed after kindergarten entry.

Table 5.1. Tally of Luke's Observed Digital Tool Use

Luke	Digital tool	Frequency of use before kindergarten entry	Frequency of use after kindergarten entry
	Smartphone- camera or video	4/5 occasions	5/5 occasions
	Smartphone- games/apps	2/5 occasions	1/5 occasions
	iPad- websites	1/5 occasions	2/5 occasions

Luke	Digital tool	Frequency of use before kindergarten entry	Frequency of use after kindergarten entry
	Electric keyboard	0/5 occasions	1/5 occasions

Table 5.2. Tally of Leia's Observed Digital Tool Use

Leia	Digital tool	Frequency of use before kindergarten entry	Frequency of use after kindergarten entry
	Smartphone- camera or video	3/5 occasions	5/5 occasions
	Smartphone- games/apps	1/5 occasions	1/5 occasions
	iPad- website	0/5 occasions	1/5 occasions

Table 5.3. Tally of Belle's Observed Digital Tool Use

Belle	Digital tool	Frequency of use before kindergarten entry	Frequency of use after kindergarten entry
	Leap Pad Mini 2	2/5 occasions	3/5 occasions
	iPad- games/apps	0/5 occasions	4/5 occasions
	iPad- Netflix	3/5 occasions	2/5 occasions
	Electric keyboard	0/5 occasions	2/5 occasions
	Battery operated toy- Naya the horse	1/5 occasions	0/5 occasions
	Battery operated toy- toy guitar	1/5 occasions	0/5 occasions
	Leap Frog Violet	0/5 occasions	1/5 occasions
	CD/DVD player	1/5 occasions	0/5 occasions

This was the context in which I observed the children interact with digital tools while visiting their homes. As a result, I did not always observe the children repeat digital events over time and I did not observe any digital events during some of my visits.

Before I describe in detail the digital events that I observed in the homes, I share two ways Luke described his covert efforts to secure more time using digital tools than he was permitted. I recorded two observations, both occurring towards the end of data collection, of Luke attempting to use digital tools outside his parents' supervision and outside his allotted 10 minutes, every other day. During one participant observation, as Luke talked about *Minecraft*, he shared a secret with me:

> I asked Luke if he played *Minecraft* more frequently and he told me yes, but, "My grandpa took it." Leia clarified, "My dad deleted it" and Luke said, "Off the iPhone." Luke continued, "But he doesn't know the secret- I still have it on the iPad." I asked him, "But are you allowed to use it on the iPad?" and Luke told me, "Yeah. As long as I have it, I'm allowed to use it!" (Fieldnote, January 11, 2016).

During another visit to his home I observed Sarah ask Luke to get her Android smartphone from the kitchen:

> Luke and Leia played in the living room while Sarah sat on the couch with her legs stretched out in front of her and placed two bags of ice on her knees (one on each knee). Her Android made a noise from the kitchen and she asked Luke, "Can you get that for me, please?" Luke walked to the kitchen to get the phone. As he walked back from the kitchen, he smirked and looked at the phone. Sarah asked for the phone and Luke continued to hold and look into it. Sarah noticed he had opened a game and reminded him, "I asked you to get the phone for me, not to

play a game." Luke handed the phone to Sarah and she checked her text message. It was a text from Craig (Fieldnote, January 26, 2016).

I present these digital events in isolation from the bulk of the data because they were unique to Luke and present an intriguing line of future inquiry which investigates the way young children circumvent parental controls to pursue their own burgeoning digital literacy practices.

In the next section, I report the digital events I observed and describe the children's purposes for using or referencing a digital tool in those moments.

Digital Events in the Home

As noted, although the children infrequently used digital tools in their homes, especially Luke and Leia, I did observe all three children use or reference digital tools there. The children found digital tools fun and enjoyed spending even short amounts of time using them. They most commonly used digital technology in passive, non-interactive formats. They viewed or listened to the digital device and did not create or actively respond to something on the screen. In order to document digital events in the homes, I focused on what digital tool the child played with and how the digital tool was used in the child's activity. I next describe three ways the children used digital tools in their homes: a) for entertainment, b) to acquire knowledge, and c) transmediation from digital modes to non-digital modes.

Entertainment

The children's foremost purpose for using digital tools in their homes was for entertainment. All three children enjoyed digital tools and used them for many purposes; however, the main reason they enjoyed digital tools was they found the activities to be a source

of pleasure and enjoyment. All the digital events reported in this chapter stemmed from the children's desire to be entertained and I will describe one example for each child in order to provide a snapshot of how digital tools were a source of pleasure in their lives.

During one observation, while sitting in his playroom, Luke told me he was bored and stood up and left the room. I followed him as he walked to the kitchen and observed the following:

> Luke climbed onto a large red exercise ball and put his elbows on the kitchen counter. The iPad was kept plugged in on the counter next to the refrigerator. His mother was making lunch and was busily moving around the kitchen. Luke entered iTunes and scrolled through his father's albums. Luke tapped the album cover of a rap album, which opened a list of songs. Luke selected the first song on the list and listened (field note, July 29, 2015).

Luke bounced along to the music on the exercise ball and I watched as he continued to select songs to listen to. Luke then moved from iTunes to YouTube and asked Sarah to help him find the music video *Black Hole Sun* by the rock band Soundgarden (Fieldnote, July 29, 2015).

Leia also used digital tools to entertain herself with music. An electric keyboard was kept in the twins' bedroom and Leia showed me how she used it:

> Leia and Luke had an electric keyboard in their bedroom. Although she did not play music herself, Leia knew how to use the keyboard's "music function" to type in codes and allowed her to listen to pre-recorded piano songs. She alternated between *London Bridge* and *Jingle Bells* (Fieldnote, September 28, 2015).

On another occasion:

> Leia jumped as she told me, "I can magically play the piano!" She then ran to the electric keyboard and keyed in a number code. Leia then jumped on her bed and danced to *London Bridge* as it played (Fieldnote, November 4, 2015).

For Christmas, Belle received a *Frozen* Karaoke machine from her grandfather. Her grandfather lived outside Canada and Belle and Lindsay had flown to the USA to celebrate the holiday with him. Due to the size of the machine, Belle and Lindsay could not take it on the plane with them and were planning to ship it home to British Columbia. Thus, Belle, very eagerly, reported to me how she used the machine at her grandfather's house and talked about how the machine worked:

> Belle excitedly told me about a karaoke machine she received from her grandfather for Christmas. The machine was a Disney product and featured the movie *Frozen*. Belle told me she used it at her grandfather's house and could, "Sing and dance" along to the music. She explained the *Frozen* karaoke machine played four songs, "Even *Let it Go*", and that two songs had words and two songs were, "Just instruments." Lindsay explained the karaoke machine did not come with a screen, but was, "Fairly certain" the machine connected to a computer or iPad and displayed lyrics. She also thought you might be able to use any CD with the machine and therefore access a greater variety of music (Fieldnote, January 17, 2016).

To reiterate, the children found pleasure and enjoyment in all the digital events I observed. Even in moments of frustration (e.g., Luke and Sarah attempting to play *Minecraft* for the first time), the digital tool was ultimately sought out because it was a form of entertainment. In the next section I describe how the children used digital tools to acquire knowledge and describe the

digital events I observed before kindergarten entry and after kindergarten entry in separate subsections. I then describe the children's transmediation of digital modes to non-digital modes in the same format.

Digital Tool Use to Acquire Knowledge

One way the children used digital tools was to acquire knowledge and information on a topic. In these digital events, the children sought a digital tool, such as the iPad, to access the Internet or a map application to gain information. I rarely observed children specifically using a digital tool to gain knowledge on a topic, but I report all events I observed in the section below.

Before kindergarten entry. Luke was interested in science and on weekends he and Leia conducted science experiments with their father. Sarah and Craig accessed child-friendly science websites as one method of finding new experiments. Luke took up this practice with his mother:

> Luke and Leia made slime in the kitchen[12]. When the experiment was completed and the kitchen cleaned, the twins played with their slime in the living room for approximately 30 minutes. After playing a matching game with cards, Luke asked Sarah if he could look at a science website. Sarah obliged and Luke got the iPad from the kitchen and brought it to the living room. He sat down on the floor and Sarah sat beside him. She set the iPad on the couch and Luke tapped the Safari icon to open a web browser. Luke accessed the drop-down menu to find the website he wanted to visit. With Sarah's assistance (i.e., she read content), he scrolled through the website and pointed to images and content he found interesting (Fieldnote, April 15, 2015).

[12] A science activity that combines water, white glue and food colouring to create a slime mixture.

Interestingly, although Leia participated in the slime science experiment, she did not join Luke and Sarah in searching the science website. She left to play in her playroom with her toys.

Leia was not as interested in digital tools as Luke. I rarely observed Leia request or engage with digital tools. With respect to acquiring knowledge, the only example obtained was a description provided by Sarah during our semi-structured interview. Sarah explained:

> "[Luke and Leia] are learning the alphabet in preschool. Like every week they take a new letter and they practice drawing something that starts with that letter and drawing the letter itself. They like looking at the keyboard and they even know how to … look up for their birthday cake, … look up a *Star Wars* Lego theme. And so, they punched in … like they can do this kind of thing, where in the search engine line, they can say, okay, how do you spell and I'll tell them how to spell it or I'll just write it on a paper. And they can spell it out in that search engine. And they come up with images, or the *Star Wars* stuff or cakes or whatever comes up. They do that sometimes when they are curious about something" (Semi-structured interview, March 31, 2015).

Belle owned a Leap Pad Mini 2 and mostly used the device as an electronic reading tool (i.e., an e-book). The Leap Pad Mini 2 was a handheld device that allowed her to manually input and load a variety of game cartridges. Each game cartridge contained many different activities, such as reading stories aloud, word games, colouring activities, and quest games (i.e., user must accomplish tasks before advancing to the next level in the game). It also came with a plastic pen Belle could use to tap the screen. Reading aloud was an activity Belle enjoyed and often asked me to read print-based storybooks to her during my observations. She most frequently accessed the read-aloud function and word games available in her Leap Pad Mini 2. The device offered

two options for read aloud: a) electronically reading the story to Belle, or b) Belle reading the story herself and using the pen to tap unfamiliar words, which were then read aloud by the device. Belle used her Leap Pad Mini 2 to help her learn to read. I observed her use this digital tool during three separate observations, two of which I describe. The first time Belle showed me her Leap Pad Mini 2, she input her *Tangled* cartridge and showed three features, first the colouring game:

> Belle first showed me how she could colour in her *Tangled* game. Belle used her Leap Pad pen to tap the colouring icon. Once the page loaded she asked me which image I wanted to colour. I chose the picture of Rapunzel with a flower. Belle tapped a colour wheel to select a colour and then tapped a section of the picture. The colour appeared on the page. She continued this process until all sections of the picture contained colour (Fieldnote, March 29, 2015).

She next showed me how the Leap Pad Mini 2 read stories aloud to her:

> On the main menu page Belle tapped the book icon. This feature read the story aloud to Belle. She sat on the couch and held the Leap Pad while the audio recording of the story played (Fieldnote, March 29, 2015).

The final feature Belle showed me was a word game:

> After hearing the story, Belle returned to the main menu and selected a game. It was a word game. The Leap Pad Mini 2 displayed two or three words (the game increased in difficulty as it progressed) on the screen and an audio recording asked Belle to select a particular word (by tapping the word on the screen with her pen), for example, "cat". If Belle selected the correct word the game

congratulated her. If she selected the incorrect word the Leap Pad Mini 2 read the word out loud while flashing the word on the screen (Fieldnote, March 29, 2015).

On another occasion, I observed Belle select the read aloud function in her new *Sophia the First* game cartridge:

> Belle held the device and read aloud along with the Leap Pad. The *Sophia the First* story progressed when Belle tapped the small book icon on the bottom of the right page. Belle sounded out unfamiliar words and then tapped the screen to hear the correct reading. She did this until she completed the story (Fieldnote, September 6, 2015).

After kindergarten entry. The children continued to use digital tools to gain knowledge and information on topics of interest after starting school. However, the frequency with which these events occurred in the home remained consistent with the frequency before kindergarten. Children did not use digital tools to acquire knowledge any more or any less than they did before kindergarten began.

Luke used the iPad to learn about a new interest, magic. I observed Luke play with a magic kit he received at Christmas. After showing me a card trick, he wanted to learn more about the magic kit company through their website:

> Luke received a magic kit for Christmas from his aunt and uncle. Luke and I sat on the carpet of his bedroom and he scattered all the pieces of the magic kit on the floor so I could look at it. While I looked at the pieces, Luke prepared a magic trick to show me. He decided to do a card trick. After completing the card trick, Luke picked up a "magic business card" that he could sign. On the card a website was listed where Luke could find more "tips, tricks, and videos." Luke took the

> card to Sarah, who was in the kitchen. When I entered the kitchen, Luke and Sarah were sitting on the floor with the iPad watching a video. Sarah had typed the magic kit website into the web browser and they watched an illusion video. Leia and I joined them on the floor to watch the video. After the video finished Sarah picked up the iPad and put it away. Luke watched one video (Fieldnote, January 11, 2016).

Both Leia and Luke were enrolled in the French Immersion program at their elementary school. At Christmas, they received a joint gift of a French edition of the *Game of Life.* One component of the game required players to act out a character or action (i.e., to play charades). When playing the game with Craig, Leia used a translation app on the iPad to help her read the French language action she was required to act out (i.e., she translated the character or action from French into English). Sarah explained that "[Leia] used it [the iPad] to do a French translation so that she could play the *Game of Life* and not give away what she was supposed to mime. She would put the letters in and, yeah. [Leia] can kind of read" (Semi-structured interview, March 2, 2016). Leia used the translation app to support her French language skills and her ability to independently play the board game.

Belle and Lindsay used the iPad together to extend their knowledge on topics learned in information books. For example, I observed Lindsay read a book about penguins in a *National Geographic Kids* book:

> Lindsay read aloud to Belle about penguins from a *National Geographic Kids* book. Lindsay told me that earlier in the week she and Belle were reading the book and Belle became interested in Antarctica. As Lindsay recalled this event, Belle interrupted her mother and told me she used the iPad to, "See where

> penguins lived and where Santa lived." Belle connected the cold, snow and ice of Antarctica to Santa's home in the North Pole. Belle then initiated a re-creation of her digital information seeking by telling me to follow her to the living room, where she showed me the iPad. Belle opened the device and logged into the system using her mother's password. Once logged in, Belle tapped the "x" located in the upper right corner and closed an existing program. She scrolled the iPad's front page and found the *Google Maps* app. She opened the program and pointed to a blue dot on the screen and explained the dot told her, "Where she lived." She then located the North Pole in her previous search history (it was the only search listed). She tapped the satellite feature to show me, "What the North Pole looked like" (Fieldnote, September 30, 2015).

Belle continued to use her Leap Pad Mini 2 device to read after she began kindergarten; however, she no longer played the *My Little Pony* game and she mostly played *Sophia the First*. Another illustration of how Belle used digital tools for learning was apparent with her Leap Frog digital reading toy, Violet (described in Chapter 4). Belle showed me how to use Violet; however, Lindsay explained Belle no longer used the toy because she was reading short books independently:

> Belle took a stuffed animal off her toy shelf. Lindsay reminded her that she owns it. Violet was a battery-operated digital reading toy. Belle turned on Violet. Shaped as a dog, Violet had five large coloured buttons on her body and each button corresponded to a book. At different moments Violet prompted Belle (the reader) to press symbols on her body to activate the next sequence on the digital recording (e.g., turn the page). Belle read through one book and pressed buttons

> on Violet as instructed. When the book is done, Belle turned off Violet and left it on the floor with the books. Lindsay explained Belle is reading short books on her own and no longer uses Violet (Fieldnote, September 30, 2015).

Although the frequency of observed digital events was low, it was apparent the children did access digital tools for the purpose of learning. They sought out information or acquired a deeper knowledge of a subject by using digital tools. Luke used digital tools to extend his knowledge about science experiments and magicians. Leia used digital tools to support her alphabet knowledge and her French language vocabulary. Belle used her Leap Pad Mini 2 to develop and support her reading decoding skills and accessed the iPad to extend her knowledge about the Arctic. As noted earlier in this section, the children did not increase or decrease their uses of digital tools for the purpose of learning (i.e., acquiring knowledge) after kindergarten entry. The digital events I observed of the children in their homes indicated that digital tools for learning or acquiring knowledge remained the same throughout the entire study. I did not see evidence of how these children acquired operational skills related to digital tools (Plowman et al., 2008), which might be attributable to the relatively low number of digital events I observed.

I now describe how the children transmediated from digital modes to non-digital modes in their homes.

Transmediation from Digital Mode to Non-Digital Mode

Over the course of the study, the children's digital interests informed their non-digital activities. Suhor (1984) referred to this process as *transmediation*, and described it as understanding one sign system and moving it into another sign system in order to create meaning. Individuals rely on *modes* of expression to make and convey meaning in their worlds (Kress, 2010). Therefore, the mode of expression (i.e., "mode") is how individuals transmediate

from one sign system into another one. The focus of this study was on how digital tools (i.e., cultural tool) were used by children in their play. I analyzed data by considering the purpose for bringing or referencing digital tools in play (i.e., the purpose) and not an examination of multiple modes of expression or the children's reasoning for selecting particular modes. Therefore, I describe the digital events related to transmediation by focusing on the digital tool used (e.g., digital mode) and use non-digital mode as an umbrella term for multiple modes not using digital technology such as drawing or role playing.

For example, all three children drew on popular culture, such as *Star Wars* and *Mia and Me*, to create narratives in their non-digital play. The mothers both recognized the powerful role TV and movies (i.e., popular culture) played in their children's unstructured play activities. Sarah acknowledged during our first semi-structured interview, "There is an influence, for sure" (Semi-structured interview, March 31, 2015). Lindsay could not recall whether Belle watched Disney Princess movies or read the books first. She told me, "I don't remember if I read the stories to her before watching the movies, or if we watched the movies" (Semi-structured interview, March 19, 2015), meaning she did not know whether Disney Princesses, in Belle's experience, were originally a digital influence or a non-digital influence. All three children transmediated elements from the digital world, such as storylines and/or characters from digital popular culture (e.g., Disney) to non-digital play activities.

Before kindergarten entry. Luke often transposed his knowledge of digital games or movies from digital modes to non-digital modes. He used vocabulary learned from *The Legend of Sleepy Hollow: Jar of Marbles III* video game in his Lego play, words such as "conquer" (Fieldnote, April 9, 2015) and "secrets" (Fieldnote, May 13, 2015). Sarah decided Luke and Leia were, "Taking a break from video games" for the summer months (Informal conversation, June

25, 2015). As an alternative to playing real video games, Luke created video game blueprints to support his play:

> Luke created five blueprints: four blueprints were similar to *The Legend of Sleepy Hollow: Jar of Marbles III*[13] and one game was based on soccer. The blueprints similar to *The Legend of Sleepy Hollow: Jar of Marbles III* contained levels that could not be completed until all objectives were met. The soccer game blueprint was inspired by a Major League Soccer match Luke recently attended with Craig. Sarah was the one who directed my attention to the blue prints and described how Luke decided to draw the blueprints. Luke showed me the designs and that it was, "Like Sleepy Hollow," but Leia was the one who explained that each piece of paper was a different game. As Sarah and Leia spoke, Luke crouched on the floor and played a video game on his blueprints. He could be heard calling out, "Slide, jump! Slide, jump, jump, slide," similar commands used when playing iPhone app-based games (Fieldnotes, June 25, 2015).

Figure 5.1 shows Luke playing his soccer video game blueprint.

[13] *The Legend of Sleepy Hollow: Jar of Marbles III* game involved searching, progressing from level to level and a grand objective of capturing the Headless Horseman

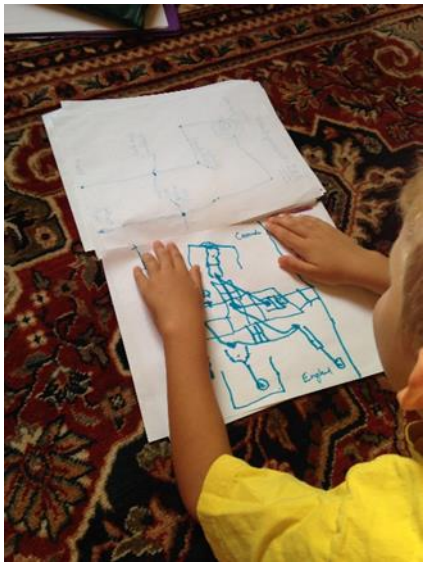

Figure 5.1. Luke's Blueprint Video Game

Luke's use of print materials to create digital games is reminiscent of the young children Wohlwend (2009a) observed in a primary classroom. She observed a kindergarten boy construct his own "iPod using materials that were 'to hand' in his classroom" (p. 126). The young boy used pompons, pipe cleaner, yarn and paper to construct his "dial and an LCD screen display that read 'Thomas and Friends" (p. 126). Wohlwend also described the action and negotiation between two young boys playing a print-based version of the two-player video game, *Digimon Rumble Arena*. Therefore, it is not a unique finding, but an interesting way Luke circumvented his lack of access to digital tools by transmediating digital interests into print-based spaces.

Luke and Leia were both highly interested in *Star Wars* and regularly transmediated the popular culture franchise into their unstructured play, despite the fact they had not watched the movies. Sarah and Craig grew up watching the original *Star Wars* trilogy and looked forward to watching the movies with their children. Sarah expressed her eagerness to watch the movies as a family during our first semi-structured interview:

> "And, I'm kind of thinking, when will we get to do that, because I think it is going to be really fun. To watch the first *Star Wars* movie together. Because you are getting into movies where the adults kind of reminiscence and oh, these are movies that we knew when we were younger. And so, it's kind of fun. We watched *ET*, which was kind of fun" (Semi-structured interview, March 31, 2015).

Although Luke and Leia had not watched the movies, they were familiar with the *Star Wars* narrative through oral stories told by Sarah and Craig and books. During an April observation I read aloud two *Star Wars* storybooks:

> Luke: This one [Luke hands me a story book].
>
> Laura: Oh *Star Wars*, from the original movie!
>
> Luke: That's Chewy [Points to Chewbacca on the cover].
>
> Leia: And Princess Leia [Points to Princess Leia on the cover].
>
> I read aloud the story to Luke and Leia. The story is based on the original *Star Wars* trilogy and the illustrations are photographs from the movies (i.e., Luke Skywalker is Mark Hamill, Princess Leia is Carrie Fisher). After I completed the book, Luke hands me another book called *Ezra's Wookie Rescue*. The storybook was branded with the *Star Wars* logo, but was a character I was unfamiliar with. Sarah explained the *Star Wars* franchise created storybooks and videos based on the *Star Wars* world, but were not actually in the movies. Luke showed me a CD-ROM located in the back of the book and told me they had looked at it and played games (Fieldnote, April 9, 2015).

This example shows the permeating nature of the *Star Wars* franchise. The *Star Wars* films have been transmediated from one sign system (i.e., film) to a new sign system (i.e., print-based texts and CD-ROM). In some ways, the transmediation of popular culture by the creators and business corporations assisted the children's transmediation of popular culture into their play.

Luke and his friends also used their imaginations to transmediate *Star Wars* storylines and borrowed battle scenes from *Star Wars* for their fantasy, rough and tumble play:

> Luke told me that last week he and his friends from the neighbourhood played in his backyard. I asked Luke what they played and he told me they pretended to be *Star Wars* and had a battle in the backyard. Leia told me they even played, "In the laneway!" behind the house (Fieldnote, August 28, 2015).

As Sarah explained, "There is a lot of stuff on *Star Wars*" (Semi-structured interview, March 31, 2015).

Leia also borrowed from *Star Wars* in her non-digital play. In addition to socio-dramatic play with her brother, she played independently with *Star Wars* Lego kits and *Star Wars* activity books. I observed Leia colour her *Star Wars* activity book and she pointed and named characters from the movie franchise, such as, "Bad droid", "Woolly droid", or "It's a warthog" (Informal conversation, May 13, 2015).

Leia also borrowed from TV programs to engage in imaginative play. As I began one participant observation, Leia pretended to be a news anchor:

> I walked from the front door towards the kitchen with Sarah. Leia ran down the hallway from the playroom and stopped at the doorway separating the living room

and the hallway. She held a Lego microphone in her hand and announced, “This is CBC news”. She then ran back to the playroom (Fieldnote, May 13, 2015).

The presence of my iPhone for data collection provided Leia an opportunity to extend her TV anchor role play in a more realistic way as she asked to create a video, a screenshot of which can be seen in Figure 5.3:

> While holding the Lego microphone, Leia directed me to take a picture of her. She quickly changed her mind and asked, “Can we do a video?” Leia stood up straight and looked directly at my iPhone. When she told me she was ready, I recorded her. Leia announced, “This is CBC News and tonight I’m going to show you a lot of funny new things …” She then made sound effects and other noises with her mouth (Fieldnote, May 13, 2015).

Figure 5.2. Leia as a CBC News Anchor

Belle often engaged in dramatic, socio-dramatic and fantasy play[14] (Hughes, 2002). She turned everyday objects in her home into pivots (Vygotsky, 1978) and allowed herself to imagine a new scenario. According to Vygotsky, a pivot "severs the meaning" (p. 97) of an object from its physical form. Belle took regular objects in her home, such as a yoga mat, and reimagined the physical object as something else. During my first visit to her home, I observed a blanket on the floor with plastic plates and utensils on top and a blue yoga mat beside the blanket:

> Lindsay told me it was the beach. Belle wanted to have a picnic but the weather outside was cold and rainy, so Belle recreated the beach in her home and ate her breakfast on a blanket on, "The beach" (Fieldnote, March 29, 2015).

On another occasion, I noted the patio furniture inside with plastic plates, utensils, and tea cups on the table:

> Belle attempted to eat her lunch outside on the patio today, but she told me, "It was too buggy," and the insects forced her back inside. To fix the issue, she and Lindsay brought the patio table and chairs inside and Belle set up her plastic tea set inside and enjoyed a tea party inside the apartment (Fieldnote, May 17, 2015).

Like Luke and Leia, Belle transmediated digital modes into non-digital play. However, since she was permitted more freedom to use digital tools in her home, her transmediation practices tended to blend digital and non-digital modes together more seamlessly than Luke and Leia. I present two different observations of imaginative play to illustrate this point. In the first example, I observed Belle feed a battery-operated, digital toy horse:

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[14] The distinction between dramatic and socio-dramatic play is as follows: dramatic play is play that dramatizes events that children have not participated in, while socio-dramatic play involves the re-enactment of real life scenarios that are based on a personal experience (Hughes, 2002).

> Belle brought out a large stuffed toy horse. She placed the toy on the carpet. She left the living room again and returned with a cardboard cut-out shaped and decorated into a stable, which she positioned behind Naya. Belle turned the "on" switch on. Belle stroked Naya's back, which initiated soft, neighing sound effects. When Belle fed the horse a plastic carrot the toy made chewing noises. Belle looked at me and asked me if I would like to feed Naya, as she continued to stroke the horse's mane (Fieldnote, March 29, 2015).

In the next example, I observed Belle read aloud to her stuffed cat:

> While Lindsay and I talked, Belle crawled behind her bookshelf in her room. She held her stuffed cat, Shara. Belle pulled a book off the shelf and began reading aloud to the cat. Belle was not yet an independent reader and was creating her own story she told the stuffed cat (Fieldnote, March 29, 2015).

The difference between her imaginative play with the stuffed cat and with the stuffed horse was that the stuffed horse purposely blended digital and non-digital modes. With the battery turned on, Belle utilized the toy's audio recording while she played with the horse, which was something she could not do with the stuffed cat. Luke and Leia did not own digital toys, such as Naya, and therefore did not engage in this type of play in their home.

The most prevalent popular culture reference in Belle's play was Disney princesses. I arrived for one observation to find Belle wearing her Cinderella costume:

> When I arrived at Belle's home I was greeted by Belle in the hallway. She wore a long blue dress and had a silver, plastic tiara on her head. She told me she wanted to, "Dress up" for my visit and was, "Cinderella." Lindsay explained it was her Cinderella costume from a previous Halloween. Belle also set up plastic tea cups,

> plates and a plastic tea kettle on her small table so we could have a tea party (Fieldnote, May 17, 2015).

Belle owned a few DVDs, such as *Cinderella* and *Beauty and the Beast*, but generally watched Disney movies on Netflix. She and her mother regularly attended the library and occasionally borrowed DVDs. Belle owned five Disney Princess dolls: Belle from *Beauty and the Beast*, Ariel from *Little Mermaid*, Tiana from *The Princess and the Frog*, Merida from *Brave*, and Rapunzel from *Rapunzel*. She had a number of picture books dedicated to the Disney Princesses and borrowed others from the library. Belle asked me to read aloud to her from her Disney storybook anthology[15] and I read *Rapunzel*, *Aladdin* and *Cinderella* (Fieldnotes, March 29, 2015). Even her Leap Pad Mini 2 was branded with the Disney symbol. She owned a bracelet making kit that was branded with Disney Princesses, which Belle showed me and named each princess who appeared on the box, "Belle, Cinderella, Ariel, Snow White- who I don't have- and Rapunzel. You can't forget Rapunzel. She has really long hair, like 50 more hairs than you" (Informal conversation, March 29, 2015). Belle also coloured in Disney Princesses activity books:

> Belle showed me a picture. It was a colouring she had done over top of a picture of Disney Princesses. Belle told me, "It's from Tianna … a princess … I'll show you. I have some dolls" and she got up and ran to her room. I followed her. I noticed a number of dolls sitting on top of her bookshelf and asked, "Who are all these friends?" which Belle responded, "Well, they are princesses. This is what

[15] Belle owned a Disney storybook that contained 12 original stories based on characters from different Disney movies, such as *Cinderella*, *Snow White and the Seven Dwarfs*, *The Lion King*, etc.

the picture was from [shows me the *Princess & the Frog* princess, Tianna]" (Fieldnote, March 29, 2015).

Belle also enjoyed the TV program *Mia and Me*[16]. I observed Belle transmediate *Mia and Me* from a digital space (TV screen) to a non-digital space:

> I arrived at Belle's apartment for my observation and Belle was finishing her dinner. She watched *Mia and Me* on Netflix with the iPad propped up by a support so she could watch "hands-free" as she ate dinner. Lindsay cleared the dishes and cleaned the kitchen while Belle finished. Once she was done eating, Belle left the table and began to draw on her blackboard with chalk. She drew a unicorn. She told me this was Uncha, the baby unicorn from *Mia and Me*. She then drew Mia riding Uncha and departed from the storyline of the episode she just watched and created a new narrative arc. As she drew her picture on the blackboard she narrated the action of her story (the new narrative arc). Belle decided Mia was the only person who could ride unicorns (in addition to communicate with them) and drew wings on Uncha so that Uncha could fly (unicorns do not have wings on the TV program). Once her chalk drawing was

[16]*Mia and Me* is the story of a girl named Mia who attends a prestigious boarding school in Florence, Italy as an exchange student. Her parents recently passed away in an accident. Her father was a successful game maker and Mia's aunt gives her a game he made before his death. The game is in the form of a large book called "*The Legend of Centopia*" (a book he read to her when she was younger) which is full of mystical rune writing that gives Mia passwords that allow her to enter the magical world of Centopia. The land is full of winged elves (fairies), pans (goat-like creatures), unicorns, dragons (they do not breathe fire) etc. When in Centopia, Mia is a winged, fairy-like, elf girl. Mia is very special because she can talk to unicorns and no one else has that ability. Mia and a unicorn, Lyria, using the oracles from the magic book, must find all the Trumptus pieces (a magic horn) that was stolen, broken into 20 pieces, and scattered throughout Centopia by order of the Evil Queen. The Evil Queen ordered this because the Trumptus is the one thing that can destroy evil creatures.

completed, Belle recorded her new narrative in a small notebook that contained images, alphabet letters and short words (Fieldnote, September 6, 2015).

In another example, Belle showed me a picture she drew earlier in the week that was inspired by *Mia and Me*. Belle drew a book that resembled Mia's *The legend of Centopia* book. Belle was inspired to retell her favourite scene in the TV program and explained that that story was contained in her book. Belle drew symbols to match the runes from that episode and explained, "When I clip the book like this [pages together], it takes me to another world like Mia" (Informal conversation, September 6, 2015). In *Mia and Me*, the oracles in the book are upside down. Figure 5.3 shows Belle using a mirror to unlock the oracles in the book she created.

Figure 5.3. Belle Unlocking the Oracles in her Book

Lindsay indicated this type of activity was typical for Belle and was confirmed to me by Belle as she described her artwork that Lindsay had hung on the apartment walls and on the refrigerator. I noted that, as per Belle's descriptions, much of her displayed artwork contained characters from TV programs and movies, such as *Cinderella* (Fieldnote, September 6, 2015).

The iPad app, *Garage Band*, was another way Belle transmediated from one domain to another. In this instance, Belle used *Garage Band* to bring her non-digital musical interests into a digital space. Lindsay described *Garage Band* to me:

> Lindsay told me, "Garage Band is fun!" The app lets users record and load audio into the app. Belle would sing into the app while Lindsay recorded it. They could then select from a variety of pre-loaded instruments, like acoustic or electric guitar, different types of drums, or they could mix electronic beats. Belle and Lindsay could play around with or manipulate the track and essentially create a song. Lindsay told me you could also record instruments into the app to increase the available instruments (Fieldnote, March 29, 2015).

It is worth pointing out, all three children selected their own pseudonyms for this study and all three selected a name based on a favourite popular culture character. As I obtained assent from Luke and Leia to participate in this study, I asked both of them what name they wished me to use instead of their real name:

> Laura: When I talk about what I see in this study I would like to use a different name than your real name. What name would you like to use [Luke]?
>
> Luke: (immediately shouts) LUKE SKYWALKER!
>
> Leia: I want to be Leia! (Fieldnote, April 9, 2015).

The process of assent with Belle occurred in a similar way. I sat with Belle on her couch and explained why I would be visiting her home and that I wanted to use a pseudonym when I talked about what I saw:

Laura: So, when I want to talk about what I see you doing, I would like to use a name that is different than your real name. Would you like to pick your own name?

Belle: Yes. I want Belle (Fieldnote, March 29, 2015).

To reiterate, transmediation is the act of understanding one sign system (i.e., digital popular culture) and moving it to another sign system (i.e., imaginative play) to create meaning (Suhor, 1984). The children in this study most frequently transmediated popular culture movies and TV programs from the screen into their unstructured play activities in their homes. Interestingly, Belle and Luke both sought out popular culture movies and TV programs in gendered ways. Belle transmediated storylines from Disney Princesses, a popular culture genre critiqued for its depictions of femininity in a number of studies (e.g., Carrington, 2003; Carrington & Dowdall, 2013; Forman-Brunell & Hains, 2015; Ray, 2009; Wohlwend, 2009b, 2011; Wohlwend, 2012). Luke transmediated from *Star Wars* and video games, genres often depicted as "male" (Harvey, 2015; Mavoa, Carter & Gibbs, 2018). Before kindergarten Leia was more prone to transmediate from *Star Wars* and therefore did not appear to favour gendered popular culture movies and/or TV sometimes associated with females.

After kindergarten entry. The children continued to transmediate from digital modes into their non-digital activities in their homes. Luke's transmediation from digital modes to non-digital modes increased after kindergarten as I observed him do this in each in-home observation from September 2015 to January 2016. Leia's transmediation of digital modes to non-digital modes remained the same and Belle's transmediation from digital to non-digital decreased after they began kindergarten.

As he did before kindergarten, Luke brought action sequences and storylines from videogames and movies into his non-digital play. For example, he would call out, "Control your guys and kill people" when referencing a bad guy in his dramatic play, which was a reference to the video game *Minecraft* (Fieldnote, September 28, 2015). In another example, Luke was building a spaceship at his Lego table when he called out, "Not the creeper!" (Fieldnote, January 11, 2016). When I asked him what the creeper was, he told me it was something you had to avoid in *Minecraft*. He further explained that he also had to avoid, "Zombies, creepers and enderman" (Fieldnote, January 11, 2016). Unbeknownst to me, he was re-enacting the *Minecraft* video game with his Lego. One gift Luke received at Christmas was a new *Minecraft* Lego set, imitating the colour scheme and design of the video game. This allowed him to bring accurate depictions of *Minecraft* into his Lego play. I recorded this example in my fieldnotes:

> Luke used his new *Minecraft* themed Lego set to construct a building he called "the snowman's home". He placed a yellow door inside the building and told me "behind the yellow door is a hidden closet" where the snowman "hides two brown shovels and one gun". Luke took a small Lego person from his Lego table and pretended the character was entering the snowman's home to take the shovels and gun because the "snowman is bad" (Fieldnote, January 11, 2016).

Star Wars remained a favoured popular culture reference in Luke's play activities. I observed him bring themes and characters from *Star Wars* into his Lego play on a number of occasions, typically depicting battle scenes. In one such example, Luke used Lego to build starfighter jets and engaged in dramatic play and fantasy play. He re-enacted battles based on his understanding of the *Star Wars* movie plots and extended those narratives in his own battle scenarios. To do this, Luke organized his fleet of starships into, as he told me, "Good guys" and

"Bad guys" (Fieldnote, November 4, 2015). With his starship fleets organized, Luke engaged in one-on-one good guy versus bad guy battle by holding a starship in each hand. He enacted battles by using his voice to create sound effects (i.e., sounds to mimic spaceship guns and explosions). Battles concluded in the same manner: starships did not collide into one another rather, the good guy (or hero) shot the bad guy (or villain) out of the air with Luke, again using vocal sound effects to establish defeat as he lowered the bad guy starship to the carpet (Fieldnote, November 4, 2015). In another example of Luke's transmediation involving *Star Wars*, I asked Sarah about shortened pool noodles I saw stacked on a bookshelf. She explained, "Luke and his friends still use those as light sabres for outside play" (Informal conversation, January 11, 2016). Similar to Lego play, Luke reported on more than one occasion that he and his friends recreated *Star Wars* battles during their outdoor play. I learned in my second semi-structured interview with Sarah that the family had recently begun watching the original *Star Wars* movies. She told me, "A few months ago we started watching the earliest ones [*Star Wars* movies]. So, we haven't seen the ones way back in time[17], but we saw the first ever *Star Wars* and the two after that." The spin-off movie, *Star Wars: Rogue One*, was in theaters during this time and Sarah told me she and another mother had planned a movie date for Luke, Leia and their friend to see the movie in theater (Semi-structured interview, March 2, 2016).

Transmediation from the digital domain to the non-digital domain occurred not only in Luke's imagined play, but in the commercial products he owned. And for example, *Pokémon*

---

[17] The *Star Wars* franchise began in 1977 with the release of *Star Wars* (later retitled *Star Wars Episode IV: A New Hope* (1981). Two sequels followed this movie: *The Empire Strikes Back* (1980) and *Return of the Jedi* (1983). A prequel trilogy was released between 1999-2005: I- *Phantom Menace* (1999); II- *Attack of the Clones* (2002); and III-*Revenge of the Sith* (2005). When Sarah referred to the, "Ones way back in time" she referred to the prequel trilogy.

playing cards became one of Luke's interests after kindergarten entry. He had watched the TV show sparingly but enjoyed playing the card game with his peers. When I asked about playing cards I saw on his bookshelf, he told me that they are not, "Ones for playing, just ones" (Informal conversation, September 28, 2015). He did not use these particular cards for playing games but saw them as cards meant for collecting. Another example of commercial transmediation in Luke and Leia's home came from a chessboard in his bedroom. During one observation Luke and Leia showed me a *Lord of the Rings* chessboard:

> Luke pulled a large board game board off of his bookshelf. He laid it flat on the floor to show me. It was a chessboard, but a map was drawn on the board. I asked Luke what the map was for and he told me, "*Lord of the Rings*". Leia explained, "Our dad really likes *Lord of the Rings* and so he got us this board." Luke told me that Craig was teaching both him and Leia how to play chess and that, "I [Luke] can play it already. I'm good" (Fieldnote, September 30, 2015).

Leia infrequently transmediated her digital interests into her non-digital play. I observed one example of Leia engaging in this behaviour after kindergarten. Leia asked me, "Have you watched *Lego Elf*?" (Informal conversation, January 26, 2016). I had not, so Leia walked to her Lego table and picked up a small character. She then described the TV program and picked up relevant characters as she spoke:

> "It's a TV show-movie. Jones (picks up Lego). She's a human. Here's the boy elf named Pharen (picked up another Lego character). A grass elf. I also have the fire elf, Azari (who she could not locate on the Lego table)" (Informal conversation, January 26, 2016).

This Lego set allowed Leia to recreate or imagine new stories for the TV program characters and in a more realistic way (i.e., the characters looked like the ones on TV). I cannot report how frequently she used the Lego pieces to re-enact storylines from *Lego Elf* as she did not provide further context when asked and Sarah was not sure how often Leia did this.

Like Luke and Leia, Belle continued to extend storylines and bring TV and movie characters into her non-digital play; however, the frequency with which she engaged in this activity decreased as her engagement in iPad app games increased. Although I observed few examples of this behaviour after kindergarten entry, Lindsay reported Belle's continued transmediation of Disney Princesses and *Mia and Me* into her non-digital activities. As well, I continued to see evidence of her fascination with *Mia and Me* in non-digital spaces in her home. For example, at Halloween, Belle decided she wanted to carve Uncha, the baby unicorn from *Mia and Me*, into her pumpkin. Lindsay assisted her by creating a stencil which was traced onto the pumpkin to carve (Fieldnote, November 15, 2015). Belle also used Lego to construct a statue of Uncha. Lindsay clarified that Belle had built Uncha in Lego so she could bring the Uncha character into her fantasy and imaginative play when she played with her Disney Princess dolls (Fieldnote, September 30, 2015). By having a physical replica of Uncha, Belle could include this character in her storylines while she played with her Disney Princess dolls.

In summary, there was evidence all three children transmediated from digital modes into their non-digital activities. Most frequently, I observed children transmediate characters, plots and action sequences from their favoured digital games and programs to non-digital modes (e.g., in non-digital sociodramatic play with Lego). The children most frequently drew from popular

culture movies and TV programs (e.g., *Star Wars* and Disney Princesses) in their transmediation. This finding is similar to other researchers' findings (e.g., Carrington & Dowdall, 2013; Wohlwend, 2011, 2013) and provides further evidence of the ways children move fluidly between digital and non-digital modes. The children in this study did not appear to see a tension between digital technology play and traditional play activities; rather, these children drew on available resources and mixed digital and non-digital modes in an effort to make meaning in their worlds. Since Belle was permitted the most freedom to access digital tools, her uses of digital and non-digital modes were often more fluid than Luke's and Leia's (e.g., extending the *Mia and Me* storyline immediately after watching the program on the iPad). However, Luke and Leia seamlessly moved from digital spaces to non-digital spaces, most notably by borrowing *Star Wars* characters and action sequences into their Lego and rough and tumble play. All three children transmediated from digital modes to non-digital modes throughout the study; however, Belle's instances decreased after kindergarten entry. This may have stemmed from an increase in time spent playing app-based games on the iPad. Interestingly, these games exhibited similar genres to narratives Belle explored in her non-digital activities. I elaborate on this finding in the next section.

Non-digital interests in digital choices. An interesting observation I noted throughout data collection was the way all three children's non-digital interests were evident in their digital choices. This finding did not neatly align between "before kindergarten" and "after kindergarten" digital events; rather, it became apparent to me when looking at each child's data set as a whole. The children did not transmediate non-digital interests into digital spaces as they were not creating digital texts; instead, I noticed, for example, narrative genres chosen in non-digital activities were the same narrative genres selected in digital games or apps.

Belle was keenly interested in nurturing dolls and stuffed animals during her imaginative play. I observed Belle mimic the physical proximity and intonation of a read aloud session as she read aloud to her stuffed cat:

> While Lindsay and I talked, Belle crawled behind her bookshelf in her room. She held her stuffed cat, Shara. Belle pulled a book off the shelf and began reading aloud to the cat. Belle was not yet an independent reader and was creating her own story she told the stuffed cat (Fieldnote, March 29, 2015).

This type of nurturing play was also apparent in the digital games she selected. After kindergarten entry, Belle began using the iPad to play app-based games more frequently. The game *Clumsy Ninja* allowed Belle to select her own avatar (a ninja) and decorate her ninja from stock costumes and colours. The game required Belle to nurture the ninja's skill development for battle. I observed Belle play *Clumsy Ninja*:

> Belle was still in "training mode" which meant she was not able to access game levels. Instead, she trained her ninja for battle. She "worked out" her ninja by jumping on a trampoline and punching a bag of rice. She accumulated skill points and once she earned enough points she was allowed to enter game levels and find her friend, Kira. In addition to training her ninja, Belle had to feed the ninja and make sure the ninja went to sleep by "tucking" the ninja into her sleeping bag (Fieldnote, November 15, 2015).

Another digital game Belle played was *Cat Hotel*. Like *Clumsy Ninja*, this game also allowed Belle to nurture avatars; however, in *Cat Hotel*, Belle was the caretaker of a cattery and cared for the cats who stayed in her cattery while their families were away. Belle requested, "No pictures" during this digital event, so I recorded my observations in fieldnotes:

> The game allows up to six cats to stay in the hotel at one time. Belle had to feed, groom and play with each cat client on every day of their stay. As well, Belle could decorate and design the rooms of her cattery with furniture, paint and new cat toys. All were selected from a stock list in the game (i.e., she could not digitally design her own, but choose from a number provided in the game). Belle liked "working out" and "grooming" each cat that stayed in her hotel. When cats arrived at the hotel Belle was responsible for completing a "checkup" which included giving the cats medicine and a shot. Belle did not like this part because she knew, "The shots hurt the cats" and she apologized to them as she injected them with the needle (Fieldnote, January 17, 2016).

Since Leia's access to digital tools was more restricted than Belle's, the instances of non-digital interests informing her digital choices was limited. However, there was evidence that Leia's non-digital interests carried over into her digital choices. Sarah reported that Leia liked, "Colouring and painting" (Semi-structured interview, March 31, 2015) and I observed Leia colour in activity books on many occasions, for example:

> As Luke continued to describe *The Legend of Sleepy Hollow: Jar of Marbles III*, Leia walked to the bookshelf, picked up a colouring book and a container of markers and sat on the living room floor. She flipped to a page of two cows and began to colour (Fieldnote, April 9, 2015).

Although I did not observe her use digital tools for drawing, Sarah reported that occasionally Leia used a digital drawing program on the iPad:

> "Leia uses this drawing pad, where you can pick with your finger what colour and then how thick the line is going to be and you can draw a picture or squiggles or,

> it's more different colours coming together. Squiggles all over the place if she likes to" (Semi-structured interview, March 31, 2015).

Leia was also interested in nail painting and hair styling. For example, during one observation, Leia decided to brush and style my hair. As she did this, she described two apps Craig had downloaded onto his iPhone for her:

> Leia decided to brush and style my hair. She took out my pony tail and brushed my hair. As she brushed, she told me she played a hair salon and pet salon game on her father's iPhone. She told me that "you style people's hair and clothes" in hair salon and that you "pet and brush cats and dogs" in pet salon (Fieldnote, January 11, 2016).

Craig had specifically downloaded these apps for Leia because of her interest in hair styling.

Luke was interested in "good guy versus bad guy" narratives. Although the majority of his good guy versus bad guy exploration saw him bring characters and storylines from digital activities into non-digital play, there was some evidence his interest in good guys and bad guys came from non-digital spaces. During one observation in the summer (when Luke was not permitted access to digital tools), Luke requested I read a story to him:

> Luke asked me to read him a storybook. He pulled *Tintin and the Blue Lotus* (Hergé, 1946) from the bookshelf and brought it to the carpet where I was sitting. Luke sat beside me while I read the comic book story to him. After the story ended he told me he often borrowed Tintin comics from the library and showed me another book from the series, *Tintin and the Black Island* (Hergé, 1943) that he had signed out from the library during his last visit to the centre (Fieldnote, August 28, 2015).

In each book of the adventure comic series the protagonist, Tintin, is tasked with solving a mystery and capturing a villain, or bad guy. Luke also created narratives at the Lego table about heroes defeating villains that were not derived from popular culture or digital games, but simply characters he imagined. Sometimes, in imaginative play, Luke took on hero roles himself or dressed up as heroes. For example, on Halloween, he decided to dress up as a ninja because, "They beat up bad guys" (Informal conversation, November 4, 2015).

Despite the limited evidence supporting this finding, it is an intriguing observation. It showed the fluid nature with which the children moved between non-digital and digital modes and suggests children may not consider digital and non-digital meaning making opportunities as separate, but may simply consider all modes of expression as tools to play and learn with. Further evidence is needed to draw strong conclusions, but this area is worthy of investigation.

As with the children's transmediation of digital modes to non-digital modes, the children's interest in popular culture tended to follow gendered lines, particularly for Luke and Belle. Luke was interested in video games (e.g., *Minecraft*) and "good guys versus bad guys", sites typically associated with boys play (Harvey, 2015; Mavoa et al., 2018). Belle continued to play and watch Disney Princesses, a brand associated with particular depictions of femininity (Carrington, 2003; Wohwenld, 2009b). Interestingly, after kindergarten, Leia's popular culture interests and transmediation practices also began to align with traditional gendered interests (Harvey, 2015), such as her increased interest in relationship stories (e.g., *My Little Ponies*) and hair styling app games (a profession often associated with being female). Gender was not a theme I sought to investigate in this study, but there was evidence of gender differences in the children's digital choices and digital interests.

I next describe the unintended influence of my iPhone as a data collection tool. Findings related to my iPhone relate solely to Luke and Leia's home.

iPhone as a Data Collection Tool

My use of my iPhone as a data collection tool appeared to influence Luke and Leia's use of digital tools in unanticipated and unintended ways. This was not the case with Belle and therefore this finding reflects only my observations in Luke and Leia's home. Throughout Chapter 4, and earlier in this chapter, I described the strict rules guiding Luke and Leia's digital tool use in their home. The presence of my iPhone gave the twins opportunities to engage with digital technology outside of sanctioned "digital days". Luke and Leia became accustomed to me using my iPhone to take photographs of them while they played. They enjoyed participating in data collection by bringing toys to me and instructing me to photograph them. For example, Luke told me to, "Take a picture of this. It's my secret hiding place" (Fieldnote, April 9, 2015). Figure 5.4 shows Luke's secret drawer and is the photograph he requested I take.

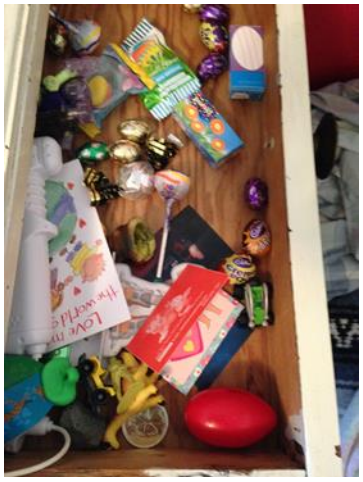

Figure 5.4 Luke's Secret Drawer

However, my iPhone also presented Luke and Leia with opportunities to use a digital device that they may not have had if it were not for my conducting the study in their home. For example, earlier in this chapter, I described a dramatic play event Leia engaged in: she used a Lego microphone to pretend she was a CBC news anchor. However, the presence of my iPhone, and Leia's knowledge that the device also recorded videos, allowed her to create a video of her play:

> Luke and Leia were building at their Lego table. Leia held her Lego microphone and instructed me to take a photograph of her. She quickly changed her mind and asked me to record a video. Leia told me when she was ready and began her video, "This is CBC News and tonight I'm going to show you a lot of funny news things …" She then made sound effects and other noises with her mouth (Fieldnote, May 13, 2015).

Watching his sister create a video inspired Luke to create a video. However, Luke did not imitate something for his video; rather, he told me he just, "[Did] something funny" (Informal conversation, May 13, 2015). Thus, began a twenty-minute video recording activity with my iPhone. I did not immediately stop the activity because I was curious about what they wanted to video record. In total, Luke and Leia created 42 short videos of their play. After each recording, Luke and Leia sat down beside me and watched the video they just made. They laughed and used it to inspire their next video:

> Luke stood in front of the iPhone and told me when to start. Once recording, he moved in and out of the camera frame making bodily function noises and repeated the word, "Butt." The video lasted 18 seconds. Leia was already sitting beside me and Luke walked to our spot on the carpet and sat down. We watched the video he

just created. Leia decided she and Luke would make a video together and told Luke to, "Do something funny" in the next video and Luke replied, "Just a silly video". Luke and Leia stood up and walked in front of the iPhone to create another video (Fieldnote, May 13, 2015).

I asked Luke and Leia if they ever created videos on their parents' smartphones and they told me, "No". I then asked Luke if he ever made videos at preschool, to which he replied he, "[Did] not" (Informal conversation, May 13, 2015). Although video recording did not become a regular digital event in the home during data collection, much later in the study Leia again requested I video record her play. Leia played with three small Styrofoam rabbits from Luke's magic kit:

Leia stacked pillows from her bed and placed a board game on top; this was her puppet stage. She sat behind the stage and held the three Styrofoam rabbits in her hands. She asked me to video her performance and instructed me on when to begin. Part way into the puppet show Leia stopped and told me to stop recording. She wanted to redo her puppet show (Fieldnote, January 11, 2016).

Below is the transcript of her second video:

Leia: "Hello, my name is Lily.

And I'm bunny.

I love you muah muah muah [Leia has the two bigger rabbits kiss]

Hey, hey. I know something"

[Leia lifts the 2 rabbits up and pretends they walk away. She lowers them so they are below her stage. As she lifts the rabbits back up to the stage she includes the 3rd, smaller rabbit]

"Ooooooo muah muah muah" [all three rabbits are now kissing]

"Lilly, stop kissing her! My turn muah muah muah

No bunny, it's my turn

No mine mine mine mine"

[video: 23 seconds in length.] (Fieldnote, January 11, 2016).

After the second recording, Leia sat beside me to review her video. She explained that her story was, "The mom and dad fighting over the baby bunny" and that they, "Both wanted [to kiss] it" (Informal conversation, January 11, 2016). Figure 5.5 is a screenshot of the video I recorded of Leia performing her puppet show.

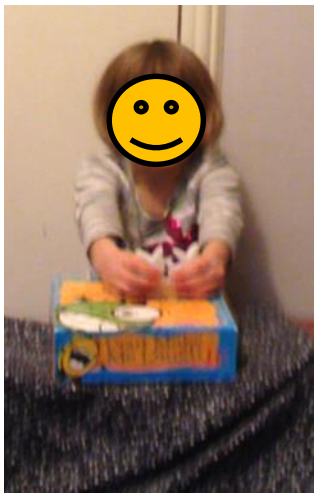

Figure 5.5. Leia Performing her Puppet Show

Although the video recording provided me with a good example of Leia's exploration of relationship narratives in play, it was a digital event only because I was in her home. Without my presence and my iPhone, this event was only an example of non-digital dramatic play and may not have been something she engaged in without my presence. There did not seem to be a particular function that video recordings played for Luke and Leia; rather, it seemed to be more about the opportunity to engage with a digital tool during these play moments. This was an intriguing finding and left me wondering if the children's lack of access to digital tools was a

reason for their repeated requests to make videos. Belle did not request a video with my iPhone at any time during the study. She had regular opportunities to engage with digital tools. It is possible that more restricted access to digital tools made these devices more enticing for Luke and Leia but it is not possible to know for certain.

During the study, I regularly showed Leia and Luke photographs of my pet rabbit on my iPhone. Initially, as I described in Chapter 3, these photographs provided a conversation topic with them and a way to establish rapport, but the practice evolved to become a typical part of my visits to their home:

> Luke and Leia sat on either side of me. I showed them photographs stored on my iPhone of [my pet rabbit] Marshmallow. As I showed them the photographs, I explained how I cared for a pet rabbit, what he ate and his funny behaviour (Fieldnote, April 9, 2015).

However, the iPhone photographs also provided Luke and Leia with extra digital time. On one occasion, as I scrolled through my photographs, Leia and Luke noticed a photograph of my son stored in the camera roll. I used the *SnapChat* app[18] to take the photograph and typed the printed text "I'm 2 months old!":

> Luke and Leia immediately commented on the photograph and Leia asked, "How did you get the words on the picture?" I told her I used an app called *SnapChat* and opened the app on my iPhone to show them. Luke exclaimed, "Oh, my dad has that!" Leia asked if she could make her own *SnapChat* image. After repeated

[18] This app allows users to take photographs and to alter the photographs with print text, emojis, filters, and drawn text.

> requests [from Leia], I showed her how to change the camera's direction and how to access the drawing function and how to select colours for drawing. Leia took a picture of herself and carefully selected colours for her image. She drew red lines over her hair, in the same direction her hair fell, pink over her right eye, like eyeshadow, and pink on her lips. She asked me to help her with the printed text so I showed her where to access the alphabet and emoji keyboards. Leia dictated the words she wanted to appear on the photograph and the emojis I was to use (Fieldnote, January 26, 2016).

Although an unsanctioned digital event, this moment provided me with an example of how Leia translated her artistic interests into the digital mode. She mimicked her colouring in activity books as she coloured over her image, as seen in Figure 5.6.

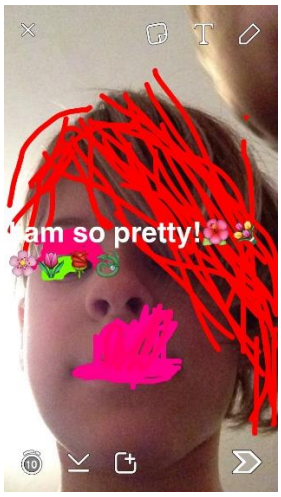

Figure 5.6. Leia's *SnapChat* Image

Luke, in particular, sought to use my iPhone for extended digital engagement. On many occasions, Luke asked about video games on my iPhone: a) "Do you have any video games on your phone?" (Informal conversation, April 9, 2015); b) "Can you show me the video games on your phone?" (Informal conversation, April 15, 2015); c) "Do you have video games on your

phone? I have way more video games now" (Informal conversation, January 11, 2016). During one observation Luke asked me to download a video game:

> Luke: Can I play *Angry Birds* on your phone?
>
> Laura: I don't have the game.
>
> Luke: Just download it then.
>
> Laura: I'm sorry Luke, but that would cost me money (Fieldnote, January 26, 2016)

Luke also extended his digital engagement by requesting to see photographs of Marshmallow:

> Luke asked me about Marshmallow. He wanted to know what Marshmallow was allowed to eat. I told him he ate hay and rabbit pellets and sometimes fruit, "As a treat." Luke asked whether Marshmallow, "Ate marshmallows?" I told Luke it would not be healthy for rabbits to eat marshmallows. Luke then asked to see a picture of Marshmallow. I opened my iPhone and scrolled to the photo album and located pictures of Marshmallow to show Luke (Fieldnote, July 29, 2015).

During another observation, Luke asked to see photographs of Marshmallow and then extended the activity by requesting I return to particular photographs:

> Luke asked me if I had any new pictures of Marshmallow on my iPhone. I told him I did not because Marshmallow had not done anything new lately. Luke then asked if I had any pictures of him sleeping. I scrolled through my photo album trying to locate a picture of Marshmallow sleeping. As we viewed a sleeping picture, Luke asked, "Can I show you a picture that I saw?" and directed me to scroll through the album and when to stop. He showed me another picture of Marshmallow sleeping that he liked (Fieldnote, August 28, 2015).

Luke's requests for photographs evolved to requests for videos of Marshmallow:

> Leia showed me a piggy bank she kept in her room. It was a dinosaur whose hind legs moved to "stomp". I told her that Marshmallow thumped, or stomped, his hind legs when he was angry or annoyed. Leia asked what Marshmallow was doing today and I told her he was asleep in the blinds when I left my home. I told Luke that I remembered to take a picture so he could see. *Luke asked (twice) "Did you get a video?"* (Fieldnote, September 28, 2015, emphasis mine).

This was not the only observation that Luke asked about a video:

> Leia was telling me why one *PlayMobil* fairy had tape over a crown. Luke interrupted to ask, "Did you take a video of Marshmallow?" (Fieldnote, January 11, 2015).

As I described in Chapter 3, my aim was to take on the role of participant observer and to engage the children as participants and allow their voices to surface. I did not intend to introduce Luke and Leia to new digital tools and only responded to requests made by them. As noted in Chapter 3, the use of smartphones is an accepted data collection method and used by multiple researchers, such as García et al. (2016), Moylan et al. (2015), and Plowman and Stevenson (2012). The practice of responding to children's requests is in line with Purcell-Gates (1996), who explained that researchers "did not initiate literacy events. At times, though, just their presence, along with the paper and pencils they brought with them to take notes, was enough to initiate requests from the children for paper and pencil for writing" (p. 412). So, although the children did use the iPhone, which gave them additional time and opportunity to use the digital tool in different ways, overall the iPhone did not significantly affect their digital tool use. Despite the fact my iPhone presented Luke with additional opportunities to engage with digital

tools, as I reported in this chapter, he also sought extra time with digital tools through covert use, such as when he told me he could secretly still access *Minecraft* on the iPad and my observation of him accessing a game when Sarah asked him to retrieve her smartphone for her.

This finding suggests a need to reconsider the role of data collection tools when designing case studies. Given the ubiquity of digital tools in Canadian society, and the rhetoric suggesting all children use digital tools daily (e.g., Canadian Paediatric Society), I had not considered that I would recruit a family where digital technology played such a minimal role in everyday life. As such, researchers should not assume that a smartphone is always appropriate to for gathering photographic data when designing studies investigating digital literacy practices of families in their homes.

Summary

Luke, Leia and Belle all lived in homes that contained a variety of digital tools. Although none of the children were permitted to spend unlimited amounts of time with digital tools, Luke's and Leia's access was more heavily regulated than Belle's. Of course, the infrequency with which Luke and Leia were permitted to have access to these tools meant that I was not able to observe many digital events in their home. Often, I relied on reports from either Sarah or the children. Given Luke's and Leia's limited use of digital tools, the ways they referenced digital tools and borrowed themes from digital games in their non-digital play was striking. Belle was permitted more time with digital tools, and as a result, I observed more examples of the types of app-based games she enjoyed and more examples of her fluidly moving from digital modes to non-digital modes and back again.

Despite these differences in access, I observed all three children use digital tools to entertain themselves, to acquire knowledge, and transmediate digital ideas and activities in their non-digital play. Also, there was some evidence all of the children's non-digital interests informed their digital choices. Transmediation from a digital mode to non-digital activities was the most common digital event I observed in the homes. The children all transmediated characters, plots and/or action sequences from digital modes into non-digital play, such as their socio-dramatic, fantasy or rough and tumble play. The types of play each child engaged in differed: Luke often re-enacted battles from *Star Wars* or *Minecraft*; while Leia and Belle cared for dolls and stuffed animals. Popular culture was the strongest source of digital inspiration for all three children; however, the type of popular culture differed among them. Luke and Leia were most interested in the movie *Star Wars*, while Belle preferred Disney princesses and *Mia and Me*.

The ways children transmediate, or borrow from one mode to create meaning in another, is an important finding for educators to recognize and draw from in classrooms. The children in this study moved from one mode to another seamlessly and borrowed from a variety of genres and modes to make meaning in their worlds. This is consistent with the literature (e.g., Marsh, 2004; Plowman & McPake, 2013; Wohlwend, 2013) and counters the discourse that children are only passive users of digital technology and should, therefore, have their screen time heavily limited (e.g., AAP, 2016; CPS, 2017; NAEYC, 2012).

In the next chapter I describe the changes I noticed in the homes as the children transitioned into kindergarten in greater detail and I specifically address any changes in digital tool use I observed during this transition. I also describe the ways the children referenced digital technology in their talk.

Chapter Six: The Digital Literacy Practices of the Home Pre and Post Kindergarten Entry

The purpose of this chapter is to highlight the changes in children's uses of digital technology in their homes as they transitioned into kindergarten and as they progressed through kindergarten. This chapter addresses Research Question 4:

4. Do the children's uses of digital tools change as they prepare for entry to kindergarten? b) Do their parents use digital tools to support their children's preparation for formal schooling (i.e., for learning purposes), and if so, how?

As I described in Chapter 3, I visited each home on 10 occasions between March 2015 and March 2016. In all, I spent approximately 13.5 hours in each home observing the children. I entered their homes as a participant observer and observed and documented the children's uses of digital tools there. In this chapter, I draw from fieldnotes, informal conversations with the mothers and children, and the second semi-structured interview with the mothers. I conclude the chapter by describing the ways the children referenced digital technology in their talk.

Changes in the Home as the Children Transitioned into Kindergarten

I was particularly interested in the children's transition into kindergarten. As I noted in Chapter 1, researchers have documented that the transition into kindergarten is a period of change within homes (Pianta & Cox, 1999; Pianta & Walsh, 1996; Purcell-Gates, 1996; Son & Morrison, 2010; Stevenson, Lee, Stigler, Hsu, & Kitamura, 1990). I sought to examine whether

these changes extended to digital literacy practices. I next describe any observed changes in regulations and the use of digital tools in each home.

Digital Literacy Practices as the Children Transitioned into Kindergarten

As they transitioned into kindergarten, the rules restricting Luke's and Leia's access to digital tools in their home remained in place, while Belle continued to have regular access to digital tools in her home. Luke and Leia's digital tool access remained limited to 10 minutes, every other day and always under the supervision of a parent. Lindsay allowed Belle to use digital tools at her leisure; however, she continued to prioritize physical activity during their free time on weekends and planned outdoor activities (e.g., swimming, hikes, visits to the park), or, during inclement weather, visits to the museum or science centre on the weekend.

In the months leading up to the children's entry to kindergarten, I did not observe many changes in the home digital environment; but the parents did introduce the children to new experiences. Sarah enrolled Luke and Leia in a preschool program one year before kindergarten in order to prepare them for school (Fieldnote, April 9, 2015). However, with respect to this study, preschool was not a new program when data collection began as Luke and Leia had been attending for six months when I met them. Sarah and Craig removed the twins' digital tool access for the summer months before kindergarten began (Fieldnote, June 25, 2015); however, this was because Sarah was concerned about what she saw as Luke's increasing fixation with digital tools, not specifically because he was entering school (Fieldnote, June 25, 2015). As well, Leia and Luke were enrolled in separate, one-week long day camps at a local university. Sarah told me Leia chose to participate in a dance camp while Luke chose to participate in a "sport ball" camp, where each day the campers learned about a different sport, such as soccer, baseball, and so forth (Fieldnote, August 28, 2015). Although I did not observe any changes to the

children's access to and use of digital tools, I did note changes to the home literacy environment after Luke and Leia began kindergarten. The twins enrolled in a French immersion program and, in an effort to support their acquisition of a new language, Sarah introduced French language books and board games. For example, the twins received a French version of the board game, *Game of Life* for Christmas from a family friend. Sarah also began checking out French language print-books from the public library in an effort to support Luke's and Leia's French vocabulary development. These new literacy practices were consistent with the support Sarah provided for the twin's development of their English language skills (e.g., borrowing English language books from the library, playing English language board games, etc.).

Belle remained in full-time childcare until school began. However, Lindsay started giving Belle piano lessons as school approached. These lessons between mother and daughter continued until the New Year, when Belle commenced formal piano lessons with a trained teacher (Fieldnote, January 17, 2016). Prior to formal piano lessons, Lindsay told me, "Almost every night" she and Belle sat down at the electric keyboard to practice reading sheet music and practice playing piano keys. Lindsay took lessons as a child and taught Belle to play, "What she [Lindsay] knows" (Informal conversation, November 15, 2015).

Although the time allowed with digital tools did not increase, I noted changes in the content of apps and games that children were interested in using (e.g., the title of games and in some instances, the genre of content). Tables 6.1- 6.3 lists each child's digital interests before kindergarten entry and the new digital devices, apps and/or games, TV programs and/or movies, or popular culture items the children expressed an interest in after entering kindergarten. This list documents all new digital tools from September 2015 until the conclusion of data collection in March 2016 and therefore does not solely address the transition into kindergarten.

Table 6.1 Luke's Digital Interests Before and After Kindergarten Entry

Before kindergarten	After kindergarten	Consistent use during study
The Legend of Sleepy Hollow: Jar of Marbles III (app game)	Electric keyboard	*Star Wars*
Science websites	Pokémon (TV/pop culture)	Science websites
Star Wars[19] (movie)	Minecraft (video game)	
	3D Motor Cross (app game	
	Magic kit website (video and website)	
	Watched *Star Wars* (movie)	

Table 6.2 Leia's Digital Interests Before and After Kindergarten Entry

Before kindergarten	After kindergarten	Consistent use during study
The Legend of Sleepy Hollow: Jar of Marbles III (app game)	Electric keyboard	*Star Wars*
Paw Patrol (TV)	*My Little Pony* (TV program)	
Star Wars (movie)	*Hello Kitty Nail Salon* (app game)	
	Pet Salon (app game)	
	Watched *Star Wars* (movie)	

[19] Although Luke and Leia were interested in *Star Wars*, they did not watch any of the movies until after they began kindergarten.

Table 6.3 Belle's Digital Interests Before and After Kindergarten Entry

Before kindergarten	After kindergarten	Consistent use during study
Mia and Me (Netflix TV)	*Clumsy Ninja* (app game)	*Mia and Me* (Netflix TV)
CD Player	*Google Earth* (app)	Leap Pad Mini 2
Leap Pad Mini 2	*Cat Hotel* (app game)	Disney Princesses (dolls and movies
Disney Princesses (dolls and movies)	*Blossom Blast* (app game)	
	Batman (TV cartoon)	
	Superman (TV cartoon)	
	Frozen Karaoke machine	

Luke's strong interest in digital technology remained during his transition into kindergarten and until data collection ended. However, his video game of choice changed from *The Legend of Sleepy Hollow: Jar of Marbles III* to *Minecraft*. As I noted in Chapter 4 and Chapter 5, Luke learned about *Minecraft* through the older brother of a friend from school and I learned of Luke's interest in *Minecraft* when I observed him read out the books he wished to purchase from the *Scholastic Book Club* flyer he received at school (Fieldnote, September 28, 2015). At this time, Luke was not playing the game; rather, Leia told me he watched videos:

Laura: Do you play *Minecraft*?

Luke: No.

Leia: We watched videos (Informal conversation, September 28, 2015).

Luke announced, "I have *Minecraft*" in November 2015 and from this observation until the end of data collection *Minecraft* was the predominant video game Luke talked about (Informal conversation, November 4, 2015).

Pokémon was another interest of Luke's that began after kindergarten entry. I learned of Luke's interest when he showed me the *Scholastic Book Club* flyer. However, Luke's interest in *Pokémon* was not as prominent as *Minecraft*. What the two popular culture icons shared, besides being in the *Scholastic Book Club* flyer, was that they were shared interests among Luke and his school aged peers. Interestingly, Belle also developed a new digital interest from school aged peers after kindergarten entry─ she developed an interest in superheroes, specifically *Batman* and *Superman* cartoons that she streamed through Netflix on the iPad, through a friend from school (Fieldnote, March 6, 2016).

Leia continued to play video games with her father on his iPhone but the video game content changed. Rather than play the same video games as Luke, such as *The Legend of Sleepy Hollow: Jar of Marbles III*, Craig downloaded apps specifically for Leia. Leia told me *The Legend of Sleepy Hollow: Jar of Marbles III* gave her, "Bad dreams and I can't sleep," so she no longer played that game (Informal conversation, June 25, 2015). After kindergarten entry, when prompted, Leia talked about *Hello Kitty Nail Salon* and *Pet Salon*, two apps her father downloaded for her to play on his iPhone. However, as the study progressed her interest in app-based games decreased and Leia's digital interest shifted to TV programs, as Sarah explained:

Sarah: She has almost started to veer away from it.

Laura: That's interesting. Does she want to use other apps, and not video games? Or is it just not interested?

Sarah: You know, she's just been asking for Netflix instead. She wants to watch, like relationship-based shows … something where … the unicorn show?

Laura: Oh, like *My Little Pony*?

Sarah: Yeah, yeah, yeah. She likes that one. Which is not always the best, I think. I'm not super keen on it because they are always, 'I don't like that person and now we are all friends again' and it's like ugh! (Semi-structured interview, March 2, 2016).

Sarah felt one reason why Leia shifted her allotted time for accessing digital tools to Netflix and TV programs, such as *My Little Pony*, was that themes contained in the TV programs played out in school for females, stating it was, "Something girls experience in their lives" (Semi-structured interview, March 2, 2016). In our first semi-structured interview (March 31, 2015), Sarah described Leia as, "More relationship based" and noted that Leia enjoyed exploring relationships through many modalities (e.g., dramatic play, storybooks, TV programs and movies). During our second semi-structured interview, as Sarah told me about Leia's preferred digital tools (i.e., Netflix and TV programs), she reflected on an experience with the children that occurred before kindergarten:

> "Even before they got into a show like that [*My Little Pony*], it happened a bit with a friend of theirs they have known since birth and she's the same age. There would be like 'I only want to play with [Luke] and I'm not going to play with [Leia]. [Luke] let's go play.' And they would leave [Leia] out. And that was an issue for a few months until we solved it. And we really had to work with them on it. So that kind of thing, I think, happens a little bit with girls, I've noticed. So, I think maybe they are interested in shows like that because that's what they experience, without even watching" (Semi-structured interview, March 2, 2016).

Throughout the study, I also observed Leia's interest in relationships, such as directing Luke in socio-dramatic play with a phrase such as, "Okay, we are playing cats. I'm the mom …"

(Informal conversation, January 26, 2016) or pretending her *PlayMobil* fairy characters were on a date:

> Leia stood behind me. I could feel something on top of my head. Before I could touch my head to feel what it was, Leia told me it was her plastic dolls. She explained that "They are on a date. They are going on a date on your head" (Fieldnote, January 11, 2016).

The amount of time Belle spent using digital tools remained consistent during her transition into kindergarten; however, she played more app-based games and watched less Netflix, which, interestingly, is the opposite of Leia. Before kindergarten, I only observed Belle use the iPad to watch *Mia and Me* (Fieldnote, September 6, 2015). After kindergarten, Lindsay began downloading app-based games from the Apple Store that Belle played on the iPad. Between the commencement of kindergarten and the end of data collection in March 2016, I observed Belle use the iPad for: *Google Earth* (Fieldnote, September 30, 2015); *Clumsy Ninja* (Fieldnote, November 15, 2015); *Mia and Me* (Fieldnote, November 15, 2015); *Cat Hotel* (Fieldnote, January 17, 2015); *Blossom Blast* (Fieldnote, March 6, 2016); *Batman* cartoon program (Fieldnote, March 6, 2016). Belle's time spent with digital tools did not increase, but rather, she opted to use the iPad rather than other digital tools in order to play games and watch TV programs. She continued to use the iPad as a source of entertainment, and not necessarily as an educational tool, but Belle seemed to prefer more interaction between her and the iPad after kindergarten entry. Before kindergarten Belle sat and watched Netflix programming, while after kindergarten she played games downloaded from the Apple App Store. She provided no reason for this change, other than telling me, "Games are fun!" (Informal Conversation, March 6, 2016).

Of note, Luke continued to be the participant most interested in digital technology after kindergarten entry. He was the only child who referenced any digital activities he did in school- he told me his favourite activity at school was the, "Listening centre" (Informal conversation, September 28, 2015). The listening centre contained a CD player, with headphones, that the children could listen to, but no print-based books accompanied these CDs. The audio books were only available in French for the students. No English audio books were available in Luke's classroom (Fieldnote, September 28, 2015). This contrasted with the activities Leia enjoyed at school, "The block centre, costumes and games" (Informal conversation, September 28, 2015). Belle preferred, "The library and Faith Anna Scott[20] [her new friend at school]" (Informal conversation, September 30, 2015).

During the months before kindergarten began and the first few months of kindergarten, little changed in both homes with respect to digital technology use. The regulations in each home remained the same. Luke's and Leia's screen time was still limited to 10 minutes, every other day. Belle continued to have more freedom to use digital tools in her home, but her mother continued to encourage physical activity (i.e., going for a bicycle ride). Throughout the study, it became clear neither Sarah nor Lindsay used digital tools as a way of supporting their children's entry to formal schooling. In fact, during our second semi-structured interview, when I asked Sarah specifically about using French language apps, such as Google Translate, for Luke and Leia to practice their French skills, she admitted, "I hadn't thought of that. But it is a good idea" (Semi-structured interview, March 2, 2016).

[20] To maintain confidentiality, I selected a pseudonym for Belle's friend.

What did change during the course of the study was the children's digital interests. Luke continued to enjoy video games on the iPhone and iPad, but his interest shifted from *The Legend of Sleepy Hollow: Jar of Marbles III* to *Minecraft*. Interestingly, this shift was a result of peer influence, which also influenced a shift in Belle's digital viewing habits. By the end of the study Belle began watching *Batman* and *Superman* cartoons on Netflix and, at that time, the superhero genre took priority over *Disney Princesses* and *Mia and Me*. Peer influence did not seem to impact Leia's choices, although her screen time interests moved from app-based games towards TV programming available on Netflix, particularly *My Little Pony*. Although this change was not necessarily due to peer influence, Sarah felt, as reported in this chapter, that Leia's enjoyment of *My Little Pony*, and similar TV shows, stemmed from the importance of friendship relationships in young girls' lives. As such, peer influence on young children's digital choices is an area worthy of further exploration.

The changes in the home literacy environment as the children transitioned into kindergarten were consistent with findings from previous studies (e.g., Purcell-Gates, 1996), in that all children were exposed to new experiences, such as preschool or organized sports, and regularly visited the library or were read storybooks by their parents. However, there were no digital literacy changes in either home as the children approached kindergarten entry. It is possible that the parents did not see digital tools as a resource that could support or enhance the children's development and learning. The parents in this study were wary of digital technology, perhaps influenced by the discourse emanating from the AAP and CPS. On the other hand, it might be that intuitively they wanted their children to be involved in a range of activities. Middle-class parents' desire for their children to be exposed to a range of activities because of the perceived benefits in cognitive and non-cognitive development has been documented by a

number of researchers (e.g., Bodovski & Farkas 2008; Covay & Carbonaro 2010; Lareau, 2011; Weininger, Lareau, & Conley, 2015) and can also be seen in these two case families. That none of the parents in this study viewed digital tools as a resource in preparing their children for school is interesting given BC's curriculum now emphasizes the development of digital literacy skills and considers them necessary for future success in school.

I now shift the focus to findings from those specifically documenting the changes in the children's digital events as they transitioned into kindergarten and describe the ways the children referenced digital technology in their talk before and after kindergarten entry.

Children Reference Digital Technology in Talk

The three children's access to digital technology was limited and in the absence of the physical digital tools, the children sometimes talked about or referenced digital tools in their conversations with me or in their play. This occurred more frequently with Luke and Leia than with Belle, likely attributable to the more limited access to digital technology that the twins experienced.

Before kindergarten entry. Of the three participant children, Luke was particularly interested in digital technology. At preschool, he drew a picture depicting "When I grow up I want to be…" and included "videogame maker" as one of his 16 future careers (Fieldnote, June 25, 2015). The strict limitations placed on Luke's digital tool use resulted in me observing digital events only twice before Luke started kindergarten. I visited his home on different days of the week and different times of the day; however, Sarah removed digital tools from Luke's and Leia's activity repertoire during the summer months, which meant I observed no digital events in their home in June, July or August. However, Luke's enthusiasm for digital technology became

apparent to me in the frequency that he spoke of digital tools and his excitement when describing these tools. He asked me, "Do you have any video games on your phone?" (Informal conversation, April 9, 2015) or asked me to recall previous conversations about digital media (particularly those pertaining to video games), for example, "Remember when we were talking about that game I have called…that daddy has, called *Sleepy Hollow* [sic]? And it was for me-that game?" (Informal conversation, May 13, 2015). He enjoyed showcasing his knowledge of app-based games by detailing how to complete levels:

> Luke: I need a pass to get out of Sleepy Hollow cemetery.
>
> Laura: How do you [get a] pass? Do you have to conquer a level?
>
> Luke: I need to find it. 'Cause that's the secret. Finding. It's very dark so I can't find it as well and I need Dad to read some stuff. Annnnnndddd you need the pumpkin because it helps! In Chapter One, you need a candle and light something on a burning tree but before you light it on a burning tree you need to press a dead guy with a hat on top of his head and a green shoot (Informal conversation, April 9, 2015).

Luke also linked his interest in digital technology to the topic of conversation, for example, he linked my question about catching frogs in ponds directly to his app-based game, *The Legend of Sleepy Hollow: Jar of Marbles III*:

> Laura: Do you ever go catch frogs by the pond?
>
> Luke: Catch frogs?! We go fishing! But there is a good fishing place in Sleepy Hollow Chapter 2. Because I got to Chapter 2.
>
> Laura: And that's your game, right? Sleepy Hollow?

Luke: Yeah. And I need a pass to get out of Sleepy Hollow cemetery (Informal conversation, April 9, 2015).

Both Luke and Leia asked questions about the digital audio recorder I brought to their home to aid me in data collection. During my first observation in their home I described the audio recorder to them:

> I explained to Luke and Leia that the small black item on a string was an audio recorder that allowed me to record sound. I showed the children how to turn the recorder on and where the microphone was located. I also stopped the recorder and replayed the speech I had just recorded. I then allowed each child to say something into the recorder while I recorded and then replayed their talk so they could listen to it (Fieldnote, April 9, 2015).

Although Leia was curious about my audio recorder, in general, she referenced digital tools less frequently than Luke did. When she did reference digital interests in conversation, they were mostly TV programs or movies she enjoyed watching, such as talking about the movies *Ratatouille* and *Big Hero 6*:

> Leia asked me if I had seen the movie *Ratatouille*. I told her I had and enjoyed the movie, to which she replied, "It's so funny". She then told me she, "Saw a commercial for *Big Hero 6*" and described the action she saw in the movie trailer (Fieldnote, June 25, 2015).

When Leia talked about digital tools or was asked questions about her digital tool use, she typically offered short, direct replies. For example, I asked her directly what the game, *The Legend of Sleepy Hollow: Jar of Marbles III* was about:

Laura: What else is the *Sleepy Hollow* game about? Besides finding secrets, what else do you do in the game?

Leia: Oh, just finding secrets and reading (Informal conversation, April 9, 2015).

A few times a month, Leia and Luke visited their father at work and during these visits they were allowed to watch TV on the iPad in his office. I asked Leia what programs she watched and she asked me, "Do you know *Paw Patrol*?", to which I indicated no, and she simply offered, "Well, I've watched it" (Informal conversation, April 9, 2015) and did not answer my follow-up questions about the TV program. During one observation, when I asked her multiple questions about *The Legend of Sleepy Hollow: Jar of Marbles III*, she offered short answers:

Laura: Is that still your favourite game you are playing right now?

Leia: We're trying to get the Headless Horseman.

Laura: Are you getting closer? (Leia does not respond) How many levels are there? Do you know? Or do you just keep going?

Leia: It's Sleepy Hollow chapter games.

Laura: Oh, it's chapters. So, do you know how many chapters there are in the game?

Leia: When we get to pass is when we get to the person who lets us out of the cemetery in *Sleepy Hollow* you get to chapter 3. We are on chapter 3.

Laura: Okay. Do you play it everyday?

Leia: No (Informal conversation, May 13, 2015).

Leia seemed most eager to volunteer information about her digital tool use when she built on descriptions Luke provided. It seemed as though she wanted to prove she knew more about the

digital tool than Luke did, although she never admitted to that. In one example, Leia extended Luke's description of the pumpkin *The Legend of Sleepy Hollow: Jar of Marbles III* by telling me:

> Leia: Oh, it gives you hints!
>
> Laura: It gives you hints, okay.
>
> Leia: It's also something that helps you find things. Like you need a ladder for something. You need things … lots of things (Informal conversation, April 9, 2015).

In another example, Leia reminded Luke that, "The pumpkin has to load. So, you have to wait until it has all of its magic powers. It takes 10 or five minutes to load the pumpkin" (Informal conversation, May 13, 2015).

As reported previously, Belle's access to digital tools was less restricted than Luke and Leia and, therefore, her referencing of digital tools occurred less frequently than Luke's and Leia's. When Belle referenced a digital tool in conversation with me, she could locate the digital tool and actively show me what she had just referenced. For example, she described using Google on the iPad and then retrieved the iPad to show me:

> Belle went to the living room to get the iPad. She brought it to me at the kitchen table and logged into the iPad without needing Lindsay to provide the password. She then tapped the Google icon on the screen to load the page (Fieldnote, May 17, 2015).

Like Luke and Leia, Belle asked questions about my digital tools; the audio recorder and iPhone I brought to document digital events. When the digital tool was unfamiliar, she would ask a question; for example, she pointed to the audio recorder and asked, "Can you record video?"

(Informal conversation, September 6, 2015). Although she rarely referenced specific digital tools like Luke did, she referenced TV programs or movies similarly to Leia, for example, I showed her a photograph of my pet rabbit, Marshmallow, and she connected "marshmallow" to the movie *Frozen*:

> Belle and I sat on the couch in the living room. I told Belle about my pet rabbit, Marshmallow. I showed her and Lindsay pictures of Marshmallow I had stored on the camera roll of my iPhone. Belle told me she would come over to my house to meet Marshmallow and that she would give him a carrot. She then told me, "Did you know, Marshmallow is in *Frozen* too. He's like a big snowman" (Fieldnote, May 17, 2015).

After kindergarten entry. After the children began kindergarten, the frequency with which they referenced digital tools in their talk remained the same. Luke described or talked about digital tools in each in-home visit; Leia talked about digital tools when I prompted her, and on one occasion spontaneously mentioned a digital game. Belle irregularly talked about digital tools but did describe digital tools and digital games when prompted. What did change after the children entered kindergarten was the digital content the children mentioned or described (e.g., describing new digital games or TV programs).

Of the three children, Luke continued to be the one most interested in digital technology. Every time I visited his home, Luke wanted to see pictures of my pet rabbit, Marshmallow, or would ask, "Did you get a video of Marshmallow?" (Informal conversation, September 28, 2015). He told me he used YouTube, "We go on YouTube. It's on the iPad" (Informal conversation, January 26, 2016). However, his central digital media focus after entering

kindergarten was the three-dimensional sandbox video game, *Minecraft*. I learned of Luke's new interest in *Minecraft* when he showed me a *Scholastic Book Club* flyer he received from school:

> Luke picked up the *Scholastic Book Club* flyer and turned a few pages. He stopped on and pointed to a book on *Minecraft*. Luke told me his friend already owned the book and, "He let me look at it" (Fieldnote, September 28, 2015).

Sarah informed me that Luke, "Learned about *Minecraft* from [friend's name]. He's the older brother of Luke's school friend" (Informal conversation, September 28, 2015). Luke displayed his knowledge of *Minecraft* by telling me about the game, and for example, he corrected my description of the game, telling me, "No, you just control guys and kill people" (Informal conversation, September 28, 2015). He also enjoyed correcting Leia's descriptions of the game: "No, these guys aren't zombies … they are just guys!" (Informal conversation, September 28, 2015). Craig eventually downloaded the *Minecraft* app onto his iPhone and the iPad and Luke began selecting *Minecraft* as his digital activity for the permitted 10 minutes, every other day. He announced during one participant observation, "I have *Minecraft*!" (Informal conversation, November 4, 2015) and from that point on, Luke updated me on his progress in the game, for example, telling me, "I know how to walk around but I don't know … I don't know how to get stuff into my thingy" (Informal conversation, November 4, 2015). He told me his plans for building in the game, "In my *Minecraft* videogame I'm literally going to make an underground house" (Informal conversation, January 11, 2016). He also told me that is he preferred to play the videogame on the laptop instead of the iPad:

> Luke told me he planned to delete *Minecraft* from the iPad and only play the game on the computer [laptop] because, "It's better on the computer." When I asked why it was better, he told me, "Because it is easier to kill stuff." So, I asked

him directly what he used on the computer- did he use his fingers on a touchpad or a mouse? Luke told me you can play using a touchpad or mouse (Fieldnote, January 11, 2016).

Luke also referenced a new motorcycle videogame he played:

> Luke described his motorcycle game to me, telling me, "There are a bunch of buttons and you have to look for the button that has red all around it and it has a fist and it's on this side of the phone [Luke points to the left side of my phone to show me where the button is on his father's iPhone]." He then explained you press that button and, "Try to get that person" and that it means, "Punch." He said the object of the game was, "People try to knock you off your motorcycle" (Fieldnote, January 11, 2016).

Leia rarely introduced or spontaneously talked about her personal digital interests. As discussed previously, one way Leia talked about digital tools was to build on or correct Luke's descriptions of a digital tool or digital game. For example, she corrected Luke's description of *Minecraft*, "First you have to dig. Then you have to build a house. You don't just start building" (Informal conversation, November 4, 2015). The other way Leia talked about digital tools was to answer directly to questions I asked. For example, I asked Leia if she played any new games on her father's iPhone and she replied, "I want to get *Monster High*" (Informal conversation, November 4, 2015). With prompting, Leia explained that *Monster High* was a game based on a movie she had watched:

> Leia: Oh, it's just a game…It's a game. I've watched the movie.
>
> Laura: It's a game based on the movie?
>
> Leia: Yeah. It's a game based on the movie.

Laura: Where did you watch the movie? [Leia is silent] Did you watch it at school? At a friend's house?

Leia: My dad's office.

Laura: So, what do you do in this *Monster High* game? [Leia did not respond to question] (Informal conversation, November 4, 2015).

When I asked Leia if she still played *The Legend of Sleepy Hollow: Jar of Marbles III*, she simply replied, "We don't have that anymore" (Informal conversation, November 4, 2015). I asked her if Craig downloaded new games for her and she quickly listed three new iPhone app-based games, "Princess nails … dog and cat cleaning … cutting hair" (Informal conversation, November 4, 2015), however she did not provide details about any of the games when asked. I attempted to engage Leia in a conversation about her digital interests and asked whether she also played *Minecraft*. The following transcription outlines our conversation:

Laura: [to Leia] Do you play *Minecraft* too?

Leia: I play this game called *Hello Kitty*.

Laura: And what happens in *Hello Kitty*?

Luke: It's *Hello Kitty Nail Salon*.

Leia: No. It's *Hello Kitty*.

Laura: So, what do you do in *Hello Kitty*? What's the game?

Leia: I paint nails. And I usually copy other people's.

Laura: So, it's kind of like a colouring game.

Leia: No. No colouring.

Laura: No colouring. Just nails?

Leia: You put jewels and stuff on.

Laura: You decorate them?

Leia does not answer and focuses on a Lego creation she is building (Fieldnote, January 11, 2016).

Leia only provided short answers and ended the conversation by not responding to a question. There was one exception to this pattern during data collection. Unprompted, Leia told me about a card game on Craig's iPhone:

Leia: Luke has cards and I do not even know how to play it. When I first tried to play it, I was like this: I picked a card. And I went like this [imitates dragging a digital card] and then it went like this [immediately drags her finger back to her starting point, as though the card were rejected].

Laura: It wasn't the right card?

Leia: I picked it and I dragged it over here [imitates dragging a card from one location to another] like, blam! And I tried another card to go there.

Laura: It didn't want to go where you wanted to put it. And this is on your dad's iPhone?

Leia: Dad's phone. He has his own applications. Like a game we can't even play (Fieldnote, November 4, 2015).

Similar to my observations of Belle in her home before kindergarten, her referencing of digital tools occurred at a much lower frequency than Luke and Leia. As I already noted in this chapter, Belle was able to show me the digital tools and digital games she talked about because she had fewer rules limiting her access to digital tools. The one example of Belle referencing digital tools after kindergarten entry was her describing the *Frozen* karaoke machine she received as a Christmas gift. As I described in Chapter 5, the karaoke machine was being shipped

from her grandfather's home in the United States as it was too large to bring on the airplane. For this reason, Belle was only able to tell me about her *Frozen* karaoke machine, rather than show me how to operate it.

Summary

In this chapter, I described the changes in digital literacy practices I observed in each home as the children transitioned into kindergarten. I also highlighted the activities the parents initiated for their children in preparation for their children's school entry. Although the rules governing the children's digital tool use remained constant, the children's interest in games and TV or movie content changed. One of the reasons for this change in Luke and Belle was the influence of peers on their digital choices. Parents reviewed and permitted content, but the requests they made were based on games and TV programs friends at school introduced to them. Luke became curious about *Pokémon* and *Minecraft*. Belle wanted to watch *Batman* and *Superman* on Netflix. I concluded this chapter by describing the ways the children referenced digital technology in their talk.

Taken together with Chapters 4 and 5, I demonstrated the ways two mothers made decisions about the inclusion of digital technology in their homes and the rules governing their children's access and use of digital tools. I also demonstrated the ways children used digital technology for learning and play, and how these uses changed or remained static as they transitioned into kindergarten. What has emerged, I suggest, is a nuanced account of digital technology in family life. I address this idea in the next and final chapter of the dissertation.

Chapter Seven: Discussion and Conclusion

The purpose for conducting this case study was to contribute to understandings about young children's digital tool use and their engagement in digital literacy practices in the context of family life before, and as they transitioned into, kindergarten. I sought to document how children used digital tools in their day-to-day lives and whether these digital literacy practices changed as they entered kindergarten. Based on the findings of my study, I believe that there is a need to characterize the role of digital technology in family life in a more nuanced manner than is described in some of the literature. For example, Prensky (2001) argued children, or digital natives, were "always plugged in" (p.1) and "native speakers" (p.1) in terms of computers, video games and so forth. Some of the parents in Plowman et al.'s (2008) study also expressed the belief that children intuitively understand digital tools, rather than learning about them from adults or significant others. As Plowman et al. noted, parents often unknowingly supported their children's digital learning and that digital technology was not as intuitive for young children as is sometimes assumed. It is also important for researchers and practitioners to recognize that, despite the ubiquity of digital tools in contemporary society, the children in my study did not have unfettered access to them, a finding consistent with other studies (e.g., Plowman & McPake, 2013; Plowman et al., 2010; O'Hara, 2011; Ozturk & Ohi, 2018).

I next discuss these key findings from the study in relation to the literature. I describe insights gained from this study and their implications for policymakers, educators and early years practitioners, and parents. I conclude by acknowledging the limitations and make suggestions for future research.

Key Findings and Relevant Research

The digital tools the children in my study accessed were most commonly TV programs or movies through cable or online streaming services (e.g., Netflix) and app-based games played on iPads or iPhones. I observed the children in my study use digital tools in their homes for the purposes of: a) entertainment; b) acquiring knowledge (or learning); and c) transmediation from digital spaces to non-digital spaces and vice versa. Although no changes in access to digital tools occurred as the children transitioned into kindergarten, there were changes in the children's digital interests, influenced by school-aged peers.

The focal parents in my study supervised their children's time spent with digital tools, either by co-using or by regulating the children's engagement with digital tools. To mediate Belle's use, Lindsay co-used digital tools with her and modelled how to use devices or play games. Sarah and Craig supervised Luke and Leia as they used digital tools and allowed the twins to engage in trial-and-error to learn to play new games. Sarah and Craig read instructions or provided advice when asked by either Luke or Leia. Although Sarah and Lindsay allowed their children to use digital tools, they both expressed tension about the decisions they made regarding their mediation and support strategies and about their children's digital tool use. These tensions manifested in both complex and subtle ways and influenced the way children took up digital tools in their homes. For example, Sarah allowed Luke to use the iPad to access iTunes and listen to music while she made lunch in the kitchen, despite her "no screens for the summer" rule (fieldnote, July 29, 2015). Sarah limited the digital event to a specific number of songs but permitted Luke's interaction with the iPad so that she could complete her chore.

"I'm not a techie": Parent Digital Literacy Practices

Something I continually noticed about the mothers in this study was how little they used or talked about digital technology. Sarah repeatedly told me she did not frequently use technology or digital media, saying for example, "You know, I'm not a tech kind of person" (Semi-structured interview, March 2, 2016). I never observed Lindsay use digital tools for herself during the 12-month study─ she only used them with Belle while I was present. Neither mother mentioned watching movies or TV programs except for those viewed with their children. As well, Sarah and Lindsay rarely referenced digital games, programs or apps. For example, Lindsay only once referenced *Spider Solitaire* as a digital game she played (Fieldnote, March 6, 2016) and this was the sole example of a digital game or program she described as something for herself. They referenced digital technology in relation to their work and indicated how they liked or disliked using digital technology with their children.

Prensky (2001) characterized parents like Sarah and Lindsay who are hesitant users of new technologies as "digital immigrants" (p.3). Typically, they grew up without digital technology. It was possible both mothers valued traditional activities they participated in as children over digital media, but neither Sarah nor Lindsay articulated this perspective. Furthermore, both mothers remembered computers in their classrooms during their elementary schooling and remembered video game consoles from their childhood (although neither regularly played video games as children) and, therefore, these mothers were not immigrants to technology in the way Prensky defined digital immigrants. It could be they simply prioritized non-digital activities or hobbies over digital ones.

Plowman et al. (2012) described parents' digital literacy practices on a spectrum. Parents fell anywhere between negative views (such as Sarah), ambivalent views (such as Lindsay), and

positive views, and that uptake of digital tools centered more on beliefs than on socioeconomic status. Both mothers' beliefs about digital technology in young children's lives were consistent with some of the discourse of the AAP and CPS: that young children need hands-on activity and that using digital tools did not fulfill this developmental need. Also noteworthy were the differences between Sarah's and Lindsay's mediation and support strategies in using digital technology with their children. Through guided interaction (Plowman & Stephen, 2007) both Sarah and Lindsay used proximal support; however, Sarah's role when using digital technology with her children was mainly supervisory. As well, she restricted Luke and Leia's use of digital tools and favored traditional activities, such as board games or reading storybooks. Her mediation strategy was to supervise her children while they used digital tools and to assist when requested. Lindsay, although not a frequent digital technology user in her personal life, allowed Belle access to digital tools and did not restrict the amount of time or frequency in the same way Sarah did. As I explained in Chapter 4, Lindsay scaffolded Belle's use of digital tools exemplifying the ZPD (Vygotsky, 1978). Lindsay provided explicit instruction during initial uses and slowly removed support until Belle was capable of using the device or playing the game independently. Interestingly, Plowman et al. (2012) also described two mothers with varying support and mediation strategies; however, the mothers in their study, Gail Bain and Catherine Searl, valued digital tools differently and shared different beliefs and attitudes towards digital technology than Sarah and Lindsay. Gail Bain was a low technology user but valued her children's engagement with digital technology as educational and encouraged and supported her children's uses with minimal restrictions. Catherine, like Sarah and Lindsay, was skeptical of the benefits of digital tools in young children's development, although she was an avid video game user and smartphone user herself. Although Catherine's children were restricted in their digital

engagement, through distal interactions (i.e., observing their mother use digital tools regularly), they learned about the role of digital tools in everyday life. The children in the current study also watched their parents use digital tools and therefore learned through distal interaction about digital technology, albeit infrequently (e.g., Sarah uploading music to her Android phone, Craig completing work on the laptop at home, or Lindsay accessing the iPad).

Other researchers (e.g., Nikken & Jansz, 2014; Nikken & Schols, 2015; Zaman et al., 2016) identified parental dispositions towards digital technology and classified parents under labels of: restrictive, active, co-use, or supervision (Nikken & Jansz, 2014); technical restriction (Nikken & Schols, 2015); and Internet parenting styles as permissive, authoritarian, lassiez-faire or mixed (Valcke, De Wever, Van Keer, & Schellens, 2011). Few researchers have examined parents' personal digital literacy practices and compared and/or contrasted them with how they supported or mediated their children's use of digital technology. Researchers need to examine this phenomenon.

Mothers' Categorization of Play

Also interesting was the way both Sarah and Lindsay separated children's play from digital spaces and did not appear to consider video games and other digital activities as play. Researchers and scholars now argue for digital activities to be categorized as a form of play and valued for their own benefits in the way traditional activities, such as dramatic play or playing with toys, are promoted for young children (Edwards, 2011; Plowman & McPake, 2013; Wohlwend, 2013). As detailed in Chapter 2, Marsh et al. (2016) adapted Hughes' taxonomy of play and included digital technologies in their updated definitions. They noted that many of their adaptations "retain the same characteristics as the original definitions" (p. 246), arguing that digital spaces did not change the types of play possible for children, but rather, it was the nature

of play that changed. They highlighted children's fluid movement across digital and non-digital boundaries in "ways that were not possible in the pre-digital era" (p. 250). As noted earlier, this fluidity was also evident in the children's play in the present study.

The mothers' belief that play was a separate activity from digital media created tensions for them. Sarah in particular felt that traditional play was more valuable than digital games and placed restrictions on both the length of time Luke and Leia could engage with digital tools and what types of digital tools they could use. As she expressed in the final semi-structured interview, she wanted them to, "Learn what it's like to become slightly bored and think about "what do I want to do next" (March 2, 2016). Based on her comments throughout the study, I inferred that Sarah felt digital tools interfered with people's ability to, "Become slightly bored". Lindsay was less explicit than Sarah about the division between play and digital, but she likened digital technology to a "bad habit" and something to be used for "downtime", and passive viewing (Semi-structured interview, March 6, 2016).

The tension with digital technology was evident in the ways they both valued digital tools, while at the same time having concerns about young children's use of them. Sarah enjoyed using science websites with Luke so they could conduct science experiments (Fieldnote, April 15, 2015) and she appreciated the family time weekend movie nights brought (Semi-structured interview, March 31, 2015). Despite referring to digital technology as a "bad habit", Lindsay believed some of the games Belle played on the iPad taught her responsibility (e.g., *Cat Hotel*) and strategy (Fieldnote, January 17, 2016). Both Sarah and Lindsay acknowledged that, in the 21st century in their communities, the use of digital technology was inescapable. However, they valued non-digital, or more traditional, childhood activities more than digital ones. This finding

echo some of the parents in the Plowman et al. (2012) study, who were unsure about the benefits of digital technology in young children's lives and limited their children's access to it.

In the next section, I discuss the findings related to the children's digital events in their homes and specifically address the children's balanced lives and the fluidity with which they moved between digital and non-digital spaces. I also discuss the influence of peers on the children's digital interests and, finally, discuss Luke's covert digital literacy practices at home.

Children's Digital Literacy Practices

Balanced Lives

Given the ubiquity of digital technology in young children's homes (Chaudron, 2015; Marsh et al., 2017b; Ozturk & Ohi, 2018; Plowman et al., 2012; Stephen et al., 2013; Wong, 2015; Zaman et al., 2016), as expected, both homes had digital tools and the children accessed these tools, albeit in a restricted or regulated way in the case of the twins. Researchers who documented young children's uses of digital tools over the last decade or so concluded many children lead media rich lives from birth (e.g., Chaudron, 2015; Common Sense Media & Rideout, 2011, 2013; Marsh et al., 2005; Rideout, Vanderwater, Wartella, 2003). However, despite what may be inferred from some of the literature and in some of the discourse circulating about young children and technology, the children in both homes in my study had rules about digital tool use and the content they could engage with. As well, all the children in my study engaged with traditional childhood activities. For example, I played the *Monopoly* board game with Lindsay and Belle during the majority of one visit to their home (Fieldnote, June 28, 2015) and played *Monopoly* with Luke (Fieldnote, September 28, 2015). On another occasion, Luke, Leia and I engaged in a riveting game of *Memory* with playing cards (Fieldnote, April 15, 2015).

Belle played counting and ball games with Lindsay at home (Fieldnote, March 29, 2015) and enjoyed showing me her gymnastics moves (Fieldnote, November 15, 2015). Belle and Leia's strong interest in non-digital activities was reminiscent of five-year-old Violet in Teichert and Anderson (2014). Violet used digital technology regularly in her home, but "drawing [was her] favourite thing to do" (p. 1685) and "imagination [was] the big thing" (p.1686) that motivated Violet during play activities. Violet preferred arts-based activities with paper and markers to digital drawing tools because she could select her own colours and draw what she wanted to draw. Although neither Belle nor Leia indicated a preference for "traditional" childhood activities, I frequently observed them select non-digital activities in their homes.

This was not the same for Luke who was fascinated by digital technology and wished for more time to engage with video games and other digital tools. Differences between boys' and girls' preferences for entertainment and learning have been documented in the literature. Siibak and Vinter (2014) noted five- to seven-years old girls and boys separated TV and movies into "boy films" (p. 365) and girl movies and each gender valued different qualities in their favoured characters. For example, boys preferred "battles between good and evil", "fighting and weapons" and "action-adventure and scary movies" (p. 367), which was not unlike Luke, whereas girls identified "cute and beautiful", "help others" and "physical capabilities" (p. 367) as preferred qualities, similar to the qualities in Leia's and Belle's favoured characters or programming. Other researchers focused their attention on children's construction of gender identities and the role popular culture played in shaping and/or allowing children to explore these identities (Wohlwend, 2011b) and explored popular media content for gendered stereotypes (Black, Korobkova & Epler, 2014; Black, Tomlinson & Korobkova, 2016; Carrington & Dowdall, 2013). There is some evidence in the literature that males and females differ in their use of

digital tools. McPake et al. (2005) noted that of their 16 case study children, "boys seemed to spend more time on ICT-related activities than girls" (p. 15), while Huh (2015) suggested that the reason boys preferred to use digital tools more than girls may stem from adults' experiences in their childhoods. The parents in her study felt that "digital games belong to boys" (p. 161) and therefore did not promote the use of digital tools with their daughters in the same way they did their sons. Kucirkova et al. (2018) found parents were more concerned about boys' digital engagement and the possible ill health effects caused by digital technology than girls. This finding echo Sarah's concern about Luke becoming addicted to digital tools. Luke's strong desire to engage with digital technology, in comparison to Leia and Belle, suggests a difference in gender preferences that is consistent with previous research. Further examination of why boys may be more drawn to digital tools than girls is needed.

Active Meaning-Makers

Marsh (2004) described children who were "active meaning-makers" (p. 56) when viewing TV. She observed that when children began watching a TV program or a movie, they temporarily sat quietly, but as the movie or TV show progressed, they engaged in a number of activities, such as talking about the programming, talking to the characters, or dancing and/or singing along with programming. The children in my study, when they did use digital tools, were similarly active meaning-makers. For example, Leia danced on her bed while the electric keyboard played music (Fieldnote, November 4, 2015). Belle drew pictures on her chalkboard or in her small notebook while she watched *Mia and Me* (Fieldnote, September 6, 2015). Luke balanced on an exercise ball while listening to iTunes (Fieldnote, July 28, 2015) and walked while playing a video game (Fieldnote, January 26, 2016). In some ways, this finding contradicts the notion of passivity that is sometimes associated with digital technology and

media (e.g., APA, 2011, 2016; CPS, 2017) as Marsh (2004) and others have noted. Their active behaviour showed a fluidity between digital and non-digital spaces, which I will address in the next section.

Fluidity

A noteworthy finding from observations of the children using digital technology in their homes was the fluidity of children's play in digital and non-digital spaces. The children's interests were not siloed in one space; rather, digital interests were apparent in non-digital play and the themes or narrative genres they enjoyed in non-digital spaces were similar to their digital choices. For example, Luke developed narratives about "good guys versus bad guys". Leia borrowed characters from digital spaces to construct relationship-based narratives in her imaginative play. Belle nurtured stuffed animals and dolls in imaginative play and sought digital games that required her to care for her avatars. This finding is consistent with other studies (e.g., Laidlaw & Wong, 2016; Marsh, 2004; Marsh et al., 2017b; Plowman, Stephen, & McPake, 2010; Wohlwend & Rowsell, 2017). As Plowman, McPake, and Stephen (2013) stated, children's "traditional' and 'digital' experiences are not so neatly segregated" (p.426). Children do not appear to see a tension between digital and non-digital activities or materials; rather, they use a variety of materials, resources and tools to make meaning in their worlds. For example, Luke's use of print materials to create digital games was similar to Wohlwend's (2009) observations in a primary classroom. As I described in Chapter 5, Wohlwend reported examples of young children appropriating elements from the digital world in print-based activities: a kindergarten boy creating an iPod to watch *Thomas and Friends*, and two young boys playing a print-based version of their favourite videogame, *Digimon Rumble Arena*. Although Luke's print video games were not unique, it adds another example to the growing literature documenting how

young children fluidly engage with a variety of tools (print and digital) in their homes and at school during play.

TV programs and movies in particular provided the children with opportunities to blur the boundaries between digital and non-digital play. They borrowed characters, storylines and action sequences and remixed these in non-digital play. Belle watched *Mia and Me* on Netflix and continued her affection for the story by retelling her favourite story lines and creating her own narrative plots (Fieldnote, September 6, 2015). Carrington and Dowdall (2013) described this practice as an "inter-media textual web" (p. 97) and used Lego to highlight the multiplatform and transmedia characteristics of the brands many young children play with in their lives. In the current study, I observed Disney Princesses and *Star Wars* as the main inter-media textual webs in the children's homes. Wohlwend (2017b) noted these same movies frequently appeared on children's backpacks, clothing and school supplies in childcare centres and kindergarten classrooms in midwestern USA.

Disney Princesses featured prominently in Belle's home and play. This is an example of the multiplatform brands many children use to transmediate characters, storylines, and so forth in their play (e.g., Dyson, 2003; Wohlwend 2009b, 2012). Belle's Leap Pad Mini 2, was branded by Disney and she owned a number of games related to Disney movies, such as *Sophia the First* and *Tangled*. Disney was also present in her non-digital play props, such as her plastic princess dolls and *Cinderella* costume. Originally, Disney was a film company that produced animated movies for children. However, over the last century, the company has expanded and the Disney Princesses franchise alone has grown into a multibillion-dollar part of the company. As Wohlwend (2011b) noted, this franchise "bundles explicit hyper-feminine princess identities with implicit girls-only consumer identities" (p. 6) while marketing Disney Princesses products

globally to three- to five-year-old girls in ways that link the movies to Barbie dolls, video games, lunch boxes, jewelry, home décor, and so forth (Wohlwend, 2011b). Disney Princesses permeate so many types of merchandise that Lindsay could not identify how Belle was first introduced to the Princesses- through storybooks or movies (Fieldnote, March 6, 2016). As well, Disney was so embedded in Belle's daily life, and had been for so long, that Lindsay no longer remembered from where the original fascination stemmed. Other researchers (e.g., Carrington & Dowdall, 2013; Wohlwend, 2013) have documented how children appropriate popular culture in literacy activities and findings from this study show that popular culture was an important narrative reference for the three children.

For Luke and Leia, the most prominent movie in their lives was *Star Wars*. As with the Disney Princesses, *Star Wars*[21] expanded its movie empire and merchandised storybooks, games, toys and so forth. For Luke and Leia, the introduction to the movie franchise was purposeful: Sarah and Craig introduced Luke and Leia to *Star Wars* with storybooks and oral stories about the movies but did not watch the movies with the children. This was because Sarah and Craig did not feel their children were ready for the movies, but *Star Wars* stories were influential in their own childhoods and something they looked forward to sharing with their children. The permeating nature of these movie franchises, and others like it, provide a good example of the fluid ways digital and non-digital interest intersect in children's play. I suggest that digital texts can be considered mirrors, or extension of non-digital texts, thus complementing them, not competing with them.

[21] Interestingly, on October 30, 2012, The Walt Disney Company bought LucasFilms, including *Star Wars*, for $4.05 billion.

However, this was not a sentiment that the mothers shared. As reported, Sarah restricted her children's uses of digital media to 10 minutes every other day. Although not as rigid as Sarah, Lindsay characterized digital media as "a bad habit" (Semi-structured interview, March 6, 2016) and prioritized physical activity and outdoor play on the weekends when she and Belle were home. Although Lindsay used digital tools with Belle, such as reading about penguins in *National Geographic* and then using Google Maps to locate Antarctica (Fieldnote, September 30, 2015), Sarah did not use such tools with her children. For Sarah, there was a clear distinction between digital spaces and non-digital spaces and she preferred Luke and Leia engage in non-digital activities. As noted in earlier chapters, Sarah's rationale for this distinction came from a fear of Luke becoming addicted to video games and a feeling that digital tools were not the best use of the children's time and they should be involved in more traditional activities such as board games and play. Whether the reasons for parents delineating play and digital tools to separate spaces is due to generational differences remains to be seen, but it seems important for parents to recognize the fluid nature of children's play and build on children's meaning-making with both digital and non-digital activities. The ubiquity of digital tools in contemporary life means that many children see adults move seamlessly between digital events and non-digital events. Recognizing that children, too, can fluidly move between digital and non-digital spaces, and providing them opportunities to do so, will increase the variety of tools that they can draw on to make meaning in their worlds.

Peer Influence

The digital content children were most interested in changed over the course of the 12-month study. On one hand, this is a natural evolution of children's development; children engage with a toy, eventually tire of it, and move onto another. The same is true for TV programs and

movies. As children mature, it is natural for their popular culture tastes to change as well. Yet, Luke and Belle's change in digital media interests began with their transition into kindergarten and the influence of classroom peers. Parents continued to review and permit (or deny) access to different apps, games and programs but the requests the children made emanated from the games and TV programs friends at school introduced to them. Luke became curious about *Pokémon* and *Minecraft*. Belle wanted to watch *Batman* and *Superman* on Netflix. This finding is not entirely surprising given the research documenting peer influence on a variety of behaviours in young children, such as peer influence on early literacy development and writing (Dyson, 2003; Genishi & Dyson, 2009; Kissel, 2009; Rogoff, 1990). Studies of youth and adolescents have examined the role of peer influence on conformity of opinion through peer pressure (e.g., Haun & Tomasello, 2011) and peer influence via social media (e.g., Sherman, Payton, Hernandez, Greenfield, & Dapretto, 2016). Wohlwend (2004; 2017b) and Carrington and Dowdall (2013) describe the role popular culture plays in young children's development of affinity groups in early childhood and primary school settings. With respect to the current study, data collection did not occur in the children's kindergarten classrooms and therefore, I cannot comment on the interactions between peers in the classroom. However, research describing how peer influence plays out in school (i.e., who influences who, how is digital media talked about and/or framed) and how this is rearticulated at home would be a valuable focus for future studies. After an extensive search, I could not locate any studies that described peer influence from school on young children's digital consumption and digital interests at home.

Luke's Covert Use of Digital Tools

As noted in Chapter 3, Luke's father was a software developer who spent his workweek developing digital programs. I explained in Chapter 6 how Luke included "video game maker"

on his preschool "when I grow up" drawing (Fieldnote, June 25, 2015). However, Sarah did not think Craig's profession influenced Luke's interest in digital technology; rather, as she suggested, "[Luke] knows that [Craig] knows how to do these kinds of things. I think he just really likes them" (Semi-structured interview, March 2, 2016). Luke was curious about digital media and wanted more opportunities to play in digital spaces. He attempted to develop his own burgeoning digital literacy practices by circumventing the restrictions placed on his use of digital tools by his mother by taking advantage of small opportunities. I explained in Chapter 5 how Luke took advantage of an opportunity when his mother asked him to retrieve her Android from the kitchen. Luke accessed and played a game in the time it took him to walk from the kitchen back to the living room where Sarah was sitting (Fieldnote, January 26, 2016). Also in Chapter 5, I described Luke quietly using the iPad in the kitchen to access iTunes while Sarah made lunch (Fieldnote, July 29, 2015) and how Luke brought his digital tools into non-digital spaces by creating paper video games to play (Fieldnote, June 25, 2015). And finally, and problematically for me, Luke gained access to digital tools through the video-recording I did of him on my smart phone. Researchers have used smartphones in data collection for a number of years and they are an efficient tool for documenting and recording data in qualitative research (García et al., 2016; Moylan et al., 2015; Plowman & Stevenson, 2012). My use of an iPhone for data collection was helpful in documenting the digital events I observed in the children's homes; however, it also proved distracting when observing Luke. This resulted in ethical dilemmas for me; I sought to conduct a naturalistic study, but this data collection tool, in this home, was additional digital tool time Luke otherwise was not permitted. Sarah knew I used my iPhone to photograph the children, but Luke's requests for video games proved to be a dilemma. On the one hand, I could use my iPhone to photograph digital events and build rapport with the children by showing them

aspects of my life (e.g., photographs of my pet rabbit, Marshmallow); on the other hand, allowing Luke to access and use my iPhone outside of prescribed digital time changed the natural role of digital tools in his home. Although Leia requested I video record her on two occasions (e.g., CBC news anchor and bunny puppet show), this finding was unique to Luke as neither Leia or Belle engaged in repeated requests to access or use my iPhone. In the next section, I highlight implications drawn from the insights from this study.

Implications

Policymakers

As Burnett, Davies, Merchant, and Rowsell (2014) pointed out, a focus solely on "the new" can "create a rather unhealthy polarisation" (p. 10) between traditional literacy practices (i.e., those associated with print) and new literacy practices (i.e., those associated with digital technology). Digital tools are important cultural tools in many communities and to vilify their use for children ignores the sociocultural ways children learn and develop. Children observe adults use relevant cultural tools in their homes and communities and learn about them in this way. Many families use digital tools in everyday life and children observe this behaviour and imitate it (Chaudron et al, 2015; Plowman et al., 2008). Polarizing print and digital literacy practices as different and isolated contributes to the tension for parents and educators in deciding whether to include digital literacy tools with young children. Indeed, alphabetic literacy is embedded within much digital content, alongside aural and visual modes. Recommendations of "no screens before two years of age" (AAP, 2011; CPS, 2017) and monitoring amounts of time for children under the age of five frame digital tools negatively and assumes digital tools are less valuable than print forms of literacy. As mentioned earlier, researchers, such as Chaudron et al.

(2015), Plowman and McPake (2012), and Plowman et al. (2010) found that the families in their studies reported that their children led well-rounded lives and while they had access to, and engaged with, digital tools, they also participated in a range of activities that did not include technology. Their findings indicated that screens did not dominate the young children's lives and that children continued to live balanced lives by engaging in traditional childhood activities (e.g., board games, storybook reading, drawing) and outdoor physical activities, while also accessing digital technology in their homes. The findings from the present study are consistent with that research. Indeed, Leia and Luke's access to technology and media was more limited than the conservative recommendations from the APA and CPA. Digital tools add to children's repertoire of meaning making tools and, as Burnett et al. (2014) suggested, are not replacing traditional literacy practices. The results of the current study suggest that the negative framing of digital tools may be causing unnecessary fears and tensions for parents and echoes calls from other scholars about the unnecessary anxiety these debates cause for parents (e.g., Kucirkova & Livingstone, 2017). Lindsay and Sarah expressed tensions about whether they were making the correct choices about their children's digital tool use and expressed a desire for their children to select non-digital activities over digital activities. It appears that the mothers may have internalized the discourse about the negative effects of screen time (e.g., AAP, 2016; CPS, 2017, NAEYC, 2012). It might also be that they intuitively valued traditional childhood activities, despite the everyday nature of digital tools in their families' lives. This framing of digital tools is unnecessary because, as George and Odgers (2015) pointed out, fear and anxiety about children's use of technology is not a new phenomenon, as "generations of parents, teachers, and other adults have worried whether new forms of media…is harming children" (p. 832). George and Odgers (2015) also reminded us that radio and comic books were also once a cause for

concern. Policy makers and those working in influential organizations such as the CPS need to consider presenting more balanced perspectives and recommendations that align with what studies, such as this one, indicate are the realities of everyday life of parents with young children. For example, rather than recommending specific policies (e.g., no screens before two years), the CPS and AAP should recommend that doctors ask parents about their own and their children's digital habits in the home and allow doctors to advise families accordingly. Shifting rhetoric and policy to reflect families' input and their lived experiences should help to alleviate some of the tensions parents and caregivers feel when making decisions about children using digital technology.

Educators and Practitioners

Karmcher-Klein and Shimas (2012) noted that teacher education candidates assumed children were "skilled technology users who understand the range of basic to complex skills of ICT" (p. 291) and were surprised to learn this narrative was often inaccurate. Wolfe and Flewitt (2010) found that early childhood educators were concerned about "technology-dominated childhoods" (p. 391) and the ill effect technology would have on young children's development. However, consistent with what other researchers have documented (Marsh et al., 2017b; Plowman & McPake, 2013; Teichert & Anderson, 2014), the lives of the children in my study were not dominated by digital technology; rather, there was an absence of daily use of digital media, especially in Luke and Leia's home. Educators and practitioners can use the current study as an example of homes in which children's lives are not dominated by digital tools and can work towards challenging assumptions about the amount of time young children spend engaged with digital technology in their homes. Setting aside these assumptions may help educators and practitioners to view digital tools from a sociocultural perspective (Vygotsky, 1978) and

recognize that these technological devices are relevant cultural tools in families' and young children's lives today. Of course, these tools also provide learning opportunities for the children at home. Digital tools are but one item in families' communicative repertoire. Rather than cast digital technology as something to be controlled and monitored, educators and practitioners could learn how digital practices are "meaningful, relevant, and purposeful" (McTavish, Streelasky, & Coles, 2012, p. 265) in families' daily lives. Educators and practitioners need to consider ways to bridge home digital literacy practices with classroom practice (Larson & Marsh, 2015). Educators might consider asking parents questions about their home digital literacy practices during parent-teacher conferences or by sending home a short survey at different points in the school year. Teachers could invite children to share their digital creations from home (e.g., five-year old Andrew making Lego instruction videos on YouTube in Wong's (2015) study), in a show and tell format. For families like Sarah's, it is important for educators to be aware that not all students come to school with lots of experience using digital tools. Children living in homes with little access to digital tools may not possess the same operational skills as other children in the classroom, so it is important that educators do not assume all children today are "digital natives" (Prensky, 2001).

Families

This study may provide parents like Lindsay and Sarah, and other family members, with some confidence that they are making the best decisions regarding digital technology in their homes for their children. By sharing my findings during the member checks, I was able to show the parents the balanced lives their children were leading and allowed them to see the many different ways their children were constructing meaning from the world around them. For other families, recognizing the tensions Sarah and Lindsay felt, may bring comfort in knowing they are

not the only ones feeling anxious about their young children's access to and use of digital technology. There is a relief in knowing you are not the only one struggling with parenting decisions and that you are not alone in second-guessing your choices.

The study may also provide families with insight into how young children use digital tools and note the creative, multimodal ways children shift from digital to non-digital spaces. Parents may begin to value the digital play their children engage in and begin to see the powerful creative and imaginative potential of digital tools, rather than framing them as bad habits.

In this section, I discussed the insights from this study for policy makers, educators and practitioners, and families, recognizing that the ability to generalize these findings is limited. In the next section, I identify and address the limitations of this study.

Limitations of the Study

Although I attended to issues of trustworthiness, including confirmability, credibility, and transferability, some caution is needed when interpreting the findings of my study. First, this study included a small sample size ─two middle-class, Caucasian families─ who may not be representative of all Canadian families. However, the small sample size allowed for an in-depth analysis and nuanced investigation through prolonged engagement in the two homes. For example, Sarah's mediation of digital technology for her young children provided an example of a home contrasting with much of the literature in which young children are depicted as having access to and using, digital tools at home on a regular basis. Her home contained few digital tools and she was restrictive in Luke and Leia's use of digital technology. Sarah was strict in Luke and Leia's "every other day for 10 minutes" (Semi-structured interview, March 31, 2015) rule about using digital tools, thus, rarely did I observe Luke and Leia engage with digital tools

in their home. I often had to rely on what Sarah, Luke and Leia told me about their families' digital literacy practices. I attempted to schedule observations at different times of the day and on different days of the week; however, it was sheer luck as to whether I was present on a "digital day" or not. Future research should aim for larger sample sizes with a more diverse participate population. The Skywalker home presented an interesting sibling dynamic as Luke and Leia were twins and preparing to enter formal schooling at the same time. Given the small sample size, I chose to analyze children's digital engagement as three children, rather than twins and only child. However, I acknowledge the impact the twins had on each other in a way that Belle could not experience. Interestingly, Leia's use of digital tools more closely approximated that of Belle than Luke, suggesting that gender may be in play, a point made elsewhere in this thesis.

A large amount of the data consisted of the mothers' reports of their and their children's behavior. Missing from the findings is the father's point of view. Although Craig was sometimes present during the study, he deferred to Sarah who spoke to the attitudes and beliefs on digital technology for the Skywalker home. There were no males in the Gaston home. Dias et al. (2016) found European mothers and fathers differed in views about young children's digital tool use. Further investigation focused on fathers', or male caregivers', beliefs and perspectives would make a worthy contribution to the topic of young children's access to and use of digital tools in the home.

Another issue that arose during the study was the unintended consequences of using an iPhone as a data collection tool. As already noted, iPhone (and other smartphone devices) use as a data collection tool is growing in popularity among qualitative researchers (e.g., García et al., 2016; Moylan et al., 2015; Plowman & Stevenson, 2012). Although I carefully attended to how I observed, documented and behaved in the homes prior to data collection (i.e., participant

observer, audio record, photographs), I did not anticipate the distraction my iPhone would prove to be for Luke as I attempted to collect data for a naturalistic study. As already noted, this was not a concern in Lindsay and Belle's home, but was a concern in Sarah, Luke and Leia's home. To minimize the distraction my iPhone presented with Luke and Leia I set limits on the number of photographs of Marshmallow the children could view at the beginning of the observation (e.g., only new images stored on my phone from my previous visit or to one video). There were also times I would say "no" to taking my iPhone out of my pocket, such as when we played a board game and Luke or Leia wished to see my phone. In the future, I would conduct a digital inventory without the assistance of my iPhone and consider frequency of smartphone use in the home before collecting data using an iPhone or similar device.

Future Research

As Burnett et al. (2014) indicated, there is a need to frame digital literacies as additive to traditional literacy practices, and not simply replacing them. As this study has shown, not all families allow their young children daily access to digital technology and parents limit children's access or encourage and promote other activities. As reported, there was a noticeable difference between Luke's interest in digital tools and Leia's and Belle's interest in digital tools. Further investigation of the gender differences in young children's digital tool selection and use is warranted. As well, it would be interesting to document the ways children, like Luke, circumvent parents' rules governing digital tool use and how they assert their own budding literacy and digital literacy practices in their homes.

The current study focused only on digital events within the family and it would be productive if future research looked at the role of peers in young children's uses of digital

technology. Indeed, the apparent dearth of research examining how peers influence young children's engagement with digital tools is surprising. Researchers have described the ways peers influence adolescent and youth behaviour (e.g., Haun & Tomasello, 2011) but whether peers have a similar influence on young children's digital engagement and interest is unknown. Future research should consider how peers influence each other's interest in digital media and the effect of this influence on the digital home environment.

Although the media capture functionality (Plowman & Stevenson, 2012) did not work well in this study, it seems to have potential in providing researchers with observational data in the absence of the researcher in the home. As Plowman and Stevenson (2012) described in their study, using media capture functionality, in combination with a set date and researcher reminders, could provide unique insights into families' lives. Similarly, García et al. (2016) used a specially designed app to collect photograph and text message data from their participants. Researchers need to continue improving this method and further explore strategies that provide consistent data while also giving participants autonomy in collecting their own data. Given how busy many families' lives are, prompts and reminders to parents should increase the amount of data collected using media capture functionality.

Finally, it is important to include lower socioeconomic status families and families from a variety of cultural backgrounds to gain a clearer picture of digital practices in the lives of young children. Researchers in Scotland (e.g., McPake et al, 2013; Plowman et al., 2010) and England (Marsh, 2004) have included families from diverse socioeconomic and cultural backgrounds in their studies; however, researchers in Canada are still attempting to collect data from minority families to ensure a fuller picture of the digital literacy practices in homes across Canada. Future studies should aim for larger sample sizes with families representing Canada's demographic

census (e.g., multicultural and diverse socio-economic families). As well, research is needed on how connectivity (or lack thereof) in rural areas affects rural families' home digital literacy practices.

Concluding Comments

As Marsh (2006) contended, for many children "communicative practices in the home focus on popular culture, media and new technologies. No longer is it possible to explore the literacy practices of young children as an isolated set of social practices" (p.35). The children in this study fluidly transmediated their literacy practices across multiple modes, including digital media. This study is significant as it provides further evidence of the ways children use digital tools in their daily lives and how these practices change or remain static as the children enter kindergarten. Parents used different mediation strategies when using digital tools with their children. Sarah and Craig limited their children's access to digital tools and supervised the children when they were permitted time with iPads or iPhones. Lindsay co-used digital tools with Belle and modeled how to use digital tools and play new games for Belle so she could learn to use digital tools independently. Yet, importantly, both mothers shared an internal struggle in determining what was best practice with regards to digital technology for their young children. The mothers' choices influenced the role of digital technology in the home and they valued traditional, non-digital, activities over digital tools. The children obeyed these rules while, in the case of Luke, also trying to develop his own, independent digital literacy practices.

In conclusion, I present this dissertation as a snapshot of the digital literacy practices occurring within two homes over the course of one year as three children transitioned into kindergarten. I followed two families with young children over 12-months and documented the

digital literacy practices of each home. As the findings show, the homes included a variety of digital tools; however, access to digital tools did not equate with use of digital tools and parents determined the role of digital tools in their homes. Ultimately, the children in this study led balanced lives with digital devices being but one tool in their meaning-making repertoire.

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Appendices

Appendix A

Parent Consent

Re: **Digital practices of young children in the home and during transition to kindergarten**

Dear Parents/Guardians,

My name is Laura Teichert. I am a doctoral candidate working on my PhD in the Department of Language and Literacy Education at the University of British Columbia under the supervision of Dr. Jim Anderson. I am looking for five families to participate in a study focusing on children's access to and use of technology and digital media in their homes. I am particularly interested in learning if the children's participation in these types of activities changes or stays the same over time as they enter kindergarten. Although there has been research into the types of technology and digital media children use, there has been little research into such use during children's transition into kindergarten.

I am inviting your family to participate in the study. The study will be carried out between March, 2015 and December, 2015. The study will include your participation in two in-home interviews, monthly in-home visits, and monthly (once between in-home visits) text-messaged photographs. You will also be invited to read through the transcription of our interviews and of the descriptions of the activities I observed taking place in your home. The total amount of time required for participation will be approximately 25 hours, spread out over a period of 10-months.

The interviews will take place in your home. The first interview will take place during March, 2015 and will last approximately one hour. In the interview, you will be asked to talk about the kinds of technology and digital media you use in your daily life as well as the kinds of technology and digital media you use with your children, and that your children use. The interview will be audio-recorded and then transcribed. I will not use your name or other identifiable information in my dissertation or in any reports or papers that I prepare for publication. This will assure your anonymity. I will return summaries of the transcript to you to check for clarity and accuracy. All information will be kept in a locked office on in password protected computer files, with paper information separate from audio-recordings and digital files tapes.

The observations will take place in your home on different days of the week and at different times, within your comfort level, March, 2015 (once a month, for 10 months for approximately 2 hours) and will focus on your child's daily life activity within your home. These observations will take place only when your child is present and awake. If I have any questions about the type

of activities and behaviours I observe, I will ask you about them following the observation. During the observation sessions, I will take notes and photographs of what I am observing. I will also collect or take photos of any print your child produces during the activity. The photos will be developed and the notes will be transcribed. I will not use your name or your child's name or other identifiable information for the report I will be preparing or for future publications. This will assure your anonymity. I will return summaries of the transcripts to you to check for clarity and accuracy. All information will be kept in a locked office or in password protected computer files.

Once a month, in between monthly in-home visits, you will be asked to take one photograph using your cellphone of your child playing with, or using, some form of technology. Each photograph may include the following: 1. Location (e.g., Tim Horton's) 2. Who is the child with? (e.g., mom) 3. What is the child doing? (e.g., playing with an iPod). In some situations, a photograph may not be appropriate. During those activities, a written description will be fine. The type of 'child using technology' moment you wish to capture will be entirely up to you. It may be your child's favourite technology activity or it may be something new for your child.

The information shared in interviews and observed during in-home visits will be confidential. I will provide you with a copy of my final report to use for your own purposes. The report will not contain any names or identifiable information about those who agree to participate in the study. Your participation will remain confidential in the dissertation I will write about this project or any publications that may arise from the project.

There are no known risks associated with your participation. You have the right to not answer any questions and to withdraw from the home visits (interview and observations) at any time with no consequences. If you have any questions concerning any aspect of this project, the procedures to be used, or the nature of your involvement, please contact me, Laura Teichert, at (XXX) XXX-XXXX. The principal investigator, Dr. Jim Anderson, can be contacted at (XXX) XXX-XXXX. If you have any concerns about you or family's treatment or rights as research participants, you may contact the Research Subject Information Line in the Office of Research Services at the University of British Columbia at (XXX) XXX-XXXX.

Thank you for considering my invitation.
Respectfully,

Laura Teichert
PhD Candidate
Department of Language and Literacy Education
Vancouver, BC

Your signature below indicates that you have received a copy of this consent form for your own records. Your signature also indicates that you consent to participate in this study.

I consent to [child's name] participation in the study titled, "Digital practices of young children in the home and during transition to kindergarten" as described above.

Signature: _____ Date: _____

I consent to my participation [adult's name] in the study titled "Digital practices of young children in the home and during transition to kindergarten" as described above.

Signature: _____ Date: _____

I consent to my home as the setting for the study.

Signature: _____ Date: _____

I consent to photographs being taken during this study.

Signature: _____ Date: _____

I consent to having interviews audio-taped during this study.

Signature: _____ Date: _____

A.1 Children's Assent Form

An examination of young children's digital literacy practices in the home and during transitions to kindergarten

Children's Assent Form

Principal Investigator: Jim Anderson
Department of Language and Literacy Education
Faculty of Education
University of British Columbia
(XXX) XXX-XXXX

Co-Investigators: Laura Teichert, PhD Candidate

Purpose: The purpose of this study is to learn how children are using digital tools, such as mobile phones, tablets, or electronic toys and/or video games, in their homes as they transition into kindergarten. A commitment of 25 hours will be required over the time we are visiting each child.

Procedures: Over the next little while, I will be visiting you and your family at your house. When I visit I will stay for about two hours. I will be watching you play, taking notes about what you say and do, and sometimes talking with you about the things you are doing, things you make in your play, and so on. Sometimes I will take photographs of you as you play or make things, as well as of things you make. Sometimes I will record your voice as you play. You can tell me to stop watching any time.

Do you assent (agree) to participate? YES _____ NO _____

The description will be read aloud to the child at the beginning of the study.

Appendix B

Semi-Structured Interview Protocol

Digital practices of young children in the home and during transition to kindergarten

Sample of the semi-structured interview protocol

First semi-structured interview

1. Parents' digital tool use
    a. What digital tools do you use in your everyday life? (e.g., TV, computer, video game, etc.)
    b. Where do you primarily use these devices?
    c. What devices do you use in your home (if not indicated earlier)? How often? For how long? (e.g., how long at a single time? How frequently do you return to the device? What are your purposes for using the device?)
    d. Does your child see you/family members using digital devices? If so, which ones? When? Where? For what purposes?
2. Children's digital tool use at home
    a. How do you feel about your child using digital tools?
    b. How do you feel about images/videos of your child appearing online, through social media or similar networks?
    c. What digital tools do you allow your child to use?
    d. How often is your child allowed to use the digital tool? For how long at a time?
    e. Does your child use the digital tool alone? With peers? With adults?
    f. When does the child use the digital tool? Where? (e.g., while grocery shopping, outside the home)
    g. Do you support or work with your child when s/he uses digital tools? If so, when and how?

Second semi-structured interview

1. Parents' digital tool use
    a. Since [child] has begun kindergarten, do you find yourself using digital tools in different ways?
        i. e.g., do you plan to use apps to help with French language development?
        ii. e.g., do you use the iPad to gain information and as a knowledge-based tool?

b. Do you attempt to show your child what you are doing with each device more often than you used to? Like, when [parent] is catching up on work, does he/she explain to the child what he/she is doing, specifically, if they ask?

c. When [child] is learning a new video game, do you just let them try it out, or do you specifically teach them first? (do you play the game before trying with the [child], or just problem solve together?)

d. Have you ever specifically taught [child] computer fundamentals? (like typing, login, passwords, etc.), or have they learned that by watching you?

e. What new ways do you support your child's digital tool use?

2. Children's digital tool use at home

   a. Since beginning kindergarten, what changes if any, have you noticed about [child's] digital tool use? Do you find they are more interested in certain games/apps/music/devices?

   b. Why do you think your child uses [particular device]?

   c. Does [child] ever show much interest in playing online/app-based games? Or is he/she happier playing with non-digital toys?

   d. What would you say is [child's] favourite play activity?