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Examining parental scaffolding in computer based contexts as a function of task difficulty and mobility of computer device

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Examining parental scaffolding in computer based contexts as a function of task difficulty and mobility of computer device

by

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Abstract

Technology is part of everyday life for most adults and children. Digital technologies allow children to engage with technology and the digital world earlier in their development than previously experienced (Orlando, 2011; Plowman, Stevenson, Stephen, & McPake, 2012). Two studies were conducted to explore joint media-based interactions of parents and their children. Parental views, age, gender, experience and familiarity with technology were considered in conjunction with parent-child interactions when engaged with stationary and mobile computers and when engaged with easy and difficult to navigate software. Study 1 employed self-report measures consistent with the wider body of literature available regarding early introduction of technology. Overall, the findings indicated that children are introduced to technology at an early age, however inconsistencies exist regarding the duration of technology use across different families. Reasons for introducing technology varied considerably and included factors such as family structure. Parents reported utilizing various forms of support when introducing the new technology, including a variety of verbal, emotional, and physical supports.

Study 2 involved behavioural observations. Qualitative examination of observations captured four levels of broad overarching themes: parental intentions during game play; supports parents provided; scaffolding; and engagements between parents and children. Subsequent subthemes were grouped under the major themes found in the self-report data: Verbal, Physical and Emotional. Overall, most parents exhibited a variety of supports and in most cases these did not differ as a function of parental gender but did differ as a function of child's age.

Keywords: parent-child interactions, scaffolding, children and technology.

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Examining parental scaffolding in computer based contexts as a function of task difficulty and mobility of computer device

In today's society, technology is seamlessly woven into everyday life for most adults and children. Digital interfaces, of good quality, allow children to engage with technology and the digital world much earlier in their development than previously experienced (Orlando, 2011; Plowman, Stevenson, Stephen, & McPake, 2012). In addition, advances in technology have created a multitude of devices varying in size, function, portability and price allowing greater flexibility and availability of devices for children. Given the vast number of digital devices available, and the changing characteristics of these devices, research examining children's use of technology employs many terms, some of which reflect these advancements in size, function and portability. Traditionally, research examining children's access to and use of computers simply referred to 'computers' and this reflected stationary desktop computers comprised of a CPU, screen, keypad, mouse (and possible a touchpad or stylus). Today, devices incorporate traditional 'computers' with some augmentation allowing for touch technologies (i.e., touchscreens) but also extend to more portable devices such as laptops and tablets, and to smaller devices such as cellphones and Smartphones. The common features across these 'computer' devices is the potential for interactivity between the user and the device. In the present study, the terms *stationary computers* and *mobile devices* will mark the distinction in portability however, these technologies, in general, may be referred to as digital technologies and digital media to permit greater ease in aligning current discussion with the extant literature. The distinction between stationary and mobile technologies is important as the present study examines potential differences that might arise in parent-child interactions when engaged with stationary computers versus mobile devices.

As noted above, prevalence of digital technologies has seen a rapid increase over the past decade. Data from a few years ago indicated that children as young as two to four years of age were engaged with computers for approximately 8.4 minutes per day (Carson, Tremblay, Spence, Timmons, & Janssen, 2013) and that 25% of three to four-year-olds in the United States and approximately 78% in the Netherlands accessed online activities (Holloway, Green, & Livingston, 2013). Increasingly sophisticated and flexible mobile devices allow technology to become more fully integrated into a variety of contexts of a child's life including the home, educational settings (libraries, day cares, schools), waiting rooms, grocery stores and even during daily commutes in a vehicle. For example, recent outcomes indicate that 60% of parents allow their children to use mobile media while they complete errands, 73% while doing household chores, and 65% report using mobile media to calm their children (Kabali et al., 2015). Current findings suggest that the vast majority of parents permit their child to access digital technologies (Wood et al., 2016) and that early interaction with computers is a global phenomenon. The increased prevalence of technology, combined with children's attraction to both the devices and software available to them, has resulted in greater adoption by parents and educators who see computer-mediated instruction as a potential means to facilitate children's learning (Blackwell, Lauricella, Wartella, Robb, & Schomburg, 2013; Lysenko & Abrami, 2014; Pynoo et al., 2011; Willoughby & Wood, 2008). Given the prevalence of digital media in the lives of young children, there is increasing need to investigate how young children are introduced to technology and how their early learning experiences unfold. Parent-child interactions, in particular, need to be understood as parents are the most likely source for early introduction and interactions with digital media. The present study investigates the joint use of technology between parents and children with a focus both on parenting behaviours and their children's responses to their interactions together. In addition, parental views toward technology and attitudes toward introduction and use of technology are examined.

Road map

Understanding introduction of digital technologies in the lives of young children requires an understanding of the developmental, social and technical aspects that impact access and outcomes. This study is part of a larger study assessing literacy and computer technology in the lives of young children. The first section of this document summarizes important developmental considerations as well as the prevalence, use and limitations regarding early introduction of digital technologies for children. This section is followed by an examination of features inherent in digital technologies that impact learning and attractiveness of these technologies from the perspective of children using the technologies and parents introducing the technologies. Finally, parental influences on children’s learning and technology use are identified and explored in terms of two key contributions parents provide: scaffolding and exposure to technology.

Introduction to Technology

Early introduction of technology now means introduction in infancy. Although the American Academy of Pediatrics (1999, 2001) indicates that children younger that 2 years of age should not be exposed to screens (e.g., television, smartphones, tablets and computers), many parents are providing digital screen-based technologies well before the recommended 2 years of age. A series of recent studies indicates increasingly earlier access to, and use of, various computer-based technologies. For example, a recent Canadian study (Wood et al., 2016) indicated that nearly 45% of parents supported introduction between the ages of 1½ to 2½ years of age. In comparison, Kabali and colleagues (2015) surveyed parents and found that by 2 years of age, 89% of children were reported to have touched or scrolled the screen of a mobile media device, 95% had watched television on a mobile device, and 77% had used apps. Even earlier, research reports were identifying substantial increases in mobile device use by infants. For example, parent surveys revealed an increase from 10% to 38% in the percentage of infants using mobile devices from 2011 to 2013 (Rideout, 2013). Apart from earlier access to technology a corresponding increase is also evident in the amount of time or number of opportunities in a day that infants and young children have to digital media. For example, recent research indicates that 14% of children use mobile media at least an hour a day by 1 year of age, with that number increasing to 26% by age 2 (Kabali et al., 2015). Together, these recent findings confirm a growing trend for younger children and even infants to become users of digital media technologies.

One caveat: the Digital Divide. One ongoing concern regarding introduction to technology involves recognition of barriers that prohibit some groups within society from accessing or using technologies to the extent experienced by others. Hohlfeld and colleagues (2008) termed digital divide as the imbalance of those who have access to technology and those who do not have access. Although there has been an increase in access to mobile devices in low-income families and a rapid decline in the digital divide, there is still a substantial gap in accessing computers and Internet between lower-income and higher-income families (Kabali et al., 2015; Rideout, 2013). Traditionally, low-income families have been less likely to have in-home access to a computer and to the Internet (Attewell, 2001; Hasseldahl, 2008; Mouza & Barrett-Greenly, 2015). Additionally, lower-income children are less likely to access educational content through technology than higher-income children. Despite this, lower-income parents were more likely to express a need for expert guidance on media content quality (Rideout, 2013).

In summary, the introduction of technology for young children appears to be evident at increasingly younger ages and across broader sectors of society. However, these general trends may not be fully representative of individual experiences for all children within any sector of society. Hence, exploring individual differences, experiences and responses to technology is an important feature in the present study. In particular, parental views, age, gender, experience with technology are all considered in conjunction with parent-child interactions when engaged with technology.

Why Parents Provide Technologies to Young Children

In part, increasingly early introduction to technology may be a product of the many forms of engagement children can have with new technologies. For example, parents of infants reported that their children 1 year and under used mobile applications sometimes or often for the following: 13% for educational games, 15% for ‘just for fun’ games, 19% for creative apps and 13% for apps based on television characters (Kabali et al., 2015). Parents of toddlers and preschoolers reported that their 2 to 4 year olds primarily used technology for playing games (63%) followed by watching videos (47%) and for educational content (30%) such as reading (Rideout, 2013). Although game play appears to have an important function for young users of technology, parents endorsed the use of technology, as having a variety of short-term and long-term benefits. Rationales for allowing their children to access technology included: development in literacy and mathematical skills, motor skills, and skills for the future, in addition to educational advantages (Davies, 2011; Wood et al., 2016).

Although studies suggest that parents are providing access to devices that professional agencies such as the American Pediatric Association perceive to be harmful to development, parents may not perceive digital technologies to be harmful. This is evident in a study by Rideout and Hamel (2006) who found that nearly 70% of the parents believed that computers “helped their [children’s] learning.” Parent’s beliefs in the efficacy of computers are evident in the extant literature. In fact, some literature supports the introduction of technology as an important contributor to early learning (Korat & Or, 2010). Children who engaged with literacy software, for example, show significant improvements on knowledge of word meaning (Korat, 2009; 2010; Korat & Shamir, 2007; 2008). Korart, Shamir and Segal-Drori (2014) showed learning gains through the use of e-learning for six facets of oral reading: word meaning, story comprehension, phonological awareness, letter naming, word reading, and word writing. Indeed, many research studies have demonstrated e-book reading leads to significant progress in reading level (e.g., Bus & Neuman, 2009; Korat, 2009, 2010; Korat & Blau, 2010; Korat & Shamir, 2008, 2012; Shamir, Korat, & Barbi, 2008). Furthermore, when young children read e-books independently it contributes to their ability to read words (Bus & Neuman, 2009; Korat, 2009, 2010; Korat & Blau, 2010). Apart from reading, additional research documents the positive impact educational software has on young children’s learning in general (Segers, Takke, & Veroeven, 2004; Segers & Verhoeven, 2002, 2003, 2005; Verhallen, Bus, & de Jong, 2006).

Although, less research assesses learning gains in very young learners, the impact of technology for early school-aged children shows some advantageous outcomes (Bus & Neuman, 2009; Korat, 2009, 2010; Korat & Blau, 2010). When children reach school age, they will likely encounter technologically sophisticated environments. Specifically, the presence of multi-media classrooms is an increasingly common feature of modern schools. The proliferation of technologies present in schools reflect both the promise of increased educational outcomes for typically and atypically developing learners and greater preparedness for students for living and working in the world that will be their future (Davies, 2011; Lai, Khaddage & Knezek, 2013).

For example, the integration of interactive whiteboards, iPads/iPods and desktop computers offer affordances that can increase engagement in learners and also provide individual support for learners with specific needs (Mercer, Warwick, Kershner, & Staarman, 2010). Access to these new technologies can engage students in learning opportunities by permitting greater diversity in teaching tools which enhances methods of delivery and learning opportunities—both of which foster unique classroom experiences (Mueller & Wood, 2012). However, the advantages afforded by technology in the classroom are contingent on the availability of teachers who can fully adopt and utilize these tools (Mueller & Wood, 2012; Prestridge, 2012; West & Vosloo, 2013). Full utilization of technology by teachers requires training, infrastructure and technological support (Ally, Grimus & Ebner, 2014; Mouza & Barrett-Greenly, 2015). Overall, positive learning gains have been demonstrated within the early school-aged population when technologies are able to be used effectively and efficiently as an appropriate pedagogical tool. Although in previous research some children may have had minimal exposure to technology prior to their early school years (Clements, 1997; McCarrick & Li, 2007), as noted above, the trend toward increasingly earlier exposure suggests that infants and toddler's today will be more familiar with technology than their predecessors.

Parental Beliefs. Over half of parents (60%) let their children play with mobile media while running errands, 73% while doing chores around the house, 65% used mobile media to calm their children and 29% used it to put their children to sleep (Kabali et al., 2015) demonstrating children's use of technology may be encouraged for parental convenience. However, parents also indicate technology provides educational benefits to children (Zimmerman, Christakis, & Meltzoff, 2007). Parent beliefs and attitudes influence the amount of time children spend with media (Lauricella, Wartella, & Rideout, 2015; Plowman, McPake, &

Stephen, 2008; Plowman et al., 2012). Parental beliefs around technology are divided between those that perceive technology as an educational tool and encourage its use and those that do not perceive technology to be educational and discourage its use. Parents tend to endorse the use of technology specifically to support their child's learning and to provide opportunities to gain experiences and skills which are viewed to be essential to their child's future education and employment (Davies, 2011; Wood et al., 2016). However, parents are sensitive to the need to protect their children from the potential harms of technology (Davies, 2011; Lauricella et al., 2015). Specifically, parents acknowledged the negative effects of screen-time but were not familiar with the technology use guidelines (Plowman et al., 2012).

Technology and Young Children

Over the past 15 years, computer technology has become increasingly prevalent in young children's lives, both within the home and in educational contexts, including early childhood education environments (Ko, 2002; Stephen & Plowman, 2008; Wang & Hoot, 2006; Wood, 2001). Early introduction means that children are becoming prominent users of technology before they are able to read or write (McKenney & Voogt, 2010). One study (Michael Cohen Group, 2011) explained the increased engagement of touch screen technology as it caters to a variety of ages and skills allowing for independent exploration. Children as young as 2 to 3 years of age are able to use touch screen technology to perform simple tasks such as matching and counting, and motor skills such as learning hand-eye coordination to target, press, or drag. Four to five year olds demonstrated more directed and advanced motor skills such as initial press, drag, and swipe. Finally, 6 to 8 year olds recognize and master the skills needed to operate games (Michael Cohen Group, 2011). Children also display motivation to read and enjoy learning though e-books (Greenlee-Moore & Smith, 1996; Smith 2001). The interactive nature of e-books enables children to independently explore and engage with storybooks. In addition, e-books have the ability to direct children's attention to specific words though highlighting or changing the colour of the printed text. If needed, the child could then choose to have these words defined. Given that vocabulary development occurs during the formative years of early childhood (Hiebert & Kamil, 2005) it is vital to promote language and literacy. Fostering literacy and promoting language, especially through book reading is vital in young childhood as it contributes to reading, reading comprehension and academic achievements in school (Neuman, & Dickinson, 2011; Whitehurst & Lonigan, 2001).

Effective Technology

In 2013, 91% of five to eight year olds had used a computer and averaged approximately 20 minutes per day of computer use (Rideout, 2013). Interestingly, only 34% frequently played educational games or software on the computer and 19% visited educational websites frequently, leaving much of the use for activities not related to educational development.

Not surprisingly, the element of "fun" is often identified as one of the key components of effective educational software (e.g., Ang & Rao, 2008). When educational software is designed to have a storyline with puzzles and missions to complete, participants rate the software as more motivating than the traditional classroom instruction. Moreno-Ger, Burgos, Martínez-Ortiz, Sierra, and Fernández-Manjón (2008) note that e-learning systems have evolved to include 'entertainment' aspects to increase the motivation to engage with the software concomitant with features that support learning, such as student tracking, online assessment, and user feedback. Moreno-Ger et al. (2008) advocate that design must balance educational requirements with a fun factor in order to engage the learner and encourage learners to persist with the activity. Knowing where children allocate their attention is key to determining whether critical content or distracting content is regarded as most interesting for young learners. Specifically, speed, colour, sound elements and dynamic presentation in software programs are especially engaging for young learners (e.g., Byun, & Loh, 2015; Prensky, 2001; Wood, Specht, Willoughby & Mueller, 2008). Mayer and Moreno (2002) provided a theoretical framework for understanding how dynamic or moving quality of images (animation) can enhance learning outcomes in multimedia contexts. Animation, or a simulated motion picture depicting object movement, was identified as one of the most intriguing presentation formats (Mayer & Moreno, 2002) and one most likely to facilitate learning. Furthermore, Ang and Rao (2008) suggested that avatars, or those with human-like features, are essential in an e-learning environment. They argued that this allows learners to immerse themselves in the learning environment and to become more engaged and interested in the game.

Digital devices offer the potential for enhanced instruction. Learning gains have been evident across the range of educational contexts from higher education to early childhood (e.g., Tamim, Bernard, Borokhovski, Abrami & Schmid, 2011), across many domains including science, math and reading (e.g., Kafai, 2010; Tamim et al., 2011) and across a diverse array of activities (e.g., creating presentations, gathering information, gaming, using digital cameras, listening to music and watching television: Burnett, 2013; Gronn, Scott, Edwards & Henderson, 2014). Overall, learning gains can be achieved through the use of technologies and, in some cases, may be afforded more easily in technology based contexts than in traditional instructional contexts (Tamim et al., 2011).

Traditional text-based instruction is often paired with computer-based educational software programs to assist children. Typically, these programs provide instruction in a game-like format, targeting one or more skill. However, device difficulty may impede a child’s ability to learn (Strommen, 1993). Features of software design have an impact on learning. For example, when both auditory and visual working memory systems are activated through the simultaneous use of sound and text, learners have additional processing capacity available to them because two systems are activated rather than just one (De Pasquale, et al. 2017), providing relevant images in addition to the text and sound can facilitate integration of the information (Mayer & Moreno, 2002). However, multi-modal presentations have also been shown to detract from learning if the presentation provides information that competes for resources within one memory system, rather than drawing on two systems, such as providing prose simultaneously with redundant verbal material (Mayer & Moreno, 2002). Flynn and Richert (2015) suggest touchscreen technology may require fewer working memory demands, which could result in acquiring more content learning.

Parents Role in Learning

A great deal of research shows that parents desire to support their children's learning (Davies, 2011; Evans & Shaw, 2008; Neumann, Hood, & Neumann, 2009). For example, prior to school, parents play the predominant role in facilitating their child's emergent literacy skills (Ehri & Roberts 2006; Saracho 1997). There is accumulating evidence that parents are engaging their children with literacy and mathematical activities even before pre-school (Cannon & Ginsburg, 2008; Duncan et al., 2007; Jung, 2016; Meyer et al., 2016; Neumann et al., 2009) suggesting that parents have a desire to promote their children's early skill development. Parents' expectation of, and thus involvement in, their child's readiness for school can positively impact their children's achievement when starting kindergarten (Jung, 2016). Indeed, when asked, parents rated themselves as having a primary role in developing their children's skills for key areas such as early literacy (e.g., Evans, Fox, Cremaso & McKinnon, 2004).

Considerable evidence of parental involvement in promoting children’s learning has arisen from research in literacy domains. Specifically, in traditional reading contexts parents facilitate learning by coaching their children in learning to read and print words (e.g. Evans, Shaw & Bell, 2000; Levy, Gong, Hessels, Evans, & Jared, 2006; Mansell, Evans, & Hamilton-Hulak, 2005; Stoltz & Fischel, 2003) and this coaching enhances their children’s development in the area of reading (Sénéchal & LeFevre, 2002). Children’s motivation to learn and explore print can be facilitated though pre-literacy parent-child interactions (Neumann et al., 2009). For example, a parent may incidentally expose their child to letter and sound representation of the letter “D” in the printed word “doll” (e.g., “Look, doll DDD - D is for Doll”) when at a toy store. Eventually the child may write the letter “D” in a sandbox and connect it with the word “doll” (e.g., “D is for doll”) as the parent previously demonstrated. In this example, the child has actively applied this knowledge during play, and also demonstrated his understanding of print awareness. Overall, parents engaged with their child can provide rich learning opportunities that promote acquisition of foundational skills.

Important skills involved in literacy acquisition can also be facilitated through the use of appropriate software. Using technologies to support learning requires access to relevant, accurate and interesting software. Research that assesses software for these key elements is relatively absent from the literature. However, recent evaluations provide an understanding of the quality available in current literacy software. Specifically, recent studies (Grant et al., 2012; Wood et al., 2012) evaluated offline and online literacy software both for content and quality of instruction. Grant and colleagues identified nine overall skills that should be supported through literacy software: Concepts of Print, Alphabetic Knowledge, Phonological Awareness, the Grapheme–Phoneme Relationship, Phonics, Syntactic Awareness, Decoding, Fluency, and Text

Comprehension (Grant et al., 2012). Overall, the authors found few skills were being taught than expected. Specifically, Phonological Awareness, Grapheme–Phoneme Relationship, Phonics, and Alphabetic Knowledge were trained more often in Preschool, Kindergarten and Grade 1 software whereas Text Comprehension and Fluency were trained less often; Syntactic Awareness and early Concepts of Print were least likely to be taught. Both studies (Grant et al., 2012; Wood et al., 2012) noted skill presentation was neither systematic nor consistent across the three software levels. This poses a problem because to successfully support learners, software needs to provide adjustment opportunities depending on the users' successes and failures (Grant et al., 2012; Wood et al., 2012). Without these automatic adjustments parents are required to regularly monitor and assess their child's abilities to ensure that the games are appropriately challenging and provide learning opportunities. Variations in the quality and design of software raises concerns regarding the effectiveness of instructional opportunities and also the importance of parental support to augment available instruction. To date, no research is available that assesses early numeracy or other mathematical software, science skills or other domains for which even very young learners could and should have exposure to in order to promote early learning. The research on literacy skills may be indicative of software limitations generally, and hence, understanding how parents engage their children with technology and how parents navigate joint media-based learning opportunities is especially important.

Although explicit learning opportunities are provided through direct parent instruction and through explicit instruction in software, children often acquire knowledge and skills incidentally while engaged in play. Typically incidental learning (also referred to as implicit learning) is characterized by the acquisition of knowledge without a conscious attempt to learn. This type of learning can occur within a formal learning context but most often it tends to occur in less formal and unstructured learning contexts. Moreover, incidental learning often results from an alternative activity, such as learning to spell a word resulting in learning to read the word (Purrazzella, K., & Mechling, 2013; Schuster, Morse, Griffen & Wolery, 1996). Parents can play an important role in providing incidental learning opportunities.

When using technology, parents indicated they are present to provide support to their children (Davies, 2011), provide resources, and to oversee safety (Plowman, Stevenson, McPake, Stephen, & Adey, 2011). Although researchers have observed parents providing support, parents often indicated they were not directly involved in supporting their child's learning (Plowman et al., 2011). It may be the case that parents are less aware of the learning opportunities they provide due to the implicit nature of the support they provide or the failure to recognize the importance of their scaffolding and modelling behaviours. In addition, as children interact with software, parents may attribute learning gains to the software rather than to their input. Incidental learning from software can occur especially through trial-and-error as a child explores software. However, incidental learning can also be mediated by parental actions that support learning when engaged jointly and through their selection of graduated software when children explore independently. Furthermore, mobile technology, as opposed to stationary computers, potentially mediates the spontaneous incidental learning of young children in their home due to the greater flexibility of these devices. Access to and use of technology does not guarantee parental support and supervision (Lewin & Luckin, 2010). Similar to shared-reading and shared television viewing, shared computer experiences (also referred to as joint media engagement) may allow the kind of active parental involvement that is necessary to mediate how children come to understand the information they experience as well as making the children more savvy media consumers (Gentile & Walsh, 2002). A great deal of research shows that parents desire to support their children’s learning through coaching and that this coaching significantly enhances their children’s development (Davies, 2011; Evans, Mansell, & Shaw, 2006; Neumann et al., 2009; Sénéchal & LeFevre, 2002). One goal in the present study is to directly observe and document exchanges between parents and their children as they navigate joint media-based activities to identify and describe both incidental and explicit learning opportunities.

Theoretical Underpinnings: Learning through Technology Use

Children are presented with multiple opportunities to learn throughout their daily experiences including learning with and from technology. The presence of a family member using technology initiates basic learning around the device. For example, an older sibling could support the use of technology by sharing in the device activity or even allowing the child to observe the use of the device. The work of Vygotsky (1978), Bronfenbrenner (1979) and Bandura (1977), can be translated to technology-based learning contexts to provide frameworks for understanding the transmission of skills and knowledge across development when using technology.

Vygotsky’s Theory Applied to Technology: Scaffolding

According to Vygotsky (1978) from early in infancy, learning and development are interconnected. As such two developmental levels should be examined – a child’s actual developmental level determined through problem solving and a child’s level of potential development as determined through assisted problem solving. This process results in zones of proximal development (ZPD). In the ZPD a child can grow and develop skills that are yet to be mastered. This prospective mental development takes into account what a child could do. Vygotsky’s (1978) socio-cultural perspective offers a natural framework within which parent-child interactions may be examined. Through interactions, parents can provide appropriate supports in which they guide and scaffold the child within his or her zone of proximal development. Through proper scaffolding and the use of societal techniques or tools, a child would be able to achieve a challenging task that would be otherwise unachievable. Scaffolding would promote the movement between the current level of development and the potential level of development. Vygotsky (1978) proposed that the ZPD is continually changing and as skills are mastered, the scaffolding supports once needed are no longer needed. Scaffolding success is reliant on the tailored support for individual children - that is the difficulty level of specific tasks – and in turn the support provided would vary depending on the child's independent abilities. Thus, children should have greater opportunities to engage with higher-order thinking processes and concepts in dynamic ways if effective scaffolding techniques are utilized, although the final goal of scaffolding is for the child to become independent in performing the task. Today Vygotsky's theory is still evident as parents take the opportunities to scaffold their children in content domains, skills, attitudes and behaviours. In addition to parental scaffolding, children today also receive scaffolding support through some learning software (e.g., Grant et al., 2012).

Yelland and Masters (2007) identified three types of scaffolding that occur during interactions with stationary computers: *cognitive* – providing support regarding concepts, procedures and modelling; *affective* – providing support and encouragement verbally to keep the learner on-task; and *technical* – where the computer software provides instruction and feedback as a means of scaffolding the learner. The present study extends current knowledge by focusing on cognitive and affective support provided by parents to children and children's responsiveness to feedback, observed through difficult and easy software on stationary technology and mobile technology.

Vygotsky's Theory Technology: Socio-cultural Learning Context

Central to Vygotsky's (1978) socio-cultural framework, an individual's learning cannot be separated from the environment in which it takes place (Cole, 1996; Gutierrez, 2002; Plowman et al., 2008). Children's learning occurs through social interaction with an adult or a more experienced peer (Vygotsky, 1978). Knowledgeable others support and assist children in acquiring knowledge and skills but this transmission always takes place within the cultural context in which the child is raised. Within these cultural contexts, cultural tools are essential in facilitating learning. Digital technologies are now considered the cultural tools of today's societies.

Bronfenbrenner and Technology: Social Influences on Learning

Similar to Vygotsky's socio-cultural framework, Bronfenbrenner's (1979) ecological systems theory explains how child development takes place through processes of complex interactions between a child and the persons and objects in its immediate environment. Key to Bronfenbrenner's understanding of development is the relative positioning of influences on children. Specifically, Bronfenbrenner's notions are depicted in a series of concentric circles spreading outward from the child who is in the centre. The influences first and foremost represented in the first circle surrounding the child are parents. Parents play an integral role in their child's life. According to this model, parental beliefs and perceptions shape the belief and perceptions of their children. Through these interactions, parents have a direct impact on their children. In addition, children's responses and initiation also direct and expand the relationship they have with their parents. As the adult provided instruction or example; the child learns through understanding the actions but also reacts to the instruction, influencing how the parent provides future instructions.

Bandura and Technology: Social Modelling

Bandura's Social Learning Theory (1977) depicts how behaviours are learned though the observation and imitation of others. Children may learn specific behaviours which are modeled by their peers, siblings, teachers and parents. By observing others that are interesting and are perceived to be valuable resources, children are exposed to new behaviours which could later change or drive their own behaviours. Bandura (1986) identified four necessary conditions for effective modelling: Attention, Retention, Production, and Motivation. *Attention* is influenced by perceived value and importance of the modelled activities. *Retention* refers to remembering what was previously learnt. Retention is increased through the use of strategies such as rehearsal. *Production* is mimicking the observed behaviours. *Motivation* drives attention, retention and production as behaviours that are seen as valuable give motive to be imitated (Schunk, 1987). Through this modelling, and subsequent imitation, children may learn appropriate behaviours and attitudes (Horner, Bhattacharyya & O'Connor, 2008). Observed learning begins to occur at a young age. Children as young as 6 months can imitate modeled behaviours (Nielsen, 2006) and children between the ages of 3 and 6, showed mimicked same-sex models more than opposite-sex models (Grace, David & Ryan, 2008).

Applying Theoretical Models to Technology Use in Children

Parental use of technology in the home environment provides a context for facilitating learning and understanding of technological devices and potential uses in children (Plowman et al., 2008). Children's learning can occur through observation or scaffolded intervention. Research demonstrates that parents' technology habits likely guide the habits of their young children, supporting Bronfenbrenner's ecological model and Bandura's social cognitive theory (Bleakley, Jordan, & Hennessy, 2013). Considering the ecological system theory, parent belief regarding technology would influence the child's beliefs. For example, parents who are highly comfortable with technology may be more likely to encourage technology use in comparison to parents who are less comfortable and therefore discourage or limit technology use. Technology use is most likely modeled in the home. Bandura's (1977) social cognitive model may explain how parents influence device use in the home. Modelling would not be limited to how technology is being used but also to the amount technology is being used (Lauricella et al., 2015). Young children are exposed to older sibling, parents and grandparents on devices (Plowman et al., 2008; Plowman et al., 2012). Simply being engaged with digital technology, parents promote learning from the technology.

Recent research has demonstrated the importance of these key theories in the context of mobile technology use in children. Parents have been observed to employ a variety of scaffolding techniques while interacting with their child and mobile screen tablets (Wood et al., 2016). In this study, parents provided a variety of scaffolds for their children aged 2 to 6. Specifically, verbal scaffolding (i.e., repeating or rewording instructions), physical scaffolding (i.e., pointing/adjusting the screen), emotional-verbal (i.e., words of encouragement and praise) and emotion-physical (i.e., hugs, kisses, ruffling of hair) were identified. Parents actively provided a great deal of support to their children while interacting with mobile technology. Overall, parents provided more physical and verbal supports. Congruent with literature, parental scaffolding was consistent with expected developmental gains in their children's capabilities – parents provided fewer supports for older children than for younger children (Wood et al., 2016). When using mobile technology, parents were involved as active contributors to children's learning. Cognitive, affective, and technical scaffolds delivered through verbal and physical support, enhance children's success while using technology (Wood et al., 2016; Yelland &

Masters, 2007). The current study extends previous literature by comparing these scaffolds for both stationary technology and mobile technology when using software deemed by previous literature (e.g., Grant et al., 2013; Wood, Hui, & Willoughby, 2008) as easy or hard. Furthermore, children's responsiveness to the types of support provided on each device will be assessed.

Current Research

The present studies examined how parents view computers as a tool for instruction for their young children and how they interact during shared computer use. The study employs self-report measures consistent with the wider body of literature available regarding early introduction of technology. In addition, the present study includes behavioural observations to allow comparisons between self-report and observed interactions. This extends current literature which typically relies on one of these two methodological tools. Another important extension from previous work was to investigate how parents interact when using both stationary and mobile technologies. To date sporadic information is available about each context individually (Flynn & Richert, 2015; Martin & Ertzberger, 2013; Wood et al., 2016; Yelland & Masters, 2007), however, no research to date juxtaposes these two technologies in one study to permit comparative analyses of interactions. In addition, the present study, examines these same parent-child dyads as they explore and engage in software that is relatively easy versus relatively difficult to navigate. This permits an examination of parental scaffolding when complexity differs across tasks. The overall purpose of the present study was to survey and observe parents of diverse backgrounds in order to understand how parents view technology use for young children and how parents scaffold their children across tasks and media devices.

Study 1

The present study examined how parents view computers as a tool for instruction for their young children. The vast majority of parents allow their child to access digital technologies (Wood et al., 2016) and parental beliefs regarding media use influence the amount of time children spend with technology (Lauricella et al., 2015; Plowman et al., 2008; Plowman et al., 2012). Although existing research provides a scattered picture of elements that might impact parent’s beliefs regarding timing of introduction to technology and expectations and challenges inherent in using technology with young children (e.g., Davies, 2011; Evans & Shaw, 2008; Kabali et al., 2015; Neumann et al., 2009; Rideout, 2013), a comprehensive understanding of parental factors and parental variables influencing early introduction is not yet available. Through survey measures, the present study provided an opportunity to identify and describe parent and children exposure to technology, and, in particular, parental scaffolding during technology use.

Study 1 provided a mechanism for gaining insight regarding parental beliefs about the use of technology and the context of technology within their children’s lives and how parents see themselves contributing to their children’s use of technology. Research across many domains related to early development suggests that parents want to support their children’s learning (e.g., Evans & Shaw, 2008; Neumann et al., 2009) and the increased prevalence of technology has resulted in a greater adoption by parents who see computer-mediated instruction as a potential means to facilitate children’s learning (Davis, 2011; Kabali et al., 2015; Rideout, 2013). However, a critical step in assessing the impacts of media use for learning in the home, is understanding how parents engage their children with technology and how parents navigate joint technology use. Scaffolding (Vygotsky, 1978) is a powerful and effective instructional tool that parents can use to enhance their children's development. As previously mentioned, Yelland and Masters (2007), identified three broad types of scaffolding that typically occur during interactions with technology: cognitive, affect, and technical. The present study extends this existing research by examining scaffolding practices in greater detail. Using additional and more discrete categories to assess parental support among parents and children who have experience with more diverse technologies than in previous research (Yelland & Masters, 2007) permitted a more thorough picture of scaffolding practices with young children in technology rich exchanges. The primary goal of Study 1 was to provide a descriptive account of early introduction and parental scaffolding related to the use of technologies. Study 1 employed self-report measures to examine the following:

1. Opportunities for play in children's home-life
2. The age at which children were introduced to technology, their access to technology, and duration of technology use
3. The variety and amount of verbal, physical and emotional support provided to children as reported by parents.

Outcomes from the self-report measures permitted exploratory analysis of parent's views and self-reported behaviours as a function of individual variables such as SES, parent gender, and younger versus older children.

In addition to providing a fuller description of children's early exposure to technology, Study 1 also provided an opportunity to test the following hypothesis based on previous research:

Hypothesis 1: Given the increasingly ubiquitous presence and increasing array of available technologies (e.g., Carson et al., 2013; Kabali et al., 2015; Rideout, 2013; Wood et al., 2016), it is expected that older children would be exposed to technology at a later age than younger cohorts of children.

Method

Participants

In total, 271 parents (200 mothers and 69 fathers, 2 did not provide a response to the question of gender) completed one online survey. Parents were asked to select one child in their family within the 2 to 6 age range and to complete the survey regarding this child. Approximately equal numbers of mothers selected a son (n = 105) or a daughter (n = 95) as the target child. Similarly, approximately equal numbers of fathers selected a son (n = 32) or a daughter (n = 37) as a target child (see Table 1 for a complete summary of the sample by gender).

Parents. Parent age ranged from 21 to 56 years (M_{age} = 34.96, SD = 5.11). Overall, 52.8% of the sample were 35 years of age or younger. A t-test revealed significant differences in age between the 200 mothers (M_{age} = 34.57, SD = 4.92, range = 21 to 50) and the 69 fathers (M_{age} = 36.13, SD=5.55, range = 22 to 56), $t_{(267)}$= 2.21, p < .03 with fathers being slightly older than mothers. Although the study was designed to assess parents of children 24 months and older, seven parents reported on children between 12 and 24 months. Of these seven target children, three participants were confirmed to be between 23 and 24 months of age. Given the proximity in age to the desired target age, responses from parents of these three children were retained in analyses. The remaining 4 younger participants were not included in subsequent analyses, removing three mothers and one father from the sample. Thus, the final sample of survey participants reflected 267 parents.

Parent age range for this final sample, 22 to 56 years ($M = 35.02$, $SD = 5.07$), remained similar to the original sample. Overall, 52.4% of the sample were 35 years of age or younger. A *t*-test revealed significant differences in age between the 197 mothers ($M = 34.65$, $SD = 4.85$, range = 21 to 50) and the 68 fathers ($M = 36.12$, SD=5.59, range = 22 to 56), $t_{(263)}= 2.06$, $p < .04$ with fathers being slightly older than mothers.

Further examination of age indicated that, the age distributions were similar and represented normal distributions with the exception of one older outlier in the sample of fathers (see Figure 1). Given the small sample of fathers completing the survey, this individual was retained in all analyses. The majority of mothers and fathers were between 30 and 40 years old. Therefore, despite the small but statistically significant difference in parental age, age was not examined in subsequent analyses. Given that mean ages fell within a small range generally within the present data, cohort differences related to technology were not anticipated as would be the case with a larger age range.

Overall, all participants reported at least some high school education with 0.7% just having some high school; 4.9% having a high school diploma, 8.6% having some post secondary education, 24.3% having a College diploma, 33% having a Undergraduate degree, 19.9% having a Master's degree, 4.9% having a Doctorate, 3.4% having completed a Post-Doctorate, and only one (.4%) participant did not indicate education level. Similar patterns were present in both mothers and fathers. Specifically, among mothers 1% reported just having some high school; 4.1% having a high school diploma, 7.6% having some post secondary education, 25.4% having a College diploma, 33.5% having a Undergraduate degree, 18.8% having a Master's degree, 6.1% having a Doctorate, 3% having completed a Post-Doctorate, and one (.5%) participant did not indicate education level. Given the smaller number of fathers in the sample not all categories were present in levels of education, however the range was similar to mothers with 7.4% having a high school diploma, 10.3% having some post secondary education, 20.6% having a College diploma, 32.4% having a Undergraduate degree, 23.5% having a Master's degree, 1.5% having a Doctorate, and 4.4% having completed a Post-Doctorate. A *t*-test revealed no significant differences in education level between mothers and fathers, ($t_{(263)}$ = .352, p = .725).

Overall, the vast majority (92.5%) of participants were in a committed relationship (*n* = 247), with 4.5% of the remaining participants being single (*n* = 12); 2.6% were divorced or separated (*n* = 7) and one participant did not answer. Marital status of mothers and fathers was similar. Specifically, the vast majority of mothers (92.4%, *n* = 182) and fathers (92.6%, n = 63) reported being in a committed relationship, with few mothers (5.6%, *n* = 11) or fathers (1.5%, *n* =1) being single and fewer being separated, divorced or widowed (mothers = 1.5%, *n* = 3; fathers = 5.9% *n* = 4). These outcomes suggest that the present sample reflects two-parent family contexts.

The majority of parents (91.4%) indicated that the primary language of both the parent and child was English (*n* = 244). English was the first language for the majority of participants (85%, *n* = 227) and the remaining 15% (*n* = 40) indicated another language. Of the 15% that did not indicate English as a first language, 52.5% learnt English at 7 years of age or younger, 17.5% learnt English as a teenager between the ages of 13 and 16 and 7.5% of the population after the age of 20, (M_{age} = 8.78, *SD* = 5.86).

The vast majority of mothers (92.9%, *n* = 183) and fathers (86.8%, *n* = 59) indicated that the primary language of both the parent and child was English. Specifically, English was the first language for the majority of mothers (86.8%, *n* =171). Of the 13.2% that did not indicate English as a first language, 50% learnt English at 6 years of age or younger (M_{age} = 8.69, *SD* = 6.39).

Similarly, English was the first language for the majority of fathers (79.4%, n = 54) and the remaining 20.6% (n = 14) indicated another language. Of the 20.6% that did not indicate English as a first language, 50% learnt English at 6 years of age or younger (M_{age} = 8.93, SD = 4.95). Mothers and fathers did not significantly differ on English as a first language X^2 (1, N = 265) = 2.154, p = .142. A t-test revealed no significant differences in primary language used in the home, ($t_{(262)}$ = 1.90, p = .059).

To better understand the family context, the number of children within the family was also assessed. Overall, 25.5% of parents had one child, 53.2% had two children, 15.7% had three children and 2.6% had four or more children (3% did not respond). Family context of mothers and fathers were similar as the majority of mother and fathers indicated 2 children (51.8% and 58.8% respectively). Approximately one quarter of mothers (26.9%) and fathers (20.6%) have only one child, 15.7% of mothers and 14.7% fathers had three children, 2% of mothers and 2.9% of fathers had four children and only one mother indicated five children. A t-test revealed no significant differences in the number of children in the households of mothers and fathers, ($t_{(255)}$ = .544, p = .587).

Children. Parents were asked to identify one child as a target child. They identified the age of their child using an eight-item scale which presented ages in six month increments from 25 months of age onward to older than 5 years of age with one additional category to capture children from 12 to 24 months of age[1]. Overall, 68% of parents' target child was 3 years or older (M = 4.98, SD = 2.12). Specifically, 2.6% reported on children 23 to 24 months of age (n = 7), 12.2% reported on children 25 to 30 months (n = 33), 17% reported on children 31 to 36 months (n = 46), 12.5% reported on children 37 to 42 months (n = 34), 10.7% reported on children 43 to

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[1] Some children subsequently participated in an observation session. In these cases exact date of birth could be confirmed thus allowing some children who were just below the expected 24 month cut off to be included in the final sample.

48 months (*n* = 29), 14% reported on children 49 months to 4 years, 6 months (*n* = 38), 14.8% reported on children 4 years, seven months to 5 years (*n* = 40), and 15.9% reported on children older than 5 years of age (*n* = 43). Seven parents reported on children between 12 and 24 months. Of these 7 children, 3 were between 23 and 24 months of age. Although the study was designed to assess parents of children 24 months and older, the three participants between 23 and 24 months of age were retained in analyses and the remaining 4 younger participants were not included in subsequent analyses. Thus, the final sample of target children reflected 267 children aged 23 months and older.

Age range of the target child was similar for both mothers and fathers. Specifically, 1% of mothers (*n* = 2) and 1.5% of fathers (*n* = 1) reported on children 23 to 24 months of age, 12.2% of mothers (*n* = 24) and 13.2% of fathers (*n* = 9) reported on children 25 to 30 months, 18.3% of mothers (*n* = 36) and 13.2% of fathers (*n* = 9) reported on children 31 to 36 months, 13.2% of mothers (*n* = 26) and 11.8% of fathers (*n* = 8) reported on children 37 to 42 months, 12.7% of mothers (*n* = 25) and 4.4% of fathers (*n* = 3) reported on children 43 to 48 months, 13.2% of mothers (*n* = 26) and 17.6% of fathers (*n* = 12) reported on children 49 months to 4 years, 6 months, 13.2% of mothers (*n* = 26) and 20.6% of fathers (*n* = 14) reported on children 4 years, seven months to 5 years, and 16.2% of mothers (*n* = 32) and 16.2% of fathers (*n* = 11) reported on children older than 5 years of age. One father did not report his child's age. A *t*-test revealed no significant differences in target child age range between mothers and fathers, ($t_{(262)}$ = .878, p = *.381*). An additional *t*-test indicated no significant differences in target child age as a function of child gender, ($t_{(264)}$ = 1.17, p = .242). See Table 2.

Of the 267 target children identified, approximately equal numbers of boys and girls were included (50.9% and 49.1% respectively). Of these children, 21.7% were the only child, 36.3%

were the first-born, 6.7% were the middle child and 34.8% were the last-born. One parent did not report birth order. Birth order was relatively similar for target boys and target girls. Specifically, among boys 22.1% were only children, 35.3%% were the first-born, 8.1% were the middle child and 33.8% were the last-born. Among girls, 21.4% were only children, 37.4% were the first-born, 5.3% were the middle child and 35.9% were the last-born. A *t*-test indicated no significant differences in target child birth order as a function of child gender, ($t_{(264)}$ = -.114, p = .909).

Overall, English was the first language for the majority of children (93.3%). Having English as a first language was similar of boys and girls. Boys (94.1%) were not significantly different than girls (92.4%) in having English as a first language, X^2 (1, N = 267) = .325, p = .568. Of those that did not indicate English as the first language, overall, 83.3% indicated their child understood/spoke English. Parental reports of fluency in English (understood/spoke) did not differ between boys (75%) and girls (90%), X^2 (1, N = 18) = .720, p = .396.

In order to better understand the care relationship between the child and reporting parent, parents were asked to identify the number of hours of care provided each week by themselves versus others (including: spouse or partner, grandparent, older sibling to the child, other family members, babysitter, and Educational worker). Overall, parents identified themselves and their spouse as providing the most hours of child-care per week (M = 93.35, SD = 48.81 and M = 65.05, SD = 48.16) followed by an educational worker (e.g., daycare provider, school teacher etc.; M = 28.92, SD = 14.19). All other caregivers fell below 20 hours per week. Seven *t*-tests were conducted to assess potential differences in reported childcare hours as a function of parent gender. Given the number of *t*-tests a Bonferroni correction p = .007 was used. Overall, hours for oneself and spouse differed as a function of parent gender. Specifically, mothers reported themselves as being responsible for a greater number of childcare hours ($M_{mothers}$ = 100.66, SD =

47.46 versus $M_{fathers}$ = 71.69, *SD* = 46.83; $t_{(249)}$ = 4.19, $p < .001$). Fathers' responses were in agreement, reporting their spouses as being responsible for more childcare hours $M_{fathers}$ = 87.91, *SD* = 49.61 versus $M_{mothers}$ = 56.77, *SD* = 45.08; $t_{(229)}$ = 4.53, $p < .001$). (See Table 3 for a complete summary).

Materials

Survey. The 34-item survey was comprised of five sections (see Appendix A). The sections assessed demographic information, parental behaviours and views regarding computer use with their young child, their home activities, knowledge of child development and how they select computer programs for use in home by young children. In addition to questions about computer use in general, there was a portion of questions that targeted literacy development and technology. A reoccurring statement appeared throughout the survey reminding parents to respond in particular to the child they indicated at the start of the survey ("* Reminder * You are answering the following questions about your child between the ages 2 and 6 years of age (you specified this particular child earlier in the survey")).

Demographic Information. Demographic information was obtained for the parent and for the child. Specifically, of the 34 questions in the survey, ten questions assessed parent demographic information and six questions provided information about the child participating in the study. The parent demographic section asked parents to provide their age, gender, marital status, highest level of education completed, and, English as a first language -- if English was not the parent's first language, parents were asked to identify their first language and the age at which they acquired English. All parents were asked to identify the primary language they use at home. Finally, parents were asked to indicate how many children they have.

Demographic information about the children included gender, age (listed in six-month increments starting at 12 – 24 months and ending at 6 years of age), birth order of child (only child, first born, middle born or, last born), child's first language, and, child's ability to understand English (yes or no).

An additional question examined the number of hours per week the child spent with different caregivers ("For each of the caregivers listed below, please indicate the average number of hours per week each of the following people provides care for your child. If not applicable, please indicate 'NA'" [list: yourself; your partner/spouse; grandparent; older sibling; other family member; babysitter/nanny; educational worker (daycare provider, preschool teacher); Other (please specify)])

Parental behaviours. Eleven questions assessed parents' self-reported scaffolding behaviours when their child was engaged with technology. Questions assessed verbal, physical and emotional supports parents could provide.

Verbal Prompts. Parental support given through verbal prompts was assessed through one question containing a list of 12 items. Parents were asked, "Of the following, which verbal prompts do you use to help your child when your child is using software?" (measured on a 5-point Likert-type scale with anchors of *1 = Never, 3 = Sometimes* and, *5 = Almost Always*). The items included were: Rewording instructions from the software; Re-phrasing my own wording to progress through the software; Reading aloud information provided in the software; Explaining how the software works; Giving additional examples in addition to software; Providing hints but not complete instructions to guide the child in how to navigate the software; Providing direct step-by-step instructions to guide the child in how to use the technology; Telling him/her that he or she is doing well; Telling him/her to try again; Telling him/her that what he or she is doing is incorrect; Asking questions of my child (e.g., What happens next? How did that work?); and Other (please specify).

Physical Prompts. Parental support given through physical prompts was assessed though one question containing a list of 17 items. Parents were asked, “Of the following, which physical prompts do you use to help your child when guiding them through a challenging computer task?” (measured on a 5-point Likert-type scale with anchors of *1 = Never, 3 = Sometimes* and, *5 = Almost Always*). The items included were: Provide booster seat; Adjust screen location/angle; Adjust screen properties (font size, brightness, etc.); Buy devices made specifically for children; Adjust the computer so the child can access it more easily; Sit beside child (you in front of monitor); Sit beside child (child in front of monitor); Let your child sit on your lap while you work on the computer; Let your child sit on your lap while the child uses the computer; Place your hand over your child’s hand to help him/her move the mouse; Move your child’s hand to the correct place on the keyboard; Move your child’s hand over a touch pad; Move the mouse for him/her; Press the keyboard for him/her; Point directly at or touch important information on screen; Point in general to the screen and; Hold a portable device so your child can use it.

Emotional Support. Parental support given through emotional prompts was assessed through seven questions. Four questions were measured on 5-point Likert-type scale with anchors of *1 = Never, 3 = Sometimes* and, *5 = Almost Always* (e.g., “In general, how likely are you to provide emotional support to your child through physical behaviours such as a hug, ruffling his/her hair, squeezing a shoulder etc.?”; “In general, how likely are you to provide emotional support to your child through words (such as ‘good job’, you can do it?)”; “When introducing your child to computers or new software, how often do you encourage your child to keep trying an activity by using emotional support words like ‘Good job’, ‘You can do it’ etc.”;

and “When your child is working on a challenging activity with computers, how often do you encourage your child to keep trying an activity by using emotional support words like ‘Good job,’ ‘You can do it,’ etc.?”). An additional two questions were measured on 5-point Likert-type scale with anchors of *1 = Not at all likely, 3 = Neutral* and, *5 = Very Likely* (e.g., “When introducing your child to computer or new software, how likely are you to provide physical emotional supports (a hug, ruffling hair, etc.) to keep your child involved in computer-based activities?”; and “When your child is working on a challenging activity with computers, how likely are you to provide physical emotional supports (a hug, ruffling hair etc.) to keep your child involved in computer-based activities?”).

In addition to the above forms of support, parents were also asked two questions assessing parental support more generally. Parents were asked, “In general, how demonstrative or emotional (e.g., show strong emotions) would you rate your way of interacting with your child?” (measured on a 5-point Likert-type scale with anchors of *1 = Rarely show emotions, 3 = Sometimes* and, *5 = Almost all the time)* and “If your child were working on a challenging activity with computers, how would you MOST LIKELY respond: a) Ignore the situation and let my child work it out; b) Crouch near my child, bring a chair up beside them or stand near my child to show support and simply observe; c) Tell my child I have confidence that they can get it if they keep trying; d) Crouch near my child, bring up a chair beside them or stand near my child and tell them I think they can get it; e) Give a hug or touch my child to encourage them and tell them they can do it; and f) Other (please specify)”.

Activities and Home Environment. The number and types of activities that children enjoyed and the instructional tools and supports to permit these activities in the home environment were assessed through two questions. Two questions inquired about toys and the home environment in general. The first question examined the number of toys, books, games, activities etc. the child has access to in their home environment, “Considering the following items, please give estimates on how many of each your child has:” [Magazines; Books; Dolls/action figures; Craft sets; Stuffed animals; Toy Vehicles (e.g., car, boats, trains, planes); Lego sets/building blocks; Puzzles; Musical instruments; Activity centres (e.g., farms, kitchen, garage); Outdoor toys (e.g., bikes, wagons, sleds); and Remote control toys)]. Parents were able to select from a range (e.g., None, 1 - 5, 6 - 10, 11 - 20, 21 - 50, 51 - 100 and, More than 100). To assess access and availability to technology, the second question asked parents to indicate the variety of places their child has access to computer based technologies. Specifically, parents were asked, “Does your child have access to any computer based technology (including gaming computers/laptops, desktops, iPads in: a) Your home; b) At daycare/childcare; c) At school and; d) At friends/relatives. Parents were able to indicate Yes, No or, Not Applicable.

Technology and Technology Use. This section was comprised of two questions. Parental perceptions regarding the optimal time to introduce technology was assessed through one question (e.g., “At what age would you introduce technology/computers/digital devices to your child?” listed in six-months increments starting at “Birth - 6 months” and ending at “After 6 years of age”). One question, asked how often parents allowed or encouraged the target child to access certain technologies using a five-point Likert –type scale (*1 = Never, 3 = Sometimes,* and *5 = Almost Always).*

Frequency of technology use was assessed through two survey questions. The first question asked parents to indicate how often their target child uses each of 20 technologies in a normal week. Parents selected one of five options: *Never heard of it*; *Not at all*; *1 - 2 days a week*; *3 - 6 days a week* or; *Everyday*. Technologies included: TV; Desktop Computer; Laptop;

Mobile Phone; Internet; Kindle Reader; iPod; iPad; Playbook; Portable DVD player; Vtech Toys; Leap Frog/Leapster; Leappad Explorer; Xbox; Playstation; Nintendo Wii; Nintendo DS; Nintendo Game Cube; Zeebo and; PSP Go. To report use, given that weekly use does not clearly depict amount of time spent on technology, parents were asked an open-end question, “On average, how much time IN HOURS does YOUR CHILD spend using software/computer technology in a given WEEK? Please enter N/A if this is not applicable to you.”

Ease of Use and Comfort with Technology. Two questions assessed comfort with technology in regards to the parent’s comfort using new or unfamiliar technology (one in regards to stationary technology, one in regards to mobile technology).

Procedure

Participants were recruited through local daycares, community centres, day camps and online advertisements. A link to the survey was also placed on a research lab website, allowing parents seeking to participate in research to contact the researcher to fill out the survey. Parents expressing an interest in participating in the study were contacted by email and were provided with a link to an online survey. All participants were treated in accordance with ethical guidelines established by CPA and APA. Parents were entered in a draw to win one of 20 $50 gift certificates.

Results

Plan for Analyses

An important contribution of the present research was to provide a comprehensive description of children’s exposure to and use of technologies. In addition, contextual variables related to the child’s home, and parents were included to enhance understanding of the children’s lives. Thus, the first goal of the present research was to describe these key elements. As such, parental responses to these key issues are presented first to provide an overall understanding of exposure, use and variables related to exposure and use of technology.

Subsequent to the descriptive analyses, for data reduction purposes, factor analyses were conducted for multi-item questions to assess the potential for aggregating items. All factor analyses employed a principle components extraction and varimax rotation. Only eigenvalues of greater than 1 were accepted for each factor. Aggregated items were used as scales in analyses that followed the descriptive section of the results.

A critical component of analyses related to the examination of potential child age and parent gender differences. Thus, analyses of the newly developed scale items were first examined descriptively, then examined as a function of age and gender differences. Finally, regression analyses were used to assess the relationship regarding parents and children and technology use and parental support. Overall, a minimal *p* value of .05 was set as criterion for significance. In cases where multiple variables were tested, more conservative *p* values were determined using a Bonferroni correction.

Understanding Opportunities for Play in Children's Lives

In order to understand the impact and presence of technologies in young children's lives, it was important first to explore the types of play opportunities available to the present sample of children more generally. The information in the next section describes the home context with respect to enrichment and play opportunities.

Types of play activities represented in the home. Through the online survey, parents were asked to rate the quantity of play activities available to their child from a list of 12 common possibilities (see Table 4 for a complete summary). Across the entire sample, the most heavily represented items were books (between 21-50 and 51-100; *M* = 5.72, *SD* = 1.10), followed by toy vehicles (approximately 11-20; (*M* = 4.13, *SD* = 1.52), stuffed animals (approximately 6-10 to 11 to 20; *M*= 3.85, *SD* = 1.10), dolls and action figures (approximately 6-10; *M* = 3.37, *SD* = .1.30), Lego sets or Building blocks (approximately 6-10; *M* = 3.15, *SD* = 1.56) and puzzles (approximately 6-10; *M* = 3.07, *SD* = .908). All other activities fell at or below 1-5 items on the scale. Twelve *t*-tests were conducted to assess potential differences in types of activities available to children as a function of child age. Given the number of *t*-tests a Bonferroni correction $p = .004$ was used. Overall, 4 activities differed as a function of age. Specifically, older children were reported to have more remote control toys (*M*= 1.67 versus *M* = 1.46; $t_{(258)} = 3.10$, $p < .003$), magazines or comics toys (*M*= 2.03 versus *M* = 1.41; $t_{(257)} = 5.18$, $p < .001$), dolls (*M* = 3.68 versus *M*= 3.10; $t_{(257)} = 3.66$, $p < .001$) and craft sets than younger children (*M* = 2.95 versus *M*= 2.61; $t_{(257)} = 2.91$, $p = .004$).

There were no differences in the number of books, stuffed animals, toy vehicles, Lego, puzzles, musical instruments, activity centers, and outdoor toys (e.g., bikes, wagons, sleds) available in the homes of younger and older children. See Table 4 for complete results.

Quantity of enriching play activities. Overall quantity of each play activity was assessed. The average number of toys available to children was moderate with parents reporting having approximately 6 to 10 of each listed play activity (*M* = 3.04, *SD* = 0.57). Older children were reported to have more of each play activity (*M* = 3.13, *SD* = 0.62) than younger children (*M* = 2.97, *SD* = 0.50; $t_{(259)} = 2.38$, $p < 0.02$).

Diversity of enriching play activities. Comparisons of the overall quantity of each play activity were further examined by constructing an aggregate score to reflect the diversity of play activities available to children. Specifically, each child received a score out of 12 to reflect the number of categories of toys parents indicated were available for their child. Higher scores reflected more types of toys available. Overall, the average number of types of toys available to children was high with parents reporting having approximately 10 out of the 12 types of listed activities/toys (88.4%; $M = 10.61$, $SD = 1.61$). Although not statistically significant, there was a strong trend suggesting that older children had a greater diversity of toy types available to them ($M = 10.76$, $SD = 1.25$) than younger children ($M = 10.49$, $SD = 1.05$; $t_{(258)} = 1.90$, $p = .058$).

Technology in the Lives of Young Children

In addition to the more traditional play opportunities, the present study examined technology as another play or educational activity in young children's lives. The following section captures the prevalence and use of technology by young children.

Introduction of technology. Parents were asked at what age they would introduce technology such as computers and digital devices to their child. They identified the age of introduction using a 12-item scale which presented ages in six month increments from birth to 6 years of age (with this latter category also capturing after 6 years of age) Overall, mean responses ($M = 4.68$, $SD = 2.65$) indicate that parents support the introduction to technology between the ages of 2 and 3 years old. Specifically, 60.6% of parents indicated they would introduce technology before 2.5 years of age and 71.4% would introduce technology before the age of 3. Importantly, this increases to 81.2% before the age of 3.5 indicating that within a year the number of parents introducing technology to their children rose by 20%. By the age of 6, nearly all children (94.9%) were expected to have been introduced to technology as reported by parents. Older children ($M = 5.04$, $SD = 2.64$) were introduced to technology later than were younger children ($M = 4.36$, $SD = 2.57$; $t_{(231)} = 1.98$, $p < .05$).

Access to technology. Parents were asked where, if at all, their child had access to computer based technology (i.e., home, daycare, friends and relatives and, school). As expected, the majority of parents indicated that their children had access to technology at home (91.2%). In addition, over three quarters of the sample also had access at a friend or relative's house (72.3%). Children also had access at school (61.8%) and daycare (38.7%). As expected, all parents responded to the availability of access to technology within the home, however, other contexts such as daycare and school were not relevant for a third or more of this sample. Parents who indicated "not applicable" for this question were not included in further analyses (see Table 5 for complete summary). There were no significant differences when comparing parent gender to each access to computer-based technology locations, X^2 (1, N = 258) = 1.98, p = .160. However, there were significant differences when comparing younger and older children to access to computer-based technology locations. Parents reported their older children had significantly more access in all locations except for at a friends or relatives house where there was no significant difference, X^2 (1, N = 212) = .008, p = .931 (see Table 5 for complete summary).

In addition to access to technology, parents were asked to rate how often their child used specific technologies within a normal week. Frequency of use for 20 possible types of technologies was assessed (see Table 6). Overall, the three most widely used devices were the TV (approximately 3-6 days a week; M = 3.19, SD = .95), Internet (1-2 days per week; M = 1.96, SD = 1.10) and, iPad (1-2 days per week; M =1.85, SD = 1.03). Overall, the three least used devices were the GameCube (M = 1.00, SD = .676), PSP Go (M = 1.01, SD = .105), and the Xbox (M = 1.06, SD = .273).

Subsequent analyses were conducted using only a subsample of these potential sources of media exposure. Specifically, the gaming system Zeeboo was removed from analysis because the majority of parents (99.6%) reported never having heard of or used this technology. In addition, all of the 'gaming technologies' (Xbox, PlayStation, Nintendo Wii, Nintendo DS, Nintendo

GameCube, PSP Go) received mean ratings close to “1” which reflects a rating of “not at all” used, thus these were also omitted from analyses. Finally, the Kindle Reader similarly received a mean rating reflecting that this technology was not used. As a result, this technology was not included in further analyses.

Interestingly, apart from the TV, reported use of all digital technologies was relatively low with the Internet followed by the iPad receiving the highest mean use rating.

Twelve *t*-tests were conducted on the remaining types of technology to assess potential differences in use as a function of child age. Given the number of *t*-tests a Bonferroni correction $p = .004$ was used. Overall, frequency of use for 11 of the 12 technologies did not differ as a function of age (see Table 7 for a complete summary). However, the use of Vtech toys was significant as a function of age. Younger children were reported to more often use Vtech toys ($M = 1.56$, $SD = .76$) than older children ($M = 1.30$, $SD = .52$; $t_{(245)} = 2.98$, $p = .003$).

Parents reported the length of time (in hours) children were engaged with software/computer technology in a given week. Time reported ranged from 0 hours to 80 hours a week. A third of parents (33%) reported children spending 2 hours or less on technology, approximately half (47.1%) of the children were reported to spend 4 hours or less, and 80% reported children spending 10 hours or less in a week. Interestingly, 20% of parents reported that their child spends over 10 hours a week on software/computer technology ($M = 7.56$, $SD = 9.75$. Amount of time reported did not differ as a function of child’s age group (younger versus older; $t_{(225)} = 1.05$, $p = .296$).

Independent use of technology. Child independence with technology was assessed by asking parents to report how often their child used each of eight types of technology on their own. Overall, more than half of the parents indicated completely restricting independent use of the computer (58.1%) and laptop (57.7%) with less restriction for cellphones (38.6%), tablets (28%), and TV (24%). Overall, average ratings indicate that parents reported they “never” to “rarely” allow their child to use the laptop (*M* = 1.80, *SD* = 1.19, computer (*M* = 1.85, *SD* = 1.30) and cellphone (*M* = 2.33, *SD* = 1.40) on their own but “rarely” to “sometimes” allow their child to use the TV (*M* = 2.72, *SD* = 1.35) or, Tablet (*M* = 2.83, *SD = 1.53*) on their own. Overall parents indicated they would “sometimes” let their child select the software/program to play with (*M* = 3.04, *SD* = 1.39) and they themselves “sometimes” selected the software/program for their child (*M* = 3.14, *SD* = 1.22; reversed coded; see Table 8 for complete summary).

Contextual Factors Impacting on Play Opportunities and Technology use in Children

Two linear regression analyses were conducted to examine the relationship between parental education, reported child-care hours, child age[2], and child birth order, for the quantity and diversity of toys available to children. The overall model for quantity of toys available was significant ($F_{(4,\,243)}$ = 4.54, p < .002; R^2 = .069). A child’s age was significantly related to the quantity of toys available to them. As children got older, they were reported to have more toys (β = .056, *t* = 3.38, *p* < 0. 002). Birth order approached significance (β = .056, *t* = 1.90, *p* = .058). The overall model for diversity of toys did not yield significant results ($F_{(4,\,242)}$ = 1.32, *p* = .264.

Similarly, two linear regression analyses were conducted to assess the impact of age of introduction to technology, duration of time spent with technology and independent use of the two most prevalent technologies (TV and iPad) on these same dependent variables, quantity and diversity of toys. The overall models for both quantity and diversity were not significant ($F_{(4,\,202)}$ = .277, *p* = .093 and $F_{(4,\,202)}$ = 1.13, *p* = .342, respectively).

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[2] For this analysis, child’s reported age range was used not the child’s age group of younger verses older.

Parental Scaffolding When Engaged in Joint Media Based Play

Overall, a diverse array of potential scaffolds was assessed. These scaffolds were organized into three broad types of scaffolding: verbal, emotional and physical. In addition, supports provided within varied contexts, such as task difficulty were also assessed.

Verbal Prompts. Parental support during technology use was assessed through self-report of verbal scaffolds. Parents were asked to indicate the verbal prompts they use from a list of 11 possibilities (see Table 9 for complete list). Of these 11 types of verbal prompts, most commonly parents indicated they “tell their child that he/she is doing well” (*M* = 3.98, *SD* = 1.23) followed by “encouraging their child to try again” (*M* = 3.94, *SD* = 1.18) and “asking questions” of their child (*M* = 3.38, *SD* = 1.23; see Table 9 for complete summary).

A factor analysis of the 11 types of verbal scaffolding was conducted to examine underlying structures among the 11 potential types of scaffolds presented to parents. Two clear factors emerged. The first was labelled “Additional Instruction” which included 6 items (rewording instructions, re-phrasing own words, reading aloud information, explaining the software, giving additional examples and, providing hints; See Table 10). When combined into a single scale, these six items were highly reliable (Cronbach’s α = .884). The second factor was labelled “Feedback” which included 3 items (“Telling child he/she is doing well”,” Telling child to try again” and, “Asking questions”; see Table 10). Internal reliability for these three items was also high (Cronbach’s α = .849). The remaining two supports (i.e., provide direct step-by-step instructions and telling child he/she is incorrect) loaded approximately equally on each factor. In subsequent analyses these types of supports were used as individual items[3].

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[3] Given that step-by-step instructions and corrective feedback are a common source of support that parents provide, the decision was made to retain these two items as individual items in subsequent analyses acknowledging that they do overlap with other categories

Using the aggregated measures and two individual items derived from the factor analysis, six paired *t*-tests contrasted overall reported endorsements for each of the scaffolds. Given the number of *t*-tests a Bonferroni correction $p = .008$ was used. In all comparisons involving feedback, feedback was provided more frequently. The majority of parents indicated they “sometimes” to “often” provide their child with feedback ($M = 3.77$, SD = 1.06) while only “sometimes” providing direct instructions ($M = 2.80$, $SD = 1.15$; $t_{(244)} = 14.44$, $p < .001$) and telling their child he/she is incorrect ($M = 2.84$, $SD = 1.11$; $t_{(243)} = 14.65$, $p < .001$). Parents provided additional instructions ($M = 3.05$, $SD = 1.02$) more than they provided direct instructions ($M = 2.80$, $SD = 1.15$; $t_{(244)} = 3.90$, $p < .001$), and telling their child he/she is incorrect ($M = 2.84$, $SD = 1.11$; $t_{(243)} = 3.37$, $p < .002$). Only one comparison was not statistically significant. Specifically, providing direct instructions ($M = 2.79$, $SD = 1.15$) was endorsed approximately equally to telling their child he/she is incorrect ($M = 2.84$, $SD = 1.11$; $t_{(243)} = .602$, $p = .548$). See Table 11 for complete summary.

A 2 (Parent Gender) X 2 (Child Age Group) MANOVA was conducted to assess potential differences in the frequency of the four parental verbal prompts as a function of the parental gender and of child age. Using Pillai’s Trace criterion, the multivariate analyses indicated a significant main effect of parent gender ($F_{(4, 234)} = 3.37$, $p < .02$), child age group ($F_{(4, 234)} = 3.05$, $p < .02$) and no statistically significant interaction. Although the effect for parent gender was significant, examination of the main effects for each item did not yield any statistically significant differences. However, there was a strong trend for fathers to tell their child he/she is incorrect more often than mothers ($F_{(1, 237)} = 3.31$, $p = .07$). Examination of the simple effects for child age yielded one significant outcome regarding the provision of additional instructions ($F_{(1, 237)} = 3.92$, $p < .05$). Parents reported providing additional instructions to older children (*M* = 3.21, *SD* = .934) more often than to their younger children (*M* = 2.92, *SD* = 1.07). No other main effects or interactions were significant, largest ($F_{(1, 237)}$ = 3.02, *p* = .083) for telling child he or she is incorrect (see Table 12 for complete summary).

Physical Prompts. Parental support during technology use was also assessed through self-report of physical scaffolds. Parents were asked to indicate how frequently they use physical prompts from a list of 17 possibilities. Overall, visual inspection of mean ratings suggests that the two most frequently endorsed physical scaffolds involved: parents sitting beside their child while the child is seated in front of the computer (*M* = 3.25, *SD* = 1.25), followed by parents pointing directly at or touching important information on the screen (*M* = 3.24, *SD* = 1.13). Letting their child sit on their lap while the child uses the computer (*M* = 2.87, *SD* = 1.23) received the third highest endorsement. In comparison, parents reported they were least likely to provide a booster seat (*M* = 1.66, *SD* = 1.18; see Table 13 for complete summary).

A factor analysis of the 17 individual items yielded 4 clear factors and 2 individual items. The factors included: 1) Device Adjustment (4 items: provide booster seat, adjust screen location or angle, adjust screen properties and, adjust computer; Cronbach's α = .764); 2) Where child is seated (3 items: sit beside child with child in front of screen, child on lap while parent uses computer and, child on lap while child uses computer; Cronbach's α =.730); 3) Supports to facilitate play (4 items: buy child specific devices, hand over hand to help with mouse, move child's hand to correct place on the keyboard, move child's hand over touch pad; Cronbach's α = .770) and; 4) Actions to progress play (4 items: move mouse for child, press keyboard for child, point in general to the screen and hold portable device for child; Cronbach's α =756). Two items loaded on multiple factors and were subsequently treated as individual items: 1) Sit beside child with parent in front of screen and 2) Point directly at or touch important information on the screen (see Table 14 for complete summary).

Examination of parental endorsement for each of the four aggregated and two individual items indicated that parents most commonly reported just over “sometimes” pointing directly at or touching important information on the screen in efforts to support their child (*M* = 3.24, *SD* = 1.13). This was followed by approaching “sometimes” for position child is seated (*M* = 2.95, *SD* = 1.00) and actions to progress play (*M* = 2.56, *SD* = .872), followed by slightly more than “rarely” for supports to facilitate play (*M* = 2.33, *SD* = .956), sit beside child with parent in front of screen (*M* = 2.31, *SD* = 1.31), and device adjustment (*M* = 2.24, *SD* = 1.00; see Table 15). Fifteen paired *t*-tests contrasted overall reported endorsements for each of the scaffolds. Given the number of *t*-tests a Bonferroni correction *p* = .003 was used. Of these 15 paired t-tests only three did not yield significant results (See Table 16 for complete summary). Specifically, parents were equally likely to engage in adjusting the device for a child and providing supports to facilitate their child’s play or sit in front of the computer with their child beside them. In addition, parents were equally likely to provide supports to facilitate play and sit in front of the computer with their child beside them. Among those comparisons that were statistically significant, in each case, parents endorsed pointing directly at or touching important information on the screen in efforts to support their child relative to all other forms of physical support. Similarly, parents endorsed where the child is seated more frequently than all other supports except the pointing directly at or touching important information on the screen. Actions to progress play were endorsed more so than device adjustment, supports to facilitate play, and sitting beside the child (parent in front of monitor).

The four subscales and two individual items were used to conduct a 2 (Parent Gender) X 2 (Child Age group) MANOVA which examined parental physical prompts as a function of the parental gender and of child age. Using Pillai's Trace criterion, the multivariate analyses indicated there were no main effects nor was the interaction significant; largest ($F_{(1, 238)} = 2.59$, $p = .109$) for supports to facilitate play (see Table 15 for complete summary).

Emotional Supports. Parental support during technology use also was assessed through self-report of emotional scaffolds. Parents were asked to rate their level of support through seven questions. One question assessed overall general use of emotional prompts or scaffolds. Overall, the majority (71.5%) of parents indicated they "often" (39.7%) or "almost always" (31.8%) are demonstrative or emotional when interacting with their child ($M = 4.06$, $SD = .85$). Only 3.8% of parents indicated they are "rarely" ($n = 1$) or "seldom" ($n = 9$) emotional when interacting with their children followed by 18.7% indicating they are sometimes demonstrative or emotional when interacting with their child, 6% of parents ($n = 16$) did not respond. The 2 (Parent Gender) X 2 (Child Age Group) ANOVA yielded a main effect of parent gender. There was no significant main effect for age, nor were there any significant interactions. Overall, general use of emotional prompts or scaffolds differed between mothers and fathers ($F_{(1, 226)} = 6.35$, $p < .02$). Mothers reported that they "often" demonstrate strong emotions while interaction with their child ($M = 4.14$, $SD = .85$) whereas fathers reported that they "sometimes" demonstrate strong emotions while interaction with their child ($M = 3.81$, $SD = .81$; see Table 17).

Two subsequent questions queried physical behaviours and verbal comments that serve as emotional supports. When asked about specific physical (e.g., hug, ruffling hair, etc.,) and verbal supports (e.g., "good job", "you can do it" etc.) outcomes were similar. Overall, the majority of parents (90.6%) indicated that they "often" to "almost always" provide these emotionally based physical supports to their child (*M* = 4.71, *SD* = .52). The remaining parents (3%) indicated they "sometimes" provide emotional physical support and 6.4% of parents did not respond. Similarly, 88.8% of parent indicated that they "often" to "almost always" provide verbal emotional support to their child (*M* = 4.69, *SD* = .59). The remaining parents (5.3%) indicated they "rarely" or "seldom" provide emotional verbal support and 6% of parents did not respond.

Context Specific Emotional Supports

In addition to the general questions noted above, parents were also asked to identify types of emotional supports used in novel or challenging contexts.

New Technology. To better understand emotional supports provided when introducing their child to new technology, parents were asked to respond to two Likert-type questions regarding emotional-physical and emotional-verbal supports. For the question regarding emotional-physical support, overall, almost half of the parents (46.8%) indicated they were "likely" to "very likely" to provide emotional-physical support, the remaining indicated they were "not at all likely" (9.7%), "somewhat unlikely" (4.1%) or "neutral" (31.8%) in providing emotional-physical supports; 7.5% of parents (*n* = 20) did not respond. For the second question regarding emotional-verbal support, however, 68.1% of parents indicated they "often" to "almost always" provide their child with emotional-verbal support when introducing new technology; the remaining indicated they would "never" (2.6%), "rarely" (3%) or "sometimes" (18%) provide emotional-verbal supports; 8.2% of parents did not respond (*n* = 22). Comparisons by parent gender and child age are reported below.

Challenging Technology. To better understand emotional supports provided when their child is working on a challenging activity with computers, parents were asked to respond to two

Likert-type questions regarding emotional-physical and emotional-verbal supports. With respect to emotional-physical support, overall, the majority of parents (52%) indicated they were "likely" to "very likely" to provide emotional-physical support, the remaining indicated they were "not at all likely" (7.5%), "somewhat unlikely" (7.9%) or "neutral" (24.7%) in providing emotional-physical supports; 7.9% of parents did not respond. With respect to emotional-verbal support, however, more parents (67.8%) indicated they "often" to "almost always" provide their child with emotional-verbal support when their child is working on a challenging activity; the remaining indicated they would "never" (3%), "rarely" (3.4%) or "sometimes" (17.2%) provide emotional-verbal supports; 8.6% of parents did not respond. Comparisons by parent gender and child age are reported below.

Three aggregate average scores for emotional supports were created using the categories identified above: 1) General emotional support provided; 2) Emotional supports provided for new technology and; 3) Emotional supports provided for challenging technology. A 2 (parent gender) X 2(child age group) X 3(Emotional support: General emotional support, New technology and Challenging technology) repeated measures MANOVA was conducted to assess potential differences in emotional supports provided as a function of parent gender, child age group and types of emotional support. Types of emotional support served as the within-subjects factor. Using Pillai's Trace criterion, the multivariate analyses indicated a significant main effect for type of emotion, ($F_{(2, 238)} = 90.82$, $p < .001$). Further investigation of the main effect for type of emotion was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to endorse provision of emotional support in general (M = 4.70, SD = .487) than emotional support when introducing new technologies (M = 3.77, SD = .958; $t_{(246)} = 16.42$, $p < .001$) or emotional support in challenging computer activity contexts (M

= 3.81, *SD* = 1.00; $t_{(246)}$ = 16.42, *p* < .001; see Table 18). This main effect was qualified by a significant 2 way interaction for emotional support and child-age ($F_{(1, 239)}$ = 3.93, *p* < *.05*). To explore this interaction, differences between younger and older children were assessed for each of the three type of emotion. The 3 *t*-tests indicated that parents reported more general emotional supports (*M* = 4.76, *SD* = .42) and more emotional support for new technology (*M* = 3.89, *SD* = .94) for younger children than for older children (*M* = 4.63, *SD* = .55, smallest $t_{(244)}$ = 2.20, *p* < .03). There were no differences in emotional support provided to younger and older children for challenging tasks (see Table 19 for summary).

Responding to challenging activities. In addition to the general assessment of emotional supports offered, parents were asked to identify the most likely support they would offer (from 5 options) when their child was engaged in a challenging task. The majority of parents (40.1%) indicated that they would "Crouch near my child, bring a chair up beside them or stand near my child *and tell them I think they can get it*" (*M* = 3.78, *SD* = 1.02) followed by 21.7% of parents who indicate that they would "Give a hug or touch my child to encourage them and tell them they can do it". Furthermore, 13.9% of parents reported they would most likely "Tell my child I have confidence that they can figure it out if they keep trying" followed by 11.6% who reported "Crouch near my child, bring a chair up beside them or stand near my child *to show support and simply observe*" represented what they would most like do to support their child. Overall, 1.5% of parent respondents indicated they would "Ignore the situation and let my child work it out on their own" (See Table 20 for complete summary).

Exploring the Relationship Between Education and Parental Child-care and Parental Scaffolding

Three multiple regressions were conducted to examine the relationship between parent education and reported child-care for each of the three types of reported parental supports: verbal, physical and emotional. Parents reported the amount of time they provided child-care in a given week through one open-ended question. Responses varied between 2 hours to 168 hours (24 hours, 7 days) a week. The models for the verbal and emotional supports were statistically significant ($F_{(2, 233)} = 4.24$, $p < .02$; $R^2 = .035$ for verbal feedback; $F_{(2, 231)} = 3.68$, $p < .03$; $R^2 = .031$ for telling child they are incorrect and; $F_{(2, 237)} = 3.27$, $p < .05$; $R^2 = .027$ for emotional support). The model for physical supports was not statistically significant ($F_{(2, 229)} = 2.20$, $p = .113$; $R^2 = .019$).

Verbal Prompts. Four regressions were conducted to examine the relationship between parent education and parental time spent with the child and each of the 4 verbal scaffolds. Two overall models were significant. The overall models for feedback ($F_{(2, 233)} = 4.24$, $p < .02$; $R^2 = .035$) and telling the child they were incorrect ($F_{(2, 231)} = 3.68$, $p < .03$; $R^2 = .031$) were significant. Higher parental education predicted lower reports of verbal feedback ($\beta = -.128$, $t = -2.51$, $p < 0.\ 02$) and lower reports of telling the child he or she is incorrect ($\beta = -.145$, $t = -2.70$, $p < .009$; see Table 21).

Emotional Support. One regression was conducted to examine the relationship between parent education and reported parental child-care and emotional supports. The overall model was significant ($F_{(2, 237)} = 3.27$, $p < .05$; $R^2 = .027$). Increased time caring for their child was related to increased parental report of general emotional support ($\beta = .002$, $t = 2.50$, $p < .02$; see Table 21).

Exploring the Relationship Between Comfort with Technology and Parental Scaffolding

Three multiple regressions were conducted to examine the relationship between the independent variable parent comfort with technology and the types of reported parental supports: verbal, physical and emotional. Parents reported their comfort with new/unfamiliar technology for both stationary (e.g., desktops) and mobile (e.g., tablets) technologies. An aggregate score was used to examine overall parent comfort with new/unfamiliar technology. The model for verbal supports (specifically feedback) was significant ($F_{(1, 212)} = 4.33$, $p < .04$; $R^2 = .02$). Parent comfort with technology was not related to general emotional support ($F_{(1, 218)} = .005$, $p = .942$; $R^2 = .001$) or physical supports ($F_{(2, 229)} = 4.51$, $p = .035$; $R^2 = .021$; given the number of regressions a Bonferroni correction $p = .008$ was used)

Verbal Prompts. Four regressions were conducted to examine the relationship between parent comfort with technology and each of the 4 verbal scaffolds. The overall model for feedback ($F_{(1, 212)} = 4.33$, $p < .04$; $R^2 = .02$) was significant. Parent comfort with technology was related to higher reports of verbal feedback ($\beta = .147$, $t = 2.08$, $p < 0. 04$; see Table 22).

Exploring the Relationship Between Time Spent on Technology and Parental Scaffolding

Three multiple regressions were conducted to assess whether the amount of time children spent on the computer was related to the types of reported parental supports: verbal, emotional and physical. Parents reported the length of time children were engaged with software/computer technology in a given week through one open-ended question. Responses varied between 0 hours to 80 hours a week. None of the models were statistically significant (highest $F_{(4, 212)} = 1.06$, $p = .378$ for Verbal Prompts). Length of time children were engaged with software/computer technology was not related to parental scaffolding.

Exploring the Relationship Between Birth Order and Time Spent on Technology

A linear regression analysis was conducted to examine the relationship between birth order and the amount of time spent on technology. The overall model was not significant ($F_{(1, 224)} = .181$, $p < .671$; $R^2 = .001$). Birth order was not related to the amount of time a child spent on technology within a typical week.

Discussion

The key goals of Study 1 involved identifying and describing children’s exposure to technology, and parental scaffolding of children when technology was introduced. Overall, the present findings suggest that children are introduced to technology at an early age. In addition inconsistencies exist regarding the duration of technology use across different families. Reasons for introducing technology vary considerably with factors such as family structure often impacting introduction. With respect to scaffolding, the present study suggests that parents utilize various forms of support when introducing the new technology, including a variety of verbal, emotional, and physical supports.

Exposure to Technology: First Experiences

Recent research suggests that parents are providing young children with increasingly earlier access to and use of technology (e.g., Wood et al., 2016). In particular, early access is being reported to occur prior to 2 years of age (Kabali et al., 2015; Rideout, 2013) despite the American Academy of Pediatrics (1999, 2001) recommendation that children younger that 2 years of age should not be exposed to screens (e.g., television, smartphones, tablets and computers). Parents in the current study, however, were generally slightly more conservative than some of these recent reports would suggest as these parents indicated they would introduce technology by the time their children were 2 years and 6 months of age, six months beyond the

American Pediatric Association recommendation of no screen time. Although not assessed in the current study, it would be interesting to determine if parents made this decision because they were aware of APA guidelines or if this decision reflects other considerations. For example, are parents influenced by characteristics of their child, characteristics of technology (more or less mobile), or other considerations? Interestingly however, after the two year time frame the decision to introduce technology grew rapidly. Specifically, in the present sample, by the time children were 3 years and 6 months of age exposure to technology had increased by 20% and by the age of 6 nearly all children were exposed to technology.

Interestingly, younger children in this sample were introduced to technology at a much earlier age than were the older children in the sample. This pattern is important for two reasons. First, the pattern suggests cohort differences in the timing for the first introduction to technology. Specifically, the earlier introduction time for younger children, coincides with the increasing number of reports that infants (i.e., children under two years of age) are indeed being exposed to technology (e.g., Archer, 2017) while for children born earlier, expectations were more in alignment with the American Pediatric Association guidelines. Second, the reason that earlier introduction occurred for younger children in the sample may also be a function of family context. In particular, infants may be exposed to technology earlier in contexts where an older sibling is present and presumably using technology. Examining family contexts, especially the influence of siblings, therefore, is an important area for further study in order to more fully understand the context in which technology is introduced (McHale, Updegraff, & Whiteman, 2012).

Exposure to Technology: Duration

The length of time children were engaged with software/computer technologies within a given week varied drastically, ranging from 0 hours to 80 hours. Recent research has suggested this is a challenging question to answer (Archer, 2017). Almost half of the children were reported to spend 4 hours or less on technology over the course of a week. In contrast, 20% of parents reported that their children spend over 10 hours a week on software/computer technology. The lack of consistent patterns across parents in the amount of exposure suggests that, although children's introduction to technology was relatively uniform, that is early in life, utilization of technology was much less uniform across parents. Specifically, individual differences across families are large with some families exhibiting much more restrictive access and use of technologies than others. In previous research, comfort with technology has been showed to impact use (Mueller & Wood, 2012). Exploratory analyses were conducted to determine whether parental comfort with technology was associated with children's use. Consistent with past research parental comfort with technology was associated with increased children's use; however, this was only the case for mobile technologies such as the iPad, in the present study.[4]

Parental reports on the amount of time children spent on technology varied as a function of the technology examined. Specifically, children most commonly used the television approximately 3 days a week, and the Internet was reported to be the second most commonly used technology. These were followed by the use of a tablet or mobile phone, presumably because these devices were used to access the Internet. It is interesting that television continues to be the most commonly cited technology in young children's lives, especially within the home.

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[4] Two Pearson correlations were conducted to assess the relationship between comfort and children's use of technology for the stationary and mobile devices respectively. Only the correlation for the mobile was significant ($r = .178, p = .028$)

Considerable research has examined the use of television as source of entertainment, education, and child-care for young children (e.g., Rideout & Hamel 2006; Rideout, Vandewater, & Wartella, 2003; Wartella, Richert, & Robb, 2010; Zimmerman, Christakis, & Meltzoff 2007). It is possible that television continues to be an important technological device because it is familiar to parents and serves these multiple purposes. The flexibility of mobile devices, however, permits parents and children to access the Internet anywhere, anytime, (Chen & Kinshuk, 2008; Evans & Johri, 2008; Hoppe, Joiner, Milrad, & Sharples, 2003; Mueller, Wood, De Pasquale, & Archer, 2011; Norris & Soloway, 2008) which allows technology to become more fully integrated into a variety of contexts in everyday life, for example, while travelling in the car, shopping, or visiting. Thus its visible presence in the lives of young children in the present sample suggest it is an important part of children's lives and it allows the potential for greater technology exposure overall. In terms of previous research, these current findings demonstrate an alarming increase in the amount of time children engage with technology. For example, in 2013, Rideout (2013) reported that five to eight year olds averaged only approximately 20 minutes per day of computer time (averaging 2 and a half hours per week). Despite the variability in duration of exposure among parents in the present study, most parents were permitting their children to have more exposure than reported in previous research. This growing trend of increased screen time for children suggests that young children today will be more familiar with technology than previous cohorts. Exposure time has both positive and negative potential. For example, if used for educational purposes this increased exposure could lead to some advantageous learning experiences for children (Bus & Neuman, 2009; Korat, 2009, 2010; Korat & Blau, 2010), however, passive use or exposure to inappropriate content could lead to decrements in learning (Vandewater, Bickham, & Lee, 2006).

Findings from the current study also suggest that birth order does not predict the length of time a child was engaged with software/computer technology within a typical week. Younger and older children spent approximately the same time on technology over a typical week despite parents reporting older children having access to technology in more locations (home, friends or relatives, school, and daycare). Older children were exposed to technology later than were younger children, however once exposed the findings suggest older children had more opportunities to access technologies in a variety of locations. As expected, almost all parents indicated that their children had access to technology at home and 75% had additional access at a friend or relative's house. Children also had access at school and daycare. Interestingly, this increase in opportunities did not coincide with more time on technology over a typical week. This outcome may reflect ongoing greater restriction for the older cohort of children or, as suggested above, greater access among younger cohorts perhaps as a function of the presence of an older sibling. Specifically, a younger sibling may have "access" to the technology while it is in use by an older sibling. It is also possible that when the technology is novel, such as would be the case for younger children, there is greater interest in using the technology.

As noted above, parents reported that their older children had significantly more access to technology compared to younger children. The number of places in which children can gain access to technology is consistent with the literature supporting the ubiquitous presence of computer technology in the lives of children today (Calvert, Rideout, Woolard, Barr, & Strouse, 2005; Carson et al., 2013; Holloway, Green, & Livingston, 2013).

Exposure to Technology: Safety

Previous literature suggests that when children are engaged with technology, parents are present to oversee interactions in order to ensure safety (Plowman et al., 2011). The results of the present study support this finding. Overall, more than half of the parents completely restricted children’s independent use of the computer and laptop. However, children’s independent use of technologies varied depending on device. For example, the majority of parents allowed independent use of cellphones, tablets and TV. Thus, the smaller and more mobile technologies and the traditionally more passive technology (i.e., TV) were both those reported as the most commonly used technologies and those most frequently used independently. Perhaps children’s greater experience with these technologies provided children opportunities to gain sufficient skills with the technology that parents perceived that their children would be able to interact with them successfully. Indeed, parents were more likely to allow older children independent use of the computer, laptop and TV suggesting that developmental differences, perhaps in skills could be related to use of specific technologies. Moreover, although not significant, there was a strong trend indicating parents were more likely allow older children to independently select computer software compared to younger children.

In summary, parents generally supported an early introduction to technology, most frequently during the early toddler years, although older child cohorts were introduced to technology later than were younger children. Interestingly, there were apparent restrictions both in the amount of time children were permitted to spend on technologies and in terms of which technologies children had access to with most children having exposure to only TV, Internet, and iPads. Time spent using technologies varied, but on average parents reported that children spent approximately seven and a half hours per week on technologies and this amount of time was not affected by child age. To further understand exposure to technology, parental interactions were investigated.

Parental Scaffolding

A second goal of this study was to determine supports provided to children when they were engaged with technology. More specifically, three overall support categories were examined: Verbal Supports, Physical Supports, and Emotional Supports. In the present study verbal supports included parents providing instructions and feedback on the game or use of technology; physical supports included actions to progress or advance game play, such as physically moving the mouse or pointing to relevant information on the screen; and finally, emotional support included parents offering verbal praise or physical affection. Parents indicated that they provided a variety of supports to their children with many indicating supports in each of the three categories.

Overall, parents reported providing verbal supports more often than physical supports or emotional supports. Furthermore, parents reported providing "additional instructions" to older children more often than to their younger children. This increased verbal direction is consistent with appropriate scaffolding techniques as children's strategies and problem-solving techniques develop with age (Lemaire & Lecacheur, 2011; Siegler, 2007). In addition to verbal scaffolds to initiate play, parents reported providing feedback after an action or task was made. This elaboration suggests that parents perceived the feedback alone to be insufficient for their children to acquire the necessary skills to effectively engage the technology. This result is interesting given that one of the affordances often cited in the literature regarding the efficacy of software is the presence of immediate and accurate feedback (Moreno-Ger et al., 2008). The present findings suggest that the feedback provided in the software may need to be augmented to provide the most effective instructional opportunities for young children. This is consistent with teacher supported models of technology use where software is supported by additional instructional by teachers (Blackwell et al., 2013; Lysenko & Abrami, 2014; Pynoo et al., 2011; Willoughby & Wood, 2008). In addition, the elaboration by parents in the present study demonstrates parents' effort to support and scaffold their children through their technology usage.

Physical supports were reported to occur slightly less often than verbal supports. However, parents were equally likely to "adjust the device for their child", "provide supports to facilitate their child's play", or "sit in front of the computer with their child beside them". Moreover, compared to all other forms of physical support, parents most frequently endorsed pointing directly at or touching important information on the screen in an effort to support their child; the second most common physical support was the endorsement of where the child is seated while using technology. Finally, "actions to progress play" were endorsed more so than "device adjustment", "supports to facilitate play", and "sitting beside the child (parent in front of monitor)". Overall, parents reported being physically engaged with their children quite often while using technology. The nature of this self-reported interaction in terms of number of supports and duration of supports over time, however, is not as clear. Given the limited categories provided to parents in the survey it is possible that critical physical exchanges may have been missed. It would be useful to more clearly identify interactions between parents and children in future research. Direct observation of parents and children engaged jointly while using technology would permit a more accurate map of specific forms of physical support parents provide their children.

Parents indicated that helping their children through the use of emotional support was a typical and normal part of their daily lives. Parents endorsed the use of emotional supports as a regular feature of general interactions with their children in everyday contexts and slightly more when introducing new technologies or during challenging computer activity contexts. At the same time, compared to older children, parents reported providing younger children with more “general emotional support” and more “emotional support when introducing new technology”. However, when a software/computer task was difficult, parents provided their children with support regardless of the children’s age; in other words, emotional support of challenging tasks did not differ as a function as age. Again, this increased emotional support for challenging tasks is consistent with effective scaffolding (Vygotsky, 1978), as children may have required more support to persist on difficult tasks.

A particularly promising result from the current investigation is that when asked to select only one type of support that reflects their most common behaviour, the majority of parents indicated that they would “Crouch near my child, bring a chair up beside them or stand near my child and tell them I think they can get it” and nearly no parents indicated they would “Ignore the situation and let my child work it out on their own”. Interestingly, parent education and reported child-care were related to parental reports of scaffolding. More specifically, higher parental education resulted in lower reports of verbal feedback and lower reports of telling the child he or she is incorrect. This outcome could suggest that parents with more education may have been more likely to allow their child to engage in trial-and-error without perceived interference. Alternatively, it may be that these parents opted for a different form of scaffolding than verbal scaffolding. It would be an important next step to directly observe parents engaged with their child to assess these possibilities. At the same time, increased time caring for their child predicted increased parental reports of overall emotional support. This current finding contradicts past literature concerning emotional support. Forbes and colleagues (2004) examined the number of hours mothers and fathers worked outside the home in relation to emotional support and found that the number of hours worked did not impact the amount to emotional support parents provided to their child. Perhaps, parents only consider at-home time as central to their self-assessment of time caring for their children and the provision of emotional support. Thus, unsurprisingly, the more time parents spent with their child the higher their reports of providing emotional support.

Interestingly, fathers reported being less demonstrative of strong emotional support while interacting with their child and reported they were more likely to tell their child that they are incorrect while engaging with computer technologies. This difference between mothers and fathers in demonstrative emotional supports is consistent with previous literature (Forbes, Cohn, Allen, & Lewinsohn, 2004; Volling, McElwain, Notaro, & Herrera, 2002). This outcome indicates the importance of considering gender differences specifically when emotional scaffolding is being examined. Finally, parent comfort with technology predicted higher reports of verbal feedback. That is, when comfortable with technology, parents tended to provide more feedback such as telling their child he/she is doing well, telling him or to try again and asking questions.

Enriching Play Activities

The vast majority of children in the present sample had access to a wide array of toys and literacy materials in their home. Therefore, in addition to technology, children had a rich and diverse play life. Children not only had access to a variety of different activities, they also spent varying amounts of time across activities. Not surprisingly, older children were reported to have more play activities compared to younger children. However, neither quantity nor diversity of play activities were affected by the age at which technology was introduced or the duration of time spent with technology. Regardless of the number of toys children had access to, the age at which they were introduced to technology and their use of technology did not differ. These findings suggest that the presence of technology does not seem to impact the diversity or quantity of enriching play activities within the home.

Limitations and Future Directions

One limitation in the present research is that the study's participant sample may not be representative of the general population. In particular, marital status among the majority of participants reflected parents in a committed relationship. This finding suggests that the present sample reflects two-parent family contexts rather than capturing more diverse arrangements that can be found in the larger population.

This study employed self-report measures consistent with the wider body of literature available regarding introduction of technology (e.g., Archer, 2017; Davies, 2011; Kabali et al., 2015; Rideout, 2013, 2015; Wood et al., 2016). The study also primarily focuses on parental views regarding the introduction to technology and how parents see themselves contributing to their children’s use of technologies. The notable limitation to the study, therefore, is that parents’ self-reported behaviours and perceptions may not reflect actual behaviours. An important next step would be to observe how parents and children interact when using technology. In particular, it would be beneficial to examine which supports (verbal, physical and emotional) parents provide during shared-computer use and, in turn, how children respond to their parents.

In addition, the present study indicated that children had access to different technologies (i.e., mobile versus larger technologies) and that these technologies could be accessed in different contexts such as home, friend of relative’s house, school and daycare. Future research should broaden the assessment of technologies to include different types of technologies, perhaps both stationary and mobile technology, as well as exposure across settings to more fully capture children’s early experiences with technology.

Study 2

Study 2 aims to address the limitations of Study 1. Through in-lab observations, Study 2 examined how parents and children interact when using technology. Parents desire to support their children's learning through coaching (Davies, 2011; Evans, Mansell, Shaw, 2006; Neumann et al., 2009; Sénéchal & LeFevre, 2002) and indicate that parents are available to provide supports to their children (Davies, 2011). The present study directly observed and documented exchanges between parents and their children and how they navigate joint media-based activities. Furthermore, the present study examined how these same parent-child dyads explored and engaged in software that is relatively easy versus relatively difficult to navigate. This contrast permitted an examination of parental scaffolding when complexity differs across tasks. The overall purpose of the present study was to survey and observe parents of diverse backgrounds in order to understand how parents view technology use for young children and how parents scaffold their children across tasks and media devices.

Method

Participants

A subsample of 162 parents recruited to complete the survey in Study 1 agreed to participate in the observation and interview sessions conducted for Study 2. Of this subsample of 162 parent-child dyads (109 mothers and 53 fathers), the corresponding survey data from Study 1 for seven of the parent-child dyads were excluded. Surveys were excluded for one of three reasons: the parent who completed the survey was not the same parent who participated in the observation session (*n* = 5), the parent completed the survey regarding one child but participated with another child (*n* = 1) or both parents jointly participated in the observation session (*n* = 1). In total, comparisons between the survey and observations could only be conducted for 155 parent-child dyads. Among these 155 participants 67.7% (*n* = 105) were mothers and 32.3% (*n* = 50) were fathers.

As noted in Study 1, participants were recruited through a variety of sources including local daycares, community centres, day camps and online advertisements. All participants were treated in accordance with ethical guidelines established by CPA and APA. Parents were given $25 compensation and were entered in a draw to win one of 20 $50 gift certificates.

Parents. Parental age ranged from 23 to 56 (*M* = 35.94, *SD* = 4.84). Overall, 46.5% of the sample were 35 years or younger. A *t*-test revealed significant differences in age between the 105 mothers (*M* = 35.38, *SD* =4.59, range = 23 to 50) and 50 fathers (*M* = 37.10, *SD* = 5.17, range = 25 to 56), $t_{(153)}$= 2.09, $p < .05$ with fathers being slightly older than mothers.

Further examination of age indicated that, the age distributions were similar and represented normal distributions with the exception of one older outlier in the sample of fathers (see Figure 2). Given the small sample of fathers completing the survey plus observation, this individual was retained in all analyses. The majority of mothers and fathers were between 30 and 40 years old. Therefore, despite the small but statistically significant difference in parental age, age was not examined in subsequent analyses.

Consistent with Study 1, parents in this sample were relatively well-educated. Overall, all participants reported at least a high school diploma with 5.2% having a high school diploma, 7.7% having some post secondary education, 16.8% having a College diploma, 36.8% having an Undergraduate degree, 21.3% having a Master’s degree, 5.8% having a Doctorate, 5.8% having completed a Post-Doctorate, and one (.6%) participant did not indicate education level. Similar patterns were present in both mothers and fathers. Specifically, among mothers 3.8% having a high school diploma, 7.6% having some post secondary education, 18.1% having a College diploma, 35.2% having a Undergraduate degree, 21% having a Master's degree, 7.6% having a Doctorate, 5.7% having completed a Post-Doctorate, and one (1%) participant did not indicate education level. Among fathers the range was similar to mothers with 8% having a high school diploma, 8% having some post secondary education, 14% having a College diploma, 40% having a Undergraduate degree, 22% having a Master's degree, 2% having a Doctorate, and 6% having completed a Post-Doctorate. A *t*-test revealed no significant differences in education level between mothers and fathers, ($t_{(152)}$ = .779, *p* = .438).

Consistent with Study 1, the vast majority (94.8%) of participants were in a committed relationship (*n* = 147), with 2.6% of the remaining participants being single (*n* = 4); 1.9% were separated, divorced or widowed (*n* = 3) and one participant did not answer. Marital status of mothers and fathers was similar. Specifically, the vast majority of mothers (94.3%, *n* = 99) and fathers (96%, *n* = 48) reported being in a committed relationship, with few mothers (3.8%, *n* = 4) and no fathers being single and fewer being separated, divorced or widowed (mothers = 1%, *n* = 1; fathers = 4% *n* = 2). These outcomes suggest that the present sample reflects two-parent family contexts.

Language in this subsample reflected language in Study 1. The majority of parents (90.3%) indicated that the primary language of both the parent and child was English (*n* = 140). English was the first language for the majority of participants (85.8%, *n* = 133) and the remaining 14.1% (*n* = 22) indicated another language. Of the approximately 15% that did not indicate English as a first language, 45.5% learnt English at 6 years of age or younger, 22.7% learnt English as a teenager between the ages of 13 and 16 and 13.5% of the population after the age of 20, (*M* = 10.45, *SD* = 6.68).

The vast majority of mothers (92.4%, $n = 97$) and fathers (86%, $n = 43$) indicated the primary language of both the parent and child was English. Specifically, English was the first language for the majority of mothers (87.6%, $n = 92$). Of the 12.4% that did not indicate English as a first language, 38.5% learnt English at 4 years of age or younger ($M = 11.54$, $SD = 7.42$). Similarly, English was the first language for the majority of fathers (82%, $n = 41$) and the remaining 18% ($n = 9$) indicated another language. Of the 18% that did not indicate English as a first language, 55.6% learnt English at 6 years of age or younger ($M = 8.89$, $SD = 5.47$). Mothers and fathers did not significantly differ on English as a first language X^2 (1, $N = 155$) = .878, $p = .349$. A *t*-test revealed no significant differences in primary language used in the home, ($t_{(152)} = 1.61$, $p = .109$).

The number of children within the family was also assessed. Overall, 20% of parents had one child, 57.4% had two children, 16.8% had three children and 1.9% had four or more children (3.2% did not respond). Family context of mothers and fathers were similar as the majority of mother and fathers indicated 2 children (53.3% and 66% respectively). Approximately a quarter of mothers (22.9%) and fathers (14%) had only one child, 18.1% of mothers and 14% fathers had three children, 1.9% of mothers and 2% of fathers had four children and only one mother indicated five children. A *t*-test revealed no significant differences in the number of children in the households of mothers and fathers, ($t_{(148)} = .174$, $p = .862$).

Children. Parents were asked to identify one child as a target child. They identified the age of their child using an eight-item scale which presented ages in six months increments from 25 months of age onward to older than 5 years of age with one additional category to capture children from 12 to 24 months of age. Although the study was designed to assess children 24 months and older, three parents reported on the survey that their child was between 12 and 24 months. When parent-child dyads arrived to the observation session, child gender and the child's birthdate were recorded. All three children were confirmed to be between 23 and 24 months of age. Given the proximity in age to the desired target age, responses from parents of these three children were retained in analyses. Thus, children's age at the time of the observation session ranged from 23 months to 6 years and 11 months (M = 3.90, SD = 1.26). Average age of the child participating was similar for both mothers (M = 3.83, SD = 1.26) and fathers (M = 4.04, SD = 1.27). Of the 155 children, approximately equal numbers of boys (n = 80) and girls (n = 75) were included (51.6% and 48.4% respectively). Approximately equal numbers of mothers participated with a son (n = 55) or a daughter (n = 50) as the target child. Similarly, equal number of fathers participated with a son (n = 25) or a daughter (n = 25; see Table 23 for complete number of participants in the Observation Session). A *t*-test revealed no significant differences in target child age between mothers and fathers, ($t_{(153)}$ = .976, p = .331). An additional *t*-test indicated no significant differences in target child age as a function of child gender, ($t_{(153)}$ = .504, p = .615).

Of these children, 18.1% were the only child, 34.2% were the first-born, 7.1% were the middle child and 40.6% were the last-born. Birth order was relatively similar for target boys and target girls. Specifically, among boys 18.8% were only children, 28.7% were the first-born, 8.8% were the middle child and 43.8% were the last-born. Among girls, 17.3% were only children, 40% were the first-born, 5.3% were the middle child and 37.3% were the last-born. A t-test indicated no significant differences in target child birth order as a function of child gender, ($t_{(153)}$ = .781, p = .436).

Overall, English was the first language for the majority of children (92.3%). Having English as a first language was similar of boys and girls. Boys (92.5%) were not significantly different than girls (92%) in having English as a first language, X^2 (1, *N* = 155) = .014, *p* = .907. Of those that did not indicate English as the first language, overall, 91.7% indicated their child understood/spoke English. Parental reports of fluency in English (understood/spoke) did not differ between boys (100%) and girls (83.3%), X^2 (1, *N* = 12) = 1.09, *p* = .296.

In order to better understand the care relationship between the child and reporting parent, parents were asked to identify the number of hours of care provided each week by themselves versus others (including: spouse or partner, grandparent, older sibling to the child, other family members, babysitter, and Educational worker). Overall, parents identified themselves and their spouse as providing the most hours of child-care per week (*M* = 88.01, *SD* = 47.88 and *M* = 63.95, *SD* = 47.60) followed by an educational worker (e.g., daycare provider, school teacher etc.; *M* = 29.69, *SD* = 14.34). All other caregivers fell below 20.5 hours per week. Seven *t*-tests were conducted to assess potential differences in reported childcare hours as a function of parent gender. Given the number of *t*-tests a Bonferroni correction *p* = .007 was used. Overall, hours for oneself and spouse differed as a function of parent gender. Specifically, mothers reported themselves as being responsible for a greater number of childcare hours (*M* = 96.14, *SD* = 46.00 versus *M* = 69.47, *SD* = 47.38; $t_{(149)}$ = 3.25, *p* < .002). Fathers' responses were in agreement, reporting their spouses as being responsible for more childcare hours *M*= 83.33, *SD* = 50.81 versus *M* = 54.16, *SD* = 42.94; $t_{(138)}$ = 3.57, *p* < .001). (See Table 24 for a complete summary).

Materials

Some observational data in Study 2 were compared to survey responses provided in Study 1. All parents had completed the survey for Study 1 prior to attending an observational session with his or her child. Subsequent observational sessions were comprised of one 20-

minute session working with a desktop computer and one 10-minute session working with an iPad^{TM}.

Observational Session. The room layout, equipment and protocols were identical across participants. Each parent-child dyad was tested in a child-friendly University lab space equipped with two adult chairs, a table with a desktop computer, two child-size tables with three child chairs, a love-seat sofa and an area rug depicting the alphabet (see Appendix B for layout schematic).

Equipment. All testing was conducted using a computer with a 17" LCD monitor and one of two Apple iPads (second generation, 1024 by 768 pixel, 9.7-inch – diagonal LED-backlit display). Observations were recorded by three Sony Video Recorders. The three recorders were arranged to record from all angles to discreetly capture parent-child interactions. The first camera was placed in the left corner of the room, which captured the right side of the room and parent-child interactions. The second camera was placed in the right corner which captured the left side of the room and parent-child interactions. The third camera was used as a screen capture as it recorded the computer screen and mouse movement. A Sony MP3 recorder was used to record participants' voice interactions. An iPad application (DispRecorder®) recorded onscreen video and audio during the iPad task.

The observational session was comprised of two mini sessions. One mini session involved a 20-minute desktop computer component and the other involved a 10-minute iPad task. The desktop component was further subdivided into two 10 minute subsections -- ten minutes using an easy desktop software game (Jumpstart® -- preschool or kindergarten), ten minutes using a hard desktop software game (Disney® - preschool or kindergarten). Order of these computer subsections was counterbalanced. Consistent with descriptions provided in previous research (Grant et al., 2013; Wood, Hui, & Willoughby, 2008), easy programs provided supports that ensured users were working at an appropriate level of difficulty and navigation through the games/activities was clear, explicit and supported visually and through instructions. hard programs were difficult to navigate and did not provide support for appropriate assignment to level of difficulty. The iPad was pre-loaded with 12 learning applications -- seven applications targeted reading and literacy skills (Reader Rabbit Preschool, Reader Rabbit Kindergarten, Reader Rabbit 1st Grade, Super Why, Super Why Alpha Boost, Pocket Phonic, and Little Writer), and five targeted numeracy skills (TeachMe: Toddler, TeachMe: Kindergarten, TeachMe: 1st Grade, Monkey Math School Sunshine, Bugs & Buttons).

Each desktop game had a brief introduction scene/song after the child enters his or her name. To ensure participants received equal playing time, timing for the 10-minutes did not commence until after the introduction scene/song. Timing for the iPad task commenced immediately after the device was handed to the parent.

Procedure

Participants were recruited through local daycares, community centres, day camps and online advertisements. A link to the survey was also placed on a research lab website, allowing parents seeking to participate in research to contact the researcher to fill out the survey. Parents expressing an interest in participating in the study were contacted by email and were provided with a link to an online survey. Participants were greeted upon entering the testing room. Parents were instructed to engage their child as they normally and typically do. Cameras were turned on and a research assistant moved out of range but within the room. To minimize interference with parents and their children, the research assistant was engaged in “a writing/reading activity” which limited eye contact. If a parent expressed concern or difficulty to the research assistant, the research assistant assessed the situation, if there was an equipment failure, the research assistant addressed the issue and then returned to their previous task and location. If the issue did not require intervention, research assistants instructed parents to “do what you would normally do at home” and did not interfere. All participants were treated in accordance with ethical guidelines established by CPA and APA. Parents were entered in a draw to win one of 20 $50 gift certificates for completing the survey and $25 compensation for travel to the observation session.

Results

At the outset the plan for coding of the observational data was to assess parent-child interactions using the categories derived from the factor analyses conducted in Study 1. Specifically, coding would assess the verbal, physical and emotional supports identified in Study 1. However, as coders began to observe parent –child interactions during the observation sessions it became clear that parent behaviours were more intricate and these categories were too general to effectively capture the interactions. As a result, qualitative methods were used to extract common themes and subthemes from the observations using an open-coding approach (Boyatzis, 1998; Strauss and Corbin, 1990; Thomas, 2006). Videos of the observations were watched until saturation of themes and subthemes were developed. Saturation occurred for all three session types (easy software session, hard software session, and the iPad session). Throughout this process common themes and subthemes were refined, expanded or aggregated until each theme captured unique information and all data could be accounted for (Boyatzis, 1998). These final themes and sub-themes were then used as the codes to capture all observational data. To ensure thoroughness in coding, each session was viewed at least twice. In the first viewing, verbal and physical supports were coded. In the second viewing, interactions were recorded. Given the number of codes, this separation in the coding allowed for greater ease in coding sessions. Two raters simultaneously coded several videos to achieve saturation in themes. Once themes were finalized the two raters independently viewed and coded videos for 29 easy computer sessions, 29 hard computer sessions and 29 iPad sessions. Interrater reliability was 80% for easy sessions, 81% for hard sessions and 80% for the iPad sessions.

Overview of the Observational Themes Coded

Observational sessions yielded rich data regarding parents' and children's experiences during the desktop computer (easy and hard software) and the iPad events. The richness of data resulted in a complex, hierarchically organized coding scheme. The present overview provides an introduction to the overarching structure of the themes and subthemes observed during the play sessions with more detailed exploration of individual themes and subthemes following the overview.

Coding of the observational sessions resulted in thematic data relevant to: parental intentions during game play; supports parents provided; scaffolding; and engagements between parents and children. Within each of these broad themes are subthemes that capture the complexity of the interactions. These major themes and subthemes are summarized in Figures 3 through 6 and Table 25 and are described in detail below. In addition to the above themes, an "other" theme was included to capture information that did not fit the above themes but did provide unique information relevant to the present study.

Identifying and describing the themes and subthemes constituted the primary goal of the observational sessions. Figure 3 outlines the major themes and Figures 4 and 5 outlines the subthemes for verbal supports and physical support, respectively. In addition to the qualitative analyses subsequent quantitative evaluation of the occurrence of each theme was examined as a function of parental gender, examining the relationship between age and occurrence of each theme, comparison across context (easy and hard computer and iPad) regarding occurrences correlations between parental self-report of supports provided and actual observed supports provided.

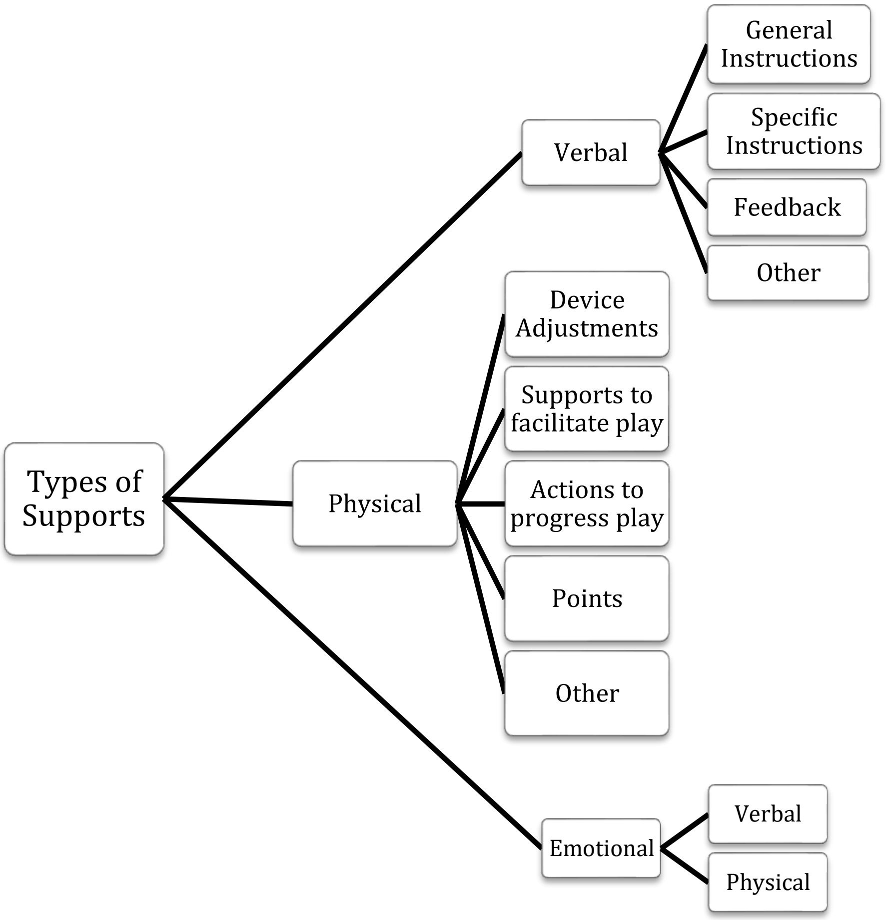

Figure 3: Types of supports parents provide during computer play context

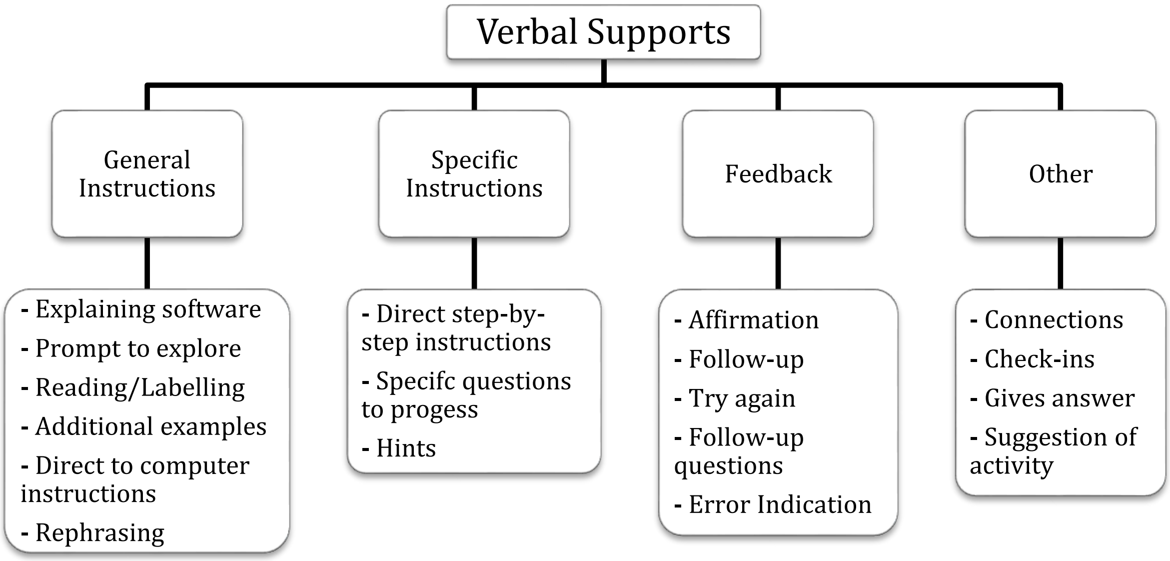

Figure 4: Verbal supports themes and subtheme

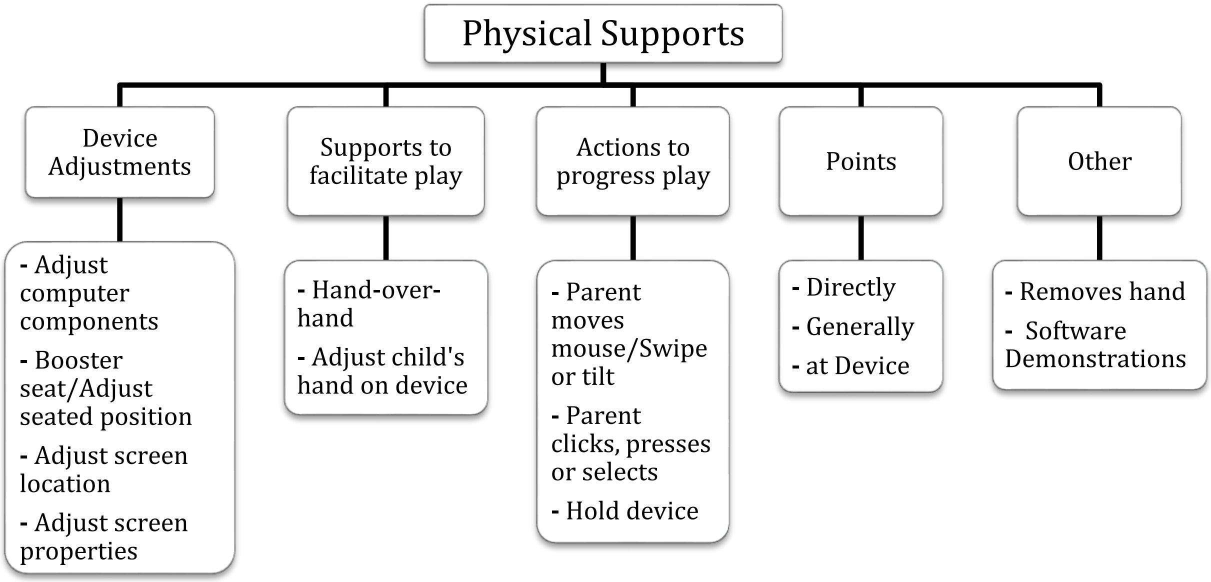

Figure 5: Physical supports themes and subthemes

Parental Intentions During Game Play

Two main themes emerged with respect to parental intentions during play: Goal oriented and entertainment based (see Figure 6). Goal oriented play is presented first followed by entertainment based play.

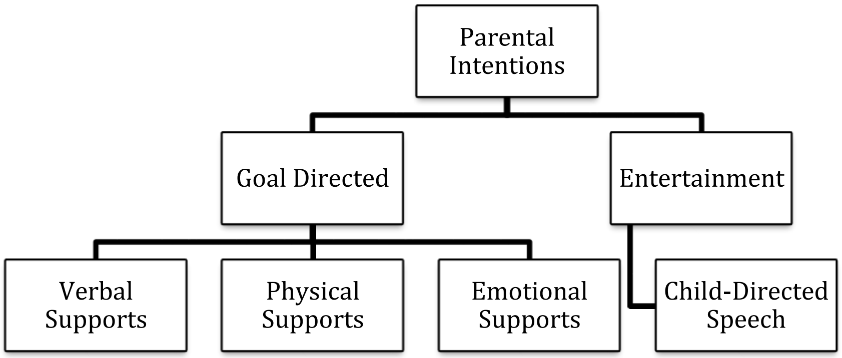

Figure 6: Parental intentions during play

Goal Oriented. Goal oriented behaviours referred to observations in which parents primarily interacted with the software but involved their child in completing the task such as “Let’s sort the trash, he wants the egg shells. Look over here, is this an egg shell? ... Ok let’s put it in”. Parents were in control of the mouse/device while engaged in this theme. Within this theme overall verbal supports, physical supports and emotional supports were recorded (see Figure 6). It is important to note that although parents were observed to be providing these “supports”, parents were primarily engaged in controlling the game and there was no required response from the child to go forward in the game. Goal oriented play was a unique theme such that parents, while being coded in this theme, could not be coded for any of the interactive and scaffolding themes. However, parents could move in and out of goal oriented play during a game play session and, thus, be scored for other themes when not in goal oriented play.

Play to Entertain. A second theme capturing parental goals in the play contexts involved playing the games simply to entertain the child. In some cases, parents played the software to keep their child interested. During this time, the goal appeared to be to simply entertain the child and no supports were provided (see Figure 6).

Types of Supports Parents Provide During Computer play contexts

Overall supports provided by parents were organized into three broad themes: verbal, physical or emotional (see Figure 3). Within the verbal theme three overall themes were observed: General Instructions, Specific Instructions and Feedback. All three of these themes contained subthemes for a total of 14 subthemes (see Table 25). Within the physical supports theme four overall themes were observed: Device Adjustments, Supports to facilitate play, Actions to progress play and, Points. All four themes contained subthemes, for a total of 11 subthemes (see Table 25). One additional physical support was recorded, Seated Position, this theme was recorded once at the start of each session. Emotional supports were comprised of two themes 1) Emotional- Physical supports such as a hug, ruffling hair, kiss etc. and 2) Emotional-Verbal supports comments such as “You can do it”, “You did it”, “Great job” etc. (see Table 25)

An exchange or an attempt at an exchange that warranted a response was categorized as an interaction. Both scaffolds and engagements were recorded when initiated by the parent or by the child. Interactions were categorized as either: 1) Scaffolds, which helped progress the game, or 2) Engagements, which incorporated game content.

Parent and Child Scaffolding Interactions

Scaffolds progressed the game. When the parent initiated the scaffold child responses were categorized into one of three categories: 1) Positive – child followed through; 2) Ignored – child ignored parents; 3) Negative – child opposed the parent, said no or pushed the parent away.

Parents’ scaffolds were also coded when the child asked for assistance. In addition to the type of scaffold provided, the type of response was also coded as either 1) simply giving the child the answer or 2) not providing supports or ignoring the child (See figure 7).

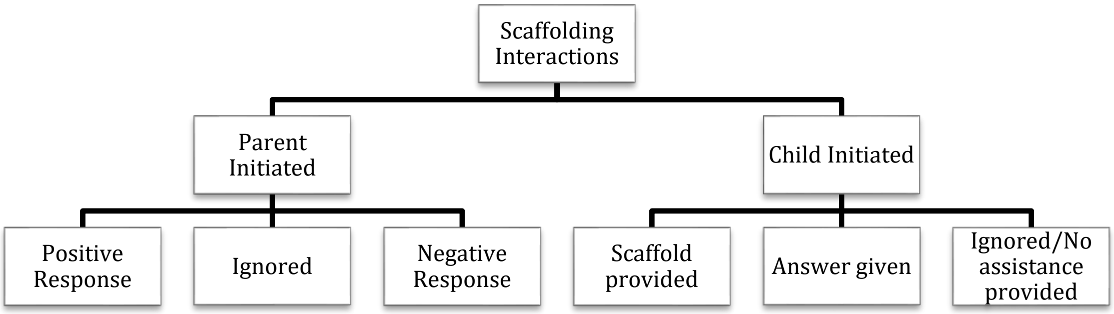

Figure 7. Parent and child scaffolding interactions

Parent and Child Engagement

Engagements involved dialogue about the game but did not progress the game. Each interaction theme also had subthemes, for a total of 9 subthemes. All themes and subthemes are depicted in Figure 8. Interactions were coded examining the engagements initiated by the parent or the child. Responses were categorized in one of three subthemes 1) Positive – the parent/child responded; 2) Ignore – the parent/child ignored the engagement; and 3) Unobservable – parent/child’s response was not visible. Within each of these themes, responses were separated based on whether the interaction added value or not. For example, parents took additional opportunities in an attempt to teach or expand their child’s knowledge and experience. In case of “child initiated engagements” the child asked relevant questions that expanded their knowledge such as “What bug is that?” or “Why does the computer keep saying that?” or made comments that expanded the experience (see figure 8).

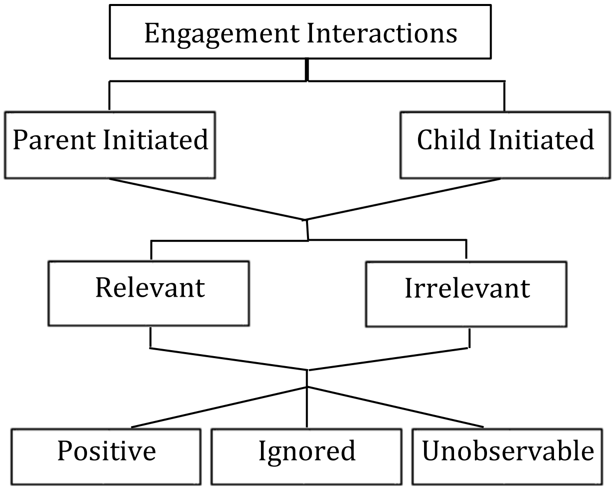

Figure 8: Parent and Child Engagements

Analyses of Qualitative Data

Consistent with the complex structure of the coded themes and subthemes, there were variations in behaviours among parents which impacted the analyses of data. As a result the analyses presented are divided as a function of parental intentions. Specifically, some parents engaged solely in Goal Oriented play. This meant that, for these observations, few themes were available to be coded. To address differences between this subgroup of parents and other parents, the parents engaging solely in Goal Oriented behaviours were examined first and were not included in subsequent analyses.

The following sections of the results introduces the Goal Oriented parents first, followed by the larger sample of parents who engaged in diverse behaviours. The results for the more diverse parents provides a more exhaustive description of the themes and subthemes described in the overview. These summaries are accompanied by examination of frequency of occurrence, potential gender differences, differences as a function of device and relationships between observed and self- reported information.

Sample Included Vs. Excluded in Subsequent Analyses

For the easy and hard software games, observations indicated that 19 parent-child dyads engaged exclusively in one subtheme: goal-oriented behaviour meaning that no other physical, verbal or emotional themes of behaviour were observed outside of this one subtheme. Four parents in the iPad observations similarly only engaged in goal oriented behaviours. Data for these parents was analyzed independently of the remaining analyses and a summary of outcomes for this group of parents is provided below. Following the description of this subgroup of parents the remaining subset of parents could be examined with respect to the broader range of themes.

Easy Software. Analyses for the easy session was based on a sample of 134 (68.7% mothers *n* = 92; and 31.3% fathers *n* = 42) reflecting the exclusion of the 19 parents who engaged in goal-oriented (with the exception of ‘seated position’ as all 153-seated positions were examined) and the additional two participants who were excluded because the parent-child dyad did not play the easy game. Of these 134 participants, two children only played with the software for a portion of the 10 minutes allotted (of the expected 600 seconds of play one child played for 490 seconds and the other played for 541 seconds). These children were included in subsequent analyses.

Hard Software. Analyses for the hard session was based on a sample of 136 (69.1% mothers *n* = 94; and 30.9% fathers *n* = 42) reflecting the exclusion of the 19 parents who engaged in goal-oriented (with the exception of ‘seated position’ as all 153-seated positions were examined). Of these 136 participants, five children did not play with the software for the entire 10 minutes. Of the expected 600 seconds of play, these children averaged 229.6 seconds (*SD* = 212.61; range 31 seconds to 545 seconds). All five children were included in subsequent analyses.

iPad Software. Analyses for the iPad session was based on a sample of 150 (69.3% mothers *n* = 104; and 30.7% fathers *n* = 46) reflecting the exclusion of the 4 parents who engaged in goal-oriented (with the exception of 'seated position' as all 154-seated positions were examined) and one additional participant was excluded because the parent-child dyad did not play with the iPad. Of these 150 participants, twelve children did not play with the software for the entire 10 minutes. Of the expected 600 seconds of play, these children averaged 431.25 seconds (SD = 157.54; range 120 seconds to 588 seconds). All twelve children were included in subsequent analyses.

Goal Oriented Behaviours

The occurrence of the theme Goal Oriented behaviours is presented for each of the three contexts (easy, hard, iPad). This occurrence is followed by 3 *t*-tests to examine potential parental gender differences in the number of occurrences during a session in which goal directed behaviours were observed, and three remaining *t*-tests to assess the number of verbal, physical and emotional responses generated while engaged in goal-directed behaviour. Subsequently, 5 regression analyses were conducted to examine the impact of child's age with respect to the number of occurrences of goal directed behaviour, the amount of time in goal directed behaviours, and the number of verbal, physical and emotional supports provided while engaged in goal directed behaviour.

Goal Oriented: Easy. Overall of the 153 participants, 35.3% of parents (39 mothers, 15 father) engaged in goal-oriented behaviour between one and four times (*M* = 1.46, *SD* = .72). The average time spent in goal-oriented interaction was 424.76 seconds (*SD* = 202.24, range 17 to 600 seconds). In total, 35.2% of the subsample (*n* = 19: 12 mothers and 7 fathers) fell into this theme for the entire duration of the session (600 seconds). During these interactions all parents provided verbal supports (range 2 to 100; M = 35.24, SD = 22.49). The majority of parents (88%; n = 48) engaged in physical supports (range 1 to 40; M = 14.73, SD = 10.89) and 79.6% of parents (n = 43) provided emotional support (range 1 to 29; M = 6.30, SD = 6.29). See Table 26 for full summary.

There were no significant differences between mothers and fathers with respect to providing goal oriented interactions ($t_{(52)} = 1.70$, $p = .096$) or any of the subthemes. See Table 27 for full summary.

A linear regression was conducted to examine the relationship between child's age and goal-oriented interactions. The overall model was significant ($F_{(1, 151)} = 71.46$, $p < .001$; $R^2 = .321$). Child's age was significantly related to the occurrence of goal-oriented interactions. As a child's age increased, parents were less likely to engage in goal-oriented interactions (β = -.369, $t = -8.45$, $p < .001$). See Table 28 for complete summary. Four subsequent regressions were conducted to examine the relationship between age and : 1) time engaged in goal oriented behaviours; 2) Number of Verbal supports provided; 3) Number of Physical supports provided and; 4) Number of Emotional supports provided. The overall model for amount of time spent within goal-oriented was significant ($F_{(1, 52)} = 28.52$, $p < .001$; $R^2 = .354$). As age increased, parents spent less time in goal-oriented interactions (β = -204.92, $t = -5.34$, $p < .001$). The overall model for verbal supports was significant ($F_{(1, 52)} = 10.38$, $p < .003$; $R^2 = .166$). As age increased, parents provided fewer verbal supports while in goal-oriented interactions (β = -15.61, $t = -3.22$, $p < .003$). The overall models for physical supports and emotional supports were not significant. See Table 28 for complete summary.

The remaining analyses for the easy software were based on the 134 participants who were observed engaging in behaviours other than simply goal directed ones.

Goal Oriented: Hard. Overall of the 155 participants, 34.2% of parents (42 mothers, 11 father) engaged in goal-oriented behaviour between one and four times (M = 1.45, SD = .70). The average time spent in goal-oriented interaction was 431.43 seconds (SD = 185.01, range 20 to 600 seconds). In total, 35.8% of the subsample (n = 19: 11 mothers and 8 fathers) fell into this theme for the entire duration of the session (600 seconds). During these interactions 52 parents provided verbal supports (range 1 -112; M = 32.42, SD = 22.02). The majority of parents (94.3%; n = 50) engaged in physical supports (range 1 to 42; M = 14.00, SD = 10.95) and 69.8% of parents (n = 37) provided emotional support (range 1 to 18; M = 5.68, SD = 5.24). See Table 26 for full summary.

There was a trend towards significance between mothers and fathers indicating mothers (M = 1.55, SD = .74) were more likely to engage in goal oriented interactions than were fathers (M = 1.09, SD = .30; $t_{(51)} = 1.99$, $p = .051$). Three subsequent t-tests examined the relationship between parent gender and the types of supports provided. Interestingly, fathers provided more verbal supports and emotional supports than did mothers (highest $t_{(35)} = 3.15$, $p < .004$ for emotional supports). Physical supports did not differ between mothers and father during ($t_{(48)} = 1.57$, $p = .122$). See Table 27 for complete summary.

A linear regression was conducted to examine the relationship between child’s age and goal-oriented interactions. The overall model was significant ($F_{(1, 153)} = 63.17$, $p < .001$; $R^2 = .292$). Child’s age was significantly related to the occurrence of goal-oriented interactions. As a child’s age increased, parents were less likely to engage in goal-oriented interactions ($\beta = -.343$, $t = -7.95$, $p < .001$). See Table 28 for complete summary. Four subsequent regressions were conducted to examine the relationship between: 1) time within goal orientation; 2) Verbal supports provided; 3) Physical supports provided and; 4) Emotional supports provided. The overall model for amount of time spent within “goal-oriented” was significant ($F_{(1, 51)} = 14.28$, $p < .001$; $R^2 = .219$). As age increased, parents spent less time in goal-oriented interactions ($\beta = -120.53$, $t = -3.78$, $p < .001$). The overall model for verbal supports was significant ($F_{(1, 50)} = 4.12$, $p < .05$; $R^2 = .166$). As age increased, parents provided fewer verbal supports while in goal-oriented interactions ($\beta = -8.42$, $t = -2.03$, $p < .05$). The overall models for physical supports and emotional supports were not significant. See Table 28 for complete summary.

Goal Oriented: iPad. Overall of the 154 participants, 22.7% of parents (24 mothers, 11 father) engaged in goal-oriented behaviour between one and three times ($M = 1.54$, $SD = .74$). The average time spent in goal-oriented interaction was 243.77seconds ($SD = 189.07$, range 16 to 600 seconds). In total, 11.4% of parents ($n = 4$: 1 mothers and 3 fathers) fell into this theme for the entire duration of the session (600 seconds). During these interactions 34 parents provided verbal supports (range 1 - 47; $M = 15.41$, $SD = 14.28$). The majority of parents (94.3%; $n = 33$) engaged in physical supports (range 1 to 34; $M = 9.55$, $SD = 8.25$) and 60% of parents ($n = 21$) provided emotional support (range 1 to 14; $M = 4.48$, $SD = 3.46$). See Table 26 for full summary.

There was a trend towards significance between mothers and fathers indicating mothers ($M = 1.71$, $SD = .81$) were more likely to engage in goal oriented interactions than were fathers ($M = 1.18$, $SD = .41$; $t_{(33)} = 2.04$, $p = .05$). Three subsequent *t*-tests examined the relationship between parent gender and the types of supports provided: Verbal, Physical and Emotional. There were no significant differences between mothers and fathers and any of the three supports provided (highest $t_{(32)} = .626$, $p = .504$ for verbal supports). See Table 27 for complete summary.

A linear regression was conducted to examine the relationship between child’s age and goal-oriented interactions during the iPad session. The overall model was significant ($F_{(1, 153)} =$

45.19, $p < .001$; $R^2 = .229$). Child's age was significantly related to the occurrence of goal-oriented interactions. As a child's age increased, parents were less likely to engage in goal-oriented interactions ($\beta = -.279$, $t = -6.72$, $p < .001$). See Table 28 for complete summary. Four subsequent regressions were conducted to examine the relationship between: 1) time within goal orientation; 2) Verbal supports provided; 3) Physical supports provided and; 4) Emotional supports provided. None of the overall models were significant (highest $F_{(1, 19)} = .642$, $p = .433$; $R^2 = .033$ for emotional supports).

Summary for Goal oriented behaviours. Overall, more parents were observed engaging in goal-oriented interactions during both desktop sessions ($n = 54$ for easy and $n = 53$ for hard) than in the iPad session ($n = 35$). Furthermore, more parents were engaged in goal oriented behaviour for the entire session (600 seconds) during both desktop sessions ($n = 19$ for easy and hard) in comparison to the iPad session ($n = 4$). Mothers and fathers differed in engaging in goal-oriented interactions for the hard and iPad sessions but not the easy session such that mothers were more likely to engage in goal-oriented behaviours than were fathers. Similarly the number of verbal and physical supports drastically differed from the iPad session. Engaging in goal-oriented interactions was related to the child's age across all three sessions such that as age increased, parents were less likely to engage in this theme. Interestingly, age was related to the amount of time spent engaged in goal-oriented behaviours and the number of verbal supports provided for the easy and hard software but not the iPad. Specifically, as a child's age increased parents spent less time in this theme and provided less verbal supports during the desktop sessions however in the iPad session age was not related to time or verbal supports provided.

Play to entertain

In some cases, parents played the software to keep their child interested. The occurrence of the theme play to entertain behaviours is presented for each of the three contexts (easy, hard, iPad). During this time, the goal appeared to be to entertain the child and no supports were provided. Parents were rated on the amount of child-directed speech (0 = none to little, 1 = Equal parent versus child speech, and 2 = majority child-directed speech).

Play to entertain: Easy. Overall, few parents (7.5%, *n* = 10) played as many as two times simply to entertain their child (*M* = 1.40, *SD* = .52). Parents played the game for up to 600 seconds (*M* = 117.50, *SD* = 174.22; range 7 to 600 seconds). The majority of parents in this theme (66.7%, *n* = 6) engaged primarily in child-directed speech, followed by 22.2% (*n* = 2) who provided equal amounts of parent and child-directed speech and 11.1% (*n* = 1) provided little to none. In one case the parent played for the entire session however the amount of child direct speech could not able to be coded as the parent spoke a combination of English and Korean. See Table 29 and Table 30.

Play to entertain: Hard. Overall, few parents (14%, *n* = 19) played as many as 3 times simply to entertain their child (*M* = 1.37, *SD* = .68). Parents played the game for up to 600 seconds (*M* = 157, *SD* = 157.75; range 7 to 600 seconds). The majority of parents in this theme (70.6%, *n* = 12) engaged primarily in child-directed speech, followed by 23.5% (*n* = 4) who provided equal amounts of parent and child-directed speech and 5.9% (*n* = 1) provided little to none. One case involved missing data. Similar to the easy session one parent played for the entire session however the amount of child direct speech could not be coded as the parent spoke a combination of English and Korean. See Table 29 and Table 30.

Play to entertain: iPad. Overall, few parents (9.3%, *n* = 15) played as many as 3 times simply to entertain their child (*M* = 1.20, *SD* = .56). Parents played the game for up to 233 seconds (*M* = 82.00, *SD* = 78.39; range 19 to 233 seconds). The majority of parents in this theme (46.7%, *n* = 7) engaged primarily in child-directed speech, followed by 26.7% (*n* = 4) who provided equal amounts of parent and child-directed speech and 26.7% (*n* = 4) provided little to none See Table 29 and Table 30.

Three multiple regressions were conducted to examine the relationship between the theme of parent playing to keep the child interested for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 31 for complete summary.

Supports Parents Provided

Three types of supports were observed: Verbal, physical and emotional. In the subsequent analyses a description of each type of support and the sub-themes assumed under each of these three broad themes is provided followed by subsequent quantitative analyses of the occurrences of themes.

Verbal Supports. Verbal supports were identified as purposeful verbal supports that assisted the child to progress within a game. Verbal supports were categorized by one of three themes: 1) Providing general instructions such as “Connect the dots”; 2) Providing specific instructions such as “Click on the dots in order, one, two, what comes next?”; or 3) Providing feedback such as “Yup you got it, three” or “try again”. Within any given interaction it was possible for a parent to engage in more than one of these supports at one time. However, each individual statement was only ever coded once.

Verbal Supports: Easy. Overall, 95.5% of the 134 parents (*n* = 128) provided as many as 91 verbal supports during their session with the easy software (range: 2 to 91; *M* = 28.11, *SD* = 18.42). Overall, the majority of mothers (95.7%, *n* = 88) and the majority of fathers (95.2%, *n* = 40) provided verbal supports to their children. Although the mean number of observations for verbal supports did not differ between mothers (*M* = 28.75, *SD* = 20.04) and fathers (*M* = 26.70, *SD* = 14.36) mothers provided verbal supports as many as 91 times (range: 2 to 91) while fathers provided additional information up to 61 times in a session (range: 2 to 61).

The majority of parents (98.4%, *n* = 126) provided general instructions (range: 1 to 27; *M* = 8.93, *SD* = 5.39). Specific instructions were provided by 97.7% of parents (*n* = 125) between one and 42 times (*M* = 13.29, *SD* = 10.19). Finally, 89.8% of parents (*n* = 115) provided between 1 and 37 feedback supports (*M* = 7.06, *SD* = 5.65). See Table 32 for complete summary.

Within each theme of Verbal Supports, similar patterns were found across mothers and fathers. Nearly all mothers (97.7%; *n* = 86) and all fathers (*n* = 40) provided general instructions at least once (*M* = 9.03, *SD* = 5.56 for mothers and *M* = 8.70, *SD* = 5.04 for fathers). Similarly, nearly all mothers (97.7%; *n* = 86) and fathers (97.5%; *n* = 39) provided specific instructions at least once (*M* = 13.57, *SD* = 10.70 for mothers and *M* = 12.67, *SD* = 9.06 for fathers). Slightly fewer mothers (90%; *n* = 80) and fathers (87.5%; *n* = 35) provided feedback at least once (*M* = 7.33, *SD* = 6.42 for mothers and *M* = 6.46, *SD* = 3.32 for fathers). There were no significant differences between mothers and fathers in any of the above overall verbal supports themes (highest $t_{(113)}$ = .756, *p* = .451 for total feedback). See Table 33 for complete summary.

A linear regression analysis was conducted to examine the relationship between total verbal supports. The overall model for the total number of verbal supports was significant ($F_{(1, 125)}$ = 7.20, *p* < .009; R^2 = .054). A child's age was significantly related to the number of total verbal supports provided by parents. As children got older, parents provided fewer verbal supports overall (β = -3.55, *t* = -2.68, *p* < .009) See Table 34 for complete summary.

Verbal Supports: Hard. Overall, 91.9% of the 136 parents (*n* = 125) provided on average 32 verbal supports during their session with the hard software (range: 1 to 93; *M* = 31.88, *SD* = 18.60). Overall, the majority of mother (91.5%, *n* = 86) and the majority of fathers (92.9%, *n* = 39) provided verbal supports to their children. Although the mean number of observations for providing verbal supports did not differ between mothers (*M* = 30.85, *SD* = 19.90) and fathers (*M* = 34.15, *SD* = 15.35) mothers provided verbal supports as many as 93 times (range: 1 to 93) while fathers provided additional information up to 64 times in a session (range: 4 to 64).

The majority of parents (94.4%, *n* = 118) provided general instructions (range: 1 to 29; *M* = 9.03; *SD* = 5.27). Specific instructions were provided by 98.4% of parents (*n* = 123) between one and 39 times (*M* = 16.04, *SD* = 10.39). Finally, 86.4% of parents (*n* = 108) provided between 1 and 38 feedback supports (*M* = 8.77; *SD* = 6.85). See Table 32 for complete summary.

Within each theme of Verbal Supports, similar patterns were found across mothers and fathers. Nearly all mothers (91.9%; *n* = 79) and all fathers (*n* = 39) provided general instructions at least once (range 1 to 29; *M* = 9.15, *SD* = 5.73 for mothers and range 1 to 29; *M* = 8.77, *SD* = 4.25 for fathers). Similarly, nearly all mothers (97.7%; *n* = 84) and all fathers (*n* = 39) provided specific instructions at least once (range 1 to 38; *M* = 15.39, *SD* = 10.40 for mothers and range 1 to 39; *M* = 17.44, *SD* = 10.39 for fathers). Slightly fewer mothers (83.7%; *n* = 72) and fathers (92.3%; *n* = 36) provided feedback at least once (range 1 to 38; *M* = 8.85, *SD* = 7.26 for mothers and range 1 to 30; *M* = 8.61, *SD* = 6.04 for fathers). There were no significant differences between mothers and fathers in any of the above overall verbal supports themes (highest $t_{(121)}$ = 1.02, *p* = .312 for specific instructions). See Table 33.

A linear regression analysis was conducted to examine the relationship between total verbal supports. The overall model for the total number of verbal supports was not significant ($F_{(1, 123)}$ = .934, *p* = .336; R^2 = .008). A child's age was not significantly related to the number of total verbal supports provided by parents during the hard session. See Table 34 for complete summary.

Verbal Supports: iPad. Overall, 98% of the 150 parents (*n* = 147) provided on average 29 verbal supports during their session with the iPad session (range: 1 to 98; *M* = 29.13, *SD* = 16.03). Overall, the majority of mother (98.7%, *n* = 102) and the majority of fathers (97.8%, *n* = 45) provided verbal supports to their children. Although the mean number of observations for providing verbal supports did not differ between mothers (*M* = 29.67, *SD* = 15.99) and fathers (*M* = 27.91, *SD* = 16.24) mothers provided verbal supports as many as 74 times (range: 1 to 74) while fathers provided additional information up to 98 times in a session (range: 3 to 98).

The majority of parents (97.3%, *n* = 143) provided general instructions (range: 1 to 23; *M* = 9.37; *SD* = 4.82). Specific instructions were provided by 92.5% of parents (*n* = 136) at least once (range: 1 to 36; *M* = 8.46, *SD* = 5.96). Finally, 95.9% of parents (*n* = 141) provided between 1 and 50 feedback supports (*M* = 12.71; *SD* = 9.31). See Table 32 for complete summary.

Within the each theme of Verbal Supports, similar patterns were found across mothers and fathers. Nearly all mothers (98%; *n* = 100) and fathers (95.6%; *n* = 43) provided general instructions at least once (range 1 to 23; *M* = 9.89, *SD* = 5.01 for mothers and range 1 to 16; *M* = 8.95, *SD* = 4.12 for fathers). Similarly, nearly all mothers (95.1%; *n* = 97) and fathers (97.8%; *n* = 44) provided specific instructions at least once (range 1 to 42; *M* = 13.38, *SD* = 9.45 for mothers and range 1 to 50; *M* = 11.23, *SD* = 8.91 for fathers). Slightly fewer mothers (91.2%; *n*

= 93) and fathers (95.6%; n = 43) provided feedback at least once (range 1 to 24; M = 8.09, SD = 5.04 for mothers and range 1 to 36; M = 9.26, SD = 7.58 for fathers). There were no significant differences between mothers and fathers in any of the above overall verbal supports themes (highest $t_{(139)}$ = 1.28, p = .204 for specific instructions). See Table 33.

A linear regression analysis was conducted to examine the relationship between total verbal supports. The overall model for the total number of verbal supports was significant ($F_{(1, 145)}$ = 10.83, p < .002; R^2 = .070). A child's age was significantly related to the number of total verbal supports provided by parents. As children got older, parents provided less verbal supports overall (β = -3.36, t = -3.19, p < .002) See Table 34 for complete summary.

General Instructions. General Instructions were placed into one of six subthemes. Subthemes were: 1) General prompts to explore such as "Move the mouse around and see what you can find" or "Give it a try"; 2) Reading aloud information provided on the screen such as "this says log and this says car"; 3) Explaining how the software works such "This is a sorting game, put things where they belong"; 4) Adding or expanding examples provided by the software such as "so if you have five fish and you lose two…."; 5) rephrasing own words; and 6) directing child to software instructions such as "listen to what he has to say". There were no significant differences between mothers and fathers for any of the subthemes during the easy session (highest $t_{(92)}$ = 1.11, p = .272 for reading aloud) or for any of the subthemes during the hard sessions (highest $t_{(38)}$ = 1.88, p = .69 for directed child to computer instructions. There was a significant difference between mothers and fathers for reading aloud information during the iPad session ($t_{(38)}$ = 1.98, p = .05) such that mothers were more likely to read information aloud (M = 4.24, SD = 2.54) than did fathers (M = 3.33, SD = 2.34).

The following six subthemes are based on the 126 parents (86 mothers and 40 fathers) who provided general instructions during the easy game session, 118 parents (79 mothers and 39 fathers) who provided general instructions during the hard game session and 143 parents (100 mothers and 43 fathers) who provided general instructions during the iPad session.

Explained Software: Easy. The majority of parents (88.1%; *n* = 111) explained how the software worked ranging between 1 to 10 times (*M* = 3.59, *SD* = 2.19). Mothers and fathers were similar. Of the 86 mothers who provided a general instruction, 88.4% (*n* = 76) explained how the software worked between 1 to 10 times (*M* = 3.61, *SD* = 2.23). Similarly of the 40 fathers who provided general instructions, 87.5% of fathers (*n* = 35) explained how the software worked between 1 and 8 times (*M* = 3.54, *SD* = 2.12). See Table 35.

Explained Software: Hard. The majority of parents (89%; *n* = 105) explained how the software worked ranging between 1 to 11 times (*M* = 3.50, *SD* = 2.22). Mothers and fathers were similar. Of the 79 mothers who provided a general instruction, 91.1% (*n* = 72) explained how the software worked between 1 to 11 times (*M* = 3.35, *SD* = 2.28). Similarly of the 39 fathers who provided general instructions, 84.6% of fathers (*n* = 33) explained how the software worked between 1 to 9 times (*M* = 3.82, *SD* = 2.08). See Table 35.

Explained Software: iPad. The majority of parents (82.5%; *n* = 118) explained how the software worked ranging between 1 to 8 times (*M* = 2.90, *SD* = 1.66). Mothers and fathers were similar. Of the 100 mothers who provided a general instruction, 82% (*n* = 82) explained how the software worked between 1 to 8 times (*M* = 3.02, *SD* = 1.71). Similarly of the 43 fathers who provided general instructions, 83.7% of fathers (*n* = 36) explained how the software worked between 1 to 7 times (*M* = 2.61, *SD* = 1.52). See Table 35.

Three multiple regressions were conducted to examine the relationship between subtheme Explained Software for Easy, Hard and iPad sessions and age. The overall model for the explaining the software during the easy game was significant ($F_{(1, 109)} = 4.66$, $p < .04$; $R^2 = .041$). A child's age was significantly related to the number of times a parent explained the software during the easy session. As children got older, parents provided more software explanations ($\beta = .402$, $t = 2.16$, $p < .04$). The overall models for the number of software explanations during the hard session and iPad session were not significant. See Table 36 for complete summary.

General prompt to explore: Easy. The majority of parents (80.95%, $n = 102$) encouraged their child to explore the software and to try to work out the game and the tasks. Overall these types of behaviours ranged between one and eleven times in a session ($M = 2.69$, $SD = 1.94$). Mothers and fathers were similar such that 77.9% of mothers ($n = 67$) and 85% of fathers ($n = 34$) provided general prompts to explore (range 1 to 11; $M = 2.68$, $SD = 1.98$ for mothers and range 1 to 7; $M = 2.71$, $SD = 1.87$ for fathers). See Table 35.

General prompt to explore: Hard. The majority of parents (90.7%, $n = 107$) encouraged their child to explore the software and to try to work out the game and the tasks. Overall these types of behaviours ranged between one and nine times in a session ($M = 2.65$, $SD = 1.72$). Mothers and fathers were similar such that 92.4% of mothers ($n = 73$) and 89.7% of fathers ($n = 34$) provided general prompts to explore (range 1 to 11; $M = 2.69$, $SD = 1.63$ for mothers and range 1 to 7; $M = 2.59$, $SD = 1.93$ for fathers). See Table 35.

General prompt to explore: iPad. Approximately two thirds of parents (67.1%, $n = 96$) encouraged their child to explore the software and to try to work out the game and the tasks. Overall these types of behaviours ranged between one and nine times in a session ($M = 2.21$, $SD = 1.51$). Mothers and fathers were similar such that 66% of mothers ($n = 66$) and 69.8% of fathers (*n* = 30) provided general prompts to explore (range 1 to 9; *M* = 2.26, *SD* = 1.59 for mothers and range 1 to 6; *M* = 2.10, *SD* = 1.35 for fathers). See Table 35.

Three multiple regressions were conducted to examine the relationship between subtheme Prompt to explore for the Easy, Hard and iPad sessions and age. None of the overall models were significant (highest $F_{(1, 100)} = 2.86$, $p = .094$; $R^2 = .028$ for the Easy game). See Table 36 for complete summary.

Read information aloud: Easy. Approximately three quarters (74.6%) of parents (*n* = 94) read aloud information provided on the screen (range: 1 to 10; *M* = 2.62, *SD* = 2.01). Mothers and fathers were similar. Of the 86 mothers, 73.3% (*n* = 63) provided between 1 and 10 reading supports (*M* = 2.78, *SD* = 2.20) and 77.5% of the 40 fathers (*n* = 31) read aloud information provided on the screen between 1 and 6 times (*M* = 2.29, *SD* = 1.55). See Table 35.

Read information aloud: Hard. Approximately three quarters (73.7%) of parents (*n* = 87) read aloud information provided on the screen (range: 1 to 12; *M* = 2.75, *SD* = 2.21). Mothers and fathers were similar. Of the 79 mothers, 73.4% (*n* = 58) provided between 1 and 11 reading supports (*M* = 2.95, *SD* = 2.40) and 74.4% of the 39 fathers (*n* = 29) read aloud information provided on the screen between 1 and 9 times (*M* = 2.35, *SD* = 1.72). See Table 35.

Read information aloud: iPad. Approximately three quarters (91.6%) of parents (*n* = 131) read aloud information provided on the screen (range: 1 to 11; *M* = 3.94, *SD* = 2.50). Mothers and fathers were similar. Of the 100 mothers, 88% (*n* = 88) provided between 1 and 11 reading supports (*M* = 4.24, *SD* = 2.54) and all of the 43 fathers read aloud information provided on the screen between 1 and 9 times (*M* = 3.33, *SD* = 2.34). See Table 35.

Three multiple regressions were conducted to examine the relationship between subtheme reading aloud and labelling information for Easy, Hard and iPad sessions and age. The overall model for reading aloud/labelling during the easy game was significant ($F_{(1, 92)} = 4.93$, $p < .03$; $R^2 = .051$). A child's age was significantly related to the number of times a parent read aloud or label information during the easy session. As a child's age increase, parents read or labelled less information off the screen ($\beta = -.348$, $t = -2.22$, $p < .03$). The overall models for reading aloud and labelling during the hard session and iPad session were not significant. See Table 36 for complete summary.

Provided additional information: Easy. Fewer than half (41.3%) of parents ($n = 52$) provided additional examples to the software (range 1 to 8; $M = 1.73$, $SD = 1.25$). Although the mean number of observations for providing additional examples did not differ between mothers ($M = 1.77$, $SD = 1.37$) and fathers ($M = 1.62$, $SD = .87$), mothers (45.4%; $n = 39$) provided additional information as many as eight times (range 1-8) while fathers (range 1-3; 32.5%; $n = 13$) provided additional information up to three times in a session. See Table 35.

Provided additional information: Hard. Fewer than half (40.7%) of parents ($n = 48$) provided additional examples to the software (range 1 to 11; $M = 2.23$, $SD = 1.93$). Although the mean number of observations for providing additional examples did not differ between mothers ($M = 2.26$, $SD = 2.10$) and fathers ($M = 2.18$, $SD = 1.63$), mothers (39.2%; $n = 31$) provided additional information as many as 11 times (range: 1 to 11) while fathers (range: 1 to 7; 43.6%; $n = 17$) provided additional information up to 7 times in a session. See Table 35.

Provided additional information: iPad. Fewer than half (41.3%) of parents ($n = 59$) provided additional examples to the software (range 1 to 9; $M = 1.86$, $SD = 1.46$). Although the mean number of observations for providing additional examples did not differ between mothers ($M = 1.95$, $SD = 1.65$) and fathers ($M = 1.65$, $SD = .79$), mothers (42%; $n = 42$) provided additional information as many as 9 times (range: 1 to 9) while fathers (range: 1 to 4; 39.5%; *n* = 17) provided additional information up to 4 times in a session. See Table 35.

Three multiple regressions were conducted to examine the relationship between subtheme providing additional examples for Easy, Hard and iPad sessions and age. The overall model for additional examples during the easy game was significant ($F_{(1, 50)} = 5.01$, $p < .04$; $R^2 = .091$). A child's age was significantly related to the number of times a parent provided additional examples during the easy session. As a child's age increase, parents provided fewer examples ($\beta = -.387$, $t = -2.24$, $p < .04$). The overall models for additional examples during the hard session and iPad session were not significant. See Table 36 for complete summary.

Directed child to computer instructions: Easy. Just over a third (34.1%) of parents (*n* = 43) directed their child's attention to the computer provided instructions (range: 1 to 13; *M* = 2.19, *SD* = 1.10). Although the mean number of observations for directing attention to the computer provided instructions did not differ between mothers (*M* = 2.38, *SD* = 2.38) and fathers (*M* = 1.79, *SD* = 1.31), mothers (33.7%; *n* = 29) provided additional information as many as 13 times (range: 1 to 13) while fathers (range: 1 to 5; 35%; *n* = 14) provided additional information up to 5 times in a session. See Table 35.

Directed child to computer instructions: Hard. Just over a third (33.9%) of parents (*n* = 40) directed their child's attention to the computer provided instructions (range: 1 to 8; *M* = 2.18, *SD* = 1.72). Although the mean number of observations for directing attention to the computer provided instructions did not differ between mothers (*M* = 2.52, *SD* = 1.97) and fathers (*M* = 1.46, *SD* = .66), mothers (34.2%; *n* = 27) provided additional information as many as 8 times (range: 1 to 8) while fathers (range: 1 to 3; 33.3%; *n* = 13) provided additional information up to 3 times in a session. See Table 35.

Directed child to computer instructions: iPad. Just over half (52.5%) of parents (*n* = 75) directed their child's attention to the computer provided instructions (range: 1 to 12; *M* = 2.36, *SD* = 1.95). Although the mean number of observations for directing attention to the computer provided instructions did not differ between mothers (*M* = 2.45, *SD* = 2.08) and fathers (*M* = 2.17, *SD* = 1.66), mothers (51%; *n* = 51) provided additional information as many as 12 times (range: 1 to 12) while fathers (range: 1 to 7; 55.8%; *n* = 24) provided additional information up to 7 times in a session. See Table 35.

Three multiple regressions were conducted to examine the relationship between the subtheme directed child's attention for Easy, Hard and iPad sessions and age. The overall models directed child's attention during the easy session, hard session and iPad session were not significant. See Table 36 for complete summary.

Rephrased own words: Easy. Parents were least likely to rephrase information they had already provided in another form. Only 11.1% of parents (*n* = 14) rephrased their own instructions (range: 1 to 9; *M* = 1.64, *SD* = 2.13). Although the mean number of observations for rephrasing own instructions did not differ between mothers (*M* = 1.14, *SD* = .38) and fathers (*M* = 2.14, *SD* = 3.02), mothers (8.1%; *n* = 7) rephrased their own instructions up to two times (range: 1 to 2) while fathers (range: 1 to 9; 17.5%; *n* = 7) rephrased their own instructions up to 9 times in a session. See Table 35.

Rephrased own words: Hard. Parents were least likely to rephrase information they had already provided in another form. Only 7.6% of parents (*n* = 9) rephrased their own instructions only once. Mothers (6.3%; *n* = 5) and fathers (10.3%; *n* = 4) rephrased their own instructions only one. See Table 35.

Rephrased own words: iPad. Similarly to the easy and hard sessions, parents were least likely to rephrase information they had already provided in another form during the iPad session. Only 9.1% of parents (n = 13) rephrased their own instructions up to two times (range 1 to 2; M = 1.15, SD = .38). Mothers (8%; n = 8) rephrased up to two times (M = 1.25, SD = .46) and fathers (11.6%; n = 5) rephrased their own instructions only once. See Table 35.

Three multiple regressions were conducted to examine the relationship between the subtheme rephrasing or repeating instructions for Easy, Hard and iPad sessions and age. The overall models for rephrasing own words during the easy session, hard session and iPad session were not significant. See Table 36 for complete summary.

Specific Instructions. Specific instructions were divided into three subthemes: 1) Providing direct step-by-step instructions; 2) Asking specific questions; and 3) Providing hints. There were no significant differences between mothers and fathers for any of the subthemes during the easy session ($t_{(121)}$ = .781, p = .436 for direct step-by-step), the hard sessions (highest $t_{(89)}$ = .65, p = .519 for providing hints) or the iPad session ($t_{(134)}$ = 1.25, p = .2.14 for providing step-by-step instructions).

The following three subthemes are based on the 125 parents (86 mothers and 39 fathers) who provided specific instructions during the easy game session, 123 parents (84 mothers and 39 fathers) who provided specific instructions during the hard game session and 141 parents (97 mothers and 44 fathers) who provided specific instructions during the iPad session.

Direct step-by-step instructions: Easy. Almost all parents, 98.4%, (n = 123) provided step-by-step instructions. Overall, the range for these types of supports was between 1 and 39 times across all parents (M = 10.06, SD = 8.23). Although the mean number of observations for providing step-by-step instructions did not differ between mothers (M = 10.45, SD = 8.39) and fathers (*M* = 9.21, *SD* = 7.91) mothers (97.7%; *n* = 84) provided direct step-by-step instructions as many as 31 times (range: 1 to 31) while all fathers (*n* = 39) provided direct step-by-step instructions up to 39 times in a session (range: 1 to 39). See Table 37.

Direct step-by-step instructions: Hard. Almost all parents, 93.5%, (*n* = 115) provided step-by-step instructions. Overall, the range for these types of supports was between 1 and 31 times across all parents (*M* = 8.90, *SD* = 6.46). Although the mean number of observations for providing step-by-step instructions did not differ between mothers (*M* = 8.65, *SD* = 6.67) and fathers (*M* = 9.44, *SD* = 6.02) mothers (94%; *n* = 79) provided direct step-by-step instructions as many as 31 times (range: 1 to 31) while fathers (92.3%; *n* = 36) provided direct step-by-step instructions up to 26 times in a session (range: 1 to 26). See Table 37.

Direct step-by-step instructions: iPad. Parents (96.5%, *n* = 136) who provided a specific instruction provided step-by-step instructions. Overall, the range for these types of supports was between 1 and 42 times across all parents (*M* = 8.49, *SD* = 6.86). Although the mean number of observations for providing direct step-by-step instructions did not differ between mothers (*M* = 9.00, *SD* = 6.80) and fathers (*M* = 7.43, *SD* = 6.94) mothers (94.8%; *n* = 92) provided direct step-by-step instructions as many as 39 times (range: 1 to 39) while all fathers (*n* = 44) provided direct step-by-step instructions up to 42 times in a session (range: 1 to 42). See Table 37.

Three multiple regressions were conducted to examine the relationship between the subtheme direct step-by-step instructions for Easy, Hard and iPad sessions and age. The overall model for direct instructions during the easy game ($F_{(1, 121)} = 15.43$, $p < .001$; $R^2 = .113$), hard game ($F_{(1, 113)} = 13.58$, $p < .001$; $R^2 = .107$) and iPad session ($F_{(1, 134)} = 29.86$, $p < .001$; $R^2 = .182$) were significant. A child's age was significantly related to the number of times a parent provided a direct instruction to help progress the game during each session. As a child's age increased, parents provided fewer direct instructions in the easy session (β = -2.29, t = -3.93, p < .001), hard session (β = -1.82, t = -3.69, p < .001), and the iPad session (β = -2.39, t = -5.46, p < .001). See Table 38 for complete summary.

Specific questions: Easy. Nearly 65% of parents (n = 81) asked at least one specific question to assist their child (range: 1 to 14; M = 4.41, SD = 3.32). There were no statistically significant mean differences between mothers (M = 4.38, SD = 3.45) and fathers (M = 4.48, SD = 3.07). Mothers (65.1%; n = 56) asked specific questions as many as 14 times (range: 1 to 14) and fathers (64.1%; n = 25) asked specific questions as many as 13 times (range: 1 to 13). See Table 37.

Specific questions: Hard. Nearly 82.1% of parents (n = 101) asked at least one specific question to assist their child (range: 1 to 20; M = 6.39, SD = 4.71). There were no statistically significant mean differences between mothers (M = 6.24, SD = 4.60) and fathers (M = 6.68, SD = 4.98). Mothers (79.8%; n = 67) and fathers (87.2%; n = 34) asked specific questions as many as 20 times (range: 1 to 20). See Table 37.

Specific questions: iPad. Nearly 76.6% of parents (n = 108) asked at least one specific question to assist their child (range: 1 to 15; M = 4.31, SD = 3.33). There were no statistically significant mean differences between mothers (M = 4.54, SD = 3.64) and fathers (M = 3.79, SD = 2.50). Mothers (76.3%; n = 74) asked specific questions as many as 15 times (range: 1 to 15) and fathers (77.3%; n = 34) asked specific questions as many as 11 times (range: 1 to 11). See Table 37.

Three multiple regressions were conducted to examine the relationship between the subtheme asking specific questions to help progress the game for Easy, Hard and iPad sessions and age. The overall model for specific questions during the easy game ($F_{(1, 79)}$ = 5.79, p < .02;

R^2 = .068), hard game ($F_{(1, 99)}$ = 6.82, p < .02; R^2 = .064) and iPad session ($F_{(1, 106)}$ = 5.29, p < .03; R^2 = .048) were significant. A child's age was significantly related to the number of times a parent provided a direct instruction to help progress the game during each session. As a child's age increase, parents provided fewer direct instructions in the easy session (β = -.840, *t* = -2.41, *p* < .02), hard session (β = -1.06, *t* = -2.61, *p* < .02), and the iPad session (β = -.605, *t* = -2.30, *p* < .03). See Table 38 for complete summary.

Hints: Easy. Approximately a third (30.4%) of parents (*n* = 38) also provided hints at least once and as many as 7 times (*M* = 1.76, *SD* = 1.20). There were no statistically significant mean differences between mothers (*M* = 1.76, *SD* = 1.36) and fathers (*M* = 1.77, *SD* = .83). Mothers (29.1%; *n* = 25) provided hints as many as 16 times (range: 1 to 16) and fathers (33.3%; *n* = 13) provided hints as many as 17 times (range: 1 to 17). See Table 37.

Hints: Hard. Approximately three quarters (74%) of parents (*n* = 91) also provided hints at least once and as many as 17 times (*M* = 3.35, *SD* = 3.10). There were no statistically significant mean differences between mothers (*M* = 3.20, *SD* = 2.87) and fathers (*M* = 3.65, *SD* = 3.52). Mothers (71.4%; *n* = 60) provided hints as many as 16 times (range: 1 to 16) and fathers (79.5%; *n* = 31) provided hints as many as 17 times (range: 1 to 17). See Table 37

Hints: iPad. Approximately three quarters (46.8%) of parents (*n* = 66) also provided hints at least once and as many as 12 times (*M* = 2.61, *SD* = 2.18). Although the mean number of observations for providing hints did not differ between mothers (*M* = 2.79, *SD* = 2.42) and fathers (*M* = 2.11, *SD* = 1.23), mothers (49.5%; *n* = 48) provided hints as many as 12 times (range: 1 to 12) while fathers (40.1%; *n* = 18) provided hints up to 5 times in a session (range: 1 to 5). See Table 37.

Three multiple regressions were conducted to examine the relationship between the subtheme hints for Easy, Hard and iPad sessions and age. The overall models for hints provided during the easy session, hard session and iPad session were not significant. See Table 38 for complete summary.

Feedback. The feedback theme was comprised of five subthemes: 1) Affirmation such as “yup that’s right”; 2) Follow-up such as “that completed the pattern”; 3) Telling child to try again such as “try again”; 4) Asking follow up questions “What word did you spell? Can you sound it out?”; and 5) Error indication “nope, that’s not it”. There were no significant differences between mothers and fathers for any of the subthemes during the easy session (highest $t_{(86)}$ = 1.55, p = .126 for follow to task), the hard sessions (highest $t_{(41)}$ = 1.41, p = .166 for asking follow-up questions) or the iPad session ($t_{(26)}$ = 1.67, p = .107 for telling them to try again).

The following five subthemes are based on the 115 parents (80 mothers and 35 fathers) who provided feedback during the easy game session, 108 parents (72 mothers and 36 fathers) who provided feedback during the hard game session and 136 parents (93 mothers and 43 fathers) who provided feedback during the iPad session.

Affirmation: Easy. The majority of parents (81.7%, n = 94) affirmed their child’s action or task completion. Instances of affirmation ranged between 1 and 26 (M = 4.32, SD = 3.91). Although there were no statistically significant mean differences between mothers (80%; n = 64) and fathers (85.7%, n = 30), mothers provided up to 26 affirmations (range: 1 to 26; M = 4.72, SD = 4.42) and fathers provided up to 11 affirmations (range: 1 to 11; M = 3.47, SD = 2.32). See Table 39.

Affirmation: Hard. The majority of parents (87%, n = 94) affirmed their child’s action or task completion. Instances of affirmation ranged between 1 and 31 (M = 5.48, SD = 5.50).

Although the mean number of observations for providing affirmation did not differ between mothers (*M* = 5.75, *SD* = 6.06) and fathers (*M* = 4.94, *SD* = 4.18), mothers (87.5%; *n* = 63) provided affirmation as many as 31 times (range: 1 to 31) while fathers (86.1%, *n* = 31) provided affirmation up to 18 times in a session (range: 1 to 18). See Table 39.

Affirmation: iPad. The majority of parents (87.5%, *n* = 119) affirmed their child's action or task completion. Instances of affirmation ranged between 1 and 19 (*M* = 4.24, *SD* = 3.45). Although the mean number of observations for providing affirmation did not differ between mothers (*M* = 4.10, *SD* = 3.05) and fathers (*M* = 4.57, *SD* = 4.25), mothers (88.2%, *n* = 82) provided affirmation as many as 15 times (range: 1 to 15) while fathers (86%, *n* = 37) provided affirmation up to 19 times in a session (range: 1 to 19). See Table 39.

Three multiple regressions were conducted to examine the relationship between the subtheme affirming a child's actions or tasks for Easy, Hard and iPad sessions and age. The overall models hints provided during the easy session, hard session and iPad session were not significant. See Table 40 for complete summary.

Follow-up: Easy. Approximately three quarters of parents (76.5%, *n* = 88) provided follow-up information after an action or task. Follow-ups provided ranged between one and eleven (*M* = 2.38, *SD* = 1.72). Although the mean number of observations for providing follow-up feedback did not differ between mothers (*M* = 2.57, *SD* = 1.93) and fathers (*M* = 1.96, *SD* = 1.04), mothers (75%; *n* = 60) provided follow-ups as many as 11 times (range: 1 to 11) while all fathers (*n* = 28) provided follow-ups up to 4 times in a session (range: 1 to 4). See Table 39.

Follow-up: Hard. The majority of parents (79.6%, *n* = 86) provided follow-up information after an action or task. Follow-ups provided ranged between one and eight (*M* = 2.86, *SD* = 1.79). Three quarters of mothers (*n* = 54) and 88.8% of fathers (*n* = 32) provided at least one prompt. Mothers and fathers were similar such that mothers provided feedback up to 8 times (range: 1 to 8; $M = 2.89$, $SD = 1.81$) and fathers provided feedback up to 7 times (range: 1 to 7; $M = 2.81$, $SD = 1.79$). See Table 39.

Follow-up: iPad. The majority of parents (81.6%, $n = 111$) provided follow-up information after an action or task. Instances of follow-up feedback ranged between 1 and 12 ($M = 2.95$, $SD = 1.97$). Although there were no statistically significant mean differences between mothers (87.5%; $n = 77$) and fathers (86.1%, $n = 34$), mothers provided up to 10 follow-ups (range: 1 to 10; $M = 2.90$, $SD = 1.80$) and fathers provided up to 18 affirmations (range: 1 to 12; $M = 3.06$, $SD = 2.33$). See Table 39.

Three multiple regressions were conducted to examine the relationship between subtheme providing follow-up information for Easy, Hard and iPad sessions and age. The overall model for follow-up information during the iPad session was significant ($F_{(1, 109)} = 6.20$, $p < .02$; $R^2 = .054$). A child's age was significantly related to the number of times a parent provided follow-up information during the iPad session. As a child's age increase, parents provided less follow-up information ($\beta = -.377$, $t = -2.49$, $p < .02$). The overall models for additional examples during the easy session and hard session were not significant. See Table 40 for complete summary.

Try again: Easy. Just over a third (35.7%) of parents ($n = 41$) also encouraged their child to try again (range 1 to 7; $M = 1.56$, $SD = 1.40$). Although the mean number of observations for encouraging trying again did not differ between mothers ($M = 1.52$, $SD = 1.39$) and fathers ($M = 1.70$, $SD = 1.49$), mothers (38.8%, $n = 31$) encouraged their child to try again as many as 7 times (range: 1 to 7) while fathers (28.6%; $n = 10$) encouraged their child to try again as many as 5 times in a session (range: 1 to 5). See Table 39.

Try again: Hard. Only 19.4% of parents (*n* = 21) also encouraged they child to try again (range 1 to 3; *M* = 1.38, *SD* = .67) in the hard software session. There were no statistically significant mean differences between mothers (*M* = 1.30, *SD* = .68) and fathers (*M* = 1.46, *SD* = .69). Mothers (13.9%; *n* = 10) and fathers (30.6%; *n* = 11) encouraged their child to try again as many as three times (range: 1 to 3). See Table 39.

Try again: iPad. Only 20.6% of parents (*n* = 28) also encouraged they child to try again (range 1 to 10; *M* = 1.54, *SD* = 1.79) in the iPad session. However, there was more variation between mothers and fathers during this session. Although the mean number of observations for encouraging trying again did not differ between mothers (*M* = 1.16, *SD* = .50) and fathers (*M* = 2.33, *SD* = 3.04), mothers (20.4%, *n* = 19) encouraged their child to try again as many as 3 times (range: 1 to 3) while fathers (20.9%; *n* = 9) encouraged their child to try again as many as 10 times in a session (range: 1 to 10). See Table 39.

Three multiple regressions were conducted to examine the relationship between the subtheme encouraging their child to try again for Easy, Hard and iPad sessions and age. The overall models for the easy session, hard session and iPad session were not significant. See Table 40 for complete summary.

Follow-up questions: Easy. Approximately one third (33%) of parents (*n* = 38) asked follow-up questions (range: 1 to 3; *M* = 1.58, *SD* = .76). There were no statistically significant mean differences between mothers (*M* = 1.44, *SD* = .66) and fathers (*M* = 1.80, *SD* = .86). Mothers (28.8%; *n* = 23) and fathers (42.9%; *n* = 15) asked follow-up questions as many as 3 times in a session (range: 1 to 3). See Table 39.

Follow-up questions: Hard. Approximately one third (39.8%) of parents (*n* = 43) asked follow-up questions (range: 1 to 4; *M* = 1.49, *SD* = .80). There were no statistically significant mean differences between mothers (*M* = 1.60, *SD* = .86) and fathers (*M* = 1.23, *SD* = .60). Mothers (41.7%; *n* = 30) ask follow-up questions up to 4 times (range: 1 to 4) and fathers (36.1%; *n* = 13) asked follow-up questions as many as 3 times in a session (range: 1 to 3). See Table 39.

Follow-up questions: iPad. Approximately one third (41.2%) of parents (*n* = 56) asked follow-up questions (range: 1 to 10; *M* = 2.07, *SD* = 1.73). Although the mean number of observations for asking follow-up question did not differ between mothers (*M* = 1.81, *SD* = 1.15) and fathers (*M* = 2.42, *SD* = 2.26), mothers (34.4%, *n* = 32) asked questions as many as 5 times (range: 1 to 5) while fathers (55.8%; *n* = 24) asked questions as many as 10 times in a session (range: 1 to 10). See Table 39.

Three multiple regressions were conducted to examine the relationship between the subtheme asking follow-up questions for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 40 for complete summary.

Error Indication: Easy. Approximately one third of parents (33.04%, *n* = 38) indicated errors in their child’s actions between one and eight times (*M* = 1.92, *SD* = 1.58). Although the mean number of observations for indication of errors made did not differ between mothers (*M* = 2.17, *SD* = 1.90) and fathers (*M* = 1.53, *SD* = .83), mothers 28.8%, *n* = 23) indicated incorrect actions as many as 8 times (range: 1 to 8) while fathers (42.9%, *n* = 15) indicated errors as many as 3 times in a session (range: 1 to 3). See Table 39.

Error Indication: Hard. Slightly fewer than half (45.4%) of parents (*n* = 49) indicated errors in their child’s actions between one and seven times (*M* = 1.90, *SD* = 1.46). There was a slight variation between mothers (*M* = 2.00, *SD* = 1.65) and fathers (*M* = 1.75, *SD* =1.16).

Mothers (40.3%, $n = 29$) indicated incorrect actions as many as 7 times (range: 1 to 7) while fathers (55.6%, $n = 20$) indicated errors as many as 5 times in a session (range: 1 to 5). See Table 39.

Error Indication: iPad. Slightly fewer than half (47.1%) of parents ($n = 64$) indicated errors in their child's actions between one and nine times ($M = 2.48$, $SD = 1.89$). There was no significant difference between mothers ($M = 2.57$, $SD = 1.92$) and fathers ($M = 2.30$, $SD = 1.87$). Mothers (46.3%, $n = 44$) indicated incorrect actions as many as 9 times (range: 1 to 9) while fathers (46.5%, $n = 20$) indicated errors as many as 8 times in a session (range: 1 to 8). See Table 39.

Three multiple regressions were conducted to examine the relationship between the subtheme error indication for Easy, Hard and iPad sessions and age. The overall model for follow-up information during the easy session was significant ($F_{(1, 36)} = 4.86$, $p < .04$; $R^2 = .119$). A child's age was significantly related to the number of times a parent indicated errors in their child's actions during the easy session. As a child's age increased, parents indicated fewer errors in their child's actions ($\beta = -.457$, $t = -2.20$, $p < .04$). The overall models for error indication during the hard session and iPad session were not significant. See Table 40 for complete summary.

Additional Verbal Involvement: "Other"

In addition to verbal supports, some parents provided additional verbal remarks, some of which did not progress or contribute to the progressions of the game. Verbal involvement that contributed to the game included: 1) Connections or examples made in relation to the child's previous learning or home/school environment. Such connections included relating letters to the alphabet song they just learned, sight words to the classroom "popcorn" words, or indicating the game was similar to one the child has played before (i.e., "Just like connect the dots"); 2) Checking in to see if the child understood what is to be done such as "Do you understand what you have to do?"; and 3) Giving the answer with no attempt to scaffold such as "Press B". There were no significant differences between mothers and fathers in any of the above Additional Verbal Involvement subthemes during the easy session (highest $t_{(33)} = 1.52$, $p = .139$). There was a significant difference between mothers and fathers for check-ins during the hard session ($t_{(13)} = 2.26$, $p < .05$) such that mothers provided fewer check-ins (*M* = 1.10, *SD* = .32) than did fathers (*M* = 2.00, *SD* = 1.23). There was a significant difference between mothers and fathers for providing an answer without an attempt to scaffold during the iPad session ($t_{(28)} = 2.91$, $p < .008$) such that mothers provided less answers without attempting to scaffold (*M* = 1.42, *SD* = .78) compared to fathers (*M* = 3.17, *SD* = 2.64).

The following six subthemes are based on the 134 parents (92 mothers and 42 fathers) for the easy game session, 136 parents (94 mothers and 42 fathers) for the hard game session and 150 parents (104 mothers and 46 fathers) for the iPad session.

Connections: Easy. Few parents (21.6%; *n* = 29) made at least one connection. Overall the range for these types of supports was between 1 and 3 (*M* = 1.28, *SD* = .53). The mean number of observations for providing connections did not differ between mothers (*M* = 1.28, *SD* = .54) and fathers (*M* = 1.25, *SD* = .50). Mothers (27.2%; *n* = 25) provided connections as many as 3 times (range: 1 to 3) while fathers (9.5%; *n* = 4) provided connections up to 2 times in a session (range: 1 to 2). See Table 41.

Connections: Hard. Few parents (16.9%; *n* = 23) made at least one connection. Overall the range for these types of supports was between 1 and 4 (*M* = 1.30, *SD* = .70). Although the mean number of observations for providing connections did not differ between mothers (*M* =

1.41, *SD* = .80) and fathers (*M* = 1.00, *SD* = 0), mothers (18.1%; *n* = 17) provided connections as many as 4 times (range: 1 to 4) while fathers (14.3%; *n* = 6) provided connections only once. See Table 41.

Connections: iPad. Nearly a quarter (24.7%) of parents (*n* = 37) made at least one connection. Overall the range for these types of supports was between 1 and 5 (*M* = 1.46, *SD* = .90). Although the mean number of observations for providing connections did not differ between mothers (*M* = 1.35, *SD* = .56) and fathers (*M* = 1.73, *SD* = 1.42), mothers (25%; *n* = 26) provided connections as many as 3 times (range: 1 to 3) while fathers (23.9%; *n* = 11) provided connections as many as five times (range: 1 to 5). See Table 41.

Three multiple regressions were conducted to examine the relationship between the subtheme of parent making connections for Easy, Hard and iPad sessions and age. The overall model for connections during the easy session was significant ($F_{(1, 27)} = 5.04$, $p < .04$; $R^2 = .157$). A child's age was significantly related to the number of times a parent made a connection to the child's previous learning/home environment during the easy session. As a child's age increase, parents made fewer connections ($\beta = -.207$, $t = -2.25$, $p < .04$). The overall models for error indication during the hard session and iPad session were not significant. See Table 42 for complete summary.

Check-ins: Easy. Overall, 17.9% of parents (*n* = 24) checked-in to assess their child's understanding at least once during the session (*M* = 1.13, *SD* = .45). Although the mean number of observations for accessing child's understanding did not differ between mothers (*M* = 1.21, *SD* = .58) and fathers (*M* = 1, *SD* = 0), mothers (15.2%, *n* = 14) assessed understanding as many as three times whereas fathers (23.8%; *n* = 10) assessed their child's understanding only once. See Table 41.

Check-ins: Hard. Few parents (11%; *n* = 15) checked-in to assess their child's understanding. Overall parents accessed understanding as many as 4 times during the session (*M* = 1.40, *SD* = .83). Providing connections significantly differ between mothers (*M* = 1.10, *SD* = .32) and fathers (*M* = 2.00, *SD* = 1.23) as variability was lower for mothers than fathers ($t_{(13)}$ = 2.26, $p < .05$). Mothers (10.6%, *n* = 10) assessed understanding as many as two times (range 1 to 2) whereas fathers (11.2%; *n* = 5) assessed their child's understanding up to 4 times (range: 1 to 4). See Table 41.

Check-ins: iPad. Few parents (8%; *n* = 12) checked-in to assess their child's understanding. Overall parents accessed understanding as many as 2 times during the session (*M* = 1.08, *SD* = .29). The mean number of observations for accessing child's understanding did not differ between mothers (*M* = 1.14, *SD* = .38) and fathers (*M* = 1, *SD* = 0). Mothers (6.7%, *n* = 7) assessed understanding as many as two times whereas fathers (10.9%; *n* = 5) assessed their child's understanding only once. See Table 41.

Three multiple regressions were conducted to examine the relationship between the subtheme of parent assesses understanding for Easy, Hard and iPad sessions and age. The overall model for check-ins during the iPad session was significant ($F_{(1, 10)}$ = 8.39, $p < .02$; R^2 = .456). A child's age was significantly related to the number of times a parent assessed understanding such as asking "do you understand" during the iPad session. Interestingly, as a child's age increase, parents made more attempts to assess understanding (β = .198, t = 2.90, $p < .02$). The overall models for error indication during the easy session and hard session were not significant. See Table 42 for complete summary.

Gives answer: Easy. In total only 9.7% of parents (*n* = 13) provided the child with an answer. Overall, parents provided an answer to progress the game without an attempt to scaffold between one to two times ($M = 1.39$, $SD = .51$). The mean number of observations for providing an answer did not differ between mothers ($M = 1.44$, $SD = .53$) and fathers ($M = 1.25$, $SD = .50$). Mothers (9.8%; $n = 9$) and fathers (9.5%; $n = 4$) both provided as many as two answers during the session. See Table 41.

Gives answer: Hard. In total 12.5% of parents ($n = 17$) provided the child with an answer. Overall, parents provided an answer to progress the game without an attempt to scaffold between one to five times ($M = 1.71$, $SD = 1.16$). Although the mean number of observations for providing an answer did not differ between mothers ($M = 1.14$, $SD = .38$) and fathers ($M = 2.10$, $SD = 1.37$), mothers (7.4%; $n = 7$) provided the answer to progress the game without an attempt to scaffold as many as two times (range: 1 to 2) whereas fathers (23.8%; $n = 10$) provided an answer as many as five times (range: 1 to 5). See Table 41.

Gives answer: iPad. More parents (20%; $n = 30$) provided the child with an answer during the iPad session. Overall, parents provided an answer to progress the game without an attempt to scaffold more frequently, as many as eight times. The mean number of observations for providing an answer significantly differ between mothers ($M = 1.42$, $SD = .78$) and fathers ($M = 3.17$, $SD = 2.64$) as variability was lower for mothers than fathers ($t_{(28)} = 2.91$, $p < .008$). Mothers (23.1%; $n = 24$) provided the answer to progress the game without an attempt to scaffold as many as four times (range: 1 to 4) whereas fathers (13%; $n = 6$) provided an answer as many as eight times (range: 1 to 8). See Table 41.

Three multiple regressions were conducted to examine the relationship between the subtheme of parents providing the answer without an attempt to scaffold for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 42 for complete summary.

Suggestions of new activity: Easy. As mentioned above, 38.8% of parents (*n* = 52) suggested a change of activity between one and four times (*M* = 1.67, *SD* = .83) when their child showed no signs of disinterest or discontent indicating parental boredom. There were no statistically significant mean differences between mothers (*M* = 1.64, *SD* = .83) and fathers (*M* = 1.75, *SD* = .86). Both mothers (39.1%, *n* = 36) and fathers (38.1%; *n* =16) suggested a change of activity between one and four times. See Table 41.

Suggestions of new activity: Hard. In total parents (33.8%; *n* = 46) suggested a change of activity as many as four times (*M* = 1.41, *SD* = .72) when their child showed no signs of disinterest or discontent indicating parental boredom. There were no statistically significant mean differences between mothers (*M* = 1.41, *SD* = .69) and fathers (*M* = 1.42, *SD* = .77). Mothers (28.7%, *n* = 27) suggested a change of activity as many as 3 times (range: 1 to 3) whereas fathers (45%; *n* =19) suggested a change of activity between one and four times (range: 1 to 4). See Table 41.

Suggestions of new activity: iPad. In total parents (34.7%; *n* = 52) suggested a change of activity as many as four times (*M* = 1.50, *SD* = .83) when their child showed no signs of disinterest or discontent indicating parental boredom. There were no statistically significant mean differences between mothers (*M* = 1.47, *SD* = .81) and fathers (*M* = 1.56, *SD* = .89). Mothers (34.6%, *n* = 36) and fathers (34.8%; *n* =16) suggested a change of activity as many as 4 times (range: 1 to 4). See Table 41.

Three multiple regressions were conducted to examine the relationship between the suggestion of a new activity for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 42 for complete summary.

Fillers. Two remaining verbal involvement themes involved fillers. Such dialogue included 1) Fillers where parents responded to the computer characters comments, verbalized their inner thoughts or provided supports when the child had already executed the required action; and 2) Suggestion to change the activity when the child showed no signs of distress or disinterest or which interrupted activities and indicated parental boredom.

Easy. Throughout the session, 64.2% parents (*n* = 86) provided fillers as many as eleven times (*M* = 4.00, *SD* = 3.03). Both mothers (68.5%; *n* = 63) and fathers (54.8%; *n* = 23) provided between one and eleven fillers (*M* = 3.94, *SD* = 2.94 for mothers and *M* = 4.17, *SD* = 3.31 for fathers). Fillers were subcategorized as 1) *Fluff –dialogue* which was out of the scope of the software activity or 2) Unnecessary prompt "Ya get the letter, get it".

In general, parents (96.5%) who provided fillers, provided a "fluff-dialogue" (range 1 to 10; *M* = 3.35, *SD* = 2.50) compared to an unnecessary prompt (40.7% of parents; range of fillers 1 to 6; *M* = 1.89, *SD* = 1.08). "Fluff –dialogue" was demonstrated by 96.8% of mothers overall up to ten times (*M* = 3.26, *SD* = 2.47) and by 95.7% of fathers up to 9 instances (*M* = 3.59, *SD* = 2.63). Unnecessary prompts were demonstrated by 44.4% of mothers up to three instances of unnecessary prompts (*M* = 1.75, *SD* = .84) and 30.4% of fathers provided up to 6 unnecessary prompts (*M* = 2.43, *SD* = 1.72). See Table 43.

Hard. Throughout the session, 64.7% parents (*n* = 88) provided fillers as many as 12 times (*M* = 4.02, *SD* = 2.79). Both mothers (67%; *n* = 63) and fathers (59.5%; *n* = 25) provided between one and eleven fillers. Although the mean number of observations fillers did not differ between mothers (*M* = 3.91, *SD* = 2.84) and fathers (*M* = 4.32, *SD* = 2.67), mothers (63%; *n* = 63) provided fillers as many as 12 times (range: 1 to 12) whereas fathers (59.5%; *n* = 25) provided fillers as many as 9 times (range: 1 to 9).

In general, parents (93.2%; n = 84) who provided fillers, provided a "fluff dialogue" as many as 10 times (M = 3.41, SD = 2.32) compared to 47.7% of parents (n = 82) who provided unnecessary prompts as many as four times (M = 1.76, SD = 1.03). Mothers (93.7%; n = 59) provided "fluff –dialogue" as many as 12 times (M = 3.26, SD = 2.47) whereas fathers (92%; n = 23) provided "fluff –dialogue" as many as 8 times (M = 3.52, SD = 2.31). Overall mothers (46%, of n = 29) and fathers (52%; n = 13) provided up to 4 instances of unnecessary prompts (M = 1.62, SD = 1.02 and M = 2.43, SD = 1.72, respectively) provided. See Table 43.

iPad. Throughout the session, 82% of parents (n = 123) provided fillers as many as 28 times (M = 5.50, SD = 4.47). Although the mean number of observed fillers did not differ between mothers (M = 5.54, SD = 4.60) and fathers (M = 5.44, SD = 4.23), mothers (80.8%; n = 84) provided fillers as many as 28 times (range: 1 to 28) whereas fathers (84.8%; n = 39) provided fillers as many as 20 (range: 1 to 20).

In general, parents (93.5%; n = 115) who provided fillers, provided "fluff-dialogue" as many as 15 times (M = 4.04, SD = 3.03) compared to 60.2% of parents (n = 74) who provided an unnecessary prompts as many as four times (M = 2.85, SD = 2.14). Mothers (96.4%; n = 81) provided "fluff –dialogue" as many as 15 times (M = 4.07, SD = 3.04) whereas fathers (87.2%; n = 34) provided "fluff –dialogue" as many as 13 times (M = 4.00, SD = 3.06). Overall mothers (59.5%, of n = 50) provided "unnecessary prompts" as many as 4 times (M = 2.70, SD = 2.26) whereas fathers (61.5%; n = 24) provided "unnecessary prompts" as many as 8 times (M = 3.17, SD = 1.86). See Table 43.

Three multiple regressions were conducted to examine the relationship between the theme fillers for easy, hard and iPad sessions and age. The overall model for fillers during the easy game ($F_{(1, 86)} = 6.84$, $p < .02$; $R^2 = .075$), hard game ($F_{(1, 86)} = 8.50$, $p < .006$; $R^2 = .090$) and iPad session ($F_{(1, 121)} = 9.04, p < .004; R^2 = .069$) were significant. A child's age was significantly related to the number of times a parent provided filler during each session. As a child's age increase, parents provided more fillers in the easy session ($\beta = .713$, $t = 2.62$, $p < .02$), hard session ($\beta = .767$, $t = 2.92$, $p < .006$), and the iPad session ($\beta = .936$, $t = -3.01$, $p < .004$). See Table 44.

Six additional multiple regressions were conducted to examine the relationship between the subthemes of fillers for the easy, hard and iPad sessions and age. The first three regressions examined the relationship between "fluffy dialogue" for easy, hard and iPad sessions and age. The overall model for "fluff-dialogue" during the easy game ($F_{(1, 81)} = 4.34, p < .05; R^2 = .051$), hard game ($F_{(1, 80)} = 5.81, p < .02; R^2 = .068$) and iPad session ($F_{(1, 113)} = 7.06, p < .01; R^2 = .059$) were significant. A child's age was significantly related to the number of times a parent demonstrated "fluff-dialogue" during each session. As a child's age increase, parents provided more in the easy session ($\beta = .4.86$, $t = 2.08$, $p < .05$), hard session ($\beta = .553$, $t = 2.41$, $p < .02$), and the iPad session ($\beta = .583$, $t = 2.66$, $p < .01$). See Table 44 for complete summary.

Physical Supports

Physical supports were identified as purposeful supports that assisted the child to progress within a game. Physical supports were categorized within one of the following four groups: 1) Points; 2) Device Adjustment; 3) Supports to facilitate play; and 4) Actions to progress play. One additional theme assessed parent-child seated position. Seated-position was once recorded at the start of each 10-minute session.

The parent-child seated position was tracked for all 153 participants who played the easy game session. Parents (54.9%, $n = 84$) most commonly sat beside their child while their child played on the computer, followed by 22.2% of parents ($n = 34$) who had their child sit on their lap while the parent used the device, 19.6% of parents (*n* = 30) had their child sit on their lap while the child used the device, 2% of parents (*n* = 3) sat in front of the monitor with their child sitting beside them and finally 1.3% of parents (*n* = 2) did not sit at the computer table with their child (e.g., parents sat behind the child on the sofa).

The parent-child seated position was tracked for all 155 participants who played the hard game session. Parents (54.2%, *n* = 84) most commonly sat beside their child while their child played on the computer, followed by 25.8% of parents (*n* = 40) who had their child sit on their lap while the parent used the device, 16.8% of parents (*n* = 26) had their child sit on their lap while the child used the device, 1.9% of parents (*n* = 3) sat in front of the monitor with their child sitting beside them and finally 1.3% of parents (*n* = 2) did not sit at the computer table with their child (e.g., parents sat behind the child on the sofa).

The parent-child seated position was tracked for all 154 participants who played the iPad session. Parent’s (70.8%, *n* = 109) most commonly sat beside their child while their child played on the iPad, followed by 11% of parents (*n* = 17) sat in front of the monitor with their child sitting beside them, 9.1% of parents (*n* = 14) had their child sit on their lap while the child used the device, 8.4% of parents (*n* = 13) who had their child sit on their lap while the parent used the device, and finally .6% of parents (*n* = 1) did not sit with their child (e.g., parents sat behind the child on the sofa). See Table 45.

Physical Supports: Easy. Overall, 91.8% of parents (*n* = 123) provided as many as 52 physical supports during their session with the easy software (*M* = 14.94, *SD* = 10.76). Although the mean number of observations physical supports did not differ between mothers (*M* = 15.31, *SD* = 11.17) and fathers (*M* = 14.13, *SD* = 9.88), mothers (92.4%, *n* = 85) provided physical supports as many as 52 times (range: 1 to 52) whereas fathers (90.5%; *n* = 38) provided physical supports as many as 45 times (range: 1 to 45).

Of the 123 participants, nearly all parents (99.2%; *n* = 122) provided at least one point and at most 51 points (*M* = 10.66, *SD* = 8.05). Although the mean number of observations for total number of points did not differ between mothers (*M* = 10.74, *SD* = 8.74) and fathers (*M* = 10.47, *SD* = 6.35), mothers (98.8%, *n* = 84) provided points as many as 51 times (range: 1 to 51) whereas all fathers (*n* = 38) provided points as many as 25 times (range: 1 to 25), which is about half as many points that mothers provided.

Nearly half of parents (52%; *n* = 64) who provided a physical support provided a device adjustment at least once (range: 1 to 5; *M* = 1.73, *SD* = .91). Variability was similar for mothers (*M* = 1.64, *SD* = .74) and fathers (*M* = 1.95, *SD* = 1.22). Mothers (52.9%; *n* = 45) adjusted the device as many as 4 times (range: 1 to 4) whereas fathers (50%; *n* = 19) adjusted the device as many as 5 times.

Fewer than half of parents (43.1%; *n* = 53) provided between one and 20 instances of supports to facilitate play (*M* = 4.45, *SD* = 4.10). Although the mean number of observations for total supports to facilitate play did not differ between mothers (*M* = 4.67, *SD* = 4.20) and fathers (*M* = 3.86, *SD* = 3.90), mothers (45.9%; *n* = 39) provided supports to facilitate play as many as 20 times (range: 1 to 20) whereas fathers (36.8%; *n* = 14) provided supports to facilitate play as many as 13 times (range: 1 to 13).

Finally, parents (36.6%, *n* = 45) performed actions to progress play between one and 19 times (*M* = 4.24, *SD* = 3.86). Variability was similar for mothers (*M* = 4.47, *SD* = 3.89) and fathers (*M* = 3.69, *SD* = 3.88). Mothers (37.7%; *n* = 32) performed actions to progress play as many as 19 times (range: 1 to 19) whereas fathers (34.2%; n = 13) performed actions to progress play as many as 14 times (range: 1 to 14). See Table 46.

There were no significant differences between mothers and fathers (highest t for overall device adjustments, $t_{(62)}$ =1.22, p = .228).

A linear regression analysis was conducted to examine the relationship between total physical supports. The overall model for the total number of physical supports was significant ($F_{(1, 121)}$ = 3.95, p < .05; R^2 = .032). A child's age was significantly related to the number of total physical supports provided by parents during the easy session. As a child's age increase, parents provided fewer physical supports in the easy session (β = -1.62, t = -1.99, p < .05). See Table 47 for complete summary.

Physical Supports: Hard. Overall, 89.7% of parents (n = 122) provided as many as 52 physical supports during their session with the hard software (M = 14.10, SD = 9.63). Although the mean number of observed physical supports did not differ between mothers (M = 13.48, SD = 10.03) and fathers (M = 15.51, SD = 8.59), mothers (90.4%, n = 85) provided physical supports as many as 52 times (range: 1 to 52) whereas fathers (88.1%; n = 37) provided physical supports as many as 36 times (range: 4 to 36).

Of the 122 participants, nearly all parents (99.2%; n = 121) provided at least one point and at most 48 points (M = 10.88, SD = 8.03). Although the mean number of observations for total number of points did not differ between mothers (M = 10.17, SD = 8.10) and fathers (M = 12.51, SD = 7.75), mothers (98.8%, n = 84) provided points as many as 48 times (range: 1 to 48) whereas all fathers (n = 37) provided points as many as 36 times (range: 3 to 36).

Nearly half of parents (47.5%; n = 58) who provided a physical support, provided a device adjustment at least once (range: 1 to 4; M = 1.64, SD = .85). Variability was similar for mothers (*M* = 1.61, *SD* = .82) and fathers (*M* = 1.70, *SD* = .92). Mothers (44.7%; *n* = 38) and fathers (54.1%; *n* = 20) adjusted the device as many as 4 times (range: 1 to 4).

Fewer than half of parents (41.8%; *n* = 53) provided between one and 15 instances of supports to facilitate play (*M* = 3.41, *SD* = 3.28). Although the mean number of observations for total supports to facilitate play did not differ between mothers (*M* = 3.46, *SD* = 3.40) and fathers (*M* = 3.25, *SD* = 2.96), mothers (45.9%; *n* = 39) provided supports to facilitate play as many as 15 times (range: 1 to 15) whereas fathers (32.4%; *n* = 12) provided supports to facilitate play as many as 9 times (range: 1 to 9).

Finally, parents (34.4%, *n* = 42) performed actions to progress play between one and 12 times (*M* = 3.19, *SD* = 2.63). Variability was similar for mothers (*M* = 3.20, *SD* = 2.67) and fathers (*M* = 3.17, *SD* = 2.66). Mothers (35.3%; *n* = 30) performed actions to progress play as many as 12 times (range: 1 to 12) whereas fathers (32.4%; *n* = 12) performed actions to progress play as many as 8 times (range: 1 to 8). There were no significant differences between mothers and fathers (highest *t* for total points, $t_{(119)}$ =1.49, *p* = .139). See Table 46.

A linear regression analysis was conducted to examine the relationship between total physical supports. The overall model for the total number of physical supports was significant ($F_{(1,\ 120)} = 4.72$, $p < .04$; $R^2 = .038$). A child's age was significantly related to the number of total physical supports provided by parents. As a child's age increase, parents provided fewer physical supports in the hard session (β = -1.62, *t* = -2.17, *p* < .04). See Table 47 for complete summary.

Physical Supports: iPad. Overall, 95.3% of parents (*n* = 143) provided as many as 45 physical supports during their session with the iPad (*M* = 13.51, *SD* = 8.08). The mean number of observations physical supports differed between mothers (*M* = 14.79, *SD* = 8.08) and fathers (*M* = 10.73, *SD* = 7.44; $t_{(141)} = 2.85$, $p < .006$). Mothers (94.2%, *n* = 98) provided physical supports as many as 43 times (range: 1 to 43) whereas fathers (97.8%; *n* = 45) provided physical supports as many as 45 times (range: 2 to 45).

Of these 143 participants, all parents (*n* = 143) provided at least one point and at most 30 points (*M* = 9.38, *SD* = 5.66). The mean number of observations for total number of points differ between mothers (*M* = 10.11, *SD* = 5.57) and fathers (*M* = 7.78, *SD* = 5.58) such that mothers provided significantly more points than did fathers ($t_{(141)} = 2.33$, $p < .03$) however variability was greater for fathers than for mothers. All mothers (*n* = 98) provided points as many as 25 times (range: 1 to 25) whereas all fathers (*n* = 45) provided points as many as 30 times (range: 1 to 30).

Nearly half of parents (54.5%; *n* = 78) who provided a physical support, provided a device adjustment at least once (range: 1 to 6; *M* = 2.06, *SD* = 1.28). Variability was similar for mothers (*M* = 2.19, *SD* = 1.36) and fathers (*M* = 1.71, *SD* = 1.01). Mothers (58.2%; *n* = 57) adjusted the device as many as 6 times (range: 1 to 6) and fathers (46.7%; *n* = 21) adjusted the device as many as 4 times (range: 1 to 4).

Fewer than half of parents (36.4%; *n* = 52) provided between one and 9 instances of supports to facilitate play (*M* = 2.19, *SD* = 2.01). Variability was similar between mothers (*M* = 3.46, *SD* = 3.40) and fathers (*M* = 3.25, *SD* = 2.96). Mothers (37.8%; *n* = 37) provided supports to facilitate play as many as 8 times (range: 1 to 8) whereas fathers (33.3%; *n* = 15) provided supports to facilitate play as many as 9 times (range: 1 to 9).

Finally, parents (72%, *n* = 103) performed actions to progress play between one and 16 times (*M* = 3.07, *SD* = 2.55). Although the mean number of observations for total actions to progress play did not differ between mothers (*M* = 3.336, *SD* = 2.72) and fathers (*M* = 2.33, *SD* = 1.82), mothers (77.6%; *n* = 76) performed actions to progress play as many as 16 times (range: 1

to 16) whereas fathers (60%; $n = 27$) performed actions to progress play as many as 8 times (range: 1 to 8). See Table 46.

A linear regression analysis was conducted to examine the relationship between total physical supports. The overall model for the total number of physical supports was significant ($F_{(1, 141)} = 19.59$, $p < .001$; $R^2 = .122$). A child's age was significantly related to the number of total physical supports provided by parents. As a child's age increase, parents provided fewer physical supports during the iPad session ($\beta = -2.27$, $t = -4.43$, $p < .001$). See Table 47 for complete summary.

Device Adjustments. Since codes were derived from the survey factor analysis (see Study 1) this theme initially included four codes, however only two of the four subthemes were observed. The two themes not observed were adjustment of the screen location and adjustment of the screen for the easy and hard sessions. Only adjustment of screen properties was not observed during the iPad session. The following subthemes are based on the 64 parents (45 mothers and 19 fathers) who provided device adjustments during the easy game session, 58 parents (38 mothers and 20 fathers) who provided device adjustments during the hard game session and 78 parents (57 mothers and 21 fathers) who provided device adjustments during the iPad session.

There were no significant difference between mothers and fathers and any of the device adjustment subthemes for the easy session (largest t for booster seat $t_{(13)} = 1.47$, $p = .165$), hard session (largest t for booster seat $t_{(12)} = 1.39$, $p = .190$), or the iPad session (largest t for booster seat $t_{(60)} = .91$, $p = .366$).

Device Adjustments: Easy. Overall, 95.3% of parents ($n = 61$) adjust components of the computer (range 1 to 4; $M = 1.54$, $SD = .74$) in comparison to 23.4% ($n = 15$) who provided a booster seat or adjusted the child's seated position (range 1 to 3; $M = 1.13$, $SD = .52$). Mothers

(93.3%; *n* = 42) adjusted the computer components as many as 4 times (range: 1 to 4; *M* = 1.52, *SD* = .71) whereas all fathers (*n* = 19) adjusted the computer components as many as 3 times (range: 1 to 3; *M* = 1.58, *SD* = .83). Mothers (22.2%, *n* = 10) ever only provided a booster seat or adjusted the child's seated position once (*M* = 1.00, *SD* = 0) whereas fathers (26.3%, *n* = 5) provided a booster seat or adjusted the child's seated position as many as 3 times (range: 1 to 3; *M* = 1.40, *SD* = .89). See Table 48.

Device Adjustments: Hard. Overall, 89.7% of parents (*n* = 52) adjust components of the computer (range 1 to 4; *M* = 1.52, *SD* = .73) in comparison to 24.1% (*n* = 14) who provided a booster seat or adjusted the child's seated position (range 1 to 3; *M* = 1.14, *SD* = .54). Mothers (89.5%; *n* = 34) adjusted the computer components as many as 4 times (range: 1 to 4; *M* = 1.53, *SD* = .75) whereas fathers (90%; *n* = 18) adjusted the computer components as many as 3 times (range: 1 to 3; *M* = 1.50, *SD* = .71). Mothers (23.7%, *n* = 9) ever only provided a booster seat or adjusted the child's seated position once (*M* = 1.00, *SD* = 0) whereas fathers (25%, *n* = 5) provided a booster seat or adjusted the child's seated position as many as 3 times (range: 1 to 3; *M* = 1.40, *SD* = .89). See Table 48.

Device Adjustments: iPad. Overall, 21.8% of parents (*n* = 17) adjust components of the computer (range 1 to 3; *M* = 1.29, *SD* = .59) in comparison to 23.1% (*n* = 18) who provided a booster seat or adjusted the child's seated position (range 1 to 2; *M* = 1.11, *SD* = .32). Most commonly, parents (79.5%, *n* = 62) adjusted the screen location/adjusted for tilting issues as many as 6 times (*M* = 1.92, *SD* = 1.23). Mothers (21.1%; *n* = 12) adjusted the computer components as many as 3 times (range: 1 to 3; *M* = 1.33, *SD* = .65) whereas fathers (23.8%; *n* = 5) adjusted the computer components as many as 2 times (range: 1 to 2; *M* = 1.20, *SD* = .45). Mothers (22.8%, *n* = 13) provided a booster seat or adjusted the child's seated position as many as two times (*M* = 1.15, *SD* = .38) whereas fathers (23.8%, *n* = 5) provided a booster seat or adjusted the child's seated position only once. Finally, although the mean number of observations for screen adjustment did not differ between mothers (*M* = 2.00, *SD* = 1.34) and fathers (*M* = 1.67, *SD* = .82), mothers (82.5%, *n* = 47) adjusted the screen as many as 6 times (range: 1 to 6) whereas fathers (71.4%; *n* = 15) adjusted the screen half as many time (range: 1 to 3). See Table 48.

Three multiple regressions were conducted to examine the relationship between the device adjustment for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 49 for complete summary.

Supports to Facilitate Play. The supports to facilitate play theme was comprised of two subthemes: 1) Hand over hand and 2) Move child's hand to the correct place on the mouse or keyboard. The following two subthemes are based on the 53 parents (39 mothers and 14 fathers) who provided device adjustments during the easy session, 51 parents (39 mothers and 12 fathers) during the hard session and 52 parents (37 mothers and 15 fathers) who provided device adjustments during the iPad session.

There were no significant differences between mothers and fathers for any of the supports to facilitate play subthemes during the easy session (largest *t* for place hand in correct $t_{(18)} = .537$, $p = .598$), the hard session (largest *t* for place hand in correct $t_{(14)} = .65$, $p = .525$) or the iPad session (largest *t* for place hand in correct $t_{(2)} = 1.00$, $p = .423$).

Hand over hand: Easy. The majority of parents (94.3%, *n* = 50) placed their hand over their child's hand as many as 13 times (range: 1 to 13; *M* = 3.80, *SD* = 3.10). Although the mean number of observations for hand over hand did not differ between mothers (*M* = 3.90, *SD* = 3.19) and fathers (*M* = 3.46, *SD* = 2.84), all mothers (*n* = 39) performed hand over hand to help facilitate play as many as 13 times (range: 1 to 13) while fathers (78.6%, *n* = 11) performed hand over hand to help facilitate play as many as 9 times in a session (range: 1 to 9). See Table 50.

Hand over hand: Hard. The majority of parents (94.1%, *n* = 48) placed their hand over their child's hand as many as 12 times (range: 1 to 12; *M* = 3.00, *SD* = 2.87). Although the mean number of observations for hand over hand did not differ between mothers (*M* = 3.11, *SD* = 3.05) and fathers (*M* = 2.60, *SD* = 2.12), nearly all mothers (97.4%, *n* = 38) performed hand over hand to help facilitate play as many as 12 times (range: 1 to 12) while fathers (83.3%, *n* = 10) performed hand over hand to help facilitate play as many as 8 times in a session (range: 1 to 8). See Table 50.

Hand over hand: iPad. The majority of parents (96.1%, *n* = 50) placed their hand over their child's hand as many as 9 times (range: 1 to 9; *M* = 2.12, *SD* = 1.88). Although the mean number of observations for hand over hand did not differ between mothers (*M* = 2.14, *SD* = 1.80) and fathers (*M* = 2.07, *SD* = 2.12), nearly all mothers (94.6%, *n* = 35) performed hand over hand to help facilitate play as many as 7 times (range: 1 to 7) while all fathers who provided supports to facilitate play (*n* = 17) performed hand over hand actions as many as 9 times in a session (range: 1 to 9). See Table 50.

Three multiple regressions were conducted to examine the relationship between the subtheme hand-over hand for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 51 for complete summary.

Adjust child's hand: Easy. Just over a third of parents (37.7%, *n* = 20) moved their child's hand to the correct place on the mouse or keyboard as many as nine times (range: 1 to 9; *M* = 2.30, *SD* = 2.00). Although the mean number of observations for hand over hand did not differ between mothers (*M* = 2.50, *SD* = 2.39) and fathers (*M* = 2.00, *SD* = 1.31), mothers

(30.8%, *n* = 12) moved their child's hand to the correct place on the mouse or keyboard as many as 9 times (range: 1 to 9) while fathers (40%, *n* = 8) moved their child's hand to the correct place on the mouse or keyboard as many as 5 times in a session (range: 1 to 5). See Table 50.

Adjust child's hand: Hard. Just under a third of parents (31.4%, *n* = 16) moved their child's hand to the correct place on the mouse or keyboard as many as 5 times (range: 1 to 5; *M* = 1.88, *SD* = 1.36). The mean number of observations for hand over hand did not differ between mothers (*M* = 1.70, *SD* = 1.34) and fathers (*M* = 2.17, *SD* = 1.47) as variability was similar for mothers than fathers. Mothers (25.6%, *n* = 10) moved their child's hand to the correct place on the mouse or keyboard as many as 5 times (range: 1 to 5) while fathers (50%, *n* = 6) moved their child's hand to the correct place on the mouse or keyboard as many as 4 times in a session (range: 1 to 4). See Table 50.

Adjust child's hand: iPad. Few parents (7.7%, *n* = 4) moved their child's hand to the correct place on the device or screen as many as 3 times (range: 1 to 3; *M* = 2.00, *SD* = 1.15). Mothers (8.1%, *n* = 3) moved their child's hand to the correct place on the screen as many as 3 times (range: 1 to 3; *M* = 1.67, *SD* = 1.15) while only one father (6.67%) moved their child's hand to the correct place on the screen a total of three times in a session (*M* = 3.00, *SD* = 0). See Table 50.

Three multiple regressions were conducted to examine the relationship between the subtheme of parent adjusting their child's hand for Easy, Hard and iPad sessions and age. The overall model for moving their child's hand to the correct place on the device during the iPad session was significant ($F_{(1,\,2)}$ = 34.00, $p < .03$; $R^2 = .944$). A child's age was significantly related to the number of times a parent moved their child's hand to the correct place on the device during the iPad session. As a child's age increase, parents moved their child's had fewer times (β

= -7.28, *t* = -5.83, *p* < .03). However, this result should be interpreted with caution as few parents (7.7%, n = 4) engaged in this behaviour. The overall models for adjusting child's hand on the device during the easy session and hard session were not significant. See Table 51 for complete summary.

Action to progress. This theme was comprised of three subthemes related to the parent's action: 1) Moves mouse for child; 2) Press the keyboard or mouse; and 3) Holds device for child. The following three subthemes are based on the 45 parents (32 mothers and 13 fathers) during the easy session, 42 parents (30 mothers and 12 fathers) for the hard session and 103 parents (76 mothers and 27 fathers) for the iPad session.

There were no significant differences between mothers and fathers for any of the following subthemes during the easy session (largest *t* for hold device $t_{(9)}$ = 1.64, *p* = .136), hard session (largest *t* for hold device $t_{(4)}$ = 1.63, *p* = .178) or the iPad session (largest *t* for hold device $t_{(50)}$ = 1.81 *p* = .077).

Moves mouse: Easy. The majority of parent (89.7%, *n* = 37) most commonly moved the mouse for their child. Instances of moving the mouse occurred as many as 10 times (*M* = 2.43, *SD* = 2.13). Although the mean number of observations moving the mouse did not differ between mothers (*M* = 2.63, *SD* = 2.36) and fathers (*M* = 1.90, *SD* = 1.29), nearly all mothers (84.4%, *n* = 27) moved the mouse to help progress play as many as 10 times (range: 1 to 10) while fathers (76.9%, *n* = 10) moved the mouse to help progress play as many as many as 4 times in a session (range: 1 to 4). See Table 52.

Moves mouse: Hard. The majority of parent (81%, *n* = 34) most commonly moved the mouse for their child. Instances of moving the mouse occurred as many as 9 times (*M* = 1.97, *SD* = 1.60). Although the mean number of observations moving the mouse did not differ between mothers (*M* = 2.00, *SD* = 1.76) and fathers (*M* = 1.89, *SD* = 1.17), nearly all mothers (83.3%, *n* = 25) moved the mouse to help progress play as many as 9 times (range: 1 to 9) while fathers (75%, *n* = 9) moved the mouse to help progress play as many as many as 4 times (range: 1 to 4). See Table 52.

Swipes or tilts: iPad. Fewer than half (40.8%, *n* = 42) of the parents swiped or titled the iPad for their child. Instances of swiping or tilting occurred as many as 5 times (*M* = 1.55, *SD* = .86). Although the mean number of observations of swiping or tilting did not differ between mothers (*M* = 1.55, *SD* = .95) and fathers (*M* = 1.55, *SD* = .69), mothers (40.8%, *n* = 31) swiped or tilted to help progress play as many as 5 times (range: 1 to 5) while fathers (40.7%, *n* = 11) swiped or tilted to help progress play as many as many as 3 times (range: 1 to 3). See Table 52.

Three multiple regressions were conducted to examine the relationship between the subtheme parent moves the mouse for Easy, Hard sessions and swipes or tilts device for the iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 53 for complete summary.

Clicks, presses or selects: Easy. Nearly three quarters (75.6%) of parents (*n* = 34) pressed the mouse or keyboard for their child. Instances of these supports were observed as many as 9 times (*M* = 2.27, *SD* = 1.83). Although the mean number of observations moving the mouse did not differ between mothers (*M* = 3.39, *SD* = 2.00) and fathers (*M* = 1.88, *SD* = 1.13), mothers (81.3%, *n* = 26) clicked the mouse or pressed the keyboard to help progress play as many as 9 times (range: 1 to 9) while fathers (61.5%, *n* = 8) clicked the mouse or pressed the keyboard to help progress play as many as many as 4 times (range: 1 to 4). See Table 52.

Clicks, presses or selects: Hard. Parents (71.4%; *n* = 30) pressed the mouse or keyboard for their child. Instances of these supports were observed as many as 8 times (*M* = 1.90, *SD* =

1.58). Although the mean number of observations did not differ between mothers (*M* = 1.91, *SD* = 1.72) and fathers (*M* = 1.88, *SD* = 1.25), mothers (73.3%, *n* = 22) clicked the mouse or pressed the keyboard to help progress play as many as 8 times (range: 1 to 8) while fathers (66.7%, *n* = 8) clicked the mouse or pressed the keyboard to help progress play as many as many as 4 times (range: 1 to 4). See Table 52.

Presses to selects: iPad. Parents (66%; *n* = 68) pressed the screen to select for their child. Instances of these supports were observed as many as 14 times (*M* = 2.76, *SD* = 2.49). Although the mean number of observations did not differ between mothers (*M* = 2.87, *SD* = 2.61) and fathers (*M* = 2.36, *SD* = 1.98), mothers (71.1%, *n* = 54) pressed the screen to help progress play as many as 14 times (range: 1 to 14) while fathers (51.9%, *n* = 14) pressed the screen to select to help progress play as many as many as 7 times (range: 1 to 7). See Table 52.

Three multiple regressions were conducted to examine the relationship between the subtheme of parent presses or clicks to progress the game for Easy, Hard and iPad sessions and age. The overall model for pressing to select during the iPad session was significant ($F_{(1, 66)}$ = 5.24, $p < .03$; $R^2 = .074$). A child’s age was significantly related to the number of times a parent “pressed to select” during the iPad session. As a child’s age increased, parents pressed to select for their child fewer times ($\beta = -.551$, $t = -2.29$, $p < .03$). The overall models for presses or clicks to progress the game during the easy session and hard session were not significant. See Table 53 for complete summary.

Held device: Easy. Approximately a quarter (24.4%) of parents (*n* = 11) held the device (mouse, mouse pad or keyboard) for their child. Instances of holding the device occurred as many as 8 times (*M* = 2.18, *SD* = 2.18). Although the mean number of observations did not differ between mothers (*M* = 1.43, *SD* = .79) and fathers (*M* = 3.50, *SD* = 3.32), mothers (21.9%, *n* = 7) held the device to help progress play as many as 3 times (range: 1 to 3) while fathers (30.8%, n = 4) held the device to help progress play as many as many as 8 times (range: 1 to 8). See Table 52.

Held device: Hard. Approximately a quarter (14.3%) of parents (n = 6) held the device (mouse, mouse pad or keyboard) for their child. Instances of holding the device occurred as many as 5 times (M = 1.67, SD = 1.63). Mothers (13.3%, n = 4) held the device to help progress play only once (M = 1.00, SD = 0) while fathers (16.7%, n = 2) held the device to help progress play as many as many as 5 times (range: 1 to 5; M = 3.00, SD = 2.83). See Table 52.

Held device: iPad. Half (50.5%) of parents (n = 52) held the device for their child. Instances of holding the device occurred as many as 3 times (M = 1.21, SD = .50). Mothers (51.3%, n = 39) held the device to help progress play as many as 3 times (range: 1 to 3; M = 1.28, SD = .56) while fathers (48.1%, n = 13) held the device to help progress play only once (M = 1.00, SD = 0). See Table 52.

Three multiple regressions were conducted to examine the relationship between the subtheme holds the device for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 53 for complete summary.

Points. The most common physical prompt provided was a point. This theme was comprised of three subthemes: 1) Direct points; 2) General points; and 3) Points to device. These subthemes were based on observations for 122 parents (84 mothers and 38 fathers) who provided at least one type of point during the easy session, 121 parents (84 mothers and 37 fathers) during the hard session and 143 parents (98 mothers and 45 fathers) during the iPad session. There were no significant difference between mothers and fathers during the easy session (largest t for general points $t_{(63)}$ = 1.32, p = .193) or the hard session (largest t for direct points $t_{(115)}$ = 1.23, p =

.222). There was a significant difference between mothers (*M* = 8.81, *SD* = 5.21) and fathers (*M* = 6.67, *SD* = 5.10) during the iPad session for the mean number of direct points ($t_{(141)}$ = 2.29, *p* < .03).

Direct points: Easy. The majority of parents (97.5%; *n* = 119) pointed directly to the screen. Instances of direct points were observed as many as 51 times (*M* = 8.99, *SD* = 7.22). Although the mean number of observations for direct points did not differ between mothers (*M* = 9.20, *SD* = 7.97) and fathers (*M* = 8.54, *SD* = 5.26), mothers (97.6%, *n* = 82) pointed as many as 51 times (range: 1 to 51) whereas fathers (97.4%, *n* = 37) pointed as many as 22 times (range: 1 to 22). See Table 54.

Direct points: Hard. The majority of parents (96.7%; *n* = 117) pointed directly to the screen. Instances of direct points were observed as many as 46 times (*M* = 9.16, *SD* = 7.38). Although the mean number of observations for direct points did not differ between mothers (*M* = 8.61, *SD* = 7.42) and fathers (*M* = 10.42, *SD* = 7.23), mothers (96.4%, *n* = 81) pointed as many as 46 times (range: 1 to 46) whereas fathers (97.3%, *n* = 36) pointed as many as 33 times (range: 2 to 33). See Table 54.

Direct points: iPad. All parents (*n* = 143) pointed directly to the screen. Instances of direct points were observed as many as 29 times (*M* = 8.13, *SD* = 5.26). As mentioned above, there was a significant difference between mothers (*M* = 8.81, *SD* = 5.21) and fathers (*M* = 6.67, *SD* = 5.10). Mothers provided more direct points than did fathers ($t_{(141)}$ = 2.29, *p* < .03). Although the mean number of points was greater for mothers than for fathers, there was greater variability in direct points for fathers than for mothers. Mothers provided as many a 25 direct points (range: 1 to 25) whereas fathers provided as many as 29 direct points (range: 1 to 29). See Table 54.

Three multiple regressions were conducted to examine the relationship between the subtheme of parent points directly to important information on the screen for Easy, Hard and iPad sessions and age. The overall model for pointing directly to the screen during the iPad session was significant ($F_{(1, 141)} = 6.93$, $p < .03$; $R^2 = .01$). A child's age was significantly related to the number of times a parent pointed directly to the screen during the iPad session. As a child's age increase, parents directly pointed to important information fewer times ($\beta = -.916$, $t = -2.63$, $p < .01$). The overall models for presses or clicks to progress the game during the easy session and hard session were not significant. See Table 55 for complete summary.

General Points: Easy. Approximately half of these parents (53.3%, $n = 65$) provided a general point. Instances of general points were observed as many as 7 times, ($M = 2.17$, $SD = 1.31$). The mean number of observed general points did not differ between mothers ($M = 2.02$, $SD = 1.27$) and fathers ($M = 2.48$, $SD = 1.36$). Mothers (52.4%, $n = 44$) provided general points as many as 6 times (range: 1 to 6) whereas fathers (55.3%, $n = 21$) provided general points as many as 7 times (range: 1 to 7). See Table 54.

General Points: Hard. More than half (57%, $n = 69$) of parents provided a general point. Instances of general points were observed as many as 10 times, ($M = 2.29$, $SD = 1.79$). The mean number of observed general points did not differ between mothers ($M = 2.27$, $SD = 1.95$) and fathers ($M = 2.33$, $SD = 1.49$). Mothers (53.6%, $n = 45$) provided general points as many as 10 times (range: 1 to 10) whereas fathers (64.9%, $n = 24$) provided general points as many as 7 times (range: 1 to 7). See Table 54.

General Points: iPad. More than half (49.7%, $n = 71$) of parents provided a general point. Instances of general points were observed as many as 4 times, ($M = 1.62$, $SD = .80$). The mean number of observed general points did not differ between mothers ($M = 1.65$, $SD = .82$)

and fathers (*M* = 1.55, *SD* = .76). Mothers (52%, *n* = 51) provided general points as many as 4 times (range: 1 to 4) whereas fathers (44.4%, *n* = 20) provided general points as many as 3 times (range: 1 to 3). See Table 54.

Three multiple regressions were conducted to examine the relationship between the subtheme of parent points in general to important information on the screen for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 55 for complete summary.

Point to device: Easy. Parents (29.5%, *n* = 36) pointed to the device. Instances of "points to the mouse or keyboard" were observed as many as 11 times (*M* = 2.47, *SD* = 2.26). Although the mean number of observations did not differ between mothers (*M* = 2.27, *SD* = 1.95) and fathers (*M* = 3.00, *SD* = 2.98), mothers (31%, *n* = 26) pointed as many as 7 times (range: 1 to 7) whereas fathers (26.3%, *n* = 10) pointed as many as 11 times (range: 1 to 11). See Table 54.

Point to device: Hard. Parents (35.5%, *n* = 43) pointed to the device. Instances of "points to the mouse or keyboard" were observed as many as 10 times (*M* = 2.02, *SD* = 1.73). Although the mean number of observations did not differ between mothers (*M* = 1.96, *SD* = 1.35) and fathers (*M* = 2.13, *SD* = 2.33), mothers (33%, *n* = 28) pointed as many as 5 times (range: 1 to 5) whereas fathers (40.5%, *n* = 15) pointed up to twice as many times (range: 1 to 10). See Table 54.

Point to device: iPad. Parents (36.7%, *n* = 52) pointed to the home button. Instances of "points to the home button" were observed as many as 3 times (*M* = 1.21, *SD* = .46). The mean number of observations did not differ between mothers (*M* = 1.22, *SD* = .42) and fathers (*M* = 1.19, *SD* = .54) as variability was similar for mothers than fathers. Mothers (36.7%, *n* = 36) pointed as many as 2 times (range: 1 to 2) whereas fathers (35.6%, $n = 16$) pointed as many as 3 times (range: 1 to 3). See Table 54.

Three multiple regressions were conducted to examine the relationship between the subtheme of parent points to important information on the device for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 55 for complete summary.

"Other" Theme for Physical Involvement

In addition to the above physical supports, two additional themes were observed: 1) Parents removed their child's hand from the device or took over the device and 2) Parents demonstrated how to use the device or software. There was a significant difference between mothers and fathers for software demonstrations during the easy software session ($t_{(14)} = 2.65$, $p < .02$) such that mothers only provided a demonstration whereas fathers varied in demonstration of the software or device ($M = 1.67$, $SD = .82$). There were no significant differences between mothers and fathers in any of the above Other theme for the hard session (highest $t_{(20)} = 1.71$, $p = .104$ for software or device demonstration) or the iPad session ($t_{(23)} = .850$, $p = .404$ for software or device demonstration).

The following two themes are based on the 134 parents (92 mothers and 42 fathers) for the easy software session, 136 parents (94 mothers and 42 fathers) for the hard game session and 150 parents (104 mothers and 46 fathers) for the iPad session.

Takes over device: Easy. Nearly a quarter of parents (24.6%, $n = 33$) removed their child's hand or took over the device. Instances of this were observed as many as 5 times ($M = 1.49$, $SD = .94$). The mean number of observations did not differ between mothers ($M = 1.50$, $SD = .96$) and fathers ($M = 1.40$, $SD = .89$). Mothers (30.4%, $n = 28$) removed their child's hand or took over the device as many as 5 times (range: 1 to 5) whereas fathers (11.9%, *n* = 5) removed their child's hand or took over the device as many as 3 times (range: 1 to 3). See Table 56.

Takes over device: Hard. Fewer than a quarter of parents (22.1%, *n* = 30) removed their child's hand or took over the device. Instances of this were observed as many as 4 times (*M* = 1.67, *SD* = .96). The mean number of observations did not differ between mothers (*M* = 11.81, *SD* = 1.03) and fathers (*M* = 1.33, *SD* = .71). Mothers (22.3%, *n* = 21) removed their child's hand or took over the device as many as 4 times (range: 1 to 4) whereas fathers (21.4%, *n* = 9) removed their child's hand or took over the device as many as 3 times (range: 1 to 3). See Table 56.

Takes over device: iPad. Fewer than a quarter of parents (16.7%, *n* = 25) removed their child's hand or took over the device. Instances of this were observed as many as 4 times (*M* = 1.24, *SD* = .66). Although the mean number of observations did not differ between mothers (*M* = 1.19, *SD* = .68) and fathers (*M* = 1.50, *SD* = .58), mothers (20.2%, *n* = 21) removed their child's hand or took over the device as many as 4 times (range: 1 to 4) whereas fathers (8.7%, *n* = 4) removed their child's hand or took over the device as many as 2 times (range: 1 to 2). See Table 56.

Three multiple regressions were conducted to examine the relationship between the theme parent taking over the device for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 57 for complete summary.

Software demonstration: Easy. Parents (11.9%, *n* = 16) demonstrated how to use the software or device as many as three times (*M* = 1.25, *SD* = 2.58). Interestingly, the 62.5% of mothers (*n* = 10) demonstrated the software significantly less than did the 37.5% of fathers (*n* =

6; $t_{(14)} = 2.65$, $p < .02$). Mothers demonstrated how to use the software or device only once (M = 1.00, SD = 0) whereas fathers demonstrated how to use the software as many as 3 times (range: 1 to 3; M = 1.67, SD = .82). See Table 56.

Software demonstration: Hard. Parents (16.2%, n = 22) demonstrated how to use the software or device as many as two times (M = 1.05, SD = .21). The mean number of observations did not differ between mothers and fathers as mothers (17%, n = 16) demonstrated how to use the software or device only whereas as fathers (14.3%, n = 6) demonstrated how to use the software or device as many as 2 times (range: 1 to 2, M = 1.33, SD = .71). See Table 56.

Software demonstration: iPad. Parents (63.3%, n = 95) demonstrated how to use the software or device as many as 11 times (M = 2.80, SD = 2.14). The mean number of observations did not differ between mothers (M = 2.87, SD = 2.09) and fathers (M = 2.58, SD = 2.32). Both mothers and fathers demonstrated how to use the software or device as many as 11 times during the iPad session (range: 1 to 11). See Table 56.

Three multiple regressions were conducted to examine the relationship between the theme of parent demonstrates how to use the software for Easy, Hard and iPad sessions and age. The overall model for demonstrations during the iPad session was significant ($F_{(1, 79)} = 3.99$, $p < .05$; $R^2 = .048$). A child’s age was significantly related to the number of times a parent demonstrated how to use the software during the iPad session. As a child’s age increased, parents provided fewer demonstrations ($\beta = -.281$, $t = -2.00$, $p < .05$). The overall models for software demonstrations during the easy session and hard session were not significant (see Table 57 for complete summary).

An additional “Others” theme was observed during the iPad session. Parents (54%, n = 81) were observed repositioning the device for their own benefit. Instances of this were observed as many as 10 times (M = 1.90, SD = 1.37). Although the mean number of observations did not differ between mothers (M = 1.95, SD = 1.50) and fathers (M =1.76, SD = .89), mothers (57.7%, n = 60) repositioned the iPad as many as 10 times (range: 1 to 10) whereas fathers (45.7%, n = 21) repositioned the iPad as many as 4 times (range: 1 to 4). See Table 56.

A single regression was conducted to examine the relationship between above theme for iPad sessions and age. The overall model for repositioning the device for own use was significant ($F_{(1, 23)}$ = 7.79, p < .02; R^2 = .253). A child's age was significantly related to the number of times a parent repositioned the device during the iPad session. As a child's age increase, parents repositioned the device for their own use more (β = .273, t = -2.79, p < .02). See Table 57 for complete summary.

Emotional Supports

Emotional supports were comprised of two themes 1) Emotional- Physical supports such as a hug, ruffling hair, kiss etc. and 2) Emotional-Verbal supports comments such as "You can do it", "You did it", "Great job" etc. There were no significant differences between mothers and fathers for either of the emotional supports during the easy session (highest $t_{(95)}$ = 1.21, p = .229 for emotional-verbal supports), the hard session (highest $t_{(94)}$ = 1.53, p = .130 for emotional-verbal supports) or the iPad session (highest $t_{(59)}$ = .266, p = .791 for emotional-physical supports). See Table 58.

The following two themes are based on the 134 parents (92 mothers and 42 fathers) for the easy software session, 136 parents (94 mothers and 42 fathers) for the hard software session and 150 parents (104 mothers and 46 fathers) for the iPad session.

Emotional-Physical Supports: Easy. Over a third (35.8%, n = 48) of parents provided an emotional-physical support. Instances of emotional-physical supports were observed as many as 8 times (*M* = 1.98, *SD* = 1.45). Although the mean number of observations did not differ between mothers (*M* = 1.97, *SD* = 1.22) and fathers (*M* = 2.00, *SD* = 1.84), mothers (33.7%, *n* = 31) provided as many as 5 emotional-physical supports (range: 1 to 5) whereas fathers (40.5%, *n* = 17) provided as many as 8 emotional-physical supports (range: 1 to 8). See Table 58.

Emotional-Physical Supports: Hard. Almost a third of parents (30.9%, *n* = 42) provided an emotional-physical support. Instances of emotional-physical supports were observed as many as 6 times (*M* = 2.12, *SD* = 1.38). The mean number of observations did not differ between mothers (*M* = 2.04, *SD* = 1.31) and fathers (*M* = 2.25, *SD* = 1.53). Mothers (27.7%, *n* = 26) provided as many as 5 emotional-physical supports (range: 1 to 5) whereas fathers (38.1%, *n* = 16) provided as many as 6 emotional-physical supports (range: 1 to 6). See Table 58.

Emotional-Physical Supports: iPad. Parents (40.7%, *n* = 61) provided an emotional-physical support. Instances of emotional-physical supports were observed as many as 10 times (*M* = 2.72, *SD* = 2.37). The mean number of observations did not differ between mothers (*M* = 2.67, *SD* = 2.41) and fathers (*M* = 2.84, *SD* = 2.34). Mothers (40.4%, *n* = 42) and fathers (41.3%, *n* = 19) provided as many as 10 emotional-physical supports (range: 1 to 10). See Table 58.

Emotional-Verbal Supports: Easy. More parents were likely to provide an emotional-verbal support than emotional-physical supports during the easy software session. Parents (72.4%, *n* = 97) provided an emotional-verbal supports as many as 15 times (*M* = 5.47, *SD* = 3.79). The mean number of observations did not differ between mothers (*M* = 5.19, *SD* = 3.77) and fathers (*M* = 6.22, *SD* = 3.79). Both mothers (76.1%, *n* = 70) and fathers (64.3%, *n* = 27) provided emotional-verbal supports as many as 15 times. See Table 58.

Emotional-Verbal Supports: Hard. More parents were likely to provide an emotional-verbal support than emotional-physical supports during the hard software session. Parents

(70.6%, *n* = 96) provided an emotional-verbal supports as many as 19 times (*M* = 5.22, *SD* = 3.88). Although the mean number of observations did not differ between mothers (*M* = 5.68, *SD* = 4.04) and fathers (*M* = 4.44, *SD* = 3.51), mothers (63.8%, *n* = 60) provided emotional-verbal supports as many as 19 times (range: 1 to 19) and fathers (85.7%, *n* = 36) provided emotional-verbal supports as many as 17 times (range: 1 to 17). See Table 58.

Emotional-Verbal Supports: iPad. More parents were likely to provide an emotional-verbal support than emotional-physical supports during the iPad session. Parents (82.7%, *n* = 124) provided an emotional-verbal supports as many as 33 times (*M* = 6.65, *SD* = 5.30). Although the mean number of observations did not differ between mothers (*M* = 6.71, *SD* = 4.73) and fathers (*M* = 6.50, *SD* = 6.48), mothers (82.7%, *n* = 86) provided emotional-verbal supports as many as 21 times (range: 1 to 21) whereas fathers (82.6%, *n* = 38) provided emotional-verbal supports as many as 33 times (range: 1 to 33). See Table 58.

Three multiple regressions were conducted to examine the relationship between the theme emotional-physical supports provided for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 59 for complete summary.

Three multiple regressions were conducted to examine the relationship between the theme emotional-verbal supports provided for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 59 for complete summary.

Examining Interactions: Scaffolds and Engagements

An exchange or an attempt at an exchange that warranted a response was categorized as an interaction. Both scaffolds and engagements were recorded when initiated by the parent or by the child. Interactions were categorized as either: 1) Scaffolds, which helped progress the game, or 2) Engagements, which incorporated game content. There were no significant differences between mothers and fathers and any of the overall interaction during the easy session (highest $t_{(87)}$ = .373, *p* = .710 for child asks for assistance), the hard session (highest $t_{(92)}$ = 1.06, *p* = .292 for child asks for assistance), or the iPad session (highest $t_{(141)}$ = 1.68, *p* = .095 for total parent scaffold).

Interactions between parents and children were examined. During the easy session, 95.5% of parent-child dyads (*n* = 128) exchanged interactions (*M* = 21.38, *SD* = 10.11; range 2 to 50), during the hard session 94.1% of parent-child dyads (*n* = 128) exchanged interactions (*M* = 21.70, *SD* = 10.64; range 2 to 43) and during the iPad session 97.3% of parent-child dyads (*n* = 146) exchanged interactions (*M* = 21.38, *SD* = 9.00; range 2 to 42). See Table 60.

The following interaction themes are based on the 128 parents (88 mothers and 40 fathers) for the easy game session, 128 parents (88 mothers and 40 fathers) for the hard game session and 146 parents (101 mothers and 45 fathers) for the iPad session.

Scaffolds

Scaffolds: Easy. The majority of parents (99.2%, *n* = 127) provided at least one scaffold. Instances of scaffold interactions were observed as many as 25 times. Although the mean number of observations for scaffolds did not differ between mothers *(M* = 7.98, *SD* = 4.72) and fathers (*M* = 7.85, *SD* = 3.69), mothers (98.9%, *n* = 87) provided assistance as many as 25 times (range: 1 to 25) whereas fathers (100%, *n* = 40) provided assistance as many as 16 times (range: 1 to 16).

A single regression was conducted to examine the relationship between the above theme for “overall scaffold interactions” provided and age. The overall model approached significance

($F_{(1, 123)}$ = 3.67, *p* = .058; R^2 = .029). A child's age was related to the number of scaffolds a parent provided. As a child's age increase, there was a trend for parents to provided fewer scaffold interactions (β = -.614, *t* = -21.92, *p* = .058). See Table 61 for complete summary.

When the parent initiated the scaffold the child responses were categorized into 1) Positive – child followed through; 2) Ignored – child ignored parents; 3) Negative – child went against the parent, said no or pushed the parent away.

The majority of parents (98.4%, *n* = 125) initiated a scaffold with the most common child response being a positive one such that the child followed through on the directions given. Instances of a positive response to a scaffold were observed as many as 20 times (*M* = 5.34, *SD* = 3.58). Although the mean number of observations for scaffolds did not differ between mothers (*M* = 5.43, *SD* = 3.81) and fathers (*M* = 5.15, *SD* = 3.07), mothers (97.7%, *n* = 84) provided assistance as many as 20 times (range: 1 to 20) whereas fathers (*n* = 39) provided assistance as many as 11 times (range: 1 to 11).

More than half of parents (54.3%, *n* = 69) had their child ignore the support they provided. Instances of an ignored scaffold were observed as many as 9 times (*M* = 1.71, *SD* = 1.19). Although the mean number of observations for scaffolds did not differ between mothers (*M* = 1.73, *SD* = 1.39) and fathers (*M* = 1.68, *SD* = .75), mothers (51.2%, *n* = 44) provided assistance that was ignored as many as 9 times (range: 1 to 9) whereas fathers (64.1%, *n* = 25) provided assistance that was ignored as many as 3 times (range: 1 to 3).

Fewer than a quarter (22.8%, *n* = 29) of parents provided a scaffold in which their child responded negatively. Instances of this were observed as many as 5 times (*M* = 1.48, *SD* = .99). Although the mean number of observations for scaffolds did not differ between mothers (*M* = 1.55, *SD* = 1.15) and fathers (*M* = 1.33, *SD* = .50), mothers (23.3%, *n* = 29) provided assistance that received a negative response as many as 5 times (range: 1 to 5) whereas fathers (23.1%, n = 9) provided assistance that received a negative response as many as 2 times (range: 1 to 2).

Three multiple regressions were conducted to examine the relationship between how children responded to scaffolds and age. The overall model for child responding positively was significant ($F_{(1, 121)} = 6.93$, $p < .02$; $R^2 = .054$). A child's age was significantly related to the number of times they responded to a scaffold during the easy session. As a child's age increase, parents provided fewer scaffolds that the child responded positively towards ($\beta = -.719$, $t = -2.63$, $p < .02$). The overall models for ignored and negative responses were not significant. See Table 61 for complete summary.

Parents' scaffolds were also coded where the child asked for assistance. Parents (68.5%, n = 87) encountered at least one situation where they scaffolded after the child had asked for assistance. Instances of a child requesting assistance followed by a parent providing supports was observed as many as 7 times (M = 2.18, SD = 1.28). The mean number of observations did not differ between mothers (M = 2.18, SD = 1.30) and fathers (M = 2.19, SD = 1.27). Mothers (70%, n = 60) provided assistance after a request as many as 6 times (range: 1 to 6) whereas fathers (69.2%, n = 27) provided assistance after a request as many as 7 times (range: 1 to 7).

A single regression was conducted to examine the relationship between instances where a scaffold was provided when a child asked for assistance and age. The overall model was not significant ($F_{(1, 85)} = .142$, $p = .707$; $R^2 = .002$). A child's age was not significantly related to the number of times they were provided with a scaffold after having asked for assistance ($\beta = .045$, $t = .377$, $p = .707$). See Table 62 for complete summary.

Few instances were observed of parents (14.2%, n = 18) providing the answer after attempting to provide supports. Parents provided the answer as many as 3 times (M = 1.17, SD =

.52). Mothers (12.6%, n = 11) provided the answer after an attempt to support only once whereas fathers (17.5%, n = 7) provided the answer after an attempt to support as many as 3 times (range: 1 to 3; M = 1.43, SD = .79).

A single regression was conducted to examine the relationship between parents providing the answer after attempting to scaffold and age. The overall model was not significant ($F_{(1, 16)}$ = .001, p = .972; R^2 = .001). A child's age was not significantly related to the number of times parents provided the answer after scaffolding (β = .004, t = .036, p = .972). See Table 61 for complete summary.

Two additional parental responses were observed when the child requested assistance. When asked for assistance, parents 1) simply gave the child the answer and/or 2) did not provide supports or ignored the child. These were observed far less often. Parents (7.03%, n = 9) gave the answer as many as 2 times (M = 1.11, SD = .33). Mothers (11.3%, n = 7) "provided the answer without an attempt to support" as many as 2 times (range: 1 to 2; M = 1.14, SD = .38) whereas fathers (7.4%, n = 2) "provided the answer without an attempt to support" only once. Parents (13.3%, n = 17) did not assist their child as many as two times (M = 1.12, SD = .33). Mothers (22.6%, n = 14) "provided the answer without an attempt to support" as many as 2 times (range: 1 to 2; M = 1.14, SD = .36) whereas fathers (11.1%, n = 3) "provided the answer without an attempt to support" only once.

Two multiple regressions were conducted to examine the relationship between how parents responded to a child's request for assistance and age. The overall models for providing the answer ($F_{(1, 7)}$ = .708, p = .428; R^2 = .092) and providing no assistance ($F_{(1, 15)}$ = 1.78, p = .202; R^2 = .106) were not significant. See Table 62 for complete summary.

Further examination of the data explored if a single support or if multiple supports were need during a specific scaffolded interaction. The majority of parents (99.21%, *n* = 126) produced as many as 20 single supports (*M* = 6.67, *SD* = 3.51) while 60.6% of parents (*n* = 77) produced as many as 8 multiple supports (*M* = 2.21, *SD* = 1.60). Although the mean number of observations for single supports did not differ between mothers (*M* = 6.71, *SD* = 3.78) and fathers (*M* = 6.58, *SD* = 2.91), nearly all mothers (98.9%, *n* = 86) provided single supports as many as 20 times (range: 1 to 20) whereas all fathers (*n* = 40) provided single supports as many as 13 times (range: 1 to 13). Multiple supports provided were similar between mothers (*M* = 2.29, *SD* = 1.67) and fathers (*M* = 2.04, *SD* = 1.46). Mothers (59.7%, *n* = 52) provided single supports as many as 20 times (range: 1 to 20) whereas fathers (62.5%, *n* = 25) provided single supports as many as 13 times (range: 1 to 13). See Table 63.

Two multiple regressions were conducted to examine the relationship between providing single or multiple supports needed and age. The overall models for having to provide a single step support ($F_{(1, 124)}$ = .836, *p* = .362; R^2 = .007) and having to provide multiple supports ($F_{(1, 75)}$ = .875, *p* = .353; R^2 = .012) were not significant. See Table 61 for complete summary.

Scaffolds: Hard. The majority of parents (97.7%, *n* = 125) provided at least one scaffold. Instances of scaffold interactions were observed as many as 27 times (*M* = 10.47, *SD* = 5.85). Although the mean number of observations for scaffolds did not differ between mothers *(M* = 10.22, *SD* = 6.34) and fathers (*M* = 11.03, *SD* = 4.62), mothers (97.7%, *n* = 86) provided assistance as many as 27 times (range: 1 to 27) whereas fathers (97.5%, *n* = 39) provided assistance as many as 21 times (range: 2 to 21).

A single regression was conducted to examine the relationship between the above theme for “overall scaffold interactions provided” and age. The overall model was significant ($F_{(1, 123)}$ =

4.36, $p = .04$; $R^2 = .034$). A child's age was significantly related to the number of scaffolds a parent provided. As a child's age increase, parents provided fewer scaffolded interactions ($\beta = -.829$, $t = -2.09$, $p < .04$). See Table 64 for complete summary.

Similar to the easy session, when the parent initiated the scaffold child responds were categorized into 1) Positive – child followed through; 2) Ignored – child ignored parents; 3) Negative – child went against the parent, said no or pushed the parent away.

The majority of parents (95.2%, $n = 119$) initiated a scaffold with the most common child response being a positive one such that the child followed through on the directions given. Instances of a positive response to a scaffold were observed as many as 23 times ($M = 6.87$, $SD = 4.34$). Although the mean number of observations for scaffolds did not differ between mothers ($M = 6.84$, $SD = 4.66$) and fathers ($M = 6.92$, $SD = 3.64$), mothers (93%, $n = 80$) provided assistance as many as 23 times (range: 1 to 23) whereas all fathers ($n = 39$) provided assistance as many as 17 times (range: 1 to 17).

More than half of parents (61.6%, $n = 77$) had their child ignore the support they provided. Instances of an ignored scaffold were observed as many as 8 times ($M = 2.35$, $SD = 1.49$). Although the mean number of observations for scaffolds did not differ between mothers ($M = 2.28$, $SD = 1.52$) and fathers ($M = 2.50$, $SD = 1.45$), mothers (59.3%, $n = 51$) provided assistance that was ignored as many as 8 times (range: 1 to 8) whereas fathers (66.7%, $n = 26$) provided assistance that was ignored as many as 6 times (range: 1 to 6).

Parents (29.6%, $n = 37$) provided a scaffold to which their child responded negatively. Instances of this were observed as many as 6 times ($M = 1.65$, $SD = 1.11$). Although the mean number of observations for scaffolds did not differ between mothers ($M = 1.65$, $SD = 1.16$) and fathers ($M = 1.64$, $SD = 1.02$), mothers (30.2%, $n = 26$) provided assistance that received a negative response as many as 6 times (range: 1 to 6) whereas fathers (28.2%, n = 11) provided assistance that received a negative response as many as 4 times (range: 1 to 4).

Three multiple regressions were conducted to examine the relationship between how children responded to scaffolds and age. The overall model for child responding positively was significant ($F_{(1, 117)} = 4.57$, $p < .04$; $R^2 = .038$). A child's age was significantly related to the number of times they responded to a scaffold during the hard session. As a child's age increase, parents provided fewer scaffolds that the child responded positively towards ($\beta = -.740$, $t = -2.14$, $p < .04$). The overall models for ignored and negative responses were not significant. See Table 64 for complete summary.

Parents' scaffolds were also coded where the child asked for assistance. Parents (72%, n = 90) encountered at least one situation where they scaffolded after the child had asked for assistance. Instances of a child requesting assistant followed by a parent providing supports was observed as many as 12 times (M = 2.78, SD = 2.14). Although the mean number of observations did not differ between mothers (M = 2.88, SD = 2.30) and fathers (M = 2.57, SD = 1.79), mothers (69.8%, n = 60) provided assistance after a request as many as 12 times (range: 1 to 12) whereas fathers (76.9%, n = 30) provided assistance after a request as many as 9 times (range: 1 to 9).

A single regression analysis was conducted to examine the relationship between instances where a scaffold was provided when a child asked for assistance and age. The overall model was not significant ($F_{(1, 88)} = .987$, $p = .323$; $R^2 = .011$). A child's age was not significantly related to the number of times they were provided with a scaffold after having asked for assistance ($\beta = .206$, $t = .994$, $p = .323$). See Table 65 for complete summary.

Few instances were observed of parents (30.4%, n = 38) providing the answer after attempting to provide supports. Parents provided the answer as many as 8 times (M = 1.92, SD =

1.70). Although the mean number of observations did not differ between mothers (*M* = 2.13, *SD* = 1.87) and fathers (*M* = 1.60, *SD* = 1.40), mothers (26.7, *n* = 23) provided the answer after an attempt to support as many as 8 times (range: 1 to 8) whereas fathers (38.5%, *n* = 15) provided the answer after an attempt to support as many as 5 times (range: 1 to 5).

A single regression was conducted to examine the relationship between parents providing the answer after attempting to scaffold and age. The overall model was not significant ($F_{(1, 36)}$ = 2.13, *p* = .153; R^2 = .056). A child's age was not significantly related to the number of times parents provided the answer after scaffolding (β = -.347, *t* = -1.46, *p* = .153). See Table 64 for complete summary.

Two additional parental responses were observed when the child requested assistance. When asked for assistance parents 1) simply gave the child the answer and/or 2) did not provide supports or ignored the child. These were observed far less often. Parents (9.6%, *n* = 9) gave the answer as many as 8 times (*M* = 2.11, *SD* = 2.26). Mothers (11.3%, *n* = 7) gave the answer when asked for assistance as many as 8 times (range: 1 to 8; (*M* = 2.43, *SD* = 2.51) while fathers (6.3%, *n* = 2) gave the answer when asked for assistance only once. Parents (24.5%, *n* = 23) provided did not assist their child as many as 4 times (*M* = 1.30, *SD* = .70). Although the mean number of observations did not differ between mothers (*M* = 1.40, *SD* = .83) and fathers (*M* = 1.13, *SD* = .35), mothers (24.2%, *n* = 15) provided no help as many as 4 times (range: 1 to 4) whereas fathers (25%, *n* = 8) provided no help as many as 2 times (range: 1 to 2).

Two multiple regressions were conducted to examine the relationship between how parents responded to a child's request for assistance and age. The overall model for providing the answer ($F_{(1, 7)}$ = .074, *p* = .793; R^2 = .011) and providing no assistance ($F_{(1, 21)}$ = .559, *p* = .463; R^2 = .026) were not significant. See Table 65 for complete summary.

Further examination of the data explored if a single support or if multiple supports were need during a specific scaffolded interaction. The majority of parents (97.6%, n = 122) produced as many as 21 single supports (M = 7.80, SD = 4.37) while 85.6% of parents (n = 107) produced as many as 11 multiple supports (M = 3.18, SD = 2.18). Although the mean number of observations for single supports did not differ between mothers (M = 7.73, SD = 4.78) and fathers (M = 7.97, SD = 3.33), nearly all mothers (97.7%, n = 84) provided single supports as many as 21 times (range: 1 to 21) whereas nearly all fathers (n = 38) provided single supports as many as 16 times (range: 1 to 16). Although the mean number of observations for multiple supports did not differ between mothers (M = 3.24, SD = 2.21) and fathers (M = 3.06, SD = 2.14), mothers (82.6%, n = 71) provided multiple supports as many as 9 times (range: 1 to 9) whereas fathers (92.3%, n = 36) provided multiple supports as many as 11 times (range: 1 to 11). See Table 63.

Two multiple regressions were conducted to examine the relationship between providing single or multiple supports needed and age. The overall model for having to provide a single step support was not significant ($F_{(1, 120)}$ = 1.23, p = .270; R^2 = .010). The overall model for having to provide multiple supports within a single interaction was significant ($F_{(1, 105)}$ = 5.47, p < .03; R^2 = .049) was significant. A child's age was significantly related to the number of multiple supports during the hard session. As a child's age increase, parents provided fewer multiple supports during a single interaction (β = -.424, t = -2.34, p < .03). The overall models for ignored and negative responses were not significant. See Table 64 for complete summary.

Scaffolds: iPad. The majority of parents (98.6%, n = 144) provided at least one scaffold. Instances of scaffold interactions were observed as many as 22 times (M = 9.13, SD = 5.09). Although the mean number of observations for scaffolds did not differ between mothers *(M* =

9.64, *SD* = 5.14) and fathers (*M* = 8.02, *SD* = 4.86), mothers (98%, *n* = 99) provided assistance as many as 22 times (range: 1 to 22) whereas all fathers (*n* = 40) provided assistance as many as 20 times (range: 1 to 20).

A single regression was conducted to examine the relationship between above theme for overall scaffold interactions provided and age. The overall model was significant ($F_{(1,\ 141)}$ = 20.31, $p < .001$; $R^2 = .126$). A child's age was significantly related to the number of scaffolds a parent provided. As a child's age increase, parents provided fewer scaffolded interactions ($\beta = -1.41$, $t = -4.51$, $p < .001$). See Table 66 for complete summary.

When the parent initiated a scaffold the child responses were categorized into 1) Positive – child followed through; 2) Ignored – child ignored parents; 3) Negative – child went against the parent, said no or pushed the parent away.

The majority of parents (97.2%, *n* = 140) initiated a scaffold with the most common child response being a positive one such that the child followed through on the directions given. Instances of a positive response to a scaffold were observed as many as 16 times (*M* = 5.98, *SD* = 3.63). The mean number of observations for scaffolds did not differ between mothers (*M* = 5.98, *SD* = 3.63) and fathers (*M* = 6.42, *SD* = 3.62). Mothers (97%, *n* = 96) and fathers (97.8%, *n* = 44) provided assistance as many as 16 times (range: 1 to 16).

Parents (70.1%, *n* = 101) had their child ignore the support they provided. Instances of an ignored scaffold were observed as many as 10 times (*M* = 2.72, *SD* = 2.25). Although the mean number of observations for scaffolds did not differ between mothers (*M* = 2.81, *SD* = 2.37) and fathers (*M* = 2.52, *SD* = 1.98), mothers (70.7%, *n* = 70) provided assistance that was ignored as many as 10 times (range: 1 to 10) whereas fathers (68.9%, *n* = 31) provided assistance that was ignored as many as 8 times (range: 1 to 8).

Parents (36.8%, *n* = 53) provided a scaffold to which their child responded negatively. Instances of this were observed as many as 5 times (*M* = 1.49, *SD* = .93). Although the mean number of observations for scaffolds did not differ between mothers (*M* = 1.46, *SD* = .79) and fathers (*M* = 1.57, *SD* = 1.28), mothers (39.4%, *n* = 39) provided assistance that received a negative response as many as 4 times (range: 1 to 4) whereas fathers (31.1%, *n* = 14) provided assistance that received a negative response as many as 5 times (range: 1 to 5).

Three multiple regressions were conducted to examine the relationship between how children responded to scaffolds and age. The overall model for child responding positively was significant ($F_{(1, 138)} = 21.86$, $p < .001$; $R^2 = .137$). A child's age was significantly related to the number of times they responded to a scaffold during the iPad session. With increasing age of the child there were fewer parent scaffolds that received a positive response from the child (β = -1.08, *t* = -4.68, *p* < .001). The overall models for ignored and negative responses were not significant. See Table 66 for complete summary.

Parents' scaffolds were also coded where the child asked for assistance. Parents (42.4%, *n* = 61) encountered at least one situation where they scaffolded after the child had asked for assistance. Instances of a child requesting assistant followed by a parent providing supports was observed as many as 6 times (*M* = 2.03, *SD* = 1.25). The mean number of observations did not differ between mothers (*M* = 2.00, *SD* = 1.21) and fathers (*M* = 2.11, *SD* = 1.37). Mothers (42.4%, *n* = 42) provided assistance after a request as many as 6 times (range: 1 to 6) whereas fathers (42.2%, *n* = 19) provided assistance after a request as many as 5 times (range: 1 to 5).

A single regression analysis was conducted to examine the relationship between instances where a scaffold was provided when a child asked for assistance and age. The overall model was not significant ($F_{(1, 59)} = .001$, $p = .970$; $R^2 = .001$). A child's age was not significantly related to the number of times they were provided with a scaffold after having asked for assistance (β = .005, *t* = .038, *p* = .970). See Table 67 for complete summary.

Few instances were observed of parents (32.6%, *n* = 47) providing the answer after attempting to provide supports. Parents provided the answer as many as 5 times (*M* = 1.55, *SD* = 1.00). The mean number of observations did not differ between mothers (*M* = 1.49, *SD* = 1.01) and fathers (*M* = 1.75, *SD* = .97). Mothers (35.4%, *n* = 35) provided the answer after an attempt to support as many as 5 times (range: 1 to 5) whereas fathers (26.7%, *n* = 12) provided the answer after an attempt to support as many as 5 times (range: 1 to 5).

A single regression analysis was conducted to examine the relationship between parents providing the answer after attempting to scaffold and age. The overall model was not significant ($F_{(1, 45)}$ = .064, *p* = .801; R^2 = .001). A child's age was not significantly related to the number of times parents provided the answer after scaffolding (β = .034, *t* = .253, *p* = .801). See Table 66 for complete summary.

Two additional parental responses were observed when the child requested assistance. When asked for assistance parents 1) simply gave the child the answer and/or 2) did not provide supports or ignored the child. These were observed far less often. Parents (16.9%, *n* = 13) gave the answer as many as 2 times (*M* = 1.08, *SD* = .28). Mothers (18.5%, *n* = 10) gave the answer when asked for assistance as many as 2 times (range: 1 to 2; *M* = 1.10, *SD* = .32) while fathers (13%, *n* = 3) gave the answer when asked for assistance only once. Parents (27.3%, *n* = 21) did not assist their child as many as 3 times (*M* = 1.33, *SD* = .66). The mean number of observations did not differ between mothers (*M* = 1.43, *SD* = .76) and fathers (*M* = 1.14, *SD* = .38). Mothers (25.9%, *n* = 14) provided no help as many as 3 times (range: 1 to 3) whereas fathers (30.4%, *n* = 7) provided no help as many as 2 times (range: 1 to 2).

Two multiple regressions were conducted to examine the relationship between how parents responded to a child's request for assistance and age. The overall models for providing the answer ($F_{(1, 11)}$ = .349, p = .567; R^2 = .031) and providing no assistance ($F_{(1, 19)}$ = 1.06, p = .3152; R^2 = .053) were not significant. See Table 67 for complete summary.

Further examination of the data explored if a single support or if multiple supports were need during a specific scaffolded interaction. The majority of parents (98.6%, n = 142) of parents produced as many as 18 single supports (M = 6.79, SD = 4.00) while 79.2% of parents (n = 114) produced as many as 10 multiple supports (M = 3.10, SD = 2.03). Although the mean number of observations for single supports did not differ between mothers (M = 7.18, SD = 4.01) and fathers (M = 5.96, SD = 3.91), nearly all mothers (98%, n = 97) provided single supports as many as 18 times (range: 1 to 18) whereas all fathers (n = 45) provided single supports as many as 15 times (range: 1 to 15). The mean number of observations for multiple supports did not differ between mothers (M = 3.36, SD = 1.99) and fathers (M = 2.54, SD = 2.02). Mothers (77.8%, n = 77) provided multiple supports as many as 9 times (range: 1 to 9) whereas fathers (82.2%, n = 37) provided multiple supports as many as 10 times (range: 1 to 10). See Table 63.

Two multiple regressions were conducted to examine the relationship between providing single or multiple supports needed and age. The overall models for having to provide a single step support ($F_{(1, 142)}$ = 4.99, p < .03; R^2 = .034) and having to provide multiple supports ($F_{(1, 141)}$ = 26.34, p < .001; R^2 = .157) were significant. A child's age was significantly related to the number of single supports and multiple supports provided during a single interaction. As a child's age increase, parents provided fewer single supports (β = -.594, t = -2.23, p < .03) and multiple supports (β = -.691, t = -5.13, p < .001). See Table 66 for complete summary.

Engagements

Two further interactions were coded examining the engagements initiated by the parent or the child. Responses were categorized in one of three themes 1) Positive – the parent/child responded; 2) Ignore – the parent/child ignored the engagement; and 3) Unobservable – parent/child's response was not visible. Within each of these themes responses were separated based on whether the interaction added value or not. For example, parents took additional opportunities in an attempt to teach or expand their child's knowledge and experience. In case of the child initiated engagements, the child asked relevant questions that expanded their knowledge such as "What bug is that?" or "Why does the computer keep saying that?" or made comments that expanded the experience. Responses to engagements were examined through these relevant and irrelevant themes (e.g., parent and child laugh at a silly sound that either the parent or child generated that was not relevant to the game).

Parent Initiated Engagement: Easy. Almost all (98.4%) parents (*n* = 126) initiated an engagement. Instances of parent-initiated engagements were observed as many as 27 times (*M* = 9.83, *SD* = 5.76). Although the mean number of observations did not differ between mothers (*M* = 9.87, *SD* = 6.22) and fathers (*M* = 9.74, *SD* = 4.65), mothers (98.9%, *n* = 87) initiated an engagement as many as 27 times (range: 1 to 27) whereas fathers (97.5%, *n* = 39) initiated an engagement as many as 19 times (range: 1 to 19).

Overall, in 96% of sessions (*n* = 121) where the parent initiated an engagement, the child responded positively. Instances of these behaviours were observed as many as 18 times (*M* = 6.54, *SD* = 4.02). Although the mean number of observations did not differ as mothers (*M* = 6.51, *SD* = 4.22) and fathers (*M* = 6.61, *SD* = 3.58) were equally likely to receive a response from their children. Mothers (95.4%, $n = 83$) received a response as many as 18 times (range: 1 to 18) whereas fathers (97.4%, $n = 38$) received a response as many as 15 times (range: 1 to 15).

In contrast, in 88.9% of sessions ($n = 112$) where the parent engaged the child, the child ignored the engagement as many as 13 times ($M = 3.97$, $SD = 2.92$). The mean number of observations did not differ as mothers ($M = 4.06$, $SD = 2.96$) and fathers ($M = 3.77$, $SD = 2.86$) were equally likely to be ignored by their children. Mothers (89.7%, $n = 78$) were ignored as many as 13 times (range: 1 to 13) whereas fathers (87.2%, $n = 34$) were ignored as many as 11 times (range: 1 to 11).

Three multiple regressions were conducted to examine the relationship between parent-initiated engagements and age. The overall models for total parent-initiated engagements ($F_{(1, 124)} = 1.51$, $p = .221$; $R^2 = .012$) and total parent engagements where the child responded ($F_{(1, 119)} = 1.29$, $p = .258$; $R^2 = .011$) were not significant. The overall model for total parent engagements where the child ignored the parent ($F_{(1, 110)} = 7.01$, $p < .01$; $R^2 = .060$)was significant. A child's age was significantly related to the number of times they ignored a parent's engagement. As a child's age increase, children tended to ignore their parents more ($\beta = .599$, $t = 2.65$, $p < .01$). See Table 68 for complete summary.

Relevant Engagements. Nearly all parents (99.2%, $n = 125$) initiated a relevant engagement. Instances of relevant engagements were observed as many as 18 times ($M = 6.31$, $SD = 3.71$). Although the mean number of observations for relevant engagements did not differ between mothers ($M = 6.14$, $SD = 3.98$) and fathers ($M = 6.69$, $SD = 3.02$), mothers (88.9%, $n = 86$) provided relevant engagements as many as 18 times (range: 1 to 18) while all fathers ($n = 39$) provided relevant engagements as many as 11 times (range: 1 to 11).

Of these, parents (98.3%, *n* = 119) initiated a relevant engagement to which the child responded. Instances of these observations occurred as many of 16 times (*M* = 4.45, *SD* = 2.80). The mean number of observations did not differ as mothers (*M* = 4.38, *SD* = 3.03) and fathers (*M* = 4.58, *SD* = 2.27) were equally likely to receive a response from their children. Mothers (97.6%, *n* = 81) received a response as many as 16 times (range: 1 to 16) whereas all fathers (*n* = 38) received a response as many as 11 times (range: 1 to 11).

In contrast, in 89.3% of sessions (*n* = 100) the child ignored the relevant engagement as many as 8 times (*M* = 2.57, *SD* = 1.83). Although the mean number of observations did not differ as mothers (*M* = 2.44, *SD* = 1.77) and fathers (*M* = 2.87, *SD* = 1.96) were likely to be ignored by their children. Mothers (89.7%, *n* = 70) were ignored as many as 8 times (range: 1 to 8) whereas fathers (88.2%, *n* = 30) were ignored as many as 7 times (range: 1 to 7).

Three multiple regressions were conducted to examine the relationship between relevant parent-initiated engagements and age. The overall models for total relevant parent-initiated engagements ($F_{(1,\ 123)}$ = .253, p = .616; R^2 = .002) and relevant parent engagements where the child responded ($F_{(1,\ 117)}$ = 2.39, p = .125; R^2 = .02) were not significant. The overall model for relevant parent engagements where the child ignored the parent ($F_{(1,\ 98)}$ = 4.72, p < .04; R^2 = .046) was significant. A child's age was significantly related to the number of times they ignored a parent's relevant engagement. As a child's age increase, they more often ignored a relevant engagement from their parent (β = .319, t = 2.17, p < .04). See Table 68 for complete summary.

Irrelevant Engagements. Parents (84.1%, *n* = 106) initiated an irrelevant engagement. Instances of irrelevant engagements were observed as many as 17 times (*M* = 4.25, *SD* = 2.94). Although the mean number of observations for irrelevant engagements did not differ between mothers (*M* = 4.41, *SD* = 3.16) and fathers (*M* = 3.84, *SD* = 2.33), mothers (86.2%, *n* = 75) provided irrelevant engagements as many as 17 times (range: 1 to 17) whereas, fathers (79.5%, n = 31) provided irrelevant engagements as many as 9 times (range: 1 to 9).

Of these, parents (72.7%, n = 88) initiated an irrelevant engagement in which the child responded. Instances of these observations occurred as many of 8 times (M = 2.98, SD = 1.81). Although the mean number of observations for irrelevant engagements did not differ between mothers (M = 2.94, SD = 1.80) and fathers (M = 3.08, SD = 1.87), mothers (75.9%, n = 63) provided irrelevant engagements in which their child responded as many as 8 times (range: 1 to 8) whereas fathers (65.8%, n = 25) provided irrelevant engagements in which their child responded as many as 7 times (range: 1 to 7).

In contrast, in 73.2% of sessions (n = 82) the child ignored the irrelevant engagement as many as 9 times (M = 2.29, SD = 1.69). Although the mean number of observations for ignored irrelevant engagements did not differ between mothers (M = 2.47, SD = 1.83) and fathers (M = 1.83, SD = 1.15), mothers (75.6%, n = 59) provided irrelevant engagements which was ignored as many as 9 times (range: 1 to 9) while fathers (67.6%, n = 23) provided irrelevant engagements that their child responded to as many as 6 times (range: 1 to 6).

Three multiple regressions were conducted to examine the relationship between irrelevant parent-initiated engagements and age. The overall models for total irrelevant parent-initiated engagements ($F_{(1, 104)}$ = 2.05, p = .156; R^2 = .019) and irrelevant parent engagements where the child responded ($F_{(1, 86)}$ = .230, p = .633; R^2 = .003) were not significant. The overall model for irrelevant parent engagements where the child ignored the parent was significant ($F_{(1, 80)}$ = 4.98, p < .03; R^2 = .059). A child's age was significantly related to the number of times they ignored a parent's irrelevant engagement. As a child's age increase, they more often ignored an irrelevant engagement from their parent (β = .348, t = 2.23, p < .03). See Table 68 for complete summary.

In three cases the parent initiated one relevant engagement; however, the child's response could not be observed. See Table 69.

Parent Initiated Engagement: Hard. Nearly all (93%) parents (*n* = 119) initiated an engagement. Instances of parent-initiated engagements were observed as many as 25 times (*M* = 7.97, *SD* = 4.90). Although the mean number of observations did not differ between mothers (*M* = 8.06, *SD* = 5.39) and fathers (*M* = 7.80, *SD* = 3.75), mothers (90.9%, *n* = 80) initiated an engagement as many as 25 times (range: 1 to 25) whereas fathers (97.5%, *n* = 39) initiated an engagement as many as 16 times (range: 1 to 16).

Overall, in 94.1% of sessions (*n* = 112) where the parent engaged, the child responded positively. Instances of these behaviours were observed as many as 15 times (*M* = 5.50, *SD* = 3.42). Although the mean number of observations did not differ as mothers (*M* = 5.36, *SD* = 3.72) and fathers (*M* = 5.81, *SD* = 2.71) were equally likely to receive a response from their children, mothers (95%, *n* = 76) received a response as many as 15 times (range: 1 to 15) whereas fathers (92.3%, *n* = 36) received a response as many as 11 times (range: 1 to 11).

In contrast, in 83.2% of sessions (*n* = 99) where the parent engaged the child, the child ignored the engagement as many as 14 times (*M* = 3.33, *SD* = 2.57). Although the mean number of observations did not differ as mothers (*M* = 3.46, *SD* = 2.83) and fathers (*M* = 3.06, *SD* = 1.91) were equally likely to be ignored by their children, mothers (85%, *n* = 68) were ignored as many as 14 times (range: 1 to 14) whereas fathers (79.5%, *n* = 31) were ignored as many as 8 times (range: 1 to 8).

Three multiple regressions were conducted to examine the relationship between parent-initiated engagements and age. The overall models for total parent-initiated engagements ($F_{(1, 117)} = 7.71$, $p < .007$; $R^2 = .062$) and total parent engagements where the child responded ($F_{(1, 110)}$ =

7.35, $p < .009$; $R^2 = .063$) were significant. A child's age was significantly related to the number of times a parent initiated an engagement and to the number of times children responded to a parent's engagement. As a child's age increase, parents initiated more engagements ($\beta = .757$, $t = 2.71$, $p < .009$) and children tended to respond to their parents ($\beta = 1.06$, $t = 2.78$, $p < .007$). There was a trend towards significance for the overall model for total parent engagements where the child ignored the parent ($F_{(1, 97)} = 3.86$, $p = .052$; $R^2 = .038$). As a child's age increases, children tended to ignore their parents more ($\beta = .423$, $t = 1.96$, $p = .052$). See Table 70 for complete summary.

Relevant Engagements. Nearly all parents (96.6%, $n = 115$) initiated a relevant engagement. Instances of relevant engagements were observed as many as 14 times ($M = 4.53$, $SD = 2.77$). Although the mean number of observations for relevant engagements did not differ between mothers ($M = 4.58$, $SD = 2.99$) and fathers ($M = 4.42$, $SD = 2.29$), mothers (96.3%, $n = 77$) provided relevant engagements as many as 14 times (range: 1 to 14) while nearly all fathers (97.4%, $n = 38$) provided relevant engagements as many as 8 times (range: 1 to 8).

Of these, parents (96.4%, $n = 108$) initiated a relevant engagement in which the child responded. Instances of these observations occurred as many of 11 times ($M = 3.47$, $SD = 2.10$). Although the mean number of observations for relevant engagements did not differ between mothers ($M = 3.41$, $SD = 2.18$) and fathers ($M = 3.60$, $SD = 1.93$), mothers (96.1%, $n = 73$) provided relevant engagements in which their child responded as many as 11 times (range: 1 to 11) whereas fathers (89.7%, $n = 35$) provided relevant engagements in which their child responded as many as 7 times (range: 1 to 7).

In contrast, in 70.7% of sessions ($n = 70$) the child ignored the relevant engagement as many as 5 times ($M = 2.04$, $SD = 1.30$). Although the mean number of observations for ignored relevant engagements did not differ between mothers (*M* = 2.20, *SD* = 1.44) and fathers (*M* = 1.75, *SD* = .94), mothers (67.6%, *n* = 46) provided relevant engagements in which their child ignored as many as 5 times (range: 1 to 5) while all fathers (77.4%, *n* = 24) provided relevant engagements in which their child ignored as many as 4 times (range: 1 to 4).

Three multiple regressions were conducted to examine the relationship between relevant parent-initiated engagements and age. The overall models for total relevant parent-initiated engagements ($F_{(1, 113)}$ = .1.42, *p* = .236; R^2 = .012) and relevant parent engagements where the child responded ($F_{(1, 106)}$ = .570, *p* = .452; R^2 = .005) were not significant. The overall model for relevant parent engagements where the child ignored the parent ($F_{(1, 68)}$ = 7.54, *p* < .009; R^2 = .100) was significant. A child's age was significantly related to the number of times they ignored a parent's relevant engagement. As a child's age increase, they more often ignored a relevant engagement from their parent (β = .333, *t* = 2.75, *p* < .009). See Table 70 for complete summary.

Irrelevant Engagements. Parents (84.9%, *n* = 101) initiated an irrelevant engagement. Instances of irrelevant engagements were observed as many as 15 times (*M* = 4.24, *SD* = 3.19). Although the mean number of observations for irrelevant engagements did not differ between mothers (*M* = 4.29, *SD* = 3.35) and fathers (*M* = 4.12, *SD* = 2.89), mothers (85%, *n* = 68) provided irrelevant engagements as many as 15 times (range: 1 to 15) whereas, fathers (84.6%, *n* = 33) provided irrelevant engagements as many as 12 times (range: 1 to 12).

Of these, parents (71.4%, *n* = 80) initiated an irrelevant engagement in which the child responded. Instances of these observations occurred as many of 10 times (*M* = 3.01, *SD* = 2.28). Although the mean number of observations for irrelevant engagements in which the child responded did not differ between mothers (*M* = 3.04, *SD* = 2.40) and fathers (*M* = 2.96, *SD* = 2.06), mothers (68.4%, *n* = 52) provided irrelevant engagements that their child responded to as many as 10 times (range: 1 to 10) while fathers (77.8%, *n* = 28) provided irrelevant engagements that their child responded to as many as 9 times (range: 1 to 9).

In contrast, in 78.8% of sessions (*n* = 78) the child ignored the irrelevant engagement as many as 9 times (*M* = 2.40, *SD* = 1.81). Although the mean number of observations for ignored irrelevant engagements did not differ between mothers (*M* = 2.53, *SD* = 1.91) and fathers (*M* = 2.12, *SD* = 1.59), mothers (77.9%, *n* = 53) provided irrelevant engagements which was ignored as many as 9 times (range: 1 to 9) while fathers (80.6%, *n* = 25) provided irrelevant engagements that their child responded to as many as 8 times (range: 1 to 8).

Three multiple regressions were conducted to examine the relationship between irrelevant parent-initiated engagements and age. The overall models for total irrelevant parent-initiated engagements ($F_{(1, 99)} = 9.09$, $p < .004$; $R^2 = .084$) and irrelevant parent engagements where the child responded ($F_{(1, 78)} = 7.23$, $p < .01$; $R^2 = .085$) were significant. A child's age was significantly related to the total number of times a parent initiated an irrelevant engagement and the number of irrelevant engagements to which the child responded. As a child's age increase, they more often were provided with an irrelevant engagement ($\beta = .814$, $t = 3.02$, $p < .004$) and more often responded an irrelevant engagement from their parent ($\beta = .625$, $t = 2.69$, $p < .01$). The overall model for irrelevant parent engagements where the child ignored the parent was not significant ($F_{(1, 76)} = 1.23$, $p = .272$; $R^2 = .016$). See Table 70 for complete summary.

In two cases the parent initiated relevant engagements; however, the child's response could not be observed as many as two times (*M* = 1.50, *SD* = .71). See Table 69.

Parent Initiated Engagement: iPad. Nearly all (96.6%) parents (*n* = 141) initiated an engagement. Instances of parent-initiated engagements were observed as many as 22 times (*M* = 9.06, *SD* = 4.83). The mean number of observations did not differ between mothers (*M* = 8.94, *SD* = 4.47) and fathers (*M* = 9.32, *SD* = 5.60). Mothers (96%, *n* = 97) initiated an engagement as many as 22 times (range: 2 to 22) whereas fathers (97.8%, *n* = 44) initiated an engagement as many as 22 times (range: 1 to 22).

Overall, in 97.9% of sessions (*n* = 138) where the parent engaged the child responded positively. Instances of these behaviours were observed as many as 19 times (*M* = 5.42, *SD* = 3.56). Although the mean number of observations did not differ as mothers (*M* = 5.23, *SD* = 3.20) and fathers (*M* = 5.88, *SD* = 4.31) were equally likely to receive a response from their children, all mothers (*n* = 97) received a response as many as 16 times (range: 1 to 16) whereas fathers (93.2%, *n* = 41) received a response as many as 19 times (range: 1 to 19).

In contrast, in 90% of sessions (*n* = 127) where the parent engaged the child, the child ignored the engagement as many as 13 times (*M* = 4.13, *SD* = 2.88). Although the mean number of observations did not differ as mothers (*M* = 4.02, *SD* = 2.82) and fathers (*M* = 4.37, *SD* = 3.05) were equally likely to be ignored by their children, mothers (91.8%, *n* = 89) were ignored as many as 13 times (range: 1 to 13) whereas fathers (86.4%, *n* = 38) were ignored as many as 12 times (range: 1 to 12).

Three multiple regressions were conducted to examine the relationship between parent-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 139)}$ = 2.11, $p = .148$; $R^2 = .015$ for total parent-initiated engagements). See Table 71 for complete summary.

Relevant Engagements. Nearly all parents (97.9%, *n* = 138) initiated a relevant engagement. Instances of relevant engagements were observed as many as 16 times (*M* = 5.38, *SD* = 3.05). The mean number of observations for relevant engagements did not differ between mothers (*M* = 5.27, *SD* = 2.89) and fathers (*M* = 5.64, *SD* = 3.42), mothers (99%, *n* = 96) provided relevant engagements as many as 15 times (range: 2 to 15) while nearly all fathers (95.5%, n = 42) provided relevant engagements as many as 16 times (range: 1 to 16).

Of these, parents (95.7%, n = 132) initiated a relevant engagement in which the child responded. Instances of these observations occurred as many of 15 times (M = 3.51, SD = 2.39). Although the mean number of observations for relevant engagements that received a response did not differ between mothers (M = 3.38, SD = 2.13) and fathers (M = 3.82, SD = 2.93), mothers (95.9%, n = 93) provided relevant engagements in which their child responded as many as 12 times (range: 1 to 12) whereas fathers (95.1%, n = 39) provided relevant engagements in which their child responded as many as 15 times (range: 1 to 15).

In contrast, in 89.8% of sessions (n = 114) the child ignored the relevant engagement as many as 8 times (M = 2.44, SD = 1.68). Although the mean number of observations for ignored relevant engagements did not differ between mothers (M = 2.39, SD = 1.74) and fathers (M = 2.56, SD = 1.54), mothers (90%, n = 80) provided relevant engagements in which their child ignored as many as 8 times (range: 1 to 8) while all fathers (89.5%, n = 34) provided relevant engagements in which their child ignored as many as 7 times (range: 1 to 7).

Four multiple regressions were conducted to examine the relationship between relevant parent-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 136)}$ = 1.62, p = .205; R^2 = .012 for total relevant parent-initiated engagements). See Table 71 for complete summary.

Irrelevant Engagements. Parents (90.1%, n = 127) initiated an irrelevant engagement. Instances of irrelevant engagements were observed as many as 12 times (M = 4.20, SD = 2.75). Although the mean number of observations for irrelevant engagements did not differ between mothers (M = 4.15, SD = 2.63) and fathers (M = 4.33, SD = 3.01), mothers (89.7%, n = 87) provided irrelevant engagements as many as 11 times (range: 1 to 11) whereas, fathers (90.9%, *n* = 40) provided irrelevant engagements as many as 12 times (range: 1 to 12).

Of these, parents (75.4%, *n* = 104) initiated an irrelevant engagement in which the child responded. Instances of these observations occurred as many of 8 times (*M* = 2.74, *SD* = 1.80). Although the mean number of observations for irrelevant engagements in which the child responded did not differ between mothers (*M* = 2.61, *SD* = 1.69) and fathers (*M* = 3.07, *SD* = 2.02), mothers (76.3%, *n* = 74) provided irrelevant engagements that their child responded to as many as 8 times (range: 1 to 8) while fathers (73.2%, *n* = 30) provided irrelevant engagements that their child responded to as many as 7 times (range: 1 to 7).

In contrast, in 79.5% of sessions (*n* = 101) the child ignored the irrelevant engagement as many as 9 times (*M* = 2.44, *SD* = 1.69). Although the mean number of observations for ignored irrelevant engagements did not differ between mothers (*M* = 2.32, *SD* = 1.61) and fathers (*M* = 2.72, *SD* = 1.89), mothers (80.9%, *n* = 72) provided irrelevant engagements which was ignored as many as 8 times (range: 1 to 8) while fathers (76.3%, *n* = 29) provided irrelevant engagements that their child responded to as many as 9 times (range: 1 to 9).

Three multiple regressions were conducted to examine the relationship between irrelevant parent-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 125)} = 1.03$, $p = .312$; $R^2 = .008$ for irrelevant parent engagements where the child ignored the parent). See Table 71 for complete summary.

In two cases the parent initiated a single relevant engagement; however, the child’s response could not be observed. In three cases the parent initiated a single irrelevant engagement; however, the child’s response could not be observed. See Table 69.

Child Initiated Engagement: Easy. Almost all (82.8%) children (*n* = 106) initiated an engagement. Instances of child-initiated engagements were observed as many as 23 times (*M* = 4.35, *SD* = 3.68). Although the mean number of observations did not differ between mothers (*M* = 4.32, *SD* = 3.77) and fathers (*M* = 4.41, *SD* = 3.53), children initiated an engagement with mothers (81.8%, *n* = 72) as many as 23 times (range: 1 to 23) whereas children initiated an engagement with fathers (85%, *n* = 34) as many as 17 times (range: 1 to 17).

Overall, in 96.2% of sessions (*n* = 102) where the child initiated an engagement, the parent responded positively. Instances of these behaviours were observed as many as 18 times (*M* = 4.13, *SD* = 3.29). Although the mean number of observations did not differ as mothers (*M* = 4.16, *SD* = 3.32) and fathers (*M* = 4.06, *SD* = 3.27) were equally likely to provide a response, mothers (94.4%, *n* = 68) provided a response as many as 18 times (range: 1 to 18) whereas all fathers (*n* = 34) provided a response as many as 15 times (range: 1 to 15).

In contrast, in 28.3% of sessions (*n* = 30) where the child engaged the parent, the parent ignored the engagement as many as 4 times (*M* = 1.23, *SD* = .63). Although the mean number of observations did not differ as mothers (*M* = 1.24, *SD* = .70) and fathers (*M* = 1.22, *SD* = .44) were equally likely to ignore an engagement by their children, mothers (29.2%, *n* = 21) ignored their child as many as 4 times (range: 1 to 4) whereas fathers (26.5%, *n* = 9) ignored their child up to half as many times (range: 1 to 2).

Three multiple regressions were conducted to examine the relationship between child-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 104)}$ = .253, p = .616; R^2 = .002 for total child-initiated engagements). See Table 72 for complete summary.

Relevant Engagements. Children (83%, $n = 88$) initiated a relevant engagement. Instances of relevant engagements were observed as many as 8 times ($M = 2.36$, $SD = 1.47$). Although the mean number of observations for relevant engagements initiated by the child did not differ between mothers ($M = 2.30$, $SD = 1.49$) and fathers ($M = 2.50$, $SD = 1.45$), mothers (83.3%, $n = 60$) received a relevant engagement as many as 8 times (range: 1 to 8) whereas fathers (82.4%, $n = 28$) received a relevant engagement as many as 6 times (range: 1 to 6).

Of these, children (84.3%, $n = 86$) initiated a relevant engagement in which the parent responded. Instances of these observations occurred as many of 7 times ($M = 2.28$, $SD = 1.42$). Although the mean number of observations for relevant engagements initiated by the child did not differ between mothers ($M = 2.22$, $SD = 1.40$) and fathers ($M = 2.39$, $SD = 1.47$) did not differ, mothers (85.3%, $n = 58$) responded to a relevant engagement as many as 7 times (range: 1 to 7) whereas fathers (82.4%, $n = 28$) responded to a relevant engagement as many as 6 times (range: 1 to 6).

In contrast, in 40% of the sessions ($n = 12$) the parent ignored the relevant engagement once. Both mothers (42.9%, $n = 9$) and fathers (33.3%, $n = 3$) ignored a relevant engagement only once.

Two multiple regressions were conducted to examine the relationship between relevant child-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 84)} = .007$, $p = .935$; $R^2 = .001$ for relevant child-initiated engagements, parent responds). See Table 72 for complete summary.

Irrelevant Engagements. Children (79.3%, $n = 84$) initiated an irrelevant engagement. Instances of irrelevant engagements were observed as many as 16 times ($M = 3.01$, $SD = 2.94$). Although the mean number of observations for irrelevant engagements initiated by the child did not differ between mothers (*M* = 2.93, *SD* = 2.77) and fathers (*M* = 3.20, *SD* = 3.37), mothers (81.9 %, *n* = 59) received an irrelevant engagement as many as 15 times (range: 1 to 15) whereas fathers (73.5%, *n* = 25) received an irrelevant engagement as many as 16 times (range: 1 to 16).

Of these, children (77.5%, *n* = 79) initiated an irrelevant engagement in which the parent responded. Instances of these observations occurred as many of 14 times (*M* = 2.85, *SD* = 2.57). Although the mean number of observations for responses to irrelevant engagements initiated by the child did not differ between mothers (*M* = 2.80, *SD* = 2.39) and fathers (*M* = 2.96, *SD* = 3.00), mothers (80.9%, *n* = 55) responded to an irrelevant engagement as many as 11 times (range: 1 to 11) whereas fathers (70.6%, *n* = 24) responded to an irrelevant engagement as many as 14 times (range: 1 to 14).

In contrast, in 66.7% of sessions (*n* = 20) the parent ignored the irrelevant engagement as many as 3 times (*M* = 1.25, *SD* = .55). The mean number of observations for ignored irrelevant engagements initiated by the child did not differ between mothers (*M* = 1.31, *SD* = .63) and fathers (*M* = 1.14, *SD* = .38). Mothers (61.9%, *n* = 13) ignored an irrelevant engagement as many as 3 times (range: 1 to 3) whereas fathers (77.8%, *n* = 7) ignored an irrelevant engagement as many as 2 times (range: 1 to 2).

Three multiple regressions were conducted to examine the relationship between irrelevant child-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 82)} = 1.95$, $p = .166$; $R^2 = .023$ for total irrelevant child-initiated engagements). See Table 72 for complete summary.

In three cases the child initiated one relevant engagement; however, the parent's response could not be observed. See Table 73.

Child Initiated Engagement: Hard. Children (76.6%, *n* = 98) initiated an engagement. Instances of child-initiated engagements were observed as many as 23 times (*M* = 4.81, *SD* = 3.88). Although the mean number of observations did not differ between mothers (*M* = 4.63, *SD* = 3.36) and fathers (*M* = 5.15, *SD* = 4.78), children initiated an engagement with mothers (73.9%, *n* = 65) as many as 15 times (range: 1 to 15) whereas children initiated an engagement with fathers (82.5%, *n* = 33) as many as 23 times (range: 1 to 23).

Overall, parents responded at least once when their child engaged with them (100%, *n* = 98). Instances of these behaviours were observed as many as 17 times (*M* = 4.22, *SD* = 3.35). Although, the mean number of observations did not differ for mothers (*M* = 4.17, *SD* = 3.10) and fathers (*M* = 4.33, *SD* = 3.85), all mothers (*n* = 65) provided a response as many as 14 times (range: 1 to 14) whereas all fathers (*n* = 33) provided a response as many as 17 times (range: 1 to 17).

In contrast, in 29.6% of cases (*n* = 29) where the child engaged the parent, the parent ignored the engagement as many as 6 times (*M* = 1.62, *SD* = 1.08). Although the mean number of observations did not differ for mothers (*M* = 1.50, *SD* = .76) and fathers (*M* = 1.89, *SD* = 1.62), mothers (30.8%, *n* = 20) ignored their child as many as 3 times (range: 1 to 3) whereas fathers (27.3%, *n* = 9) ignored their child up to twice as many times (range: 1 to 6).

Three multiple regressions were conducted to examine the relationship between child-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 27)}$ = 2.96, p = .097; R^2 = .099 for child-initiated engagements where parent ignores). See Table 74 for complete summary.

Relevant Engagements. Children (78.6%, *n* = 77) initiated a relevant engagement. Instances of relevant engagements were observed as many as 9 times (*M* = 2.52, *SD* = 1.83). The mean number of observations for relevant engagements initiated by the child did not differ between mothers (*M* = 2.40, *SD* = 1.72) and fathers (*M* = 2.79, *SD* = 2.06) as they were equally likely to receive a relevant engagement. Mothers (81.5%, *n* = 53) and fathers (72.7%, *n* = 24) received a relevant engagement as many as 9 times (range: 1 to 9).

Of these, children (75.5%, *n* = 74) initiated a relevant engagement in which the parent responded. Instances of these observations occurred as many of 9 times (*M* = 2.45, *SD* = 1.78). Although the mean number of observations did not differ between mothers (*M* = 2.31, *SD* = 1.67) and fathers (*M* = 2.74, *SD* = 2.03), mothers (78.5%, *n* = 51) responded to a relevant engagement as many as 8 times (range: 1 to 8) whereas fathers (69.7%, *n* = 23) responded to a relevant engagement as many as 9 times (range: 1 to 9).

In contrast, in 44.8% of cases (*n* = 13) the parent ignored the relevant engagement once. Both mothers (45%, *n* = 9) and fathers (44.4%, *n* = 4) ignored a relevant engagement only once.

Two multiple regressions were conducted to examine the relationship between relevant child-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 72)} = .077$, $p = .782$; $R^2 = .001$ for relevant child-initiated engagements, parent responds). See Table 74 for complete summary.

Irrelevant Engagements. Children (78.6%, *n* = 77) initiated an irrelevant engagement. Instances of irrelevant engagements were observed as many as 23 times (*M* = 3.60, *SD* = 3.22). Although the mean number of observations for irrelevant engagements initiated by the child did not differ between mothers (*M* = 3.41, *SD* = 2.25) and fathers (*M* = 3.96, *SD* = 4.61), mothers (78.5 %, *n* = 51) received an irrelevant engagement as many as 10 times (range: 1 to 10) whereas fathers (78.8%, *n* = 26) received an irrelevant engagement as many as 23 times (range: 1 to 23).

Of these, children (76.5%, n = 75) initiated an irrelevant engagement in which the parent responded. Instances of these observations occurred as many of 17 times (M = 3.11, SD = 2.50). Although the mean number of observations did not differ between mothers (M = 3.06, SD = 1.98) and fathers (M = 3.20, SD = 3.34), mothers (76.9%, n = 50) responded to an irrelevant engagement as many as 8 times (range: 1 to 8) whereas fathers (75.8%, n = 25) responded to an irrelevant engagement as many as 17 times (range: 1 to 17).

In contrast, in 69% of sessions (n = 20) the parent ignored the irrelevant engagement as many as 6 times (M = 1.70, SD = 1.26). Although the mean number of observations did not differ between mothers (M = 1.50, SD = .85) and fathers (M = 2.17, SD = 1.94), mothers (70%, n = 14) ignored their child as many as 3 times (range: 1 to 3) whereas fathers (66.7%, n = 6) ignored their child up to twice as many times (range: 1 to 6).

Three multiple regressions were conducted to examine the relationship between irrelevant child-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 75)}$ = 2.27, p = .136; R^2 = .029 for total irrelevant child-initiated engagements). See Table 74 for complete summary.

In one case the child initiated 10 irrelevant engagements; however, the parent's response could not be observed. See Table 73.

Child Initiated Engagement: iPad. Children (88.4%, n =129) initiated an engagement. Instances of child-initiated engagements were observed as many as 17 times (M = 4.37, SD = 3.43). The mean number of observations did not differ between mothers (M = 4.46, SD = 3.49) and fathers (M = 4.19, SD = 3.34). Children initiated an engagement with mothers (91.2%, n = 92) as many as 17 times (range: 1 to 17) whereas children initiated an engagement with fathers (82.2%, n = 37) as many as 16 times (range: 1 to 16).

Overall, in 97.7% of sessions (*n* = 126) where the child engaged, the parent responded positively. Instances of these behaviours were observed as many as 16 times ($M = 3.88$, $SD = 2.98$). Although the mean number of observations did not differ as mothers ($M = 3.88$, $SD = 2.99$) and fathers ($M = 3.89$, $SD = 2.98$) were equally likely to provide a response, mothers (97.8%, $n = 90$) provided a response as many as 16 times (range: 1 to 16) whereas fathers (97.3%, $n = 36$) provided a response as many as 14 times (range: 1 to 14).

In contrast, in 32.6% of cases ($n = 42$) where the child engaged the parent, the parent ignored the engagement as many as 7 times ($M = 1.71$, $SD = 1.20$). Although the mean number of observations did not differ as mothers ($M = 1.76$, $SD = 1.25$) and fathers ($M = 1.56$, $SD = 1.01$) were equally likely to ignore an engagement by their children, mothers (35.9%, $n = 33$) ignored their child as many as 7 times (range: 1 to 7) whereas fathers (24.3%, $n = 9$) ignored their child as many as 4 times (range: 1 to 4).

Three multiple regressions were conducted to examine the relationship between child-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 124)} = 1.02$, $p = .316$; $R^2 = .008$ for total child-initiated engagements, parent responds). See Table 75 for complete summary.

Relevant Engagements. Children (79.1%, $n = 102$) initiated a relevant engagement. Instances of relevant engagements were observed as many as 6 times ($M = 2.13$, $SD = 1.44$). The mean number of observations for relevant engagements initiated by the child did not differ between mothers ($M = 2.17$, $SD = 1.43$) and fathers ($M = 2.03$, $SD = 1.47$) as they were equally likely to receive a relevant engagement. Mothers (76.1%, $n = 70$) and fathers (86.5%, $n = 32$) received a relevant engagement as many as 6 times (range: 1 to 6).

Of these, children (75.4%, *n* = 95) initiated a relevant engagement in which the parent responded. Instances of these observations occurred as many of 6 times (*M* = 2.00, *SD* = 1.35). The mean number of observations for relevant engagements initiated by the child did not differ between mothers (*M* = 2.05, *SD* = 1.39) and fathers (*M* = 1.90, *SD* = 1.30) as they were equally likely to receive a relevant engagement. Mothers (72.2%, *n* = 65) and fathers (83.3%, *n* = 30) responded to a relevant engagement as many as 6 times (range: 1 to 6).

In contrast, in 50% of sessions (*n* = 21) the parent ignored the relevant engagement as many as 3 times (*M* = 1.29, *SD* = .56). Although the mean number of observations did not differ between mothers (*M* = 1.27, *SD* = .59) and fathers (*M* = 1.33, *SD* = .52), mothers (45.5%, *n* = 15) ignored their child as many as 3 times (range: 1 to 3) whereas fathers (66.7%, *n* = 6) ignored their child as many as 2 times (range: 1 to 2).

Three multiple regressions were conducted to examine the relationship between relevant child-initiated engagements and age. None of the overall models were significant (highest $F_{(1, 100)} = 2.50$, $p = .117$; $R^2 = .024$ for total relevant child-initiated engagements). See Table 75 for complete summary.

Irrelevant Engagements. Children (81.4%, *n* = 105) initiated an irrelevant engagement. Instances of irrelevant engagements were observed as many as 12 times (*M* = 3.30, *SD* = 2.49). Although the mean number of observations for irrelevant engagements initiated by the child did not differ between mothers (*M* = 3.38, *SD* = 2.63) and fathers (*M* = 3.10, *SD* = 2.09), mothers (82.6 %, *n* = 76) received an irrelevant engagement as many as 12 times (range: 1 to 12) whereas fathers (78.4%, *n* = 29) received an irrelevant engagement as many as 10 times (range: 1 to 10).

Of these, children (77%, *n* = 97) initiated an irrelevant engagement in which the parent responded. Instances of these observations occurred as many of 10 times (*M* = 3.08, *SD* = 2.09).

Although the mean number of observations did not differ between mothers (*M* = 3.18, *SD* = 2.19) and fathers (*M* = 2.86, *SD* = 1.88), mothers (75.6%, *n* = 68) responded to an irrelevant engagement as many as 10 times (range: 1 to 10) whereas fathers (80.6%, *n* = 29) responded to an irrelevant engagement as many as 8 times (range: 1 to 8).

In contrast, in 66.7% of sessions (*n* = 28) the parent ignored the irrelevant engagement as many as 5 times (*M* = 1.61, *SD* = .88). Although the mean number of observations did not differ between mothers (*M* = 1.63, *SD* = .92) and fathers (*M* = 1.50, *SD* = .58), mothers (72.7%, *n* = 24) ignored their child as many as 5 times (range: 1 to 5) whereas fathers (44.4%, *n* = 4) ignored their child as many as 2 times (range: 1 to 2).

Three multiple regressions were conducted to examine the relationship between irrelevant child-initiated engagements and age. None of the overall models were significant (highest $F_{(1,\ 124)}$ = 1.00, *p* = .318; R^2 = .008 for irrelevant child-initiated engagements, parent responds). See Table 75 for complete summary.

In two cases the child initiated as many as 2 irrelevant engagements; however, the parent's response could not be observed (*M* = 1.50, *SD* = 71). See Table 73.

Lost

Easy. In a small subset (13.1%) of sessions (*n* = 20) both the child and parent did not know how to progress in the game. Instances of being lost were observed as many as three times (*M* = 1.25, *SD* = .64). The amount of time lost varied between 3 seconds to 149 seconds (*M* = 45.95, *SD* = 43.96). The mean number of observations did not differ between mothers (*M* = 1.29, *SD* = .73) and fathers (*M* = 1.17, *SD* = .41). Mothers (13.5%, *n* = 14) did not know how to progress in the game as many as 3 times (range: 1 to 3) whereas fathers (12.2%, *n* = 6) did not know how to progress in the game as many as 2 times (range: 1 to 2).

During this time, 85% of parents (*n* = 17) provided as many as 4 physical supports (*M* = 1.82, *SD* = .95). Furthermore, 80% of parents (*n* = 16) provided as many as 10 verbal supports (*M* = 2.88, *SD* = 2.22). During this time no emotional supports were observed. Parents (25%, *n* = 5) removed the child's hand or took over the device and in one case the parent repositioned the device for their own use. There were no significant differences between mothers and fathers ($t_{(18)}$ = .373, *p* = .713). See Table 76.

Hard. In less than half (44.9%) of sessions (*n* = 61) both the child and parent did not know how to progress in the game. Instances of being lost were observed as many as three times (*M* = 1.33, *SD* = .57). The amount of time lost varied between 4 seconds to 213 seconds (*M* = 46.93, *SD* = 41.12). The mean number of observations did not differ between mothers (*M* = 1.37, *SD* = .62) and fathers (*M* = 1.25, *SD* = .44). Mothers (39%, *n* = 41) did not know how to progress in the game as many as 3 times (range: 1 to 3) whereas fathers (40%, *n* = 20) did not know how to progress in the game as many as 2 times (range: 1 to 2).

During this time, 68.9% of parents (*n* = 42) provided as many as 9 physical supports (*M* = 3.26, *SD* = 2.26). Furthermore, 75.4% of parents (*n* = 46) provided as many as 15 verbal supports (*M* = 4.11, *SD* = 3.24). During this time only 2 parents (3.3%) provided one emotional support. Parents (4.9%, *n* = 3) removed the child's hand or took over the device as many as 2 times (*M* = 1.33, *SD* = .58) and in 18 cases, parents (29.5%) repositioned the device for their own use as many as 4 times (*M* = 1.28, *SD* = .75). There were no significant differences between mothers and fathers ($t_{(59)}$ = .74, *p* = .46). See Table 76.

iPad. In less than half (36.7%) of sessions (*n* = 55) both the child and parent did not know how to progress in the game. Instances of being lost were observed as many as three times (*M* = 1.36, *SD* = .59). The amount of time lost varied between 6 seconds to 239 seconds (*M* =

47.40, *SD* = 49.72). The mean number of observations did not differ between mothers (*M* = 1.40, *SD* = .64) and fathers (*M* = 1.29, *SD* = .47). Mothers (36.2%, *n* = 38) did not know how to progress in the game as many as 3 times (range: 1 to 3) whereas fathers (34.7%, *n* = 17) did not know how to progress in the game as many as 2 times (range: 1 to 2).

During this time, 16.9% of parents (*n* = 26) provided as many as 10 physical supports (*M* = 2.85, *SD* = 2.34). Furthermore, 22.1% of parents (*n* = 34) provided as many as 14 verbal supports (*M* = 3.06, *SD* = 3.18). During this time only 3 parents (2%) provided as many as 2 emotional supports (*M* = 1.33, *SD* = .58). Parents (22.1%, *n* = 34) removed the child's hand or took over the device as many as 9 times (*M* = 2.15, *SD* = 1.65) and in 8 cases, parents (5.2%) repositioned the device for their own use as many as 3 times (*M* = 1.50, *SD* = .76). There were no significant differences between mothers and fathers ($t_{(53)}$ = .58, *p* = .563). See Table 76.

Three multiple regressions were conducted to examine the relationship between the theme of parent and child lost for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 77 for complete summary.

Off-task behaviours

Easy. Although infrequent, both parents and children engaged in off-task behaviours. Overall, 3% of parents (*n* = 4) engaged in off-task behaviours. These behaviours were observed as many as 10 times in a session (*M* = 3.25, *SD* = 4.50) for as long as 228 seconds (*M* = 69.50, *SD* = 106.05; range: 4 to 228 seconds). Children spent less time off-task. Overall, 5.2% of children (*n* = 7) engaged in off-task behaviours as many as 2 times (*M* = 1.29, *SD* = .49) for as long as 44 seconds (*M* = 23.67, *SD* = 14.12; range: 9 to 44). See Table 78.

Hard. Both parents and children engaged in off-task behaviours. Overall, 4.4% of parents (*n* = 6) engaged in off-task behaviours. These behaviours were observed as many as 8 times in a session (*M* = 2.17, *SD* = 2.86) for as long as 319 seconds (*M* = 63.67, *SD* = 125.40; range: 5 to 319 seconds). Children more likely to spend time off-task. Overall, 8.1% of children (*n* = 11) engaged in off-task behaviours as many as 4 times (*M* = 1.36, *SD* = .92) for as long as 78 seconds (*M* = 24.09, *SD* = 23.06; range: 6 to 78). See Table 78.

iPad. Both parents and children engaged in off-task behaviours. Overall, 9.3% of parents (*n* = 14) engaged in off-task behaviours. These behaviours were observed as many as 10 times in a session (*M* = 2.14, *SD* = 2.54) for as long as 242 seconds (*M* = 32.71, *SD* = 64.05; range: 2 to 242 seconds). Children were more likely to spend time off-task. Overall, 13.3% of children (*n* = 20) engaged in off-task behaviours as many as 6 times (*M* = 2.00, *SD* = 1.41) for as long as 286 seconds (*M* = 49.20, *SD* = 69.93; range: 8 to 286). See Table 78.

Three multiple regressions were conducted to examine the relationship between the theme of parental off-task behaviours for Easy, Hard and iPad sessions and age. The overall models for the easy, hard, and iPad sessions were not significant. See Table 79 for complete summary.

Three multiple regressions were conducted to examine the relationship between the theme of child off-task behaviours for Easy, Hard and iPad sessions and age. The overall model for off-task behaviours by the child during the iPad session was significant ($F_{(1, 79)} = 3.99$, $p < .05$; $R^2 = .048$). A child's age was significantly related to the number of times the child demonstrated off-task behaviours during the iPad session. As a child's age increase, children were off-task less ($\beta = -.653$, $t = -2.63$, $p < .02$). The overall models for child off-task behaviours during the easy session and hard session were not significant. See Table 79 for complete summary.

Examining what parents say they do and what they were observed doing

A series of correlations were conducted to examine the relationship between parental self-report measures of supports and observed supports. Not all survey measures were observable; furthermore, additional observation behaviours were added. Correlations were run on the measures that could be directly matched between the self-report survey measures and the observation session. Overall, nine verbal supports were examined for the easy, hard and iPad session and ten physical supports were examines for the easy, hard and iPad session.

Relationship between verbal supports: Easy. Pearson's correlations were conducted to examine potential relationships among parental support during technology use assessed through self-report of verbal scaffolds and through in-lab observation. Self-reports of reading aloud information provided on the screen was positively correlated with observed behaviours of parent's reading aloud information provided on the screen, $r_{(93)} = .204$, $p < .05$. Self-reports of explaining how the software works was positively correlated with providing hints during the observation session, $r_{(38)} = .332$, $p < .05$. No other relationships between verbal supports through self-reports and in-lab observations were found. See Table 80.

Relationship between verbal supports: Hard. Pearson's correlations were conducted to examine potential relationships among parental support during technology use assessed through self-report of verbal scaffolds and through in-lab observation. Self-reports of providing hints were negatively correlated with observed behaviours of parents indicating errors in their child's actions, $r_{(48)} = -.334$, $p < .05$. Furthermore, self-reports of asking follow-up questions such as "how did that work" were negatively correlated with telling the child to try again during the observation session, $r_{(38)} = -.494$, $p < .05$. No other relationships between verbal supports through self-reports and in-lab observations were found. See Table 81.

Relationship between verbal supports: iPad. Pearson's correlations were conducted to examine potential relationships among parental support during technology use assessed through self-report of verbal scaffolds and through in-lab observation. Self-reports of explaining the software was positively correlated with observed behaviours of parents reading aloud information on the screen, $r_{(126)} = .177$, $p < .05$. Self-reports of giving "additional examples in additional to the software" was negatively correlated with providing direct step-by-step instructions during the observation session, $r_{(131)} = -.186$, $p < .05$. Self-reports of providing direct step-by-step instructions were positively correlated with hints $r_{(66)} = .247$, $p < .05$, and parents indicating errors in their child's actions during the observation session, $r_{(63)} = .298$, $p < .05$. Furthermore, self-reports of indicating errors in their child's actions were positively correlated with indicating errors in their child's actions during the observation session, $r_{(63)} = .322$, $p < .05$. No other relationships between verbal supports through self-reports and in-lab observations were found. See Table 82.

Relationship between physical supports: Easy. Pearson's correlations were conducted to examine potential relationships among parental support during technology use assessed through self-report of physical scaffolds and through in-lab observation. Observed parent behaviour of adjusting the computer components was positively correlation to self-reports of adjusting the computer components $r_{(57)} = .3.05$, $p < .05$, hand over hand $r_{(58)} = .353$, $p < .01$, moving hand to the correct spot on the mouse $r_{(59)} = .403$, $p < .01$, moving the mouse $r_{(58)} = .313$, $p < .05$, and pointing directly to the screen $r_{(60)} = .299$, $p < .05$. No other relationships between physical supports through self-reports and in-lab observations were found. See Table 83.

Relationship between physical supports: Hard. Pearson's correlations were conducted to examine potential relationships among parental support during technology use assessed through self-report of physical scaffolds and through in-lab observation. Observed parent behaviour of adjusting the computer components was positively correlation to self-reports of placing child's hand on the correct place on the device $r_{(49)} = .287$, $p < .05$ and presses the device or keyboard to help progress play $r_{(49)} = .386$, $p < .01$. Furthermore, observed parent behaviour of moving the mouse to help progress the game was positively correlated with parent report of moving their child's hand to the correct place on the device $r_{(32)} = .410$, $p < .05$. Interestingly, observed behaviour for holding the device so their child can use it was negatively correlated to parental self-report for the same theme $r_{(6)} = -.894$, $p < .01$. Additionally, observed parental behaviour of pointing directly to important information was positively correlated to self-reports of providing hand over hand supports $r_{(114)} = .258$, $p < .01$ and moving the child's hand to the correct place on the device to help facilitate play $r_{(113)} = .329$, $p < .01$. No other relationships between verbal supports through self-reports and in-lab observations were found. See Table 84.

Relationship between physical supports: iPad. Pearson's correlations were conducted to examine potential relationships among parental support during technology use assessed through self-report of physical scaffolds and through in-lab observation. Observed parent behaviour providing a booster seat or adjusting the child's seated position was negatively correlation to self-reports of adjusting the screen location/angle $r_{(17)} = -.515$, $p < .05$ and self-reports of holding the device for the child $r_{(17)} = -.491$, $p < .05$. Interestingly, observed parent behaviour of moving the child's hand to the correct place on the device to help facilitate play was negatively correlated with parent report of moving their child's hand to the correct place on the device $r_{(4)} = -1.00$, $p < .01$ and self-reports of general points $r_{(4)} = -.962$, $p < .05$. Furthermore, observed behaviour for moving the mouse to progress play was negatively correlated to parental self-report for adjusting the screen location/angle $r_{(40)} = -.314$, $p < .05$.

Observed parental behaviour of pressing to select was positively correlated to self-reports of holding the device for the child $r_{(63)} = .248$, $p < .05$. Additionally, observed parental behaviour of pointing directly to information on the screen was positively correlated to self-reports of providing a booster seat $r_{(136)} = .169$, $p < .05$, adjusting the screen location/angle $r_{(136)} = .186$, $p < .05$, hand over hand $r_{(138)} = .209$, $p < .05$, move hand to the correct location $r_{(138)} = .188$, $p < .05$, move the mouse to help progress play $r_{(137)} = .211$, $p < .05$, press to select $r_{(138)} = .198$, $p < .05$, point directly to important information $r_{(140)} = .223$, $p < .01$ and hold the device $r_{(137)} = .268$, $p < .01$. No other relationships between verbal supports through self-reports and in-lab observations were found. See Table 85.

Comparisons Across Device Contexts

Repeated Measures ANOVAs were conducted to assess the potential differences in support as a function of device (Easy, Hard and iPad). First verbal supports are examined followed by physical supports and emotional supports. Finally, interactions across devices are examined.

Verbal supports

A repeated measures ANOVA was conducted to access the potential differences in total verbal supports as a function of device. Using Pillai's Trace criterion, there were no significant effects for device, ($F_{(2, 117)} = 2.40$, $p = .096$). Overall themes were further examined below.

General Instructions. Six repeated measures ANOVAs were conducted to access the potential differences in general instructions as a functions of device. Using Pillai's Trace criterion, there was a significant main effect of reading aloud important information, ($F_{(2, 67)} = 6.77$, $p < .003$), explaining the software $F_{(2, 79)} = 4.08$, $p < .03$), and general prompt to explore $F_{(2, 58)} = 4.88$, $p < .02$). See Table 86 for complete summary.

Read information aloud. Further investigation of the main effect was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to read aloud information during the iPad session (*M* = 4.00, *SD* = 2.38) than the Easy session (*M* = 2.69, *SD* = 2.04; $t_{(88)}$ = 4.15, *p* < .001) and during the iPad session (*M* = 3.77, *SD* = 2.16) than the Hard session (*M* = 2.80, *SD* = 2.23; $t_{(83)}$ = 2.84, *p* < .007). There were no differences between the Easy and Hard for reading information aloud. See Table 87.

Explaining the software. Further investigation of the main effect was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to explain the software during the Easy session (*M* = 3.74, *SD* = 2.29) than the iPad (*M* = 3.13, *SD* = 1.74; $t_{(93)}$ = 2.35, *p* < .03) and more likely to explain the software during the Hard session (*M* = 3.64, *SD* = 2.30) than the iPad session (*M* = 3.10, *SD* = 1.67; $t_{(86)}$ = 2.17, *p* < .04). There were no differences between the Easy and Hard for explaining the software. See Table 87.

General prompt to explore. Further investigation of the main effect was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to encourage their child to explore the software and to try to work out the game and the tasks during the Easy session (*M* = 2.93, *SD* = 2.08) than the iPad (*M* = 2.27, *SD* = 1.66; $t_{(69)}$ = 2.352 *p* < .03). There was a trend towards significance between the Hard and iPad sessions such that parents were more likely to encourage their child to explore the software and to try to work out the game and the tasks during the Hard session (*M* = 2.80, *SD* = 1.83) than the iPad session (*M* = 2.33, *SD* = 1.43; $t_{(72)}$ = 1.90, *p* = .062). There were no differences between the easy and hard sessions for explaining the software. See Table 87.

Specific Instructions. Four repeated measures ANOVAs were conducted to access the potential differences in specific instructions as a function of device. Using Pillai’s Trace criterion, there was a significant main effect of the overall model for specific instructions ($F_{(2, 109)} = 7.20$, $p < .002$). See Table 88. Parents were more likely to provide specific instructions during the Hard session ($M = 16.52$, $SD = 10.13$) than the Easy session ($M = 13.59$, $SD = 10.32$; $t_{(115)} = 3.15$, $p < .003$). Parents were also more likely to provide specific instructions during the Hard session ($M = 16.34$, $SD = 10.48$) than during the iPad session ($M = 12.50$, $SD = 8.33$; $t_{(117)} = 3.36$, $p < .002$). There were no differences between the Easy session and iPad for Specific Instructions. See Table 89.

Using Pillai's Trace criterion, there was a significant main effect of the subthemes: direct step-by-step instructions ($F_{(2, 99)} = 4.04$, $p < .03$), hints ($F_{(2, 21)} = 17.97$, $p < .001$), and specific instructions ($F_{(2, 51)} = 10.19$, $p < .001$). See Table 88 for complete summary.

Direct Instructions. Further investigation of the main effect was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to provide direct step-by-step instructions during the Easy session ($M = 10.53$, $SD = 8.29$) than the Hard session ($M = 8.95$, $SD = 6.38$; $t_{(108)} = 2.28$ $p < .03$) and more likely during the Easy session ($M = 10.41$, $SD = 8.36$) compared to the iPad session ($M = 8.50$, $SD = 6.52$; $t_{(113)} = 2.29$, $p < .03$). There were no differences between the Hard and iPad sessions for direct step-by-step instructions. See Table 89

Hints. Further investigation of the main effect was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to provide hints during the Hard session ($M = 4.27$, $SD = 2.80$) than the Easy session ($M = 1.67$, $SD = .84$; $t_{(29)} = 5.00$ $p < .001$) and more likely during the iPad session ($M = 2.89$, $SD = 1.81$) compared to the Easy session ($M = 1.89$, $SD = 1.31$; $t_{(27)} = 2.45$, $p < .03$). There were no differences between the Hard and iPad sessions for hints. See Table 89.

Specific questions. Investigation of the main effect was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to ask specific question to assist their child during the Hard session (M = 7.32, SD = 4.94) than the Easy session (M = 4.74, SD = 3.44; $t_{(67)}$ = 4.19, p < .001) and more likely to ask specific question to assist their child during the Hard session (M = 6.89, SD = 4.78) compared to the iPad session (M = 4.08, SD = 2.96; $t_{(73)}$ = 4.72, p < .001). There were no differences between the Easy and iPad sessions for hints. See Table 89.

Feedback. Six repeated measures ANOVAs were conducted to access the potential differences in feedback as a function of device. Using Pillai's Trace criterion, there was a significant main effect of asking follow-up questions, ($F_{(2, 50)}$ = 5.12, p < .04). See Table 90 for complete summary.

Follow-up questions. Further investigation of the main effect was examined through three paired *t*-tests. There were no differences between the easy, hard and iPad sessions for follow-up questions. See Table 91.

Fillers. Three repeated measures ANOVAs were conducted to access the potential differences in feedback as a function of device. Using Pillai's Trace criterion, there was a significant main effect of total fillers ($F_{(2, 66)}$ = 13.24, p < .001), see Table 92. Parents were more likely to provide fillers during the iPad session (M = 6.71, SD = 4.85) than the hard session (M = 4.00, SD = 2.76; $t_{(81)}$ = 5.50, p < .001). Parents were also more likely to provide fillers during the iPad session (M = 6.80, SD = 4.90) than during the easy session (M = 4.18, SD = 3.06; $t_{(79)}$ = 5.52, p < .001). There were no differences between the easy and hard sessions for total fillers provided. See Table 93.

Using Pillai's Trace criterion, there was a significant main effect of "fluff-dialogue" ($F_{(2, 58)} = 8.89$, $p < .001$). Parents were more likely to provide "fluff-dialogue" during the iPad session ($M = 5.03$, $SD = 3.29$) than the hard session ($M = 3.49$, $SD = 2.34$; $t_{(70)} = 4.36$, $p < .001$). Parents were also more likely to provide "fluff-dialogue" during the iPad session ($M = 5.13$, $SD = 3.21$) than during the easy session ($M = 3.63$, $SD = 2.57$; $t_{(71)} = 4.32$, $p < .001$). There were no differences between the easy and hard sessions for "fluff-dialogue". See Table 93.

Others. Four repeated measures ANOVAs were conducted to access the potential differences in individual themes such as providing the answer without an attempt to scaffold, suggestion to change activity, assessment of understanding through check-ins and connections or examples made in relation to the child's previous learning or home/school environment as a function of device. Using Pillai's Trace criterion, there were no differences between the Easy and Hard sessions for any of the "others" themes. See Table 94.

Physical supports

A repeated measures ANOVA was conducted to access the potential differences in total physical supports as a function of device. Using Pillai's Trace criterion, the overall model for total physical supports was not significant, ($F_{(2, 110)} = 2.18$, $p = .118$). Overall themes were further examined below.

Device Adjustments. Four repeated measures ANOVAs were conducted to access the potential differences in device adjustments as a function of device. Using Pillai's Trace criterion, there were no differences between the Easy, Hard, and iPad sessions for device adjustments or for any of the subthemes. See Table 95.

Supports to facilitate play. Three repeated measures ANOVAs were conducted to access the potential differences in supports to facilitate play as a function of device. Using

Pillai's Trace criterion, there was a significant main effect of total supports to facilitate play ($F_{(2, 11)}$ = 4.35, p < .05), see Table 96. Parents were more likely to provide supports to facilitate play during the Easy session (M = 5.31, SD = 4.55) than the Hard session (M = 3.33, SD = 3.13; $t_{(35)}$ = 3.57, p < .002). Parents were also more likely to provide supports to facilitate play during the Easy session (M = 4.36, SD = 4.41) than during the iPad session (M = 2.59, SD = 2.28; $t_{(79)}$ = 2.39, p < .03). There were no differences between the Hard and iPad sessions for supports to facilitate play. See Table 97.

Using Pillai's Trace criterion, there were no significant main effect of the subthemes. See Table 96.

Actions to progress play. Four repeated measures ANOVAs were conducted to access the potential differences in actions to progress play as a function of device. Using Pillai's Trace criterion, there were no differences between the Easy, Hard, and iPad sessions for actions to progress play or for any of the subthemes. See Table 98.

Points. Four repeated measures ANOVAs were conducted to access the potential differences in points as a function of device. Using Pillai's Trace criterion, there was a significant main effect of total points ($F_{(2, 108)}$ = 3.18, p < .05), see Table 99. Parents were more likely to provide points during the Hard session (M = 10.97, SD = 8.10) than the iPad session (M = 9.27, SD = 5.42; $t_{(116)}$ = 1.99, p < .05). There was a trend towards significance between the Easy and iPad sessions such that parents were more likely to point during the Easy session (M = 10.87, SD = 8.10) than the iPad session (M = 9.27, SD = 85.54; $t_{(116)}$ = 1.92, p = .057). There were no differences between the Easy and Hard for Points. See Table 100.

Using Pillai's Trace criterion, there was a significant main effect of general points, ($F_{(2, 19)}$ = 4.71, p < .03). See Table 99 for complete summary.

General points. Further investigation of the main effect was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to provide general points during the hard session (M = 4.27, SD = 2.80) than the Easy session (M = 1.67, SD = .84; $t_{(29)}$ = 5.00 p < .001) and more likely during the iPad session (M = 2.89, SD = 1.81) compared to the Easy session (M = 1.89, SD = 1.31; $t_{(27)}$ = 2.45, p < .03). There were no differences between the hard and iPad sessions for general points. See Table 100.

Others. Three repeated measures ANOVAs were conducted to access the potential differences in individual themes such as repositioning device for their own use, removing child's hand or taking over the device, and demonstrating how to use the software as a function of device. Using Pillai's Trace criterion, there were no differences between the Easy, Hard and iPad sessions for any of the "others" themes. See Table 101.

Emotional Supports

Two repeated measures ANOVAs were conducted to access the potential differences in emotional supports as a function of device. Using Pillai's Trace criterion, there was a significant main effect of emotional-verbal supports ($F_{(2, 73)}$ = 3.29, p < .05). There were no significant differences between the Easy, Hard and iPad sessions for emotional-physical supports. See Table 102 for complete summary.

Further investigation of the main effect for emotional-verbal supports was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to provide emotional-verbal supports during the iPad session (M = 7.38, SD = 5.57) than the Easy session (M = 5.69, SD = 3.80; $t_{(88)}$ = 2.58, p < .02). Parents were also more likely to provide emotional-verbal supports during the iPad session (M = 6.92, SD = 5.32) than the Hard session (M = 5.37, SD = 3.95; $t_{(86)}$ = 2.68, p < .01). However, parents were not more likely to provide emotional-verbal supports during the Easy session (*M* = 6.00, *SD* = 3.78) than the Hard session (*M* = 5.81, *SD* = 3.90; $t_{(79)}$ = .34, *p* = .34). See Table 103.

Interactions

A series of repeat measures ANOVAs were run to explore the potential differences in the various interactions as a function of device.

Using Pillai's Trace criterion, there was no significant main effect of total interactions between the Easy, Hard and iPad sessions ($F_{(2, 119)}$ = .03, *p* = .975). Using Pillai's Trace criterion, there was a significant main effect of total scaffold ($F_{(2, 115)}$ = 10.17, *p* < .001), total child requested assistance ($F_{(2, 45)}$ = 3.78, *p* < .04), and total parent initiated engagement ($F_{(2, 110)}$ = 14.18, *p* < .002). See Table 104 for complete summary.

Scaffolds. Further investigation of the main effect for total scaffolds provided was examined through three paired *t*-tests. All three outcomes were statistically significant. Parents were more likely to provide scaffolds during the hard session (*M* = 10.64, *SD* = 5.82) than the Easy session (*M* = 8.20, *SD* = 4.36; $t_{(119)}$ = 4.65, *p* < .001) and during the Hard session (*M* = 10.50, *SD* = 5.87) compared to the iPad session (*M* = 9.26, *SD* = 4.91; $t_{(121)}$ = 2.05, *p* < .05). Parents were more likely to provide scaffolds during the iPad session (*M* = 9.27, *SD* = 4.95) than the Easy session (*M* = 7.99, *SD* = 4.45; $t_{(123)}$ = 2.52, *p* < .02). See Table 105.

The subthemes for scaffolds were examined further. Using Pillai's Trace criterion, there was a significant main effect of overall parent initiated supports ($F_{(2, 114)}$ = 9.39, *p* < .01), parent supports which receives a positive response ($F_{(2, 108)}$ = 5.63, *p* < .006), single supports ($F_{(2, 111)}$ = 3.20, *p* < .05) and multiple supports ($F_{(2, 57)}$ = 11.38, *p* < .001).

Parent initiated supports. The main effect for parent-initiated supports was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to initiate supports during the Hard session (*M* = 8.66, *SD* = 5.17) than the Easy session (*M* = 6.70, *SD* = 4.25; $t_{(118)}$ = 4.13, *p* < .001) and during the iPad session (*M* = 8.38, *SD* = 4.86) compared to the Easy session (*M* = 6.58, *SD* = 4.26; $t_{(121)}$ = 3.78, *p* < .001). There were no significant differences between the Hard and iPad sessions for parent-initiated supports See Table 105.

Parent supports, child positively responds. The main effect for parent-initiated supports was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to receive a positive response to a support during the Hard session (*M* = 6.97, *SD* = 4.37) than the Easy session (*M* = 5.54, *SD* = 3.61; $t_{(113)}$ = 3.38, *p* < .002) and during the Hard session (*M* = 6.99, *SD* = 4.37) compared to the iPad session (*M* = 5.97, *SD* = 3.49; $t_{(113)}$ = 2.28, *p* < .03). There were no significant differences between the Easy and iPad sessions. See Table 105.

Single Support. The main effect for single supports was examined through three paired *t*-tests. One outcome was statistically significant. Parents were more likely to provide a single support during the Hard session (*M* = 7.94, *SD* = 4.33) than the Easy session (*M* = 6.88, *SD* = 3.47; $t_{(116)}$ = 2.53, *p* < .002). There was a trend towards significance between the Hard (*M* = 7.80, *SD* = 4.37) and iPad sessions (*M* = 6.91, *SD* = 3.89; $t_{(118)}$ = 1.87, *p* = .064). See Table 105.

Multiple Supports. The main effect for multiple supports was examined through three paired *t*-tests. All three outcomes were statistically significant. Parents were more likely to provide multiple supports during the Hard session (*M* = 3.61, *SD* = 2.26) than the Easy session (*M* = 2.34, *SD* = 1.67; $t_{(66)}$ = 4.07, *p* < .001) and in the Hard session (*M* = 3.22, *SD* = 2.19) compared to the iPad session (*M* = 2.53, *SD* = 2.06; $t_{(103)}$ = 2.59, *p* < .02) . Parents were more likely to provide multiple supports during the iPad session (*M* = 2.93, *SD* = 2.16) than the Easy sessions (*M* = 2.20, *SD* = 1.61; $t_{(75)}$ = 2.48, *p* = .02). See Table 105.

Support ends in answer. The main effect for supports that end in an answer was examined through three paired *t*-tests. No outcomes were statistically significant however there was a trend towards significance. Parents were more likely to provide the answer after support during the iPad session (*M* = 2.10, *SD* = 1.20) than the Easy session (*M* = 1.20, *SD* = .63; $t_{(9)}$ = 2.08, *p* = .68). See Table 105.

Child requested assistance. Further investigation of the main effect for total child requested assistance was examined through three paired *t*-tests. Two outcomes were statistically significant. Children were more likely request assistance during the Hard session (*M* = 3.51, *SD* = 3.05) than the Easy session (*M* = 2.65, *SD* = 1.53; $t_{(70)}$ = 2.51, *p* < .02) and during the Hard session (*M* = 3.39, *SD* = 3.06) compared to the iPad session (*M* = 2.23, *SD* = 1.44; $t_{(60)}$ = 2.86, *p* < .007). There were no significant differences between the Easy and iPad sessions. See Table 105.

The subthemes for child requested assistance were examined further. Using Pillai's Trace criterion, there were no significant differences between the Easy, Hard and iPad sessions.

Parent Initiated Engagement. Further investigation of the main effect for total parent initiated engagements was examined through three paired *t*-tests. Two outcomes were statistically significant. Parents were more likely to initiate an engagement during the Easy session (*M* = 10.47, *SD* = 5.61) than in the Hard session (*M* = 8.10, *SD* = 4.93; $t_{(114)}$ = 5.60, *p* < .001). Parents were also more likely to initiate an engagement during the iPad session (*M* = 9.30, *SD* = 4.80) than in the Hard session (*M* = 8.06, *SD* = 4.92; $t_{(115)}$ = 2.47, *p* < .02). There were no significant differences between the Easy and iPad sessions. See Table 105.

The subthemes for parent-initiated engagements were examined further. Using Pillai's Trace criterion, there was a significant main effect of total parent initiated engagements which received a response ($F_{(2, 103)} = 7.26$, $p < .002$), parent initiate relevant engagements which received a response ($F_{(2, 96)} = 6.98$, $p < .002$), parent initiate relevant engagements which were ignored ($F_{(2, 48)} = 5.11$, $p < .02$) and a trend towards significance for parent initiated irrelevant engagements which received a response ($F_{(2, 96)} = 2.89$, $p = .064$).

Parent initiated engagement, child response. Further investigation of total parent initiated engagements in which the child responded were examined through three paired *t*-tests. Two outcomes were statistically significant. Children were more likely to respond to an engagement during the Easy session ($M = 6.90$, $SD = 4.00$) than in the Hard session ($M = 5.55$, $SD = 3.46$; $t_{(108)} = 3.75$, $p < .001$). Children were also more likely to respond to an engagement during the Easy session ($M = 6.58$, $SD = 4.04$) than in the iPad session ($M = 5.47$, $SD = 3.61$; $t_{(115)} = 2.60$, $p < .02$). There were no significant differences between the Hard and iPad sessions. See Table 105.

Relevant engagement, child response. Further investigation of relevant engagements in which the child responded were examined through three paired *t*-tests. Two outcomes were statistically significant. Children were more likely to respond to relevant engagement during the Easy session ($M = 4.68$, $SD = 2.86$) than in the Hard session ($M = 3.52$, $SD = 2.12$; $t_{(103)} = 4.07$, $p < .001$). Children were also more likely to respond to a relevant engagement during the Easy session ($M = 4.47$, $SD = 2.83$) than in the iPad session ($M = 3.34$, $SD = 2.49$; $t_{(113)} = 3.38$, $p < .002$). There were no significant differences between the Hard and iPad sessions. See Table 105.

Relevant engagement, child ignores. Further investigation of relevant engagements in which the child ignores the parent were examined through three paired *t*-tests. One outcome was statistically significant. Children were more likely to ignore a relevant engagement during the Easy session (*M* = 2.95, *SD* = 2.00) than in the Hard session (*M* = 2.15, *SD* = 1.37; $t_{(58)} = 3.04$, $p < .005$). There were no significant differences between the Hard and iPad sessions or the Easy and iPad sessions. See Table 105.

Discussion

The primary goal of the present study was to document and describe the interactions that occur when parents and children play with technology. In particular it was important to examine parent behaviours that might support or limit learning opportunities. Following from the description of behaviours, the present study also examined factors that could impact the types of interactions that occurred, specifically potential differences between mothers and fathers and device/software context (easy, hard or mobile). Observations were used to understand how parental actions are received by the child and vice versa. Finally, correspondences between self-report data and observations were examined to assess the correspondence between these two sources of information.

Observations

Observing parents engaged with their children in technology contexts indicated that parents are actively involved in varied ways with their children. The present study supports previous literature, which suggests parents indicate they are present to provide support to their children (Davies, 2011). A great deal of research shows that parents desire to support their children’s learning through coaching (Davies, 2011; Evans, Mansell, & Shaw, 2006; Neumann et al., 2009; Sénéchal & LeFevre, 2002). One goal of the present study was to directly observe and document exchanges between parents and their children as they navigate joint media-based activities.

Observations were captured in four levels of broad overarching themes: parental intentions during game play; supports parents provided; scaffolding; and engagements between parents and children. Each of these is examined individually in the following sections. Parental intentions during game play examined whether parents engaged in goal oriented behaviours, which referred to observations in which parents primarily interacted with the software but involved their child in completing the task, or whether parents' approach to the sessions was simply to entertain the child. The results of this study demonstrated that parents approached the computer game activities with different intentions. In a small but noticeable group of parents, the parents were goal oriented and persisted in this approach throughout the session. Although this particular approach did progress the game, the child's opportunities for engagement were limited. Parents operated the device and controlled the pace and progression of play and left few opportunities for the child to gain independent use of the device or for the parent to scaffold the child as the child learned to navigate the software/device. This approach to technology may limit development of skills of technology use and may not optimize learning (Archer, 2017; Flynn & Richert, 2015). Among the vast majority of parents, goal directed play was present only on a limited basis.

Identifying differences in how parents initiate and maintain technology based play is important as these approaches may dictate what and how children learn in these play contexts. In general, parents either restrict or expand opportunities for interactions. Goal oriented behaviours were more restrictive than other approaches that involved scaffolding with respect to opportunities to engage.

Three broad types of supports were identified. These included verbal, physical and emotional supports. Most parents engaged in all of these frequently. In general, 90% of parents endorsed some form of verbal or physical supports. These findings are encouraging as parents demonstrated diversity within a supportive learning context. In the present study, the observation sessions created a “best case” scenario in which parents were successful. Future research should examine how these findings translate more generally to other contexts such as the home environment, exposure over time and when children have more game experience. However, these finding support past literature indicating parents employ a variety of scaffolding techniques (Wood et al., 2017)

Parent and child scaffolding interactions yielded information about the types of scaffolds parents provide, how frequently these appear and how parents and the child received these initiations. Through interactions, parents can provide appropriate supports in which they guide and scaffold the child within his or her zone of proximal development (Vygotsky, 1978). According to Vygotsky’s (1978) model, scaffolding success is reliant on the tailored support for individual children and in turn the support provided would vary depending on the child’s independent abilities and responses. In the majority of cases, children were receptive to supports provided by their parents. Children would follow through or ask for further clarification when a parent provided supports. Less frequently did children ignore or resist a scaffolding attempt. Responsiveness was mutual. Parents almost always provided support when children requested assistance throughout the session. The interactions between parents and children were not limited to supports. Both parents and children took opportunities to engage one another throughout the session. This observation demonstrated that knowledgeable others can support and assist children in acquiring knowledge and skills above and beyond the elements of technology software.

Central to Vygotsky’s (1978) socio-cultural framework, an individual’s learning cannot be separated from the environment in which it takes place (Cole, 1996; Gutierrez, 2002;

Plowman et al., 2008). Children's learning occurs through social interaction with an adult or a more experienced peer (Vygotsky, 1978). Parents took additional opportunities in an attempt to teach or expand their child's knowledge and experience. Interestingly, although less frequently, children took additional opportunities to learn and expand their own knowledge and experiences through engagements with their parents. Expansions as provided in the technology based context mirrors the types of interactions in natural play context (Fisher, Hirsh-Pasek, Newcombe, & Golinkoff, 2013; Weisberg, Hirsh-Pasek, & Golinkoff , 2013; Weisberg, Zosh, Hirsh-Pasek, & Golinkoff, 2013; Tsao, 2008). Play serves an important function in promoting learning and is one mechanism through which socio-cultural learning occurs (Vygotsky, 1978). Specifically, consistent with Vygotsky's framework, play provides an environment through which social values and knowledge can be communicated (Cole, 1996; Gutierrez, 2002; Plowman et al., 2008). Although Vygotsky's original theory was conceived in a context where traditional play would occur, his theory can be adapted to accommodate more modern technological contexts where technology serves as a tool which promotes socio-cultural learning. Given the similarities in interactions to traditional play, technology based play can be one more venue in which children can acquire skills from their parents.

Gender Differences

The observation sessions provided opportunities to note differences in play, scaffolding and support provided by mothers and fathers. In addition, the child's response to the parents could also be noted. Overall, mothers and fathers were more similar than different in their play. Specifically, over the three game contexts few statistically significant gender differences were noted. Only one gender difference was detected in the easy computer game and two in the hard computer game. In the easy computer game the one difference indicated that fathers were more likely to demonstrate how to use the software than mothers. In the hard computer game, fathers were more likely to assess their child's understanding of the task and they engaged in more 'check-in' events with their child. These differences suggest that fathers engaged in additional, attentive interactions to promote ongoing activities than did mothers.

This conclusion is supported, in part, by the finding that mothers in both the hard software context and the iPad context, overall, engaged in more goal oriented behaviour. Given that mothers engaged in more goal-oriented play, they had fewer opportunities to engage in the other scaffolding behaviours. It was also interesting to note that within the goal oriented play orientation in the hard software computer game fathers provided more verbal and emotional supports than did mothers.

The iPad game context yielded more gender differences than either of the desktop computer contexts. Specifically, seven gender differences were detected. In only one of these instances were fathers engaging in more behaviours than mothers. In this one context, fathers provided the child with the answer requested by the game without providing additional scaffolds to the child. Overall, mothers were more likely to provide physical supports and multiple scaffolds to their child than fathers. In terms of physical supports that were observed, mothers engaged their child through pointing and in particular through pointing to critical information on the screen. Interestingly, mothers were more likely to receive a positive response from their child for their scaffolding than were fathers. It appears, in the mobile technology context, that mothers felt the need to provide more direction and attention to the device. This difference may reflect the more mobile nature of the iPad where children could move the device, and had more flexibility to move themselves.

The numerous similarities observed across mothers and fathers in the present study replicate findings noted for technology based play sessions with infants up to two years of age (Archer, 2017). That is, in previous research no gender differences were observed when playing with iPads for younger children. However, in the present study some differences were noted, albeit few, given the array of themes where differences could be noted. These small differences may tap into perceived developmental differences among mothers and father regarding play and learning. It is possible that mothers engaged in a more learning based focus than fathers, and this became especially noticeable in the iPad context where children could go off-task more easily. The behaviours exhibited by mothers suggest that mothers were trying to keep children on-task. This presents an interesting future direction to explore regarding intentions of parents when they initiate computer activities. Interviews could identify whether parents approach these opportunities differently.

Age differences

Child's age at the time of the observation session ranged between 23 months to 6 years and 11 months. Outcomes associated with verbal and physical supports suggest that parents responded in developmentally appropriate or sensitive ways to their children's needs. Consistent with the literature (e.g., Wood et al., 2016) parents provided fewer supports for older children than for younger children regardless of device (desktop vs. ipad) or software (easy vs. hard). Emotional support, however, seem to be different than verbal and physical supports. Regardless of age, parents consistently provided emotional support to their children.

Verbal Supports. The pattern of outcomes for the overall verbal theme and 7 of the 11 subthemes that were significant suggests that parents tend respond to the developmental needs of their child. Specifically overall, fewer verbal supports were provided as age increased. This pattern was evident with parents providing less additional information, fewer direct step-by-step instructions and less follow-up information. Parents also asked fewer specific questions, fewer connections to progress in the software and indicated errors less often. Finally, parents read less information from the screen out loud to older children than younger children. Interestingly, these observations most typically occurred with the easy software (6 of the 11 subthemes and the overall verbal theme). In addition, this pattern was followed for 3 of these subthemes when the iPad was in use. The pattern was only evident on only two occasions for the hard software activity and only when giving step by step instructions or asking specific questions. This suggests that when children are older or when activities are easy these particular types of verbal supports are not perceived to be as necessary. Consistent with outcomes in Study 1, this decrease in verbal direction aligns with appropriate scaffolding techniques as children’s strategies and problem-solving techniques develop with age (Lemaire & Lecacheur, 2011; Siegler, 2007).

The exception to this pattern of decreasing verbal supports as a function of age occurred when parents provided explanations about the software to cue the child about the properties of the software. This behaviour may reflect an awareness that older children can anticipate next steps. Interestingly, parents also increased the number of times they checked with the child to ensure understanding and used more fillers especially the use of “fluffy-dialogue” with increasing age. The latter two findings suggest that parents were seeking to maintain the involvement even though the child did not need specific support. This interpretation however in not entirely consistent given the variability in which these supports increased. For example, fillers appeared in all contexts while increased check-ins only appeared in the iPad context and explanations only in the easy software condition.

Physical Support. Similar to the outcomes for verbal supports, the pattern of outcomes for the overall physical theme and 4 of the 5 subthemes that were significant suggests that parents tend respond to the developmental needs of their child. Specifically overall, there were few physical supports provided to children as their age increased. Interestingly, these observations occurred with the iPad software for the subthemes, and in all overall physical themes. Parents were less likely to demonstrate how to use the software or to adjust their child's hand on the device. Furthermore, parents provide fewer direct points and pressed the screen to select important information as age increased.

The exception to this pattern of decreasing physical supports as a function of age occurred when parents repositioned the iPad for their own purposes. This behaviour may reflect an attempt to stay engaged with the child while the child independently uses the device.

Emotional Support. Emotional supports were offered regularly and at a relatively high rate, with as many as 38 emotional verbal supports during the iPad game. Emotional supports were not impacted by gender or age or computer difficulty. The lack of differences suggests that emotional supports are relatively constant and relatively independent of the variables manipulated in this study. The constancy of emotional support suggest that this is an important support for all children in all contexts. Interestingly, there were no differences noted as a function of gender in the observational data, but differences were noted in Study 1 where fathers reported being less demonstrative while interacting with their child. According to these finding, fathers are underreporting the frequency in which they provide emotional supports. Despite common perception but consistent with previous research, fathers are just as likely to provide emotional supports as are mothers (Adams, Kuebli, Boyle, & Fivush, 1995).

Other. In addition to the above themes, one additional theme demonstrates developmental growth for children such that as age increased children spent less time off-task during the iPad task. Alternatively, this behaviour could demonstrate that young children are not intrinsically motivated to use mobile devices (Archer, 2017). This finding could also be supported through Bandura's Social Learning Theory (1977). By observing others, children are exposed to new behaviours which could later impact their own actions when in the same context. Parents act as models from which children can learn how to navigate technology. Indeed, some research (Bleakley et al., 2013) demonstrates that parents' technology habits likely guide the habits of young children. Bronfenbrenner identified the important role parents and close family members play in children's early development (Bronfenbrenner, 1979). As parents and older siblings model interest in mobile technology, actions specific to using the technologies and ways of navigating software, young children can come to acquire similar skills and interests over time. Parental use of technology in the home environment provides context for facilitating learning and understanding of technological devices and potential uses in children (Plowman et al., 2008).

Scaffolded Interactions. Across all three sessions, parents provided fewer scaffolded interactions as children's age increased, suggesting that parents either did not need to provide support because their child was independently able to continue, or that parents felt their children had more skills to enable them to problem-solve their progression through the activities. These outcomes for scaffolding align with the perceived need for supports, all of which declined as age increased. Parents appear to be responding to the developmental needs of children. Furthermore, as a child's age increased, parents provided fewer scaffold interactions that received a response across the easy and hard software as well as the iPad session. Interestingly, in both the hard software session and the iPad sessions, parents provided fewer multiple supports within a single interaction. This result could also demonstrate the developmental growth in children, as they needed fewer multiple supports during difficult tasks. A similar pattern was found during the iPad session for single supports within an interaction; older children needed fewer single supports from their parents.

Parent and Child Engagements. Differences between engagements as a function of age were only seen through parent-initiated engagements. That is, regardless of age, there were no differences in how parents responded to a child-initiated engagement. Interestingly, differences were only found within the computer desktop context. Three overall themes and four subthemes were related to a child's age. As children's age increased they were more likely to ignore an engagement from their parent, regardless of whether the engagement was relevant or irrelevant to the easy or hard software. Only in the hard software context was a child's age also related to positive responses to parent-initiated engagements. Children's increase in age was related to parents initiating more irrelevant engagements to which children provided a responded.

Self-reports and Observational data

Overall, self-report and observed verbal and physical behaviours were not related. When given a list of supports, parents inaccurately reported the frequencies of verbal and physical supports they provided when compared to their observed behaviours. For verbal supports, only two of the 81 correlations for each of the easy software and hard software were significantly related. Parental self-reported physical supports were slightly more related to observed behaviours. Of the 10 physical supports self-reported and the 10 observed physical supports only seven were significant for the easy software activity and six for the hard software activity. Interestingly, there was no consistent pattern with parents overestimating or underestimating the number of supports they provided. However, consistent with the literature, these finding suggest that parents are unable to accurately assess the number and type of supports they provide to their children when engaged with technology (Archer, 2017; Morsbach & Prinz, 2006).

Of note, although poor, parental self-reports of verbal and physical supports were more frequently related to observed behaviours during the iPad session than they were for the stationary devices. Specifically, 19 correlations were significant between self-reports and observed supports within the iPad session. The slight increase in accuracy may represent the prevalence of mobile technology in today's society as parents may have more experience in supporting their child while using a mobile device in comparison to stationary technology. The overall low correspondence between self report and observed supports is evident in the existing literature. For example, Plowman and colleagues (2011) observed parents providing support, but when asked, parents often indicated they were not directly involved in supporting their child's learning. It may be the case that parents are less aware of the learning opportunities they provide due to the implicit nature of the support they provide or the failure to recognize the importance of their scaffolding and modelling behaviours (Davies, 2011; Evans, Mansell, & Shaw, 2006; Neumann et al., 2009; Sénéchal & LeFevre, 2002).

Comparing across software context

The inclusion of easy and hard software within the design of the present study permitted a more discriminating understanding of parental support during joint computer play. Within the existing literature Yelland and Masters (2007) identified three broad types of scaffolding that typically occur during interactions with technology: cognitive, affect, and technical. The present study extended this initial research in two ways. First, the present study examined scaffolding provided as a function of navigational challenges (easy versus challenging) associated with software. Second, the present study provided a more detailed and exhaustive description of scaffolding and responses to parental reports than was present in the broad categories used by Yelland and Masters (2007). Examining different types of software was an important consideration given that software design varies across developers (Grant et al., 2012). For example, Grant and colleagues (2012) noted skill presentation was neither systematic nor consistent across the three software levels. It was expected that parents would tailor their support to the demands inherent in the software and the needs of the children during depending on the successes and failures on specific software. Outcomes supported this expectation. Parents were indeed sensitive to the various demands of the software difficulty as they engaged in more scaffolding interactions for hard than easy software. In addition, the types of supports provided were clearly identified with parents providing more specific instructions in particular as well as more physical supports to facilitate play during the hard software session in comparison to the easy session.

Comparisons Across Device Contexts

Potential differences in the various interactions as a function of device was explored. Findings indicated two critical comparisons. Differences were found as a function of device (computer vs. mobile) and as a function of software (easy software vs. hard software). Overall 22 differences were found as a function of device and 14 were as a function of software. Interestingly 12 of these differences were found as both a function of device and software. These finding suggest although some differences do occur as a function of device and a functions of software, similarities are also common.

Emotional support differed as a function of device but not difficulty in software. More emotional supports were deemed to be more necessary in the iPad condition than the easy or hard software.

The present research demonstrated the importance of scaffolding in the context of computer and mobile technology use. Similar to past research, parents employed a variety of scaffolding techniques while interacting with their child on both stationary and mobile technology (Wood et al., 2017). As supported in previous literature, parents actively provided a great deal of supports to their children through cognitive, affective and technical scaffolds through verbal, physical and emotional supports (Wood et al., 2017; Yelland & Masters, 2007).

Limitations and Future Research

There are three noteworthy limitations with the design of the present study. The first concern is that the present study occurred in a controlled lab context. This was an important first step in examining parent child behaviours as this context minimized external distractions and contextual variables. However, this design represents a best-case scenario. Parents knew they were being observed and only had the child and the technology as a focal point. It would be important to extend the current research to less formal and more naturalistic settings. In particular, future research should examine parent-child interactions in the natural home environment. In-home observations would provide insight on the impacts of the home dynamics (such as chores, tasks, additional children, etc.,) and supports provided to children using technology.

An interesting feature of the present study involved the different devices and software. Given the prevalence of mobile devices relative to stationary computers today, future research should explore how parents and children interact when the software is novel or not for mobile devices in particular. In addition, it would be interesting to observe interactions over time to determine the impact of experience and exposure for both the parent and the child.

A third limitation in the current study was that sessions were limited to 10 minutes. It would be interesting to explore the typical length of interaction though more naturalistic observation opportunities. Furthermore, research might focus on supports offered at the beginning, middle, and end of interaction rather than continuously as was done in the present study. Such an examination might reveal differences in the way parents initiate and terminate technological play with their children. This extension to the current study could provide insight regarding interactions over time.

General Discussion

The purpose of the present research was to provide an exploratory investigation of parent-child interaction when jointly engaged with technology across two age groups and two device types. The two studies provided an in depth understanding of parental views and parental behaviours regarding parent-child interactions when jointly engaged with technology.

In particular, the current research identified verbal, physical and emotional supports as the most prevalent forms of support that parents offer to their children during play with technology. While previous research identified cognitive, emotional and technical supports as the most common supports during stationary computer play (Yelland & Masters, 2007), the present research indicates that these categories were not sufficiently detailed to capture technological play in the present study and in particular across devices and across the varied difficulty of software. For example, Yelland and Masters (2007) affective supports focused on overall encouragement and to keep children on task whereas the current research expanded this theme to include emotional supports through both verbal and physical means. This extension permitted a better understanding of the impact of age on emotional supports. For example, in the present study emotional-physical supports were observed often regardless of child’s age. Similarly, in the present study the cognitive supports examined were much more elaborate than those present in the earlier research of Yelland and Master's (2007). Cognitive supports in the present study included four overall verbal themes: general instructions (with 5 subthemes), specific instructions (with 3 subthemes), and feedback (with 5 subthemes). Each of these themes reflected a different kind of cognitive support and provided information regarding when the support was provided either before or after with General Instructions and Specific Instructions, for example, occurring prior to an action and Feedback occurring after an action. Most notably, Yelland and Masters (2007) did not isolate physical supports. Given that at the onset of the research it was evident the vast majority of parents provided a physical support to assist their child, physical supports were an important inclusion in the present study. For example, examining differences between supports which facilitated play such as providing hand-over-hand support with the mouse provides a very different learning opportunity than when the parent solely performed an action to progress play, such as simply moving the mouse for their child. The elaborated thematic coding used in the present research provides a more intricate understanding of the many and varied supports parents provide when engaged with their child. In addition, the themes provide a research tool that can be used in future research analyzing parent child interactions.

A consistent finding within the literature is that parents report a desire to support their children during technology use (Davies, 2011; Evans, Mansell, & Shaw, 2006; Neumann et al., 2009; Sénéchal & LeFevre, 2002). The present research not only supports parent's desire to support their children but also indicates that parents do actively support their children in multiple ways. According to Vygotsky (1978) socio-cultural learning framework, through appropriate scaffolding a child would be able to achieve a challenging task that would be otherwise unachievable. The present research suggests that parents attempt to achieve this through providing a variety of supports during joint computer tasks. Technology contexts provide an environment in which learning could occur through social interaction with an adult or a more experienced peer (Vygotsky, 1978). The current research demonstrated that during joint computer interactions, both parents and children took additional opportunities in an attempt to expand their (the child's) knowledge and experience.

The present research also supports learning opportunities through modelling. Bandura's Social Learning Theory (1977) depicts how behaviours are learned though the observation and imitation of others. By observing others, children are exposed to new behaviours which could later change or drive their own behaviours. In addition to verbal and physical supports, parents in the present study provided demonstrations that modelled behaviours the child could use to progress in the game. These demonstrations were important opportunities for the child to learn how to use or navigate the software.

Parents play an integral role in their child's life. According to the Bronfenbrenner ecological systems theory, parental beliefs and perceptions shape the belief and perceptions of their children. Through these interactions, parents have a direct impact on their children. In addition, children's responses and initiations also direct and expand the relationship they have with their parents. As the adult provided instruction or example; the child learns through understanding the actions but also reacts to the instruction, influencing how the parent provides future instructions. The present research provides insight to these interactions. In the majority of interactions, children were receptive to their parents' support and engagements. Furthermore, children interacted with their parents through requesting assistance and/or initiating engagements.

Overall, the present research contributes to the existing literature by describing children's reactions to their parents' scaffolding attempts. Although the present sample and design may have elicited a best case scenario, the outcomes are reassuring as they establish the rich and diverse nature of feedback that children receive when engaged with their parents. Even in this best case scenario, however, some parents exhibited limited scaffolding strategies. This indicates the need for further exploration across more diverse samples, over repeated exposure and across more diverse contexts to determine the educational implications and possible need for intervention.

With respect to gender differences, overall, few differences emerged. However, the interesting finding that fathers generally underestimated the amount of emotional support they provided suggests that further research is needed examining fathers' perceptions of emotional supports provided to children.

The present research provides the foundation for subsequent investigation and educational interventions through the detailed descriptive thematic categories extracted from the observational data. These thematic categories can serve as building blocks for future research analyses and instructional interventions. Given the seamless presence of technology in the lives of children today, it is critical to understand how children are taught to interact with technology – the present study provides a comprehensive understanding of possibly the most important source of exposure to technology, the parent-child interaction. Parents in the present study demonstrated thoughtful, sensitive and adaptive use of technology when interacting with their child. Specifically, parents demonstrate sensitivity to their child's needs across diverse context including: less and more challenging tasks (i.e., task difficulty), differing devices (i.e., stationary and mobile) and age (i.e., toddlers to early elementary). Awareness of the complexity of parent-child interactions during technology use, necessitates research that is equally sensitive and complex in nature. Ongoing research needs to extend beyond the simplistic analysis of interactions captured in the previous literature. The present study provides a foundation and an example of how future research can capture the complex and dynamic aspects of joint technology use between parents and children.

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Table 1.

Number of participants involved in the survey as a function of gender

		Parent		
		Mothers $n = 200$	Fathers $n = 69$	Unknown
Child Gender	Male $n = 137$	$n = 105$	$n = 32$	--
	Female $n = 134$	$n = 95$	$n = 37$	$n = 2$

Table 2

Frequency and occurrence of parental report on child within a specific age range.

	Mothers	**Fathers**
23 to 24 months	1% (*n* = 2)	1.5% (*n* = 1)
25 to 30 months	12.2% (*n* = 24)	13.2% (*n* = 9)
31 to 36 months	18.3% (*n* = 36)	13.2% (*n* = 9)
37 to 42 months	13.2% (*n* = 26)	11.8% (*n* = 8)
43 to 48 months	12.7% (*n* = 25)	4.4% (*n* = 3)
49 months to 4 years, 6 months	13.2% (*n* = 26)	17.6% (*n* = 12)
4 years, seven months to 5 years	13.2% (*n* = 26)	20.6% (*n* = 14)
5 years and over	16.2% (*n* = 32)	16.2% (*n* = 11)

Table 3.

Hours of care provided by parents and others

	Overall M (SD)	Mothers M (SD)	Fathers M (SD)	*t*	df	*p*
Yourself	93.35 (48.81)	100.66 (47.46)	71.69 (46.83)	**-4.19**	249	**.001 ***
Partner/Spouse	65.05 (48.16)	56.77 (45.08)	87.91 (49.61)	**4.53**	229	**.001 ***
Grandparent	11.22 (13.94)	13.23 (15.66)	6.22 (5.50)	-2.18	90	.032
Older Sibling	17.8 (37.83)	22.64 (44.69)	6.5 (5.09)	-0.87	18	.396
Other Family Members	13.44 (38.77)	17.08 (45.54)	4 (3.67)	-0.63	16	.538
Babysitter/Nanny	15.54 (15.23)	15.95 (15.58)	14.67 (15.33)	-0.20	26	.84
Educational worker	28.92 (14.19)	28.43 (14.68)	30.04 (12.66)	0.66	178	.511
Other	5 (3.74)	5 (3.74)				

* Significant to *p* < .007

Table 4.

Parent report on the amount of child play activities in the home

	Overall M (SD)	Younger M (SD)	Older M (SD)	*t*	df	*p*
Books	5.72 (1.10)	5.70 (1.02)	5.75 (1.20)	0.37	257	.714
Toy Vehicles	4.13 (1.52)	4.10 (1.49)	4.16 (1.57)	0.30	258	.763
Stuffed animals	3.85 (1.10)	3.86 (1.06)	3.84 (1.15)	0.14	255	.888
Dolls/Action figures	3.37 (1.30)	3.10 (1.13)	3.68 (1.41)	3.66	257	**.001***
Lego sets/Building blocks	3.15 (1.56)	2.98 (1.45)	3.33 (1.67)	1.83	258	.068
Puzzles	3.07 (0.91)	3.01 (0.85)	3.14 (0.98)	1.15	256	.250
Craft sets	2.77 (0.96)	2.61 (0.91)	2.95 (0.99)	2.91	257	**.004***
Outdoor toys	2.70 (0.77)	2.65 (0.71)	2.76 (0.85)	1.15	258	.253
Musical Instruments	2.4 (0.81)	2.44 (0.73)	2.35 (0.89)	0.86	257	.393
Activity Centers	2.24 (0.66)	2.28 (0.64)	2.18 (0.68)	1.27	256	.205
Magazines/Comics	1.69 (1.01)	1.41 (0.73)	2.03 (1.20)	5.18	257	**.001***
Remote control toys	1.55 (0.56)	1.46 (0.53)	1.67 (0.57)	3.10	258	**.002***

* Significant to $p < .004$

Table 5.

Access to computer based technology

	Overall Yes %	Overall No %	NA %	Missing %	Mothers %	Fathers %	X^2	N	p	Younger	Older	X^2	N	p
At Home	88.8%	8.6%	--	2.6%	89.6%	95.4%	1.98	258	0.160	87.4%	95.7%	5.42	259	.02
Friends/Relative	57.7%	22.1%	16.9%	3.4%	72.3%	73.2%	0.019	211	0.891	72.4%	71.9%	.008	212	.931
Daycare	23.6%	37.5%	34.8%	4.1%	37.9%	40.5%	0.084	161	0.772	31.4%	50.8%	6.09	163	.014
School	30.3%	18.7%	47.2%	3.7%	58.7%	71.1%	1.75	130	0.186	7.7%	84.6%	68.25	130	.001

Table 6.

Use of technology

	Overall	
	M	(SD)
TV	3.19	(0.95)
Internet	1.96	(1.10)
iPad	1.85	(1.03)
Mobile Phone	1.68	(0.91)
Laptop	1.54	(0.84)
Vtech Toys	1.44	(0.67)
Desktop Computer	1.41	(0.77)
Leap Frog/Leapster	1.33	(0.61)
Portable DVD player	1.29	(0.61)
iPod	1.29	(0.70)
Nintendo Wii	1.25	(0.55)
PlayBook	1.23	(0.58)
Leap Pad Explorer	1.18	(0.55)
Nintendo DS	1.10	(0.37)
PlayStation	1.09	(0.37)
Xbox	1.06	(0.27)
Kindle Reader	1.04	(0.22)
PSP Go	1.01	(0.10)
Nintendo Game Cube	1.00	(.068)

Anchors 1 = Not at all to 4 = Everyday

Table 7.

Parent report on technology use

	Overall	Child age group				
	Overall M (SD)	Younger M (SD)	Older M (SD)	*t*	df	*p*
TV	3.19 (.95)	3.05 (.98)	3.35 (.89)	-2.52	255	.012
Internet	1.96 (1.10)	1.81 (1.08)	2.16 (1.09)	-2.53	248	.012
iPad	1.85 (1.03)	1.76 (1.00)	1.96 (1.06)	-1.59	244	.114
Mobile Phone	1.68 (.91)	1.80 (.99)	1.53 (.80)	2.38	257	.018
Laptop	1.54 (.84)	1.43 (.75)	1.68 (.93)	-2.39	250	.018
Vtech Toys	1.44 (.67)	1.56 (.76)	1.30 (.52)	2.98	245	**.003***
Desktop Computer	1.41 (.77)	1.33 (.71)	1.50 (.82)	-1.74	242	.083
Leap Frog/Leapster	1.33 (.61)	1.33 (.63)	1.32 (.59)	.08	239	.935
Portable DVD player	1.29 (.61)	1.25 (.60)	1.35 (.61)	-1.27	236	.204
iPod	1.29 (.70)	1.22 (.61)	1.38 (.78)	-1.76	236	.079
PlayBook	1.23 (.58)	1.28 (.66)	1.17 (.47)	1.50	227	.136
Leap Pad Explorer	1.18 (.55)	1.15 .53)	1.21 (.57)	-.86	223	.391

Anchors 1 = Not at all to 4 = Everyday

Table 8.

Descriptive Statistics on child's independent use of technology

	M	(*SD*)	*N*
Computer	1.85	(1.30)	244
Laptop	1.80	(1.19)	246
Tablet	2.83	(1.53)	246
Cellphone/Smartphone	2.33	(1.40)	246
Television	2.72	(1.35)	246
Encourage use of Leapfrog, Vtech etc.	2.42	(1.32)	244
Child selects software	3.04	(1.39)	243
Parent selects software	3.14	(1.22)	239

Table 9.

Descriptive Statistics for Verbal Prompts

	Overall	
	Mean	(SD)
ADDITIONAL INSTRUCTIONS		
Reading aloud information provided in the software	3.22	(1.39)
Explaining how the software works	3.17	(1.34)
Providing hints but not complete instructions to help my child navigate the software	3.07	(1.16)
Rewording instructions form the software	3.04	(1.28)
Re-phrasing my own wording to progress through the software	2.96	(1.28)
Giving additional examples in addition to software	2.85	(1.25)
FEEDBACK		
Telling him/her that he or she is doing well	3.98	(1.23)
Telling him/her to try again	3.94	(1.18)
Asking questions of my child	3.38	(1.23)
INDIVIDUAL ITEMS		
Providing direct step-by-step instructions to guide the child in how to use the technology	2.80	(1.15)
Telling him/her that what he or she is doing is incorrect	2.84	(1.11)

Table 10.

Factor Analysis of Verbal Scaffolds

Rotated Component Matrix		
	Component	
	1	2
Rewording	**0.714**	0.34
Rephrasing	**0.700**	0.36
Reading Aloud	**0.722**	0.201
Explaining Software	**0.767**	0.267
Giving Additional Examples	**0.788**	0.238
Provide Hints	**0.710**	0.398
Telling child he/she is doing well	0.222	**0.895**
Telling child to try again	0.261	**0.876**
Asking questions of child	0.388	**0.658**
Providing Direct Instruction	0.477	0.49
Telling child he/she is incorrect	0.472	0.548

Table 11.

Paired t-test for verbal scaffolding

		M (SD)	*t*	*df*	*p*
Pair 1	Additional Instruction	3.05 (1.02)	12.93	245	.001
	Feedback	3.77 (1.06)			
Pair 2	Additional Instruction	3.05 (1.02)	3.90	244	.001
	Direct Instruction	2.80 (1.15)			
Pair 3	Additional Instruction	3.05 (1.02)	3.37	243	.001
	Telling child he/she is incorrect	2.84 (1.11)			
Pair 4	Feedback	3.77 (1.06)	14.44	244	.001
	Direct Instruction	2.80 (1.15)			
Pair 5	Feedback	3.77 (1.06)	14.65	243	.001
	Telling child he/she is incorrect	2.84 (1.11)			
Pair 6	Direct Instruction	2.79 (1.15)	.602	243	.548
	Telling child he/she is incorrect	2.84 (1.11)			

Table 12.

Verbal Scaffolding by parent gender and child age group

	Parent Gender				Child Age Group (Younger/Older)			
	Overall M (SD)	Mothers M (SD)	Fathers M (SD)	*F* *p*	Overall M (SD)	Younger M (SD)	Older M (SD)	*F* *p*
Additional Instruction	3.05 (1.02)	3.09 (1.05)	2.96 (0.88)	1.76 *0.19*	3.05 (1.02)	2.92 (1.07)	3.21 (0.93)	3.92 **.05***
Feedback	3.77 (1.06)	3.77 (1.10)	3.76 (0.95)	0.037 *0.85*	3.77 (1.06)	3.78 (1.17)	3.75 (0.91)	.213 .65
Direct Step-by-Step Instruction	2.80 (1.15)	2.84 (1.20)	2.67 (1.00)	1.56 *0.21*	2.80 (1.15)	2.73 (1.19)	2.87 (1.10)	.664 .42
Telling child he/she is incorrect	2.84 (1.11)	2.74 (1.11)	3.10 (1.05)	3.31 *0.07*	2.84 (1.11)	2.66 (1.17)	3.04 (1.00)	3.02 .08

*Significant at $p < .05$

Table 13.

Physical Scaffolding Item Means and Standard Deviations

	Overall	
	M	(SD)
DEVICE ADJUSTMENT		
Provide booster seat	1.66	(1.18)
Adjust screen location/angle	2.66	(1.36)
Adjust screen properties	1.95	(1.23)
Adjust Computer	2.63	(1.41)
POSITION CHILD IS SEATED IN		
Sit beside child (child in front of monitor)	3.25	(1.25)
Let child sit on lap (parent works on computer)	2.74	(1.23)
Let child sit on lap (child uses computer)	2.87	(1.23)
SUPPORTS TO FACILITATE PLAY		
Buy device specifically made for children	2.22	(1.33)
Place hand over hand to help with mouse	2.46	(1.22)
Move child’s hand to correct place on keyboard	2.37	(1.23)
Move child’s hand over touch pad	2.24	(1.18)
ACTIONS TO PROGRESS PLAY		
Move mouse for child	2.44	(1.12)
Press keyboard for child	2.60	(1.14)
Point in general to the screen	2.85	(1.10)
Hold portable device for child	2.36	(1.25)
INDIVIDUAL ITEMS		
Sit beside child (parent in front of monitor)	2.31	(1.13)
Point directly at or touch important info on screen	3.24	(1.13)

Table 14

Factor Analysis of Physical Scaffolds

Rotated Component Matrix

	Component			
	1	2	3	4
Booster seat	.110	**.678**	.034	.213
Adjust screen	.223	**.782**	.120	.089
Adjust properties	.091	**.761**	.109	.115
Adjust computer	-.003	**.557**	.278	.395
Sit Beside, child In front	.140	.367	**.555**	.222
Child on lap, parent work	.245	.035	**.806**	.082
Child on lap, child work	.195	.076	**.829**	.202
Buy child specific device	-.052	.248	.098	**.592**
Hand over hand for mouse	.361	.069	.251	**.726**
Move hand to correct place on keyboard	.298	.222	.223	**.749**
Move hand to correct place on touch pad	.393	.142	.042	**.654**
Moves mouse for child	**.816**	-.004	.129	.231
Presses keyboard for child	**.783**	.023	.192	.228
Points generally to screen	**.587**	.249	.329	.043
Holds device	**.569**	.379	.093	.090
Sit beside, parent in front	.377	.284	.420	.155
Points directly	**.611**	.190	.451	.200

Table 15.

Physical Scaffolding Categories

	Overall	Parent Gender		Child Age Group (Younger/Older)	
	M (SD)	*F*	*p*	*F*	*p*
Device adjustment	2.24 (1.00)	.065	.800	.904	.343
Position child is seated in	2.95 (1.00)	.453	.502	1.052	.306
Supports to facilitate play	2.33 (.956)	.104	.747	2.585	.109
Actions to progress play	2.56 (.872)	1.754	.187	1.263	.262
Sit beside child (parent in front of monitor)	2.31 (1.13)	.010	.921	.566	.453
Point directly at or touch important info on screen	3.24 (1.13)	.416	.520	.114	.736

Table 16.

Paired t-test for physical scaffolding

		M (SD)	*t*	*df*	*p*
Pair 1	Device adjustment	2.24 (1.00)	-10.18	239	**.001***
	Position child is seated in	2.95 (1.00)			
Pair 2	Device adjustment	2.24 (1.00)	-1.40	239	.162
	Supports to facilitate play	2.33 (0.959)			
Pair 3	Device adjustment	2.24 (1.00)	-4.76	239	**.001***
	Actions to progress play	2.56 (0.874)			
Pair 4	Device adjustment	2.24 (1.00)	-0.91	235	.365
	Sit beside child (parent in front of monitor)	2.31 (1.13)			
Pair 5	Device adjustment	2.24 (1.00)	-12.58	239	**.001***
	Point directly at or touch important info on screen	3.24 (1.13)			
Pair 6	Position child is seated in	2.95 (1.00)	9.89	239	**.001***
	Supports to facilitate play	2.33 (0.959)			
Pair 7	Position child is seated in	2.95 (1.00)	6.44	239	**.001***
	Actions to progress play	2.56 (0.874)			
Pair 8	Position child is seated in	2.95 (1.01)	8.90	235	**.001***
	Sit beside child (parent in front of monitor)	2.31 (1.13)			
Pair 9	Position child is seated in	2.95 (1.00)	-4.36	239	**.001***
	Point directly at or touch important info on screen	3.24 (1.13)			
Pair 10	Supports to facilitate play	2.33 (0.957)	-4.20	240	**.001***
	Actions to progress play	2.56 (0.873)			
Pair 11	Supports to facilitate play	2.33 (0.958)	0.225	236	.822
	Sit beside child (parent in front of monitor)	2.31 (1.13)			
Pair 12	Supports to facilitate play	2.33 (0.956)	-13.26	241	**.001***
	Point directly at or touch important info on screen	3.24 (1.13)			
Pair 13	Actions to progress play	2.56 (0.878)	3.73	235	**.001***
	Sit beside child (parent in front of monitor)	2.31 (1.13)			
Pair 14	Actions to progress play	2.56 (0.873)	-12.46	240	**.001***
	Point directly at or touch important info on screen	3.24 (1.13)			
Pair 15	Sit beside child (parent in front of monitor)	2.31 (1.13)	-11.24	236	**.001***
	Point directly at or touch important info on screen	3.24 (1.13)			

* Significant at $p < .003$

Table 17.

ANOVA for general emotional interaction as a function of parent gender and child age group

	Overall	Parent Gender		Child Age Group (Younger/Older)	
	M (SD)	*F*	*p*	*F*	*p*
General Emotional Interaction	4.05 (0.85)	6.35	**.012***	2.79	0.096

* Significant at $p < .05$

Table 18.

Paired t-test for emotional supports

		M (SD)	*t*	*df*	*p*
Pair 1	General Emotional Supports	4.70 (.49)	16.42	246	**.001**
	Emotional Support for Novel Technology	3.77 (.96)			
Pair 2	General Emotional Supports	4.70 (.49)	14.97	245	**.001**
	Emotional Support for Challenging Technology	3.81 (1.00)			
Pair 3	Emotional Support for Novel Technology	3.77 (.96)	-1.43	245	.154
	Emotional Support for Challenging Technology	3.81 (1.00)			

Table 19.

Main effect of child age group

	Child Age Group				
	Younger M (SD)	Older M (SD)	*t*	df	*p*
General Emotional Supports (physical behaviours and verbal comments)	4.76 (.42)	4.63 (.55)	2.23	248	**.027***
Emotional Support for Novel Technology	3.89 (.94)	3.62 (.96)	2.20	244	**.029***
Emotional Support for Challenging Technology	3.92 (1.03)	3.67 (.95)	1.94	243	.055

* Significant at *p < .05*

Table 20.

Parent responses of behaviours they are most likely to perform

	Frequency %
Crouch near my child, bring a chair up beside them or stand near my child and tell them I think they can get it	40.1%
Give a hug or touch my child to encourage them and tell them they can do it	21.7%
Tell my child I have confidence that they can figure it out if they keep trying	13.9%
Crouch near my child, bring a chair up beside them or stand near my child to show support and simply observe	11.6%
Ignore the situation and let my child work it out on their own	1.5%

Table 21.

Supports predicted by parent education and time spent with child

	Parent Education				Time spent with Child (hrs/wk)			
	n	β	*t*	*p*	*n*	β	*t*	*p*
Verbal								
Additional Instruction	236	-0.040	-0.821	.412	236	0.001	0.847	.398
Feedback	236	-0.128	-2.51	**.013***	236	0.002	1.11	.266
Direct Step-by-Step Instruction	235	-0.013	-0.233	.816	235	0.000	.202	.840
Telling child he/she is incorrect	234	-0.145	-2.70	**.008***	234	0.000	-.049	.961
Emotional								
General Emotional Support	240	-.004	-.163	.971	240	.002	2.50	**.013***

* Significant at $p < .05$

Table 22.

Verbal prompts predicted by overall parent comfort with technology

	Parent Comfort			
	n	β	*t*	*p*
Additional Instruction	213	.088	1.27	.206
Feedback	213	.147	2.08	**.039***
Direct Step-by-Step Instruction	213	-.082	-1.04	.300
Telling child he/she is incorrect	213	.091	1.23	.221

* Significant at $p < .05$

Table 23.

Number of participants involved in the observation as a function of gender

		Parent	
		Mothers *n* = 105	Fathers *n* = 50
Child Gender	Male *n* = 80	*n* = 55	*n* = 25
	Female *n* = 75	*n* = 50	*n* = 25

Table 24.

Hours of care provided by parents and others

	Overall M (SD)	Mothers M (SD)	Fathers M (SD)	*t*	df	*p*
Yourself	88.01 (47.88)	96.14 (46.00)	69.47 (47.38)	**-3.25**	149	**.001 ***
Partner/Spouse	63.95 (47.60)	54.16 (42.94)	83.33 (50.81)	**3.57**	138	**.001 ***
Grandparent	9.52 (9.20)	11.14 (10.22)	6.53 (6.10)	-1.80	52	.078
Older Sibling	20.5 (46.91)	28.0 (57.10)	5.50 (3.32)	-.77	10	.460
Other Family Members	19.36 (49.49)	25.63 (57.73)	2.67 (2.08)	-.67	9	.522
Babysitter/Nanny	16.42 (16.42)	18.87 (18.08)	12.57 (13.50)	-.77	17	.451
Educational worker	29.69 (14.34)	29.62 (15.08)	29.86 (12.69)	.081	112	.936
Other	3.33 (2.08)	3.33 (2.08)	--			

* Significant to p < .007

Table 25.

List of verbal, physical and emotional themes and subthemes

Supports
VERBAL SUPPORTS
General Instructions
Rephrasing my own wording to progress through the software
Reading aloud information provided in the software/ Labelling info on screen
Explaining how the software works
Giving additional examples in addition to software/Expanding on the games example
General prompt to explore/figure out what to do next
Specific Instructions
Providing direct step-by-step instructions to guide the child in how to use the technology/software/activity
Providing hints but not complete instructions to help my child navigate the software (iPad how to use home)
Specific questions to progress game - e.g., what goes next? etc.
Feedback
Telling him/her to try again
Asking questions of my child (e.g., How did that work?)
Affirmation (i.e., telling Child they are correct)
Follow up to task
Error Indication (i.e., telling him/her that what he or she is doing is incorrect
PHYSICAL SUPPORTS
Device Adjustment
Provide Booster Seat/readjust child's sitting
Adjust screen location/angle (iPad tilting issue)
Adjust the computer components/or devices so that the child can access it more easily
Supports to Facilitate Play
Place your hand over your child’s hand to help him/her move the mouse and/or clicks (screen)

Move your child’s hand to the correct place on the keyboard/mouse/ screen/

Actions to Progress Play

Parent moves the mouse/iPad for him/her Swiping/TILTING

Press the keyboard/mouse/iPad for him/her Pressing to select

Hold portable device so child can use it - hold mouse pad/mouse

Points

Point directly at or touch important information on SCREEN

Point directly at or touch important information on DEVICE (Keyboard/mouse/Home Button)

Point in general to the screen

EMOTIONAL SUPPORTS

Emotional Verbal

e.g., “good job”, “you got it”, “nice one”

Emotional Physical

e.g., hug, ruffling hair, kiss

Table 26.

Goal Oriented Descriptive Statistics

	%	*N*	*Min.*	*Max.*	*M*	*SD*
Easy						
TOTAL Goal Oriented	39.71%	54	1	4	1.46	.72
Time Range (Seconds)		54	17	600	424.76	202.24
Physical Prompts	88.89%	48	1	40	14.73	10.89
Verbal Prompts	100.00%	54	2	100	35.24	22.49
Emotional Prompts	79.63%	43	1	29	6.30	6.29
Hard						
TOTAL Goal Oriented	34.2%	53	1	4	1.45	.70
Time Range (Seconds)		53	20	600	431.43	185.01
Physical Prompts	94.3%	50	1	42	14.00	10.95
Verbal Prompts	98.11%	52	1	112	32.42	22.02
Emotional Prompts	69.8%	37	1	18	5.68	5.24
iPad						
TOTAL Goal Oriented	22.7%	35	1	3	1.54	0.74
Time Range (Seconds)		35	16	600	243.77	189.07
Physical Prompts	94.29%	33	1	34	9.55	8.25
Verbal Prompts	97.14%	34	1	47	15.41	14.28
Emotional Prompts	60.00%	21	1	14	4.48	3.46

Table 27.

Goal Oriented Interactions

			Parent Gender						
	Overall		Mothers		Fathers				
	N	*M (SD)*	*N*	*M (SD)*	*N*	*M (SD)*	*t*	df	*p*
Easy									
Goal Oriented	54	1.46 (.72)	39	1.56 (.75)	15	1.20 (.56)	1.70	52	.096
Physical	48	14.73 (10.89)	37	15.22 (11.81)	11	13.10 (7.18)	.564	46	.575
Verbal	54	35.24 (22.49)	39	34.64 (21.96)	15	36.80 (24.54)	.313	52	.755
Emotional	43	6.30 (6.29)	31	5.77 (5.62)	12	7.67 (7.89)	.882	41	.383
Hard									
Goal Oriented	53	1.45 (.70)	42	1.55 (.74)	11	1.09 (.30)	1.99	51	**.051**
Physical	50	14.00 (10.95)	40	12.80 (10.18)	10	18.80 (13.11)	1.57	48	.122
Verbal	52	32.42 (22.02)	42	28.57 (16.53)	10	48.60 (33.81)	2.75	50	**.008***
Emotional	37	5.68 (5.24)	30	4.50 (4.42)	7	10.71 (5.82)	3.15	35	**.003***
iPad									
Goal Oriented	35	1.54 (0.74)	24	1.71 (.81)	11	1.18 (.41)	2.04	33	**.050***
Physical	33	9.55 (8.25)	22	10.05 (7.84)	11	8.55 (9.33)	.486	31	.630
Verbal	34	15.41 (14.28)	24	14.33 (13.41)	10	18.00 (16.68)	.676	32	.504
Emotional	21	4.48 (3.46)	14	4.50 (3.37)	7	4.43 (3.91)	.043	19	.966

* Significant at $p < .05$

Table 28.

Goal-oriented interaction predicted by child's age.

	Child Age			
	n	β	*t*	*p*
Easy				
Goal-Oriented interaction	153	-.369	-8.45	**.001***
Time spent	54	-204.92	-5.34	**.001***
Physical	48	-4.71	-1.60	.117
Verbal	54	-15.62	-3.22	**.002***
Emotional	43	.833	.488	.628
Hard				
Goal-Oriented interaction	155	-.343	-7.95	**.001***
Time spent	53	-120.53	-3.79	**.001***
Physical	50	-2.63	-1.13	.263
Verbal	52	-8.42	-2.03	**.048***
Emotional	37	-1.85	-1.52	.137
iPad				
Goal-Oriented interaction	155	-.279	-6.72	**.001***
Time spent	155	-44.59	-5.64	**.001***
Physical	33	-1.20	.720	.720
Verbal	34	4.07	.725	.474
Emotional	21	1.31	.8.01	.433

*significant p < .05

Table 29.

Parent plays to keep child interested

	%	*N*	*Min.*	*Max.*	*M*	*SD*
Easy						
Parent Plays	7.4%	10	1	2	1.40	.52
Parent Plays Time		10	7	600	117.50	174.22
Hard						
Parent Plays	13.97%	19	1	3	1.37	.68
Parent Plays Time		19	7	600	157.00	157.75
iPad						
Parent Plays	9.3%	15	1	3	1.20	.56
Parent Plays Time	9.3%	15	19	233	82.00	78.39

Table 30.

Child-directed speech during parent plays to keep child interested

	%	Frequency
Easy		
Child-Directed Speech	6.6%	9
Little Child-Directed Speech	11.1%	1
Equal	22.2%	2
Majority Child-Directed Speech	66.7%	6
Hard		
Child-Directed Speech	12.5%	17
Little Child-Directed Speech	5.9%	1
Equal	23.5%	4
Majority Child-Directed Speech	70.6%	12
iPad		
Child-Directed Speech	10%	15
Little Child-Directed Speech	26.7%	4
Equal	26.7%	4
Majority Child-Directed Speech	46.7%	7

Table 31.

Parent plays to keep child interested predicted by child's age

	Child Age			
	n	β	*t*	*p*
Parent plays: Easy	10	-.008	-.065	.950
Parent plays: Hard	19	-.092	-.571	.575
Parent plays: iPad	15	-.151	-1.06	.308

*significant p < .05

Table 32.

Verbal Supports Descriptive Statistics

	%	*N*	*Min.*	*Max.*	*M*	*SD*
Easy						
TOTAL VERBAL	95.5%	128	2	91	28.11	18.42
Total General Instructions	94%	126	1	27	8.93	5.39
Total Specific Instructions	93.3%	125	1	42	13.29	10.19
Total Feedback	85.8%	115	1	37	7.06	5.65
Hard						
TOTAL VERBAL	91.9%	125	1	93	31.88	18.60
Total General Instructions	94.4%	118	1	29	9.03	5.27
Total Specific Instructions	98.4%	123	1	39	16.04	10.39
Total Feedback	86.4%	108	1	38	8.77	6.85
iPad						
TOTAL VERBAL	98%	147	1	98	29.36	16.27
Total General Instructions	97.3%	143	1	23	9.61	4.77
Total Specific Instructions	95.9%	141	1	50	12.71	9.31
Total Feedback	92.5%	136	1	36	8.46	5.96

Table 33.

Comparison of Total Verbal Supports.

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
TOTAL VERBAL	128	28.11 (18.42)	88	2 – 91	28.75 (20.04)	40	2 – 61	26.70 (14.36)	.58	126	.562
Total General Instructions	126	8.93 (5.39)	86	1 – 27	9.03 (5.56)	40	1 – 22	8.70 (5.04)	.32	124	.747
Total Specific Instructions	125	13.29 (10.19)	86	1 – 40	13.57 (10.70)	39	1 – 42	12.67 (9.06)	.46	123	.648
Total Feedback	115	7.06 (5.65)	80	1 – 37	7.33 (6.42)	35	1 – 14	6.46 (3.32)	.76	113	.451
Hard											
TOTAL VERBAL	125	31.88 (18.60)	86	1 – 93	30.85 (19.90)	39	4 – 64	34.15 (15.35)	.92	123	.360
Total General Instructions	118	9.03 (5.27)	79	1 – 29	9.15 (5.73)	39	1 – 19	8.77 (4.25)	.37	116	.712
Total Specific Instructions	123	16.04 (10.39)	84	1 – 38	15.39 (10.40)	39	1 – 39	17.44 (10.39)	1.02	121	.312
Total Feedback	108	8.77 (6.85)	72	1 – 38	8.85 (7.26)	36	1 – 30	8.61 (6.04)	.17	106	.867
iPad											
TOTAL VERBAL	147	29.36 (16.27)	102	1 – 74	29.79 (16.17)	45	3 – 98	28.38 (16.63)	.49	145	.628

Total General Instructions	143	9.61 (4.77)	100	1 – 23	9.89 (5.01)	43	1 – 16	8.95 (4.12)	1.08	141	.283
Total Specific Instructions	136	8.46 (5.96)	97	1 – 42	13.38 (9.45)	44	1 – 50	11.23 (8.91)	1.28	139	.204
Total Feedback	141	12.71 (9.31)	93	1 – 24	8.09 (5.04)	43	1 – 36	9.26 (7.58)	1.07	134	.288

Table 34.

Overall verbal supports predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Overall verbal supports	128	-3.55	-2.68	**.009***
Hard				
Overall verbal supports	125	-1.38	-.966	.336
iPad				
Overall verbal supports	146	-3.36	-3.29	**.001***

*significant p < .05

Table 35.

Comparisons of General Instructions subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M* *(SD)*	*N*	*Range*	*M* *(SD)*	*N*	*Range*	*M* *(SD)*	*t*	df	*p*
Easy											
Explaining software	111	3.59 (2.19)	76	1 – 10	3.61 (2.23)	35	1 – 8	3.54 (2.12)	.14	109	.890
Prompt to explore	102	2.69 (1.93)	68	1 – 11	2.68 (1.98)	34	1 – 7	2.71 (1.87)	.07	100	.943
Reading aloud/Labelling	94	2.62 (2.01)	63	1 – 10	2.78 (2.20)	31	1 – 6	2.29 (1.55)	1.11	92	.272
Additional examples	52	1.73 (1.25)	39	1 – 8	1.77 (1.37)	13	1 – 3	1.62 (.87)	.38	50	.706
Directed to computer instructions	43	2.19 (2.10)	29	1 – 13	2.38 (2.38)	14	1 – 5	1.79 (1.31)	.87	41	.391
Rephrasing	14	1.64 (2.13)	7	1 – 2	1.14 (.38)	7	1 – 9	2.14 (3.02)	.87	12	.402
Hard											
Explaining software	105	3.50 (2.22)	72	1 – 11	3.35 (2.28)	33	1 – 9	3.82 (2.08)	1.01	103	.315
Prompt to explore	107	2.65 (1.72)	73	1 – 7	2.69 (1.63)	34	1 – 9	2.59 (1.93)	.27	105	.788
Reading aloud/Labelling	87	2.75 (2.21)	58	1 – 12	2.95 (2.40)	29	1 – 7	2.35 (1.72)	1.21	85	.231

Additional examples	48	2.23 (1.93)	31	1 – 11	2.26 (2.10)	17	1 – 7	2.18 (1.63)	.14	46	.890
Directed to computer instructions	40	2.18 (1.72)	27	1 – 8	2.52 (1.97)	13	1 – 3	1.46 (.66)	1.88	38	.069
Rephrasing	9	1.00 (-)	5	1	1.00 (-)	4	1	1.00 (-)	-	-	-
iPad											
Explaining software	118	2.90 (1.66)	82	1 – 8	3.02 (1.71)	36	1 – 7	2.61 (1.52)	1.25	116	.215
Prompt to explore	96	2.21 (1.51)	66	1 – 9	2.26 (1.59)	30	1 – 6	2.10 (1.35)	.47	94	.639
Reading aloud/Labelling	131	3.94 (2.50)	88	1 – 11	4.24 (2.54)	43	1 – 36	3.33 (2.34)	1.98	129	.050
Additional examples	59	1.86 (1.46)	42	1 – 9	1.95 (1.65)	17	1 – 4	1.65 (0.79)	.73	57	.470
Directed to computer instructions	75	2.36 (1.95)	51	1 – 12	2.45 (2.08)	24	1 – 7	2.17 (1.66)	.59	73	.559
Rephrasing	13	1.15 (.38)	8	1 – 2	1.25 (0.46)	5	1	1.00 (-)	1.19	11	.260

Table 36.

General Instructions subthemes predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Explained Software	111	.402	2.16	**.033***
Prompt to explore	102	.270	1.68	.094
Read aloud	94	-.384	-2.22	**.029***
Additional Information	52	-.387	-2.24	**.030***
Directed Attention	43	.032	.112	.911
Rephrasing/repeating	14	-.825	-2.04	.065
Hard				
Explained Software	105	-.119	-.591	.556
Prompt to explore	107	.062	.408	.684
Read aloud	87	-.174	-.818	.416
Additional Information	48	-.418	-1.70	.097
Directed Attention	40	-.183	-872	.389
Rephrasing/repeating	-	-	-	-
iPad				
Explained Software	118	.085	.701	.485
Prompt to explore	96	.129	1.09	.278
Read aloud	131	-.284	-1.44	.152
Additional Information	59	.264	1.62	.112
Directed Attention	75	.118	.603	.548
Rephrasing/repeating	13		.001	

*significant p < .05

Table 37.

Comparisons of Specific Instructions subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Direct step by step	123	10.06 (8.22)	84	1 – 31	10.45 (8.39)	39	1 – 39	9.21 (7.91)	.78	121	.436
Questions to progress	81	4.41 (3.32)	56	1 – 14	4.38 (3.45)	25	1 – 13	4.48 (3.07)	.13	79	.896
Hints	38	1.76 (1.20)	25	1 – 7	1.76 (1.36)	13	1 – 3	1.77 (.83)	.02	36	.982
Hard											
Direct step by step	115	8.90 (6.46)	79	1 – 31	8.65 (6.67)	36	1 – 26	9.44 (6.02)	.61	113	.541
Questions to progress	101	6.39 (4.71)	67	1 – 20	6.24 (4.60)	34	1 – 20	6.68 (4.98)	.44	99	.661
Hints	91	3.35 (3.10)	60	1 – 16	3.20 (2.87)	31	1 – 17	3.65 (3.52)	.65	89	.519
iPad											
Direct step by step	136	8.49 (6.86)	92	1 – 39	9.00 (6.80)	44	1 – 42	7.43 (6.94)	1.25	134	.214

Questions to progress	108	4.31 (3.33)	74	1 – 15	4.54 (3.64)	34	1 – 11	3.79 (2.50)	1.08	106	.281
Hints	66	2.61 (2.18)	48	1 – 12	2.79 (2.42)	18	1 – 5	2.11 (1.23)	1.13	64	.261

Table 38.

Specific instructions subthemes predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Direct Instructions	123	-2.29	-3.93	**.001***
Specific Questions	81	-.840	-2.41	**.018***
Hints	38	-.343	-1.75	.088
Hard				
Direct Instructions	115	-1.82	-3.69	**.001***
Specific Questions	101	-1.06	-2.61	**.010***
Hints	91	-.300	-.985	.327
iPad				
Direct Instructions	136	-2.39	-5.46	**.001***
Specific Questions	108	-.605	-2.30	**.023***
Hints	66	.095	.380	.705

*significant p < .05

Table 39.

Comparisons of Feedback subthemes

					Parent Gender						
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Affirmation	94	4.32 (3.91)	64	1 – 26	4.72 (4.42)	30	1 – 11	3.47 (2.32)	1.46	92	.148
Follow up	88	2.38 (1.72)	60	1 – 11	2.57 (1.93)	28	1 – 4	1.96 (1.04)	1.55	86	.126
Try Again	41	1.56 (1.40)	31	1 – 7	1.51 (1.39)	10	1 – 5	1.70 (1.49)	.36	39	.722
Follow-up questions	38	1.58 (.76)	23	1 – 3	1.44 (.66)	15	1 – 3	1.80 (.86)	1.47	36	.149
Error Indication	38	1.92 (1.58)	23	1 – 8	2.17 (1.90)	15	1 – 3	1.53 (.833)	1.23	36	.228
Hard											
Affirmation	94	5.48 (5.50)	63	1 – 31	5.75 (6.06)	31	1 – 18	4.94 (4.18)	.67	92	.505
Follow up	86	2.86 (1.79)	54	1 – 8	2.89 (1.81)	32	1 – 7	2.81 (1.79)	.19	84	.850
Try Again	21	1.38 (.67)	10	1 – 3	1.30 (.68)	11	1 – 3	1.46 (.69)	.52	19	.610
Follow-up questions	43	1.49 (.80)	30	1 – 4	1.60 (.86)	13	1 – 3	1.23 (.60)	1.41	41	.166

Error Indication	49	1.90 (1.46)	29	1 – 7	2.00 (1.65)	20	1 – 5	1.75 (1.16)	.59	47	.562
iPad											
Affirmation	119	4.24 (3.45)	82	1 – 15	4.10 (3.05)	37	1 – 19	4.57 (4.25)	.69	117	.494
Follow up	111	2.95 (1.97)	77	1 – 10	2.90 (1.80)	34	1 – 12	3.06 (2.33)	.40	109	.690
Try Again	28	1.54 (1.79)	19	1 – 3	1.16 (.50)	9	1 – 10	2.33 (3.04)	1.67	26	.107
Follow-up questions	56	2.07 (1.73)	32	1 – 5	1.81 (1.15)	24	1 – 10	2.42 (2.26)	1.31	54	.197
Error Indication	64	2.48 (1.89)	44	1 – 9	2.57 (1.92)	20	1 – 8	2.30 (1.87)	.52	62	.604

Table 40.

Feedback subthemes provided predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Affirmation	94	-.507	-1.39	.168
Follow-up	88	-.062	-.371	.712
Try again	41	-.295	-1.39	.174
Follow-up Questions	38	-.088	-.650	.520
Error Indication	38	-.457	-2.20	**.034***
Hard				
Affirmation	94	.163	.309	.758
Follow-up	86	-.325	-1.86	.067
Try again	21	-.253	-1.85	.080
Follow-up Questions	43	.082	.679	.501
Error Indication	49	.261	1.37	.176
iPad				
Affirmation	119	.318	1.24	.216
Follow-up	111	-.377	-2.49	**.014***
Try again	28	-.219	-.823	.418
Follow-up Questions	56	.144	.751	.456
Error Indication	64	-.209	-.944	.349

*significant p < .05

Table 41.

Comparisons of "Other" subthemes

	Parent Gender										
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Connections	29	1.28 (.53)	25	1 – 3	1.28 (.54)	4	1 – 2	1.25 (.50)	.10	27	.918
Checks in	24	1.13 (.45)	14	1 – 3	1.21 (.58)	10	1	1.00 (-)	1.16	22	.257
Gives answer	13	1.38 (.51)	9	1 – 2	1.44 (.53)	4	1 – 2	1.25 (.50)	.62	11	.546
Suggests activity	52	1.67 (.83)	36	1 – 4	1.64 (.83)	16	1 – 4	1.75 (.86)	.44	50	.662
Hard											
Connections	23	1.30 (.70)	17	1 – 4	1.41 (.80)	6	1	1.00 (-)	1.25	21	.225
Checks in	15	1.40 (.83)	10	1 – 2	1.10 (.32)	5	1 – 4	2.00 (1.23)	2.26	13	**.042***
Gives answer	17	1.71 (1.16)	7	1 – 2	1.14 (.38)	10	1 – 5	2.10 (1.37)	1.79	15	.094
Suggests activity	46	1.41 (.72)	27	1 – 3	1.41 (.69)	19	1 - 4	1.42 (.77)	.06	44	.950
iPad											

Connections	37	1.46 (.90)	26	1 – 3	1.35 (.56)	11	1 – 5	1.73 (1.42)	1.18	35	.245
Checks in	12	1.08 (.29)	7	1 – 2	1.14 (.38)	5	1	1.00 (-)	.83	10	.424
Gives answer	30	1.77 (1.48)	24	1 – 4	1.42 (.78)	6	1 – 8	3.17 (2.64)	2.91	28	**.007***
Suggests activity	52	1.50 (.83)	36	1 – 4	1.47 (.81)	16	1 – 4	1.56 (.89)	.36	50	.721

Table 42.

"Other" subthemes predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Connections	29	-.207	-2.25	**.033***
Check-ins	24	-.084	-1.09	.290
Gives answer	13	-.004	-.025	.981
Suggestion of activity	52	.010	.098	.922
Hard				
Connections	23	-.018	-.110	.913
Check-ins	15	.120	.657	.523
Gives answer	17	.177	.606	.554
Suggestion of activity	46	.073	.668	.508
iPad				
Connections	37	-.109	-.849	.402
Check-ins	12	.198	2.90	**.016***
Gives answer	30	.085	.392	.698
Suggestion of activity	52	-.023	-.244	.808

*significant p < .05

Table 43.

Comparisons of Fillers

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Filler Total	86	4.00 (3.03)	63	1 – 11	3.94 (2.94)	23	1 – 11	4.17 (3.31)	.32	84	.749
Fluff-dialogue	83	3.35 (2.50)	61	1 – 10	3.26 (2.47)	22	1 – 9	3.59 (2.63)	.53	81	.600
Unnecessary prompt	35	1.89 (1.08)	28	1 – 3	1.75 (.84)	7	1 – 6	2.43 (1.72)	1.52	33	.139
Hard											
Filler Total	88	4.02 (2.79)	63	1 – 12	3.91 (2.84)	25	1 – 9	4.32 (2.67)	.63	86	.532
Fluff-dialogue	82	3.41 (2.32)	59	1 – 10	3.37 (2.34)	23	1 – 8	3.52 (2.31)	.26	80	.796
Unnecessary prompt	42	1.76 (1.03)	29	1 – 4	1.62 (1.02)	13	1 – 4	2.08 (1.04)	1.34	40	.188
iPad											
Filler Total	123	5.50 (4.47)	84	1 – 28	5.54 (4.60)	39	1 – 20	5.44 (4.23)	.12	121	.909
Fluff-dialogue	115	4.05 (3.03)	81	1 – 15	4.07 (3.04)	34	1 – 13	4.00 (3.06)	.12	113	.905

Unnecessary prompt	74	2.85 (2.14)	50	1 – 13	2.70 (2.26)	24	1 – 8	3.17 (1.86)	.88	72	.383

Table 44.

Fillers and subthemes predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Fillers Total	86	.713	2.62	**.011***
Fluff-dialogue: Easy	83	.486	2.08	**.040***
Unnecessary prompt: Easy	35	.106	.675	.504
Hard				
Fillers Total	88	.767	2.92	**.005***
Fluff-dialogue: Hard	82	.553	2.41	**.018***
Unnecessary prompt: Hard	42	.296	1.79	.082
iPad				
Fillers Total	123	.936	3.01	**.003***
Fluff-dialogue: iPad	115	.583	2.66	**.009***
Unnecessary prompt: iPad	74	.263	1.17	.246

*significant p < .05

Table 45.

Frequency of Seated Position.

	Easy		Hard		iPad	
	%	*N*	*%*	*N*	*%*	*N*
Beside child, child in front of monitor	54.9%	84	54.2%	84	70.8%	109
Child on lap, parent used the device	22.2%	34	25.8%	40	8.4%	13
Child on lap, child used the device	19.6%	30	16.8%	26	9.1%	14
Beside child, parent in front of monitor	2%	3	1.9%	3	11%	17
N/A – Did not sit with child	1.3%	2	1.3%	2	.6%	1

Table 46.

Comparisons of Overall Physical Supports

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
TOTAL PHYSICAL	123	14.94 (10.76)	85	1 – 52	15.31 (11.17)	38	1 – 45	14.13 (9.88)	-.56	121	.578
Device Adjustment Total	64	1.73 (.91)	45	1 – 4	1.64 (.74)	19	1 – 5	1.95 (1.22)	1.22	62	.228
Facilitate Play Total	53	4.45 (4.10)	39	1 – 20	4.67 (4.20)	14	1 – 13	3.86 (3.90)	-.63	51	.532
Actions to Progress Total	45	4.24 (3.86)	32	1 – 19	4.47 (3.89)	13	1 – 14	3.69 (3.88)	-.61	43	.547
Points Total	122	10.66 (8.05)	84	1 – 51	10.74 (8.74)	38	1 – 25	10.47 (6.35)	-.17	120	.867
Hard											
TOTAL PHYSICAL	122	14.10 (9.63)	85	1 – 52	13.48 (10.03)	37	4 – 36	15.51 (8.59)	1.07	120	.286
Device Adjustment Total	58	1.64 (.85)	38	1 – 4	1.61 (.82)	20	1 – 4	1.70 (.92)	.40	56	.691
Facilitate Play Total	51	3.41 (3.28)	39	1 – 15	3.46 (3.40)	12	1 – 9	3.25 (2.96)	.19	49	.847
Actions to Progress Total	42	3.19 (2.63)	30	1 – 12	3.20 (2.67)	12	1 – 8	3.17 (2.66)	.04	40	.971

Points Total	121	10.88 (8.03)	84	1 – 48	10.17 (8.10)	37	3 – 36	12.51 (7.75)	1.49	119	.139
iPad											
TOTAL PHYSICAL	143	13.51 (8.08)	98	1 – 43	14.79 (8.08)	45	2 – 45	10.73 (7.44)	2.85	141	**.005**
Device Adjustment Total	78	2.06 (1.28)	57	1 – 6	2.19 (1.36)	21	1 – 4	1.71 (1.01)	1.47	76	.145
Facilitate Play Total	52	2.19 (2.01)	37	1 – 8	2.16 (1.85)	15	1 – 9	2.27 (2.43)	.17	50	.867
Actions to Progress Total	103	3.07 (2.55)	76	1 – 16	3.33 (2.72)	27	1 – 8	2.33 (1.82)	1.76	101	.081
Points Total	143	9.38 (5.66)	98	1 – 25	10.11 (5.57)	45	1 – 30	7.78 (5.58)	2.33	141	**.021**

Table 47.

Total Physical Supports predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Total physical supports	123	-1.62	-1.99	**.049***
Hard				
Total physical supports	122	-1.62	-2.17	**.032***
iPad				
Total physical supports	143	-2.27	-4.43	**.001***

*significant p < .05

Table 48.

Comparisons of Device Adjustment subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
EASY **Device Adjustment**											
Adjust computer components	61	1.54 (.74)	42	1 – 4	1.52 (.71)	19	1 – 3	1.58 (.83)	.26	59	.791
Booster/Adjust seated position	15	1.13 (.52)	10	1	1.00 (-)	5	1 – 3	1.40 (.89)	1.47	13	.165
Adjust screen angle	0	-	-	-	-	-	-	-	-	-	-
Adjust screen properties	0	-	-	-	-	-	-	-	-	-	-
HARD **Device Adjustment**											
Adjust computer components	52	1.52 (.73)	34	1 – 4	1.53 (.75)	18	1 – 3	1.50 (.71)	.14	50	.891
Booster/Adjust seated position	14	1.14 (.54)	9	1	1.00 (-)	5	1 – 3	1.40 (.89)	1.39	12	.190
Adjust screen angle	0	-	-	-	-	-	-	-	-	-	-
Adjust screen properties	0	-	-	-	-	-	-	-	-	-	-
iPAD **Device Adjustment**											

Adjust computer components	17	1.29 (0.59)	12	1 – 3	1.33 (0.65)	5	1 – 2	1.20 (0.45)	.42	15	.684
Booster/Adjust seated position	18	1.11 (0.32)	13	1 – 2	1.15 (0.38)	5	1	1.00 (-)	.90	16	.382
Adjust computer components	17	1.29 (0.59)	12	1 – 3	1.33 (0.65)	5	1 – 2	1.20 (0.45)	.42	15	.684
Adjust screen angle	62	1.92 (1.23)	47	1 – 6	2.00 (1.34)	15	1 – 3	1.67 (0.82)	.91	60	.366

Table 49.

Device adjustment predicted by child's age

	Child Age			
	n	β	*t*	*p*
Device adjustment: Easy	64	-.175	-1.56	.124
Device adjustment: Hard	58	-.094	-.744	.442
Device adjustment: iPad	78	-.072	-.615	.540

*significant p < .05

Table 50.

Comparisons of Supports to Facilitate Play subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Hand over hand	50	3.80 (3.10)	39	1 – 13	3.90 (3.19)	11	1 – 9	3.46 (2.84)	.42	48	.680
Adjusts child's hand	20	2.30 (2.00)	12	1 – 9	2.50 (2.39)	8	1 – 5	2.00 (1.31)	.54	18	.598
Hard											
Hand over hand	48	3.00 (2.87)	38	1 – 12	3.11 (3.05)	10	1 – 8	2.60 (2.12)	.49	46	.625
Adjusts child's hand	16	1.88 (1.36)	10	1 – 5	1.70 (1.34)	6	1 – 4	2.17 (1.47)	.65	14	.525
iPad											
Hand over hand	50	2.12 (1.88)	35	1 – 7	2.14 (1.80)	15	1 – 9	2.07 (2.12)	.13	48	.897
Adjusts child's hand	4	2.00 (1.15)	3	1 – 3	1.67 (1.15)	1	3	3.00 (-)	1.00	2	.423

Table 51.

Supports to Facilitate Play subthemes predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Hand over hand	64	-.175	-1.56	.124
Adjusts child's hand	20	-.177	-.389	.702
Hard				
Hand over hand	58	-.094	-.744	.442
Adjusts child's hand	15	.522	1.02	.324
iPad				
Hand over hand	78	-.072	-.615	.540
Adjusts child's hand	4	-.7.28	-5.83	**.028***

*significant p < .05

Table 52.

Comparisons of Actions to Progress Play subthemes

	Parent Gender										
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Parent moves mouse	37	2.43 (2.13)	27	1 – 10	2.63 (2.36)	10	1 – 4	1.90 (1.29)	.92	35	.362
Clicks, presses or selects	34	2.26 (1.83)	26	1 – 9	2.39 (2.00)	8	1 – 4	1.88 (1.13)	.68	32	.500
Held device	11	2.18 (2.18)	7	1 – 3	1.43 (.79)	4	1 – 8	3.50 (3.32)	1.64	9	.136
Hard											
Parent moves mouse	34	1.97 (1.60)	25	1 – 9	2.00 (1.76)	9	1 – 4	1.89 (1.17)	.18	32	.862
Clicks, presses or selects	30	1.90 (1.58)	22	1 – 8	1.91 (1.72)	8	1 – 4	1.88 (1.25)	.051	28	.959
Held device	6	1.67 (1.63)	4	1	1.00 (-)	2	1 – 5	3.00 (2.83)	1.63	4	.178
iPad											
Swipes or tilts	42	1.55 (0.86)	31	1 – 5	1.55 (0.93)	11	1 – 3	1.55 (0.69)	.01	40	.992
Presses to selects	68	2.76 (2.49)	54	1 – 14	2.87 (2.61)	14	1 – 7	2.36 (1.98)	.68	66	.496

Held device	52	1.21 (0.50)	39	1 – 3	1.28 (0.56)	13	1	1.00 (-)	1.81	50	.077

Table 53.

Actions to progress play subthemes predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Moves mouse	37	.072	.193	.848
Clicks, presses or selects	34	.012	.043	.966
Held device	10	1.23	.958	.363
Hard				
Moves mouse	34	.490	1.73	.093
Clicks, presses or selects	30	-.188	-.608	.548
Held device	6	-.187	-.118	.912
iPad				
Swipes or tilts	42	-.195	-1.62	.112
Presses to selects	68	-.551	-2.29	**.025***
Held device	52	.020	.335	.739

*significant p < .05

Table 54.

Comparisons of Points subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Points directly at screen	119	8.99 (7.22)	82	1 – 51	9.20 (7.97)	37	1 – 22	8.54 (5.26)	.456	117	.649
Points in general	65	2.17 (1.31)	44	1 – 6	2.02 (1.27)	21	1 – 7	2.48 (1.37)	1.32	63	.193
Points at device/keyboard	36	2.47 (2.26)	26	1 – 7	2.27 (1.95)	10	1 – 11	3.00 (2.98)	.865	34	.393
Hard											
Points directly at screen	117	9.16 (7.38)	81	1 – 46	8.61 (7.42)	36	2 – 33	10.42 (7.23)	1.23	115	.222
Points in general	69	2.29 (1.79)	45	1 – 10	2.27 (1.95)	24	1 – 7	2.33 (1.49)	.146	67	.884
Points at device/keyboard	43	2.02 (1.73)	28	1 – 5	1.96 (1.35)	15	1 – 10	2.13 (2.33)	.303	41	.763
iPad											
Points directly at screen	143	8.13 (5.26)	98	1 – 25	8.81 (5.21)	45	1 – 29	6.67 (5.10)	2.29	141	**.023***

Points in general	71	1.62 (0.80)	51	1 – 4	1.65 (0.82)	20	1 – 3	1.55 (0.76)	.46	69	.649
Points at device/home button	52	1.21 (0.46)	36	1 – 2	1.22 (0.42)	16	1 – 3	1.19 (0.54)	.25	50	.803

Table 55.

Points subthemes predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Points directly	119	.129	.227	.821
Points in general	65	.115	.849	.339
Points at device/keyboard	36	-.173	-.457	.651
Hard				
Points directly	117	-.126	-.204	.839
Points in general	69	.048	.227	.821
Points at device/keyboard	43	-.31-	-1.37	.180
iPad				
Points directly	143	-.916	-2.63	**.009***
Points in general	71	.092	1.12	.265
Points at device/home button	52	-.004	-.077	.939

*significant p < .05

Table 56.

Comparisons of "Other" subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Removes hand	33	1.49 (.94)	28	1 – 5	1.50 (.96)	5	1 – 3	1.40 (.89)	-.22	31	.830
Software Demonstrations	16	1.25 (.58)	10	1	1 (-)	6	1 – 3	1.67 (.82)	2.65	14	**.019***
Hard											
Removes hand	30	1.67 (.96)	21	1 – 4	1.81 (1.03)	9	1 – 3	1.33 (.71)	1.26	28	.218
Software Demonstrations	22	1.05 (.21)	16	1	1 (-)	6	1 – 2	1.17 (.41)	1.71	20	.104
iPad											
Removes hand	25	1.24 (0.66)	21	1 – 4	1.19 (0.68)	4	1 – 2	1.50 (0.58)	.54	79	.590
Software Demonstrations	95	2.80 (2.14)	71	1 – 11	2.87 (2.09)	24	1 – 11	2.58 (2.32)	.85	23	.404
Repositions for own use – iPad only	81	1.90 (1.37)	60	1 – 10	1.95 (1.50)	21	1 – 4	1.76 (0.89)	.57	93	.569

Table 57.

Other subthemes predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Removes hand	33	.174	1.33	.195
Software Demonstrations	16	-.051	-.328	.748
Hard				
Removes hand	30	-.034	-.213	.883
Software Demonstrations	22	-.053	-.993	.332
iPad				
Removes hand	95	-.192	-1.07	.286
Software Demonstrations	81	-.281	-2.00	**.049***
Repositions for own use: iPad only	25	.273	2.71	**.010***

*significant p < .05

Table 58.

Comparisons of Emotional Supports subthemes

	Parent Gender										
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy Emotional Supports											
Emotional Physical	48	1.98 (1.45)	31	1 – 5	1.97 (1.22)	17	1 – 8	2.00 (1.84)	.073	46	.942
Emotional Verbal	97	5.47 (3.79)	70	1 – 15	5.19 (3.77)	27	1 – 15	6.22 (3.79)	1.21	95	.229
Hard Emotional Supports											
Emotional Physical	42	2.12 (1.38)	26	1 – 5	2.04 (1.31)	16	1 – 6	2.25 (1.53)	.48	40	.636
Emotional Verbal	96	5.22 (3.88)	60	1 – 19	5.68 (4.04)	36	1 – 17	4.44 (3.51)	1.53	94	.130
iPad Emotional Supports											
Emotional Physical	61	2.72 (2.37)	42	1 – 10	2.67 (2.41)	19	1 – 10	2.84 (2.34)	.27	59	.791
Emotional Verbal	124	6.65 (5.30)	86	1 – 21	6.71 (4.73)	38	1 – 33	6.50 (6.48)	.20	122	.840

Table 59.

Emotional supports predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Emotional Physical	48	-.144	-.721	.475
Emotional Verbal	97	-.656	-1.92	.058
Hard				
Emotional Physical	42	.045	.242	.810
Emotional Verbal	96	-.006	-.017	.986
iPad				
Emotional Physical	61	-.030	-.123	.903
Emotional Verbal	124	-.147	-371	.711

*significant p < .05

Table 60.

Comparisons of Total Interactions

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Total Interactions	128	21.38 (10.11)	88	2 – 50	21.44 (10.59)	40	2 – 36	21.23 (9.11)	.113	126	.910
Hard											
Total Interactions	128	21.70 (10.64)	88	2 – 43	21.17 (11.47)	40	5 – 37	22.88 (8.56)	.84	126	.403
iPad											
Total Interactions	146	21.83 (9.00)	101	2 – 42	22.27 (8.89)	45	3 – 40	20.84 (9.27)	.88	144	.379

Table 61.

Total Scaffold Interactions and subthemes during easy session predicted by age

	Child Age			
	n	β	*t*	*p*
Easy				
Total scaffold interactions	125	-.614	-1.92	.058
Child Response				
Positive response	123	-.719	-2.63	**.010***
Ignore	69	-.122	-1.02	.311
Negative response	29	-.057	-.381	.706
Scaffold ends in answer	18	.004	.036	.972
Single support needed	126	-.241	-.914	.362
Multiple support needed	77	-.145	-.935	.353

*significant p < .05

Table 62.

Parental responses during easy session predicted by age

	Child Age			
	n	β	*t*	*p*
Easy				
Child asks for assistance, parent scaffolds	87	.045	.377	.707
Child asks for assistance, parent gives answer	9	-.090	-.841	.428
Child asks for assistance, parent provides no help	17	.086	1.34	.202

*significant p < .05

Table 63.

Comparisons of Scaffold Interactions and subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Total Scaffold	127	7.94 (4.41)	87	1 – 25	7.98 (4.72)	40	1 – 16	7.85 (3.69)	.150	125	.881
Parent initiate Supports	125	6.54 (4.22)	86	1 – 25	6.55 (4.55)	39	1 – 14	6.54 (3.42)	.010	123	.992
Parent Supports - Child Positive	123	5.34 (3.58)	84	1 – 20	5.43 (3.81)	39	1 – 11	5.15 (3.07)	.395	121	.694
Parent Supports - Child Ignores	69	1.71 (1.19)	44	1 – 9	1.73 (1.39)	25	1 – 3	1.68 (.75)	.158	67	.875
Parent Supports - Child Negative	29	1.48 (.99)	20	1 – 5	1.55 (1.15)	9	1 – 2	1.33 (.50)	.540	27	.593
Child requested assistance	89	2.46 (1.50)	62	1 – 6	2.50 (1.59)	27	1 – 7	2.37 (1.31)	.373	87	.710
Child Assist - Parent Supports	87	2.18 (1.28)	60	1 – 6	2.18 (1.30)	27	1 – 7	2.19 (1.27)	.006	85	.995
Parent gives answer	9	1.11 (.33)	7	1 – 2	1.14 (.38)	2	-	1.00 (-)	.509	7	.626
Parent no help	17	1.12 (.33)	14	1 – 2	1.14 (.36)	3	-	1.00 (-)	.664	15	.517

Support Ends in Answer	18	1.17 (.52)	11	1	1.00 (-)	7	1 – 3	1.43 (.79)	1.84	16	.084
Single Support	126	6.67 (3.52)	86	1 – 20	6.71 (3.78)	40	1 – 13	6.58 (2.91)	.199	124	.843
Multiple Supports	77	2.21 (1.60)	52	1 – 8	2.29 (1.67)	25	1 – 7	2.04 (1.46)	.635	75	.527
Hard											
Total Scaffold	125	10.47 (5.85)	86	1 – 27	10.22 (6.34)	39	2 – 21	11.03 (4.62)	.71	123	.479
Parent initiate Scaffold	125	8.47 (5.22)	86	1 – 24	8.21 (5.52)	39	1 – 18	9.05 (4.49)	.84	123	.405
Parent Scaffolds - Child Positive	119	6.87 (4.34)	80	1 – 23	6.84 (4.66)	39	1 – 17	6.92 (3.64)	.10	117	.920
Parent Scaffolds - Child Ignores	77	2.35 (1.49)	51	1 – 8	2.28 (1.52)	26	1 – 6	2.50 (1.45)	.62	75	.535
Parent Scaffolds - Child Negative	37	1.65 (1.11)	26	1 – 6	1.65 (1.16)	11	1 – 4	1.64 (1.02)	.04	35	.966
Child requested assistance	94	3.18 (2.84)	62	1 – 21	3.40 (3.12)	32	1 – 11	2.75 (2.16)	1.06	92	.292
Parent Scaffolds	90	2.78 (2.14)	60	1 – 12	2.88 (2.30)	30	1 – 9	2.57 (1.79)	.66	88	.511
Parent gives answer	9	2.11 (2.26)	7	1 – 8	2.43 (2.51)	2	1	1 (-)	.77	7	.468
Parent no help	23	1.30 (.70)	15	1 – 4	1.40 (.83)	8	1 – 2	1.13 (.35)	.89	21	.384
Scaffold Ends in Answer	38	1.92 (1.70)	23	1 – 8	2.13 (1.87)	15	1 – 5	1.60 (1.40)	.94	36	.354

Single Scaffold	122	7.80 (4.37)	84	1 – 21	7.73 (4.78)	38	1 – 16	7.97 (3.33)	.29	120	.773
Multiple Scaffold	107	3.18 (2.18)	71	1 – 9	3.24 (2.21)	36	1 – 11	3.06 (2.14)	.41	105	.682
iPad											
Total Scaffold	144	9.13 (5.09)	99	1 – 22	9.64 (5.14)	45	1 – 20	8.02 (4.86)	1.78	142	.078
Parent initiate Scaffold	143	8.33 (4.93)	99	1 – 22	8.79 (5.03)	44	1 – 20	7.30 (4.59)	1.68	141	.095
Parent Scaffolds - Child Positive	140	5.98 (3.63)	96	1 – 16	6.42 (3.62)	44	1 – 16	5.02 (3.49)	2.14	141	**.034***
Parent Scaffolds - Child Ignores	101	2.72 (2.25)	70	1 – 10	2.81 (2.37)	31	1 – 8	2.52 (1.98)	.61	99	.542
Parent Scaffolds - Child Negative	53	1.49 (.93)	39	1 – 4	1.46 (.79)	14	1 – 5	1.57 (1.28)	.38	51	.709
Child requested assistance	77	2.16 (1.44)	54	1 – 7	2.13 (1.47)	23	1 – 5	2.22 (1.41)	.24	75	.809
Parent Scaffolds	61	2.03 (1.25)	42	1 – 6	2.00 (1.21)	19	1 – 5	2.11 (1.37)	.30	59	.764
Parent gives answer	13	1.08 (.28)	10	1 – 2	1.10 (.32)	3	1	1.00 (-)	.53	11	.606
Parent no help	21	1.33 (.66)	14	1 – 3	1.43 (.76)	7	1 – 2	1.14 (.38)	.94	19	.362
Scaffold Ends in Answer	47	1.55 (1.00)	35	1 – 5	1.49 (1.01)	12	1 – 4	1.75 (.97)	.79	45	.434
Single Scaffold	142	6.79 (4.00)	97	1 – 18	7.18 (4.01)	45	1 – 15	5.96 (3.91)	1.70	140	.091

Multiple Scaffold	114	3.10 (2.03)	77	1 – 9	3.36 (1.99)	37	1 – 10	2.54 (2.02)	2.06	112	**.042***

Table 64.

Total Scaffold Interactions and subthemes during the hard session predicted by age

	Child Age			
	n	β	*t*	*p*
Hard				
Total scaffold interactions	125	-.829	-2.09	**.039***
Child Response				
Positive response	119	-.740	-2.14	**.035***
Ignore	77	-.045	-.300	.765
Negative response	37	-.243	-1.76	.087
Scaffold ends in answer	38	-.347	-1.46	.153
Single	122	-.378	-1.11	.270
Multiple	107	-.424	-2.34	**.021***

*significant p < .05

Table 65.

Parental response to child requesting assistance predicted by age during hard session

	Child Age			
	n	β	*t*	*p*
Hard				
Child asks for assistance, parent scaffolds	90	.2.06	.994	.323
Child asks for assistance, parent gives answer	9	.292	.273	.793
Child asks for assistance, parent provides no help	23	.139	.747	.463

*significant p < .05

Table 66.

Total scaffold interactions and subthemes during the iPad predicted by age

	Child Age			
	n	β	*t*	*p*
iPad				
Total scaffold interactions	143	-1.41	-4.51	**.001***
Child Response				
Positive response	140	-1.08	-4.68	**.001***
Ignore	101	-.288	-1.55	.124
Negative response	53	.107	.883	.381
Scaffold ends in answer	47	.034	.253	.801
Single	144	-.594	-2.23	**.027***
Multiple	143	-.691	-5.13	**.001***

*significant p < .05

Table 67.

Parental Responses during iPad session predicted by age

	Child Age			
	n	β	*t*	*p*
iPad				
Child asks for assistance, parent scaffolds	61	.005	.038	.970
Child asks for assistance, parent gives answer	13	-.038	-.591	.567
Child asks for assistance, parent provides no help	21	.150	1.03	.315

*significant p < .05

Table 68.

Total parent engagements and subthemes predicted by age during the easy session

	Child Age			
	n	β	*t*	*p*
Easy				
Total Parent Engagements	126	.531	1.23	.221
Child Responds	121	-.361	-1.14	.258
Child Ignores	112	.599	2.65	**.009***
Total Relevant Engagements	125	.141	.503	.616
Child Responds	119	-.347	-1.54	.125
Child Ignores	100	.319	2.17	**.032***
Total Irrelevant Engagements	106	.342	1.43	.156
Child Responds	88	-.082	-.480	.633
Child Ignores	82	.348	2.23	**.028***

*significant p < .05

Table 69.

Comparisons of Parent Initiated Engagements and subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Parent Initiated Engagement TOTAL	126	9.83 (5.76)	87	1 – 27	9.87 (6.22)	39	1 – 19	9.74 (4.65)	.117	124	.907
Child Response - TOTAL	121	6.54 (4.02)	83	1 – 18	6.51 (4.22)	38	1 – 15	6.61 (3.58)	.126	119	.900
Child Ignore TOTAL	112	3.97 (2.92)	78	1 – 13	4.06 (2.96)	34	1 – 11	3.77 (2.86)	.497	110	.620
Child's response unknown TOTAL	3	1.00 (-)	2	-	1.00 (-)	1	-	1.00 (-)	-	-	-
Parent Engage: Relevant	125	6.31 (3.71)	86	1 - 18	6.14 (3.98)	39	1 - 11	6.69 (3.02)	.77	123	.442
Child Responds	119	4.45 (2.80)	81	1 - 16	4.38 (3.03)	38	1 - 11	4.58 (2.27)	.36	117	.723
Child Ignore	100	2.57 (1.83)	70	1 - 8	2.44 (1.77)	30	1 - 7	2.87 (1.96)	1.06	98	.292
Parent Engage: Irrelevant	106	4.25 (2.94)	75	1 - 17	4.41 (3.16)	31	1 - 9	3.84 (2.33)	.92	104	.363
Child Responds	88	2.98 (1.81)	63	1 - 8	2.94 (1.80)	25	1 - 7	3.08 (1.87)	.33	86	.740
Child Ignores	82	2.29 (1.69)	59	1 - 9	2.47 (1.83)	23	1 - 6	1.83 (1.15)	1.58	80	.119

Parent Engage: Child response unknown	3	1 (-)	2	1 - 1	1.00 (-)	1	1 - 1	1.00 (-)	-	1	-
Relevant	3	1 (-)	2	1 - 1	1.00 (-)	1	1 - 1	1.00 (-)	-	1	-
Irrelevant	-	-	-	-	-	-	-	-	-	-	-
Hard											
Parent Initiated Engagement TOTAL	119	7.97 (4.90)	80	1 – 25	8.06 (5.39)	39	1 – 16	7.80 (3.75)	.28	117	.781
Child Response - TOTAL	112	5.50 (3.42)	76	1 - 15	5.36 (3.72)	36	1 - 11	5.81 (2.71)	.65	110	.518
Child Ignore TOTAL	99	3.33 (2.57)	68	1 - 14	3.46 (2.83)	31	1 - 8	3.06 (1.91)	.70	97	.485
Child’s response unknown TOTAL	2	1.50 (.70)	2	1 - 2	1.50 (.71)	0	-	-	-	-	-
Parent Engage: Relevant	115	4.53 (2.77)	77	1 - 14	4.58 (2.99)	38	1 - 8	4.42 (2.29)	.30	113	.768
Child Responds	108	3.47 (2.10)	73	1 - 11	3.41 (2.18)	35	1 - 7	3.60 (1.93)	.44	106	.663
Child Ignores	70	2.04 (1.30)	46	1 - 5	2.20 (1.44)	24	1 - 4	1.75 (.94)	1.37	68	.176
Parent Engage: Irrelevant	101	4.24 (3.19)	68	1 - 15	4.29 (3.35)	33	1 - 12	4.12 (2.89)	.25	99	.800
Child Responds	80	3.01 (2.28)	52	1 - 10	3.04 (2.40)	28	1 - 9	2.96 (2.06)	.14	78	.890
Child Ignores	78	2.40 (1.81)	53	1 - 9	2.53 (1.91)	25	1 - 8	2.12 (1.59)	.93	76	.356
Parent Engage: Child response unknown	2	1.50 (.70)	2	1 - 2	1.50 (.71)	0	-	-	-	-	-
Relevant	2	1.50 (.71)	2	1 - 2	1.50 (.71)	0	-	-	-	-	-

Irrelevant	-	-	-	-	-	-	-	-	-	-	-
iPad											
Parent Initiated Engagement TOTAL	141	9.06 (4.83)	97	2 – 22	8.94 (4.47)	44	1 – 22	9.32 (5.60)	.43	139	.667
Child Response TOTAL	138	5.42 (3.56)	97	1 – 16	5.23 (3.20)	41	1 – 19	5.88 (4.31)	.98	136	.328
Child Ignore TOTAL	127	4.13 (2.88)	89	1 – 13	4.02 (2.82)	38	1 – 12	4.37 (3.05)	.62	125	.538
Child's response unknown TOTAL	5	1.00 (-)	2	1	1.00 (-)	3	1	1.00 (-)	-	-	-
Parent Engage: Relevant	138	5.38 (3.05)	96	2 - 15	5.27 (2.89)	42	1 - 16	5.64 (3.42)	.66	136	.512
Child Responds	132	3.51 (2.39)	93	1 - 12	3.38 (2.13)	39	1 - 15	3.82 (2.93)	.98	130	.331
Child Ignores	114	2.44 (1.68)	80	1 - 8	2.39 (1.74)	34	1 - 7	2.56 (1.54)	.50	112	.620
Parent Engage: Irrelevant	127	4.20 (2.75)	87	1 - 11	4.15 (2.63)	40	1 - 12	4.33 (3.01)	.33	125	.739
Child Responds	104	2.74 (1.80)	74	1 - 8	2.61 (1.69)	30	1 - 7	3.07 (2.02)	1.18	102	.240
Child Ignores	101	2.44 (1.69)	72	1 - 8	2.32 (1.61)	29	1 - 9	2.72 (1.89)	1.09	99	.279
Parent Engage: Child response unknown	5	1.00 (-)	2	1	1.00 (-)	3	1	1.00 (-)	-	-	-
Relevant	2	1.00 (-)	1	1	1.00 (-)	1	1	1.00 (-)	-	-	-
Irrelevant	3	1.00 (-)	1	1	1.00 (-)	2	1	1.00 (-)	-	-	-

Table 70.

Total parent engagements during the hard session predicted by age

	Child Age			
	n	β	*t*	*p*
Hard				
Total Parent Engagements	119	1.06	2.78	**.006***
Child Responds	112	.757	2.71	**.008***
Child Ignores	99	.423	1.96	**.052**
Total Relevant Engagements	115	.268	1.19	.236
Child Responds	108	.136	.755	.452
Child Ignores	70	.333	2.75	**.008***
Total irrelevant Engagements	101	.814	3.02	**.003***
Child Responds	80	.625	2.69	**.009***
Child Ignores	78	.191	1.11	.272

*significant p < .05

Table 71.

Total parent engagements and subthemes during the iPad session predicted by age

	Child Age			
	n	β	*t*	*p*
iPad				
Total Parent Engagements	141	.472	1.45	.148
Child Responds	138	.078	.322	.748
Child Ignores	127	.267	1.28	.202
Total Relevant Engagements	138	.267	1.27	.205
Child Responds	138	-.042	-.248	.804
Child Ignores	127	.134	1.06	.292
Response not observable	5	.329	.423	.701
Total irrelevant Engagements	127	.100	.499	.619
Child Responds	138	.120	.898	.371
Child Ignores	127	.132	1.02	.312
Response not observable	5	-.329	-.423	.701

*significant p < .05

Table 72.

Total child engagements and subthemes during the easy session predicted by age

	Child Age			
	n	β	*t*	*p*
iPad				
Total Child Engagements	106	.151	.503	.616
Parent Responds	102	.080	.290	.772
Parent Ignores	30	.005	.045	.964
Total Relevant Engagements	88	-.006	-.041	.967
Parent Responds	86	-.011	-.082	.935
Total irrelevant Engagements	84	.392	1.40	.166
Parent Responds	79	.286	1.14	.258
Parent Ignores	20	-.004	-.035	.972

*significant p < .05

Table 73.

Comparisons of Child Initiated Engagements and subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Child Initiated Engagement TOTAL	106	4.35 (3.68)	72	1 - 23	4.32 (3.77)	34	1 - 17	4.41 (3.53)	.12	104	.905
Parent Response - TOTAL	102	4.13 (3.29)	68	1 - 18	4.16 (3.32)	34	1 - 15	4.06 (3.27)	.15	100	.882
Parent Ignores - TOTAL	30	1.23 (.63)	21	1 - 4	1.24 (.70)	9	1 - 2	1.22 (.44)	.06	28	.951
Parent’s response unknown TOTAL	3	1 (-)	2	1 - 1	1.00 (-)	1	1 - 1	1.00 (-)	-	1	-
Child Engage: Relevant	88	2.36 (1.47)	60	1 - 8	2.30 (1.49)	28	1 - 6	2.50 (1.45)	.59	86	.556
Parent Responds	86	2.28 (1.42)	58	1 - 7	2.22 (1.40)	28	1 - 6	2.39 (1.47)	.51	84	.608
Parent Ignores	12	1 (-)	9	1 - 1	1.00 (-)	3	1 - 1	1.00 (-)	-	-	-
Child Engage: Irrelevant	84	3.01 (2.94)	59	1 - 15	2.93 (2.77)	25	1 - 16	3.20 (3.37)	.38	82	.705
Parent Responds	79	2.85 (2.57)	55	1 - 11	2.80 (2.39)	24	1 - 14	2.96 (3.00)	.25	77	.803
Parent Ignores	20	1.25 (.55)	13	1 - 3	1.31 (.63)	7	1 - 2	1.14 (.38)	.63	18	.537

Child Engage: Parent response unknown	3	1 (-)	2	1 - 1	1.00 (-)	1	1 - 1	1.00 (-)	-	1	-
Relevant	-	-	-	-	-	0	-	-	-	-	-
Irrelevant	3	1(-)	2	1 - 1	1.00 (-)	1	1 - 1	1.00 (-)	-	1	-
Hard											
Child Initiated Engagement TOTAL	98	4.81 (3.88)	65	1 - 15	4.63 (3.36)	33	1 - 23	5.15 (4.78)	.63	96	.533
Parent Response - TOTAL	98	4.22 (3.35)	65	1 - 14	4.17 (3.10)	33	1 - 17	4.33 (3.85)	.23	96	.820
Parent Ignores – TOTAL	29	1.62 (1.08)	20	1 - 3	1.50 (.76)	9	1 - 6	1.89 (1.62)	.89	27	.381
Parent’s response unknown TOTAL	1	10.00 (-)	0	-	-	1	-	10 (-)	-	-	-
Child Engage: Relevant	77	2.52 (1.83)	53	1 - 9	2.40 (1.72)	24	1 - 9	2.79 (2.06)	.88	75	.384
Parent Responds	74	2.45 (1.78)	51	1 - 8	2.31 (1.67)	23	1 - 9	2.74 (2.03)	.95	72	.346
Parent Ignores	13	1.00 (-)	9	1	1.00 (-)	4	1	1.00 (-)	-	-	-
Child Engage: Irrelevant	77	3.60 (3.22)	51	1 - 10	3.41 (2.25)	26	1 - 23	3.96 (4.61)	.71	75	.482
Parent Responds	75	3.11 (2.50)	50	1 - 8	3.06 (1.98)	25	1 - 17	3.20 (3.34)	.23	73	.821
Parent Ignores	20	1.70 (1.26)	14	1 - 3	1.50 (.85)	6	1 - 6	2.17 (1.94)	1.09	18	.291
Child Engage: Parent response unknown	1	10.00 (-)	-	-	-	1	-	10 (-)	-	-	-
Relevant	-	-	-	-	-	-	-	-	-	-	-

Irrelevant	1	10.00 (-)	-	-	-	1	-	10	-	-	-
iPad											
Child Initiated Engagement TOTAL	129	4.37 (3.43)	92	1 - 17	4.45 (3.49)	37	1 - 16	4.19 (3.34)	.38	127	.703
Parent Response - TOTAL	126	3.88 (2.98)	90	1 - 16	3.88 (2.99)	36	1 - 14	3.89 (2.98)	.02	124	.985
Parent Ignores – TOTAL	42	1.71 (1.20)	33	1 - 7	1.76 (1.25)	9	1 - 4	1.56 (1.01)	.45	40	.659
Parent’s response unknown TOTAL	2	1.50 (.71)	1	2	2.00 (-)	1	1	1.00 (-)	-	0	.
Child Engage: Relevant	102	2.13 (1.44)	70	1 - 6	2.17 (1.43)	32	1 - 6	2.03 (1.47)	.45	100	.650
Parent Responds	95	2.00 (1.35)	65	1 - 6	2.05 (1.39)	30	1 - 6	1.90 (1.30)	.49	93	.627
Parent Ignores	21	1.29 (.56)	15	1 - 3	1.27 (.59)	6	1 - 2	1.33 (.52)	.24	19	.813
Child Engage: Irrelevant	105	3.30 (2.49)	76	1 - 12	3.38 (2.63)	29	1 - 10	3.10 (2.09)	.51	103	.611
Parent Responds	97	3.08 (2.09)	68	1 - 10	3.18 (2.19)	29	1 - 8	2.86 (1.88)	.68	95	.501
Parent Ignores	28	1.61 (.88)	24	1 - 5	1.63 (.92)	4	1 - 2	1.50 (.58)	-.26	26	.797
Child Engage: Parent response unknown	2	1.50 (.71)	1	2	2.00 (-)	1	1	1.00 (-)	-	0	.
Relevant	-	-	-	-	-	-	-	-	-	-	-
Irrelevant	2	1.50 (.71)	1	2	2.00 (-)	1	1	1.00 (-)	-	-	-

Table 74.

Total child engagements during the hard session predicted by age

	Child Age			
	n	β	*t*	*p*
Hard				
Total Child Engagements	98	.462	1.32	.191
Parent Responds	98	.183	.601	.549
Parent Ignores	29	.292	1.72	.097
Total Relevant Engagements	77	.021	.108	.914
Parent Responds	74	-.055	-.278	.782
Total irrelevant Engagements	77	.486	1.51	.136
Parent Responds	75	.204	.797	.428
Parent Ignores	20	.104	.396	.697

*significant p < .05

Table 75.

Total child engagements and subthemes during the iPad session predicted by age

	Child Age			
	n	β	*t*	*p*
iPad				
Total Child Engagements	129	.240	.997	.321
Parent Responds	126	.215	1.01	.316
Parent Ignores	42	-.029	-.199	.844
Total Relevant Engagements	102	.180	1.58	.117
Parent Responds	126	.054	.510	.611
Parent Ignores	42	-.082	-.892	.377
Total irrelevant Engagements	125	.159	.788	.619
Parent Responds	126	.162	1.00	.318
Parent Ignores	42	.053	.416	.680

*significant p < .05

Table 76.

Comparisons of parent and child both lost and subthemes

			Parent Gender								
	Overall		Mothers			Fathers					
	N	*M (SD)*	*N*	*Range*	*M (SD)*	*N*	*Range*	*M (SD)*	*t*	df	*p*
Easy											
Both Lost	20	1.25 (.64)	14	1 – 3	1.29 (.73)	6	1 – 2	1.17 (.41)	.373	18	.713
Physical Supports	17	1.82 (.95)	12	1 – 3	1.67 (.78)	5	1 – 4	2.20 (1.30)	1.06	15	.307
Verbal Supports	16	2.88 (2.22)	11	1 – 10	3.00 (2.57)	5	1 – 4	2.60 (1.34)	.324	14	.750
Emotional Supports	-	-	-	-	-	-	-	-	-	-	-
Removes Hand or Takes Over	5	1.40 (.89)	4	1 – 3	1.50 (1.00)	1	-	1.00 (-)	-	-	-
Repositions Device for Own Use	1	1 (-)	0	-	-	1	-	1.00 (-)	-	-	-
Hard											
Both Lost	61	1.33 (.57)	41	1 – 3	1.37 (.62)	20	1 – 2	1.25 (.44)	.74	59	.460
Physical Supports	42	3.26 (2.26)	25	1 – 7	3.24 (1.79)	17	1 – 9	3.29 (2.89)	.075	40	.940
Verbal Supports	46	4.11 (3.24)	29	1 – 12	4.07 (2.87)	17	1 – 15	4.18 (3.89)	.107	44	.915

Emotional Supports	2	1.00 (-)	1	1	1 (-)	1	1	1 (-)	-	-	-
Removes Hand or Takes Over	18	1.28 (.75)	11	1 – 4	1.36 (.92)	7	1 – 2	1.14 (.38)	.596	16	.560
Repositions Device for Own Use	3	1.33 (.58)	2	1 – 2	1.50 (.71)	1	1	1 (-)	.577	1	.667
iPad											
Both Lost	55	1.36 (.59)	38	1 – 3	1.40 (.64)	17	1 – 2	1.29 (.47)	.58	53	.563
Physical Supports	26	2.85 (2.34)	19	1 – 10	2.84 (2.63)	7	1 – 5	2.86 (1.46)	.01	24	.989
Verbal Supports	34	3.06 (3.18)	26	1 – 14	3.11 (3.36)	8	1 – 9	2.88 (2.70)	.18	32	.855
Emotional Supports	3	1.33 (.58)	3	1 – 2	1.33 (.58)	-	-	-	-	-	-
Removes Hand or Takes Over	34	2.15 (1.65)	25	1 – 9	2.28 (1.88)	9	1 – 3	1.78 (.67)	.78	32	.443
Repositions Device for Own Use	8	1.50 (.76)	6	1 – 3	1.50 (.84)	2	1 – 2	1.50 (.71)	.00	6	1.00

Table 77.

Both lost predicted by child's age

	Child Age			
	n	β	*t*	*p*
Both Lost: Easy	20	1.48	1.09	.289
Both Lost: Hard	61	.104	1.67	.101
Both Lost: iPad	55	-.065	-1.09	.279

*significant p < .05

Table 78.

Descriptive Statistics of Time off Task

	%	*N*	*Min.*	*Max.*	*M*	*SD*
Easy						
Parent Off Task	2.9%	4	1	10	3.25	4.50
Parent Time Off Task		4	4	228	69.50	106.05
Child Off Task	5.2%	7	1	2	1.29	.49
Child Time Off Task		6	9	44	23.67	14.12
Hard						
Parent Off Task	4.41%	6	1	8	2.17	2.86
Parent Time Off Task		6	5	319	63.67	125.40
Child Off Task	8.09%	11	1	4	1.36	.92
Child Time Off Task		11	6	78	24.09	23.06
iPad						
Parent Off Task	9.3%	14	1	10	2.14	2.54
Parent Time Off Task		14	2	242	32.71	64.05
Child Off Task	13.3%	20	1	6	2.00	1.41
Child Time Off Task		20	8	286	49.20	69.93

Table 79.

Parent and child off-task behaviours predicted by child's age

	Child Age			
	n	β	*t*	*p*
Easy				
Parent off-task behaviours	4	1.85	.498	.668
Child off-task behaviours	6	-.080	-.481	.651
Hard				
Parent off-task behaviours	6	.507	.294	.783
Child off-task behaviours	11	-.265	-.759	.467
iPad				
Parent off-task behaviours	14	-.101	-.152	.882
Child off-task behaviours	20	-.653	-2.63	**.017***

*significant p < .05

Table 80.

Correlations of verbal supports between self-report measures and easy software session

		Survey								
		Rephrasing	Reading Aloud Info	Explaining Software	Additional Examples	Direct Instruction	Provide Hints	Asking Questions	Try Again	Error Indication
Observation	Rephrasing	-.525	.33	-.03	-.107	.108	.147	-.241	.228	-.067
	Reading Aloud Info	.146	**.204***	.036	-.076	.054	.115	.144	.123	-.036
	Explaining Software	-.043	.094	.056	.051	.069	-.001	.041	-.018	-.093
	Additional Examples	-.007	-.115	-.065	-.058	.059	-.07	.129	.04	.031
	Direct Instruction	.043	-.078	.04	-.039	.135	.092	.067	.093	.054
	Provide Hints	.097	.23	**.332***	.173	.109	.21	.123	.143	.132
	Asking Questions	-.194	.036	-.104	-.132	-.172	-.228	.097	-.05	.013
	Try Again	-.148	-.127	-.063	-.144	.104	.024	-.01	.051	.118
	Error Indication	-.061	.063	-.178	-.225	-.019	.059	.013	-.092	.048

* significant at $p < .05$

Table 81.

Correlations of verbal supports between self-report measures and hard software session

		Survey								
		Rephrasing	Reading Aloud Info	Explaining Software	Additional Examples	Direct Instruction	Provide Hints	Asking Questions	Try Again	Error Indication
Observation	Rephrasing	-	-	-	-	-	-	-	-	-
	Reading Aloud Info	.092	.194	.043	.033	.116	.106	.146	.165	.043
	Explaining Software	.052	-.058	.016	-.045	.001	.024	-.023	.072	.035
	Additional Examples	.053	-.083	-.089	.002	.076	-.122	-.008	.205	-.042
	Direct Instruction	-.091	-.171	-.066	-.082	.039	-.082	.082	-.022	.067
	Provide Hints	.021	-.135	.059	.191	.016	-.102	-.028	-.115	-.092
	Asking Questions	.144	-.037	-.077	.141	.072	-.078	-.089	-.037	-.113
	Try Again	-.073	.049	-.255	.129	-.234	-.137	**-.494***	-.206	-.376
	Error Indication	-.269	-.272	-.134	-.051	-.061	**-.334***	-.228	-.146	-.212

* significant at $p < .05$

Table 82.

Correlations of verbal supports between self-report measures and iPad session

		Survey								
		Rephrasing	Reading Aloud Info	Explaining Software	Additional Examples	Direct Instruction	Provide Hints	Asking Questions	Try Again	Error Indication
Observation	Rephrasing	.48	.195	-.291	-.222	-.049	-.039	-.049	-.12	-.274
	Reading Aloud Info	.101	.162	**.177***	.104	.095	.127	.134	.046	.114
	Explaining Software	-.065	.093	.015	.001	-.066	-.033	-.093	-.057	-.038
	Additional Examples	.022	.054	.077	.087	.134	.033	.059	-.038	.052
	Direct Instruction	-.069	-.15	-.161	**-.186***	-.069	-.13	.021	-.107	-.083
	Provide Hints	-.114	-.041	-.079	.169	**.247***	-.18	-.005	-.06	-.032
	Asking Questions	-.112	-.027	-.048	.006	-.019	-.056	-.088	-.102	-.083
	Try Again	-.045	.043	-.135	-.066	.157	-.208	-.039	-.303	.124
	Error Indication	.036	.002	.02	-.034	**.298***	-.054	.215	.103	**.322***

* significant at *p* < .05

Table 83.

Correlations of physical supports between self-report measures and easy software session

		Survey									
		Booster Seat	Adjust Screen	Adjust Computer	Hand Over Hand	Move Hand Correct Place	Move Mouse	Press Device	Point Directly	Point General	Hold Device
Observation	Booster Seat/adjust seating	-.143	.325	.268	.191	.162	.20	.19	.092	-.033	.064
	Adjust Screen	-	-	-	-	-	-	-	-	-	-
	Adjust Computer	.004	.081	**.305***	**.353****	**.403****	**.313***	.185	**.299***	.20	-.014
	Hand Over Hand	.031	.09	-.088	.054	.09	**.425****	.136	.032	.027	.023
	Move Hand Correct Place	.024	.124	-.271	-.185	-.231	.017	-.248	-.005	.026	-.031
	Move Mouse	.085	.077	.263	.06	.137	.20	-.04	.296	**.361***	.159
	Press Device	-.161	.11	.168	.123	.193	.042	-.123	.013	.206	-.085
	Hold Device	-.129	.28	.471	.135	.28	.227	-.59	-.274	.052	-.228
	Point Directly	-.034	.042	.083	.119	.179	.017	.049	.142	-.019	-.03
	Point General	-.243	.01	-.05	-.14	-.119	.024	.175	-.12	-.089	-.158

** significant at $p < .01$
* significant at $p < .05$

Table 84.

Correlations of physical supports between self-report measures and hard software session

		Survey									
		Booster Seat	Adjust Screen	Adjust Computer	Hand Over Hand	Move Hand Correct Place	Move Mouse	Press Device	Point Directly	Point General	Hold Device
Observation	Booster Seat/adjust seating	-.159	-.181	-.138	-.1	.128	-.352	.019	-.509	-.102	-.112
	Adjust Screen	-	-	-	-	-	-	-	-	-	-
	Adjust Computer	-.166	-.067	.049	.146	**.287***	.069	**.386****	.244	-.029	-.079
	Hand Over Hand	-.165	-.144	-.181	-.074	-.088	.136	-.074	-.124	.13	-.016
	Move Hand Correct Place	-.399	-.474	-.35	-.253	.054	-.113	-.084	-.323	-.237	-.438
	Move Mouse	-.178	.209	.015	0	**.410***	.066	.072	.021	.063	.026
	Press Device	-.081	-.276	-.092	-.101	.187	.006	.093	.244	.221	-.008
	Hold Device	-.2	-	.539	.533	.316	.612	-.542	-.4	0	**-.894***
	Point Directly	.012	-.07	-.009	**.258****	**.329****	.001	.028	.043	.037	.022
	Point General	-.004	.016	-.056	.188	.008	.135	.007	.068	.113	-.112

** significant at $p < .01$
* significant at $p < .05$

Table 85.

Correlations of physical supports between self-report measures and iPad software session.

		Survey									
		Booster Seat	Adjust Screen	Adjust Computer	Hand Over Hand	Move Hand Correct Place	Move Mouse	Press Device	Point Directly	Point General	Hold Device
Observation	Booster Seat/adjust seating	-.26	**-.515***	-.079	-.017	-.325	.299	.241	-.059	.035	**-.491***
	Adjust Screen	.029	.127	.168	.012	.159	.079	.03	-.182	-.122	.061
	Adjust Computer	-.14	.03	-.253	-.19	-.151	-.066	.142	.10	-.1	-.03
	Hand Over Hand	-.033	.049	-.051	.055	.026	.008	.15	.019	.153	.125
	Move Hand Correct Place	-.816	-.816	.845	-.577	**-1.00****	-.688	-.447	-.707	**-.962***	-.905
	Move Mouse	-.071	**-.314***	-.046	.019	-.043	.167	-.109	-.055	-.271	-.097
	Press Device	.143	.141	-.002	.151	.022	.073	.078	0	.163	**.248***
	Hold Device	-.039	-.009	-.168	-.22	-.077	-.02	-.142	.015	-.12	-.052
	Point Directly	**.169***	**.186***	.039	**.209***	**.188***	**.211***	**.198***	**.223****	.089	**.268****
	Point General	.099	.007	-.029	-.038	-.094	-.135	-.196	-.121	-.224	-.072

** significant at $p < .01$
* significant at $p < .05$

Table 86.

Repeated Measures for General Instructions theme and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
General Instruction Total	110	9.56 (5.33)	9.18 (5.36)	9.73 (4.77)	.54	.584
Rephrasing						
Read aloud	69	2.80 (2.19)	2.72 (2.07)	3.93 (2.15)	6.77	**.002***
Explain software	81	3.93 (2.30)	3.73 (2.35)	3.20 (1.68)	4.08	**.021***
Additional examples	14	1.86 (1.03)	2.36 (1.55)	1.79 (1.12)	.67	.532
General prompt to explore	60	3.13 (2.13)	3.05 (1.88)	2.33 (1.49)	4.88	**.011***

Table 87.

Paired t-tests for General Instruction theme and subthemes

		M (SD)	*t*	*df*	*p*
Reading Aloud					
Pair 1	Easy	2.76 (2.17)	.23	70	.821
	Hard	2.69 (2.05)			
Pair 2	Hard	2.80 (2.23)	2.84	83	**.006***
	iPad	3.77 (2.16)			
Pair 3	iPad	4.00 (2.38)	4.15	88	**.001***
	Easy	2.69 (2.04)			
Explain Software					
Pair 1	Easy	3.79 (2.19)	.61	94	.545
	Hard	3.62 (2.27)			
Pair 2	Hard	3.64 (2.30)	2.17	86	**.033***
	iPad	3.10 (1.67)			
Pair 3	iPad	3.13 (1.74)	2.36	93	**.021***
	Easy	3.74 (2.29)			
General Prompt to Explore					
Pair 1	Easy	2.88 (1.98)	.00	87	1.00
	Hard	2.88 (1.77)			
Pair 2	Hard	2.79 (1.83)	1.90	72	.062
	iPad	2.33 (1.43)			
Pair 3	iPad	2.27 (1.66)	2.32	69	**.023***
	Easy	2.93 (2.08)			

Table 88.

Repeated Measures for Specific Instructions theme and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Specific Instructions Total	111	13.77 (10.47)	16.86 (10.20)	12.59 (8.97)	7.20	**.001***
Direct step-by-step	101	10.88 (8.43)	9.22 (6.48)	8.51 (6.59)	4.04	**.021***
Hints	23	1.70 (.88)	4.39 (2.73)	2.91 (1.78)	17.97	**.001***
Asking Specific Questions	53	5.08 (3.62)	7.83 (4.81)	4.45 (3.23)	10.19	**.001***

Table 89.

Paired t-test for Specific Instructions theme and subthemes

		M (SD)	*t*	*df*	*p*
Specific Instructions: Total					
Pair 1	Easy	13.59 (10.32)	3.15	115	**.002***
	Hard	16.52 (10.13)			
Pair 2	Hard	16.34 (10.48)	3.36	117	**.001***
	iPad	12.45 (8.93)			
Pair 3	iPad	12.71 (9.06)	.86	118	.392
	Easy	13.55 (10.31)			
Step-By-Step Instructions					
Pair 1	Easy	10.53 (8.29)	2.28	108	**.025***
	Hard	8.95 (6.38)			
Pair 2	Hard	9.19 (6.58)	1.05	105	.297
	iPad	8.35 (6.54)			
Pair 3	iPad	8.50 (6.52)	2.30	113	**.024***
	Easy	10.41 (8.36)			
Hints					
Pair 1	Easy	1.67 (.84)	5.00	29	**.001***
	Hard	4.27 (2.80)			
Pair 2	Hard	3.43 (2.39)	1.48	45	.146
	iPad	2.70 (2.31)			
Pair 3	iPad	2.89 (1.81)	2.45	27	**.021***
	Easy	1.89 (1.31)			
Asking Specific Questions					
Pair 1	Easy	4.74	4.19	67	**.001***

		(3.44)			
	Hard	7.32 (4.94)			
Pair 2	Hard	6.89 (4.78)	4.72	73	**.001***
	iPad	4.08 (2.96)			
Pair 3	iPad	4.89 (3.65)	.42	64	.677
	Easy	4.65 (3.48)			

Table 90.

Repeated Measures for Feedback theme and subthemes.

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Feedback Total	95	7.73 (5.92)	9.20 (6.98)	9.06 (5.56)	2.36	.100
Try again	2	4.00 (4.24)	1.50 (.71)	2.00 (1.41)	.	.
Ask follow-up questions	10	1.80 (.79)	1.30 (.67)	1.80 (1.32)	5.12	**.037***
Affirmation	64	5.17 (4.39)	6.61 (6.03)	5.38 (3.61)	1.57	.217
Follow up task	52	2.75 (1.95)	2.94 (1.78)	3.04 (1.74)	.38	.687
Error Indication	11	2.82 (2.36)	2.55 (2.02)	3.36 (2.29)	1.57	.260

Table 91.

Paired t-test for Follow-Up Questions

		M (SD)	*t*	*df*	*p*
Follow-Up Questions					
Pair 1	Easy	1.53 (.72)	1.07	16	.299
	Hard	1.29 (.59)			
Pair 2	Hard	1.48 (.90)	1.89	22	.073
	iPad	1.83 (1.30)			
Pair 3	iPad	2.24 (2.17)	.98	20	.341
	Easy	1.71 (.78)			

Table 92.

Repeated Measures for Filler theme and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Filler Total	68	4.66 (3.06)	4.35 (2.85)	7.28 (5.09)	13.24	**.001***
Fluff-dialogue	60	4.05 (2.59)	3.77 (2.41)	5.42 (3.35)	8.89	**.001***
Unnecessary prompt	20	1.95 (1.23)	1.90 (1.17)	3.20 (2.86)	1.84	.187

Table 93.

Paired t-test for Filler theme and subthemes

		M (SD)	*t*	*df*	*p*
Fillers: Total					
Pair 1	Easy	4.47 (3.04)	.30	72	.768
	Hard	4.36 (2.90)			
Pair 2	Hard	4.00 (2.76)	5.50	81	**.001***
	iPad	6.71 (4.85)			
Pair 3	iPad	6.80 (4.90)	5.52	79	**.001***
	Easy	4.18 (3.06)			
Fluff-dialogue					
Pair 1	Easy	3.74 (2.55)	.21	68	.834
	Hard	3.67 (2.41)			
Pair 2	Hard	3.49 (2.34)	4.36	70	**.001***
	iPad	5.03 (3.29)			
Pair 3	iPad	5.13 (3.21)	4.32	71	**.001***
	Easy	3.63 (2.57)			

Table 94.

Repeated Measures for Other category

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Parent gives answer	1	1.00 (.)	1.00 (.)	2.00 (.)	.	.
Suggest of activity	11	1.64 (.92)	1.55 (.93)	1.91 (1.14)	.58	.582
Check-ins	1	1.00 (.)	2.00 (.)	1.00 (.)	.	.
Connections	4	1.25 (.50)	1.25 (.50)	1.00 (.00)	1.00	.500

Table 95.

Repeated Measures of Device Adjustment theme and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Device Adjustment	23	1.65 (.71)	1.70 (.93)	1.78 (.85)	.24	.788
Provide booster seat/adjust seat	3	1.00 (.00)	1.00 (.00)	1.00 (.00)	.	.
Adjust screen location						
Adjust computer components	7	1.71 (.76)	1.14 (.38)	1.00 (.00)	2.75	.156

Table 96.

Repeated Measures of Supports to facilitate play theme and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Supports to facilitate play Total	13	5.77 (5.15)	4.31 (3.84)	2.77 (2.68)	4.35	**.041***
Hand over hand	11	4.55 (2.77)	4.00 (3.38)	2.73 (2.33)	3.59	.071
Move hand to correct spot	3	5.67 (3.06)	2.67 (1.53)	1.67 (1.15)	1.00	.577

Table 97.

Paired t-test for Supports to Facilitate Play

		M (SD)	*t*	*df*	*p*
Supports To Facilitate Play: Total					
Pair 1	Easy	5.31 (4.55)	3.57	35	**.001***
	Hard	3.33 (3.13)			
Pair 2	Hard	3.89 (3.96)	1.86	18	.080
	iPad	2.47 (2.29)			
Pair 3	iPad	2.59 (2.28)	2.40	21	**.026***
	Easy	4.36 (4.41)			

Table 98.

Repeated Measures for Actions to progress play theme and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Actions to progress play Total	22	5.00 (4.89)	3.91 (2.84)	3.50 (2.44)	1.14	.341
Moves mouse	7	2.86 (3.24)	1.57 (.79)	1.43 (.79)	.59	.589
Presses/clicks device	8	3.38 (3.07)	2.88 (2.30)	3.00 (2.78)	.06	.946
Hold portable device	2	5.50 (3.54)	3.00 (2.83)	1.00 (.00)	.	.

Table 99.

Repeated Measures for Points theme and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Points Total	110	11.11 (8.26)	11.10 (8.09)	9.18 (5.42)	3.18	**.046***
Direct points	104	9.37 (7.53)	9.45 (7.41)	7.89 (5.00)	2.08	.131
Point to device	6	3.83 (2.56)	3.00 (1.67)	1.00 (.00)	5.58	.070
General points	21	2.67 (1.68)	3.19 (2.56)	1.71 (.90)	4.71	**.022***

Table 100.

Paired t-test for Points themes and subthemes

		M (SD)	*t*	*df*	*p*
Points: Total					
Pair 1	Easy	10.96 (8.18)	.066	113	.947
	Hard	11.01 (8.02)			
Pair 2	Hard	10.97 (8.10)	1.99	116	**.049***
	iPad	9.27 (5.42)			
Pair 3	iPad	9.27 (5.53)	1.91	116	**.057**
	Easy	10.87 (8.10)			
General points					
Pair 1	Easy	2.35 (1.37)	.774	39	.444
	Hard	2.65 (2.16)			
Pair 2	Hard	2.61 (2.07)	2.55	37	**.015***
	iPad	1.66 (.78)			
Pair 3	iPad	1.77 (.92)	2.36	33	**.024***
	Easy	2.50 (1.58)			

Table 101.

Repeated Measures for Other themes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Reposition for own use						
Remove child's hand/Take over device	7	1.86 (1.46)	2.14 (.69)	4.86 (3.67)	1.53	.303
Demonstrates how to use the software	3	1.00 (.00)	1.33 (.58)	2.67 (1.53)	1.00	.577

Table 102.

Repeated Measures for Emotional support theme and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Emotional physical	18	2.22 (1.35)	2.56 (1.42)	3.89 (2.95)	2.95	.081
Emotional verbal	75	6.16 (3.78)	5.80 (4.01)	7.47 (5.39)	3.29	**.043***

Table 103.

Paired t-test for Emotional-Verbal Supports

		M (SD)	*t*	*df*	*p*
Emotional-Verbal Supports					
Pair 1	Easy	6.00 (3.78)	.340	79	.735
	Hard	5.81 (3.90)			
Pair 2	Hard	5.37 (3.95)	2.68	86	**.009***
	iPad	6.92 (5.32)			
Pair 3	iPad	7.38 (5.57)	2.58	88	**.011***
	Easy	5.69 (3.80)			

Table 104.

Repeated Measures all Interaction themes and subthemes

		Easy	Hard	iPad		
	N	*M* *(SD)*	*M* *(SD)*	*M* *(SD)*	*F*	*p*
Total Interactions	121	21.98 (9.89)	22.15 (10.34)	22.11 (8.49)	.03	.975
Total Scaffold	117	8.27 (4.40)	10.68 (5.83)	9.24 (4.91)	10.17	**.001***
Total Parent Initiated Support	116	6.74 (4.29)	8.68 (5.19)	8.23 (4.82)	9.39	**.001***
Parent support, child positive	110	5.63 (3.64)	7.08 (4.39)	5.97 (3.54)	5.63	**.005***
Parent support, child ignores	38	2.00 (1.43)	2.45 (1.66)	3.00 (2.72)	2.17	.129
Parent support, child negative	7	1.43 (.53)	1.86 (1.21)	2.00 (1.53)	.29	.759
Single Supports	113	6.95 (3.50)	7.94 (4.35)	6.96 (3.85)	3.20	**.045***
Multiple Supports	59	2.22 (1.45)	3.66 (2.11)	3.22 (2.02)	11.38	**.001***
Support ends in answer	6	1.33 (.82)	1.33 (.52)	2.67 (1.21)	4.13	.106
Total Child requested assistance	47	2.77 (1.60)	3.68 (3.26)	2.32 (1.51)	3.78	**.030***
Child requests assistance, parents supports	34	2.56 (1.52)	2.94 (2.20)	2.15 (1.16)	2.16	.132
Child requests assistance, parents gives answer						
Child requests assistance, parent does not help	2	1.00 (.00)	1.00 (.00)	2.50 (.71)	.	.
Parent Initiated Engagement Total	112	10.51 (5.65)	8.19 (4.95)	9.17 (4.77)	14.18	**.001***
Parent engage, child response Total	105	6.98 (4.00)	5.65 (3.48)	5.57 (3.71)	7.26	**.001***
Relevant engagement: Child response	98	4.69 (2.91)	3.61 (2.14)	3.56 (2.52)	6.98	**.001***

Irrelevant engagement: Child response	55	3.45 (1.83)	3.35 (2.34)	2.82 (1.83)	2.89	.064
Parent engage, child ignores Total	81	4.46 (3.15)	3.65 (2.70)	4.32 (2.95)	2.64	.078
Relevant engagement: Child ignores	50	3.08 (2.03)	2.20 (1.34)	2.68 (1.82)	5.11	**.010***
Irrelevant engagement: Child ignores	44	2.82 (2.05)	2.45 (1.77)	2.45 (1.73)	.68	.510
Child Initiated Engagement Total	79	4.92 (3.81)	4.87 (3.92)	5.01 (3.83)	.06	.941
Child engage, parent response Total	75	4.64 (3.38)	4.43 (3.39)	4.41 (3.25)	.17	.841
Relevant engagement: Parent response	43	2.60 (1.43)	2.60 (1.69)	2.16 (1.49)	1.86	.169
Irrelevant engagement: Parent response	42	3.33 (3.00)	3.71 (2.94)	3.79 (2.47)	.47	.629
Child engage, parent ignores Total	7	1.43 (1.13)	2.14 (1.77)	2.29 (1.38)	2.51	.176
Relevant engagement: Parent ignores	1	1.00 (.)	1.00 (.)	2.00 (.)	.	.
Irrelevant engagement: Parent ignores	4	1.50 (1.00)	2.25 (2.50)	2.00 (.82)	.21	.828

Table 105.

Paired t-test for all Interactions themes and subthemes.

		M (SD)	*t*	*df*	*p*
Total Scaffold					
Pair 1	Easy	8.20 (4.36)	4.65	119	**.001***
	Hard	10.64 (5.82)			
Pair 2	Hard	10.50 (5.87)	2.05	121	**.043***
	iPad	9.26 (4.91)			
Pair 3	iPad	9.27 (4.95)	2.52	123	**.013***
	Easy	7.99 (4.45)			
Parent initiated Scaffold					
Pair 1	Easy	6.70 (4.25)	4.13	118	**.001***
	Hard	8.66 (5.17)			
Pair 2	Hard	8.49 (5.24)	.32	121	.749
	iPad	8.32 (4.80)			
Pair 3	iPad	8.38 (4.86)	3.78	121	**.001***
	Easy	6.58 (4.26)			
Parent Scaffold Child Positive					
Pair 1	Easy	5.54 (3.61)	3.38	113	**.001***
	Hard	6.97 (4.37)			
Pair 2	Hard	6.99 (4.37)	2.28	113	**.025***
	iPad	5.96 (3.49)			
Pair 3	iPad	5.99 (3.63)	1.48	118	.142
	Easy	5.41 (3.61)			
Single Supports					
Pair 1	Easy	6.88	2.53	116	**.013***

		(3.47)			
	Hard	7.94 (4.33)			
Pair 2	Hard	7.80 (4.37)	1.87	118	.064
	iPad	6.90 (3.89)			
Pair 3	iPad	6.89 (3.99)	.45	122	.657
	Easy	6.69 (3.55)			
Multiple Supports					
Pair 1	Easy	2.34 (1.67)	4.07	66	**.001***
	Hard	3.61 (2.26)			
Pair 2	Hard	3.22 (2.19)	2.59	103	**.011***
	iPad	2.53 (2.06)			
Pair 3	iPad	2.93 (2.16)	2.48	75	**.015***
	Easy	2.20 (1.61)			
Support Ends In Answer					
Pair 1	Easy	1.23 (.60)	1.47	12	.167
	Hard	2.08 (1.85)			
Pair 2	Hard	1.88 (1.75)	.12	15	.903
	iPad	1.81 (1.05)			
Pair 3	iPad	2.10 (1.20)	2.08	9	.068
	Easy	1.20 (.63)			
Child Requested Assistance: Total					
Pair 1	Easy	2.65 (1.53)	2.51	70	**.014***
	Hard	3.51 (3.05)			
Pair 2	Hard	3.39 (3.06)	2.86	60	**.006***
	iPad	2.23 (1.44)			

Pair 3	iPad	2.21 (1.47)	1.59	52	.117
	Easy	2.62 (1.58)			
Parent Engage, Child Response					
Pair 1	Easy	6.90 (4.00)	3.75	108	**.001***
	Hard	5.55 (3.46)			
Pair 2	Hard	5.59 (3.45)	.10	107	.920
	iPad	5.63 (3.69)			
Pair 3	iPad	5.47 (3.61)	2.60	115	**.010***
	Easy	6.58 (4.03)			
Parent Initiated Engagement					
Pair 1	Easy	10.47 (5.61)	5.60	114	**.001***
	Hard	8.10 (4.93)			
Pair 2	Hard	8.06 (4.92)	2.47	115	**.015***
	iPad	9.30 (4.80)			
Pair 3	iPad	9.12 (4.62)	1.39	122	.166
	Easy	9.85 (5.81)			
Relevant Engagement, Child Response					
Pair 1	Easy	4.68 (2.86)	4.07	103	**.001***
	Hard	3.52 (2.12)			
Pair 2	Hard	3.50 (2.12)	.00	104	1.00
	iPad	3.50 (2.57)			
Pair 3	iPad	3.34 (2.49)	3.38	113	**.001***
	Easy	4.46 (2.83)			
Relevant Engagement, Child Ignores					
Pair 1	Easy	2.95 (2.00)	3.04	58	**.004***

	Hard	2.15 (1.34)			
Pair 2	Hard	2.13 (1.33)	.63	63	.530
	iPad	2.30 (1.88)			
Pair 3	iPad	2.27 (1.79)	1.46	92	.147
	Easy	2.62 (1.88)			

Figure 1.

Age Distribution for Mothers and Fathers

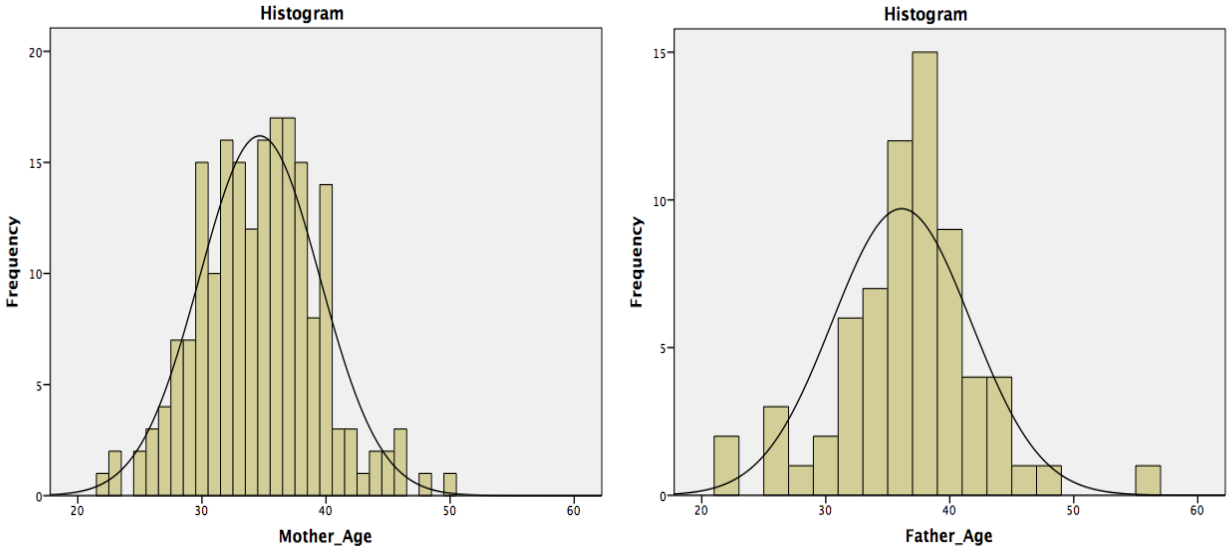
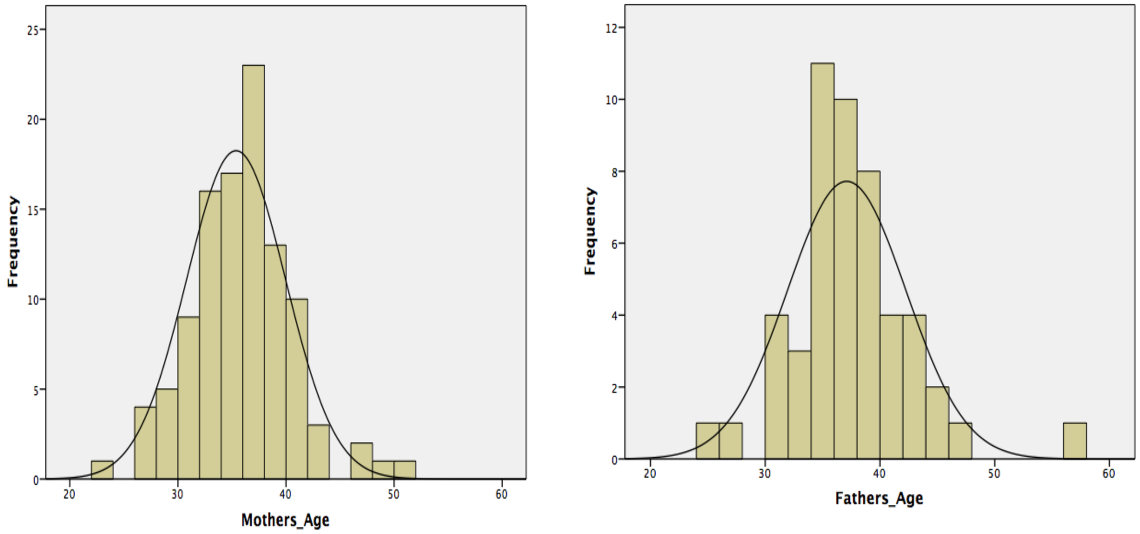
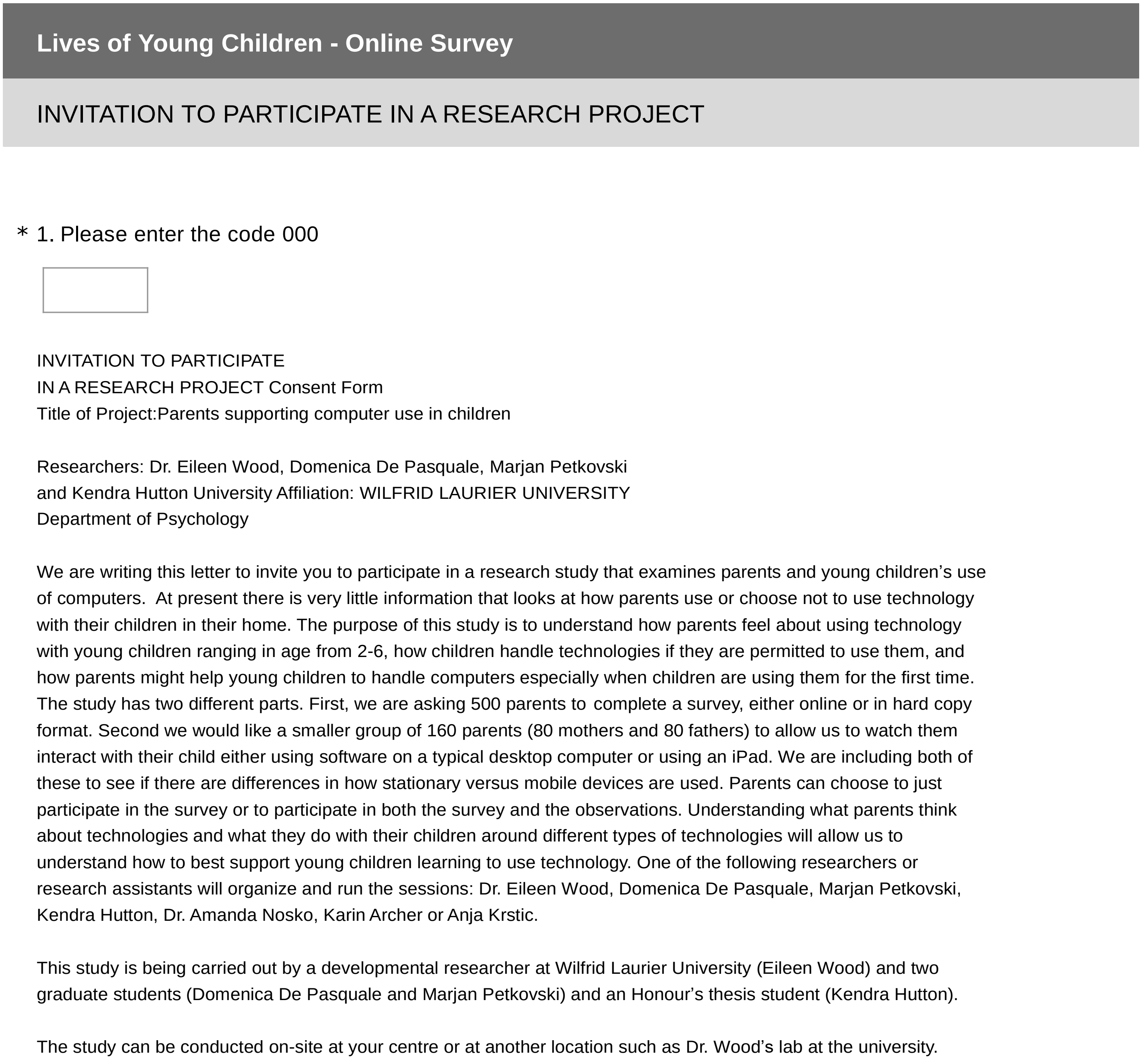


Figure 2.

Age Distribution for Mothers and Fathers (Study 2)



Appendix A: Survey



Lives of Young Children - Online Survey

INVITATION TO PARTICIPATE IN A RESEARCH PROJECT

* 1. Please enter the code 000

INVITATION TO PARTICIPATE
IN A RESEARCH PROJECT Consent Form
Title of Project:Parents supporting computer use in children

Researchers: Dr. Eileen Wood, Domenica De Pasquale, Marjan Petkovski
and Kendra Hutton University Affiliation: WILFRID LAURIER UNIVERSITY
Department of Psychology

We are writing this letter to invite you to participate in a research study that examines parents and young children's use of computers. At present there is very little information that looks at how parents use or choose not to use technology with their children in their home. The purpose of this study is to understand how parents feel about using technology with young children ranging in age from 2-6, how children handle technologies if they are permitted to use them, and how parents might help young children to handle computers especially when children are using them for the first time. The study has two different parts. First, we are asking 500 parents to complete a survey, either online or in hard copy format. Second we would like a smaller group of 160 parents (80 mothers and 80 fathers) to allow us to watch them interact with their child either using software on a typical desktop computer or using an iPad. We are including both of these to see if there are differences in how stationary versus mobile devices are used. Parents can choose to just participate in the survey or to participate in both the survey and the observations. Understanding what parents think about technologies and what they do with their children around different types of technologies will allow us to understand how to best support young children learning to use technology. One of the following researchers or research assistants will organize and run the sessions: Dr. Eileen Wood, Domenica De Pasquale, Marjan Petkovski, Kendra Hutton, Dr. Amanda Nosko, Karin Archer or Anja Krstic.

This study is being carried out by a developmental researcher at Wilfrid Laurier University (Eileen Wood) and two graduate students (Domenica De Pasquale and Marjan Petkovski) and an Honour's thesis student (Kendra Hutton).

The study can be conducted on-site at your centre or at another location such as Dr. Wood's lab at the university.

INFORMATION

Parents in the study will be asked to complete one survey. The survey asks some general questions about the parent and the child (for example age and gender) but does not ask for personal information that would identify the parent or child (no names, addresses etc.) followed by questions related to technology use in the home and parents perceptions about technology use for their child. The survey will also ask about software used by children, household rules regarding technology use, and more general questions about activities your child likes to engage in beyond technology. The survey will take about 20-30 minutes to complete.

Some parents may also volunteer to participate in an observational session. In these sessions parents and their child will be given an opportunity to play with either reading software or an iPad. There are two different observational sessions, but parents and their children will only participate in one. The first observational setting examines the use of desktop computers. In these sessions, parents and their children will have an opportunity to play with two different software packages for about 10 minutes each. The two packages are well known commercial software packages that are seen in many stores yet they are different in design and content. The two software types will allow us to assess whether different software encourages children or parents to play differently. In the second observational setting each parent and child dyad will be given an iPad to play with for approximately 15 minutes. We will video and audio record these sessions to allow us to analyze them later.

At the end of the observational session, each parent will be asked some short interview questions (about 5-10 minutes) to find out what they thought of the materials and devices, how interesting/ appropriate the software or devices were for their child, and how similar the observational setting would be to their normal interactions with computers at home. The total time commitment for this study is between 60-75 minutes.

RISKS

There are few foreseeable risks associated with participating in this study. However, you might feel uncomfortable answering some questions on the survey. These feelings are normal and should be temporary. If this is the case, please feel free to leave any questions you do not want to answer blank. You can also stop completing the survey if you are uncomfortable with the questions.

Parents and children who participate in the observational sessions also may find some of the software or devices difficult to navigate. This too is normal and you and your child can ask for assistance from researchers at any time. You may also take breaks and/or withdraw from the observational part of the study at any time.

BENEFITS

At present computers (mobile and more stationary) are appearing in many homes. Technology is a prominent feature of young children's lives, yet we know very little about how technologies are used with young children. We also know little about how to maximize and support young children's learning when they are introduced to these technologies. The results of this study will be important for parents, educators and care providers as it will give us an idea of parents perceptions and personal experiences when introducing technology to young children.

CONFIDENTIALITY

Data for parents who complete only the survey is completely anonymous. There is no way that the data could be traced back to you. Confidentiality of data cannot be guaranteed for the few moments while the information is being sent over the Internet, but the data will be stored securely once it is received. Data for parents who agree to participate in the observation sessions will initially be confidential but will become anonymous. This means that at first no one but the researchers and research assistants (Dr. Eileen Wood, Domenica De Pasquale, Marjan Petkovski, and Karin Archer) will see your responses on the survey or will be able to connect the observational session with your survey responses. Because we would like to be able to connect the survey and the observations, we will give each person who participates in the observations a code number. That number will be placed on the survey that you complete. After you finish the session that is taped, the things that were said during the session will be written out and then what happened in the session will be recorded. Once that is done (by December 28, 2016) the tape will be destroyed by Dr. Wood and the information will only be identified by the code number. Similarly, what is said at the short interview will also be coded with this code number. The code number will allow us to match up all the data for each person. Once the data are matched, the list identifying each participant's name with the code number will be destroyed by Dr. Wood and only the code number will be left. From that point on, all information will be anonymous. No identifying information will be present in the data, therefore, ensuring complete anonymity. Only group data for the scaled information will be presented in subsequent summaries of the study, therefore, no one will be able to know you or your child's individual responses or what you did in any part of this study. The data will be kept for approximately 7 years. The electronic data will be stored on a password-protected computer, and the paper data (including hard copy consent forms) will be stored in a locked cabinet. All data will be securely stored in Dr. Wood's locked research lab at Wilfrid Laurier University. After 7 years (July 31, 2023), the paper and de-identified electronic data will be shredded, destroyed and carefully disposed of by Dr. Wood.

COMPENSATION

As a small token of our appreciation all parents completing the survey will have an opportunity to go to a separate link to enter a draw for the chance to win one of 20 gift certificates for $50. The odds of winning are 1 in 25.You will be asked to go to a separate link to provide an email contact. The draw will take place at the end of the study (by December 28, 2016) and winners will be selected randomly from those who provided contact information (email address). Winners will be notified through their email address. We will ask for mailing information and send you a gift certificate for $50 for a retail outlet of your choice (limited to chain or easily accessible outlets, for example malls, gas chains, food chains). In addition, parents who agree to participate in the observational sessions with their child will receive $25 in cash to cover gas/travel expenses as well as their time.

CONTACT

If you or your child have questions at any time about the study or the procedures, (or you experience adverse effects as a result of participating in this study) you may contact the researcher, Dr Eileen Wood, Department of Psychology, Wilfrid Laurier University, Waterloo, ON N2L3C5 at 519-884-1970 ext. 3738 or Domenica De Pasquale through email at depa7310@mylaurier.ca or by phone at 519-884-1970 ext. 3359. You may also contact Marjan Petkovski through e-mail at petk2350@mylaurier.ca and Kendra Hutton through e-mail at hutt2560@mylaurier.ca or by phone at 519-884-1970 ext. 3359. This project has been reviewed and approved by the University Research Ethics Board (REB Approval Number: #3105). If you feel you have not been treated according to the descriptions in this form, or your rights as a participant in research have been violated during the course of this project, you may contact Dr. Robert Basso, Chair, University Research Ethics Board, Wilfrid Laurier University, (519) 884-1970, extension 5225 or rbasso@wlu.ca

PARTICIPATION

To participate in this study, your child must be within the range of 2-6 years of age. You and your child's participation in the study is voluntary. If you and your child decide to participate, you and your child may withdraw from the study at any time without penalty and without loss of benefits to which you are otherwise entitled. If you or your child withdraw from the study before data collection is completed your data will be removed from the study and destroyed. You and your child have the right to omit any question(s) or procedure(s) you choose. To ensure your anonymity all completed data is stored without identifiers (i.e., your name) and therefore we cannot remove your data once completed.

FEEDBACK AND PUBLICATION

The results of this research may be used for presentations at conferences (for example, Canadian Psychological Association) and in research journals such as Developmental Psychology. Some parts of the study might also be summarized as part of thesis documents for Domenica De Pasquale, Marjan Petkovski and Kendra Hutton. If you would like to see a summary of the findings, a summary will be posted at Wilfrid Laurier University on the bulletin board outside of the Psychology main office on the second floor of the Science Building by January 7, 2017. You will also have the opportunity to submit an email address (via a link at the end of the survey) if you would like to receive a summary of the research findings electronically

(Please feel free to print out this information for your records)

* 2. Please read the following consent form and if you agree to participate in the study, please click on "I agree" to continue.

○ AGREE

○ DISAGREE

3. QUOTED INFORMATION

Sometimes when we ask open questions instead of using scales, people provide really important answers that we would like to share with others. We would like to ask your permission to be able to use a quote if you would contribute so greatly to explaining a point. We would ensure that whatever we quoted could not be traced back to you (we would remove all names, institutions and personal sayings to make sure it could be anonymous). Use of quotations is not mandatory, you can still participate if you do not give us permission to quote you but if you would be willing to allow us to use a quote please indicate below.

○ AGREE

○ DO NOT AGREE

Lives of Young Children - Online Survey

Demographics

4. What gender are you?

○ Male

○ Female

○ Other

5. How old are you?

6. What is your Postal Code?

7. What is your Marital Status?

○ Single

○ Committed Relationship (Married or Common Law)

○ Separated/ Divorced/ Widowed

8. Please indicate your highest level of education

○ No formal education

○ Some Elementary School

○ Elementary School Completed

○ Some High School

○ High School Diploma

○ Some Post Secondary Education

○ College Diploma

○ Undergraduate Degree

○ Master's Degree

○ Doctorate

○ Post- doctorate

Lives of Young Children - Online Survey

Demographics

9. Is English your first language?

○ Yes

○ No

Lives of Young Children - Online Survey

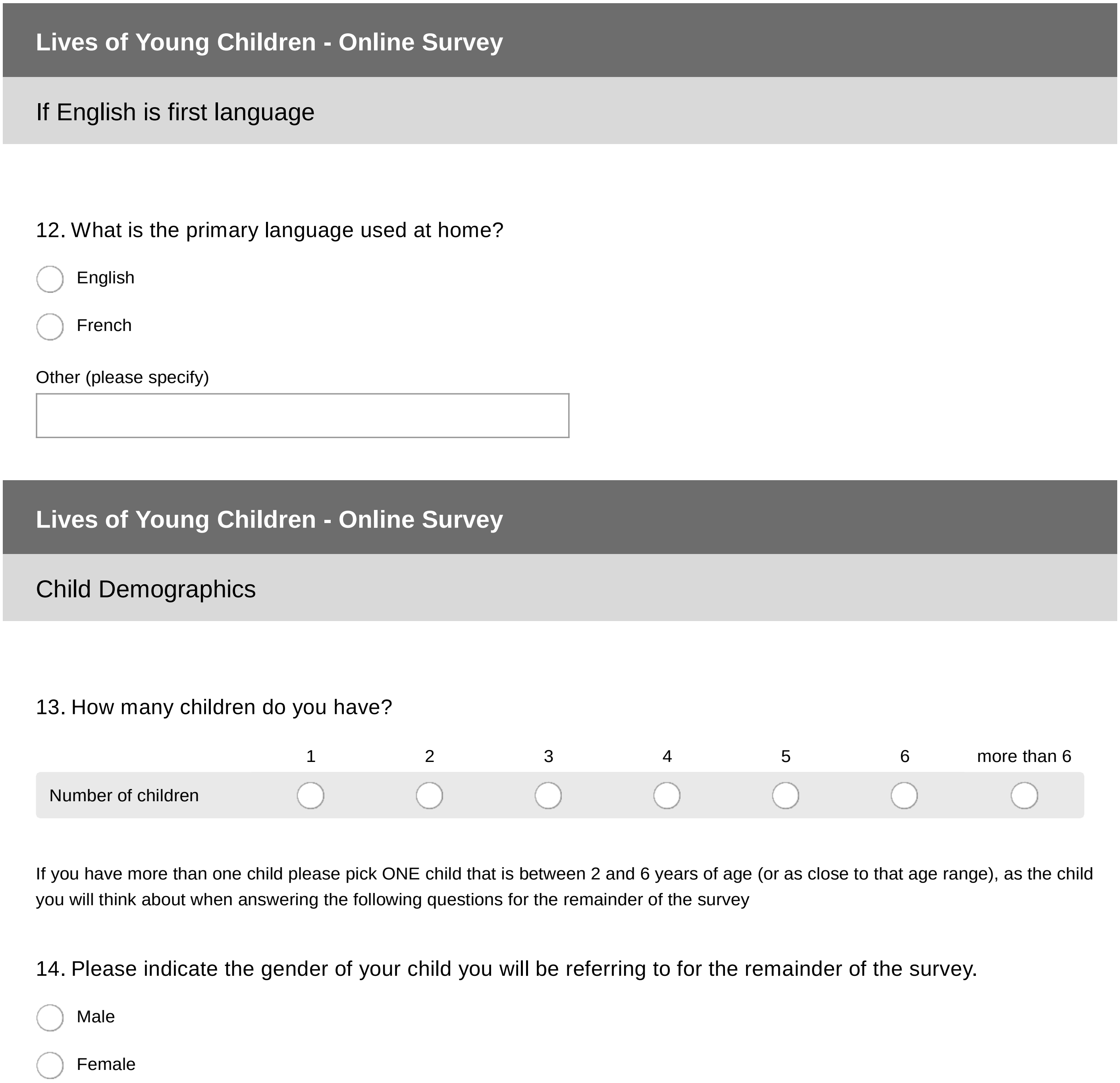
English as a second language

10. If no, how old were you when you first learned English (in years)?

☐

11. What is your first language?

☐



Lives of Young Children - Online Survey

If English is first language

12. What is the primary language used at home?

○ English

○ French

Other (please specify)

☐

Lives of Young Children - Online Survey

Child Demographics

13. How many children do you have?

	1	2	3	4	5	6	more than 6
Number of children	○	○	○	○	○	○	○

If you have more than one child please pick ONE child that is between 2 and 6 years of age (or as close to that age range), as the child you will think about when answering the following questions for the remainder of the survey

14. Please indicate the gender of your child you will be referring to for the remainder of the survey.

○ Male

○ Female

15. Please indicate the age of the child you will be referring to for the remainder of the survey

○ 12 - 24 months

○ 25 - 30 months

○ 31 - 36 months

○ 37 - 42 months

○ 43 - 48 months

○ 49 months - 4 years, 6 months

○ 4 years, 7 months - 5 years

○ Older than 5 years

16. What is your child's birth order?

○ Only child

○ First born

○ Middle born

○ Last born

17. Is your child's first language English?

○ Yes

○ No

Lives of Young Children - Online Survey

18. Does your child speak/understand English?

○ Yes

○ No

Lives of Young Children - Online Survey

Caregiver Information

19. For each of the caregivers listed below, please indicate the average number of hours per week each of the following people provides care for your child. (If not applicable, please indicate "NA")

Yourself

Your partner/spouse

Grandparent

Older sibling

Other family members

Babysitter/Nanny

Educational worker (daycare provider, preschool teacher)

Other (please specify)

Lives of Young Children - Online Survey

* Reminder * You are answering the following questions about your child between the ages 2 and 6 years of age (you specified this particular child earlier in the survey)

Lives of Young Children - Online Survey

20. Considering the following items, please give estimates on how many of each your child has

	None	1 - 5	6 - 10	11 - 20	21 - 50	51 - 100	More than 100
Magazines/comics	○	○	○	○	○	○	○
Books	○	○	○	○	○	○	○
Dolls/action figures	○	○	○	○	○	○	○
Craft sets	○	○	○	○	○	○	○
Stuffed animals	○	○	○	○	○	○	○
Toy Vehicles (e.g., car, boats, trains, planes)	○	○	○	○	○	○	○
Lego sets/building blocks	○	○	○	○	○	○	○
Puzzles	○	○	○	○	○	○	○
Musical instruments	○	○	○	○	○	○	○
Activity centers (e.g., farms, kitchen, garage)	○	○	○	○	○	○	○
Outdoor toys (e.g., bikes, wagons, sleds)	○	○	○	○	○	○	○
Remote control toys	○	○	○	○	○	○	○

Lives of Young Children - Online Survey

21. Please indicate how often YOUR CHILD uses each of the following technologies in a normal WEEK.

	Never heard of it	Not at all	1 -2 days a week	3 -6 days a week	Everyday
TV	○	○	○	○	○
Desktop Computer	○	○	○	○	○
Laptop	○	○	○	○	○
Mobile Phone	○	○	○	○	○
Internet	○	○	○	○	○
Kindle Reader	○	○	○	○	○
iPod	○	○	○	○	○
iPad	○	○	○	○	○
PlayBook	○	○	○	○	○
Portable DVD Player	○	○	○	○	○
Vtech Toys	○	○	○	○	○
Leap Frog/Leapster	○	○	○	○	○
Leappad Explorer	○	○	○	○	○
Xbox	○	○	○	○	○
Playstation	○	○	○	○	○
Nintendo Wii	○	○	○	○	○
Nintendo DS	○	○	○	○	○
Nintendo Game Cube	○	○	○	○	○
Zeebo	○	○	○	○	○
PSP Go	○	○	○	○	○

22. On average, how much time IN HOURS does YOUR CHILD spend using software/ computer technology in a given WEEK? (Please enter N/A if this is not applicable to you)

23. Please indicate how often YOU use each of the following technologies in a normal WEEK.

	Never heard of it	Not at all	1 -2 days a week	3- 6 days a week	Everyday
TV	○	○	○	○	○
Desktop Computer	○	○	○	○	○
Laptop	○	○	○	○	○
Mobile Phone	○	○	○	○	○
Internet	○	○	○	○	○
Kindle Reader	○	○	○	○	○
iPod	○	○	○	○	○
iPad	○	○	○	○	○
PlayBook	○	○	○	○	○
Portable DVD Player	○	○	○	○	○
Vtech Toys	○	○	○	○	○
Leap Frog/Leapster	○	○	○	○	○
Leappad Explorer	○	○	○	○	○
Xbox	○	○	○	○	○
Playstation	○	○	○	○	○
Nintendo Wii	○	○	○	○	○
Nintendo DS	○	○	○	○	○
Nintendo Game Cube	○	○	○	○	○
Zeebo	○	○	○	○	○
PSP Go	○	○	○	○	○

24. Does your child have access to any computer based technology (including gaming computers/laptops, desktops, iPads) in:

	Yes	No	NA
a) Your home	○	○	○
b) At daycare/childcare	○	○	○
c) At school	○	○	○
d) At friends/relatives	○	○	○

Learning and Technology

25. In COMPARISON TO MOST CHILDREN your child's age, how often would you say your child uses computer technology?

	Never	(1) Much less than most children	(2)	(3) Equal	(4)	(5) Much more than most children
In comparison to other children of the same age:	○	○	○	○	○	○

26. How often does your child play computer games WITH adult supervision or participation?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
WITH adult supervision:	○	○	○	○	○

27. How often does your child play computer games WITHOUT adult supervision or participation?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
WITHOUT adult supervision:	○	○	○	○	○

28. How often do you personally test out software BEFORE your child uses it?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
BEFORE your child uses it:	○	○	○	○	○

Lives of Young Children - Online Survey

29. When you purchase software or download programs from the Internet for your child, how often do you look for material in each of the following areas:

	(1) Never	(2)	(3) Sometimes	(4)	(5) Always
Math	○	○	○	○	○
Counting/ Number activities	○	○	○	○	○
Alphabet	○	○	○	○	○
Phonics (letters and their associated sounds)	○	○	○	○	○
Reading	○	○	○	○	○
Science	○	○	○	○	○
Games	○	○	○	○	○
Puzzles (spatial/ visual activities)	○	○	○	○	○

Lives of Young Children - Online Survey

Reminder

* Reminder * You are answering the following questions about your child between the ages 2 and 6 years of age (you specified this particular child earlier in the survey)

Lives of Young Children - Online Survey

Verbal Prompts

30. Of the following, which verbal prompts do you use to help your child when your child is using software?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
Rewording instructions from the software	○	○	○	○	○
Re-phrasing my own wording to progress through the software	○	○	○	○	○
Reading aloud information provided in the software	○	○	○	○	○
Explaining how the software works	○	○	○	○	○
Giving additional examples in addition to software	○	○	○	○	○
Providing hints but not complete instructions to help my child navigate the software	○	○	○	○	○
Providing direct step-by-step instructions to guide the child in how to use the technology	○	○	○	○	○
Telling him/her that he or she is doing well	○	○	○	○	○
Telling him/her to try again	○	○	○	○	○
Telling him/her that what he or she is doing is incorrect	○	○	○	○	○
Asking questions of my child (eg. What happens next? How did that work?)	○	○	○	○	○

Other (please specify)

Lives of Young Children - Online Survey

Emotional Supports

31. In general, how demonstrative or emotional (e.g., show strong emotions) would you rate your way of interacting with your child?

	(1) Rarely show emotions	(2)	(3) Sometimes	(4)	(5)Almost all the time
Rating	○	○	○	○	○

32. In general, how likely are you to provide emotional support to your child through physical behaviours such as a hug, ruffling his/her hair, squeezing a shoulder, etc?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
Rating:	○	○	○	○	○

33. In general, how likely are you to provide emotional support to your child through words (such as "good job", "you can do it")?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
Rating:	○	○	○	○	○

34. When introducing your child to computers or new software, how likely are you to provide physical emotional supports (a hug, ruffling hair, etc) to keep your child involved in computer-based activities?

	(1) Not at all likely	(2)	(3) Neutral	(4)	(5) Very Likely
Rating:	○	○	○	○	○

35. When your child is working on a challenging activity with computers, how likely are you to provide physical emotional supports (a hug, ruffling hair, etc) to keep your child involved in computer-based activities?

	(1) Not at all likely	(2)	(3) Neutral	(4)	(5) Very Likely
Rating:	○	○	○	○	○

36. When introducing your child to computers or new software, how often do you encourage your child to keep trying an activity by using emotional support words like "Good job," "You can do it," etc?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
Rating:	○	○	○	○	○

37. When your child is working on a challenging activity with computers, how often do you encourage your child to keep trying an activity by using emotional support words like "Good job," "You can do it," etc?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
Rating:	○	○	○	○	○

38. If your child were working on a challenging activity with computers, how would you MOST LIKELY respond?

○ a) Ignore the situation and let my child work it out on their own.

○ b) Crouch near my child, bring a chair up beside them or stand near my child to show support and simply observe.

○ c) Tell my child I have confidence that they can figure it out if they keep trying.

○ d) Crouch near my child, bring a chair up beside them or stand near my child and tell them I think they can get it.

○ e) Give a hug, touch my child to encourage them and tell them they can do it.

Other (please specify)

☐

Lives of Young Children - Online Survey

Physical Prompts

39. Of the following, which physical prompts do you use to help your child when guiding them through a challenging computer task?

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
Provide Booster Seat	○	○	○	○	○
Adjust screen location/angle	○	○	○	○	○
Adjust screen properties (font size, brightness, etc.)	○	○	○	○	○
Buy Devices made specifically for children	○	○	○	○	○
Adjust the computer so the child can access it more easily	○	○	○	○	○
Sit beside child (you in front of monitor)	○	○	○	○	○
Sit beside child (child in front of monitor)	○	○	○	○	○

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
Let your child sit on your lap while you work on the computer	○	○	○	○	○
Let your child sit on your lap while the child uses the computer	○	○	○	○	○
Place your hand over your child's hand to help him/her move the mouse	○	○	○	○	○
Move your child's hand to the correct place on the keyboard	○	○	○	○	○
Move your child's hand over a touch pad	○	○	○	○	○
Move the mouse for him/her	○	○	○	○	○
Press the keyboard for him/her	○	○	○	○	○
Point directly at or touch important information on screen	○	○	○	○	○
Point in general to the screen	○	○	○	○	○
Hold a portable device so your child can use it	○	○	○	○	○

Lives of Young Children - Online Survey

40. How often do you:

	(1) Never	(2)	(3) Sometimes	(4)	(5) Almost Always
Let your child use the computer on his/her own	○	○	○	○	○
Let your child use a laptop on his/her own	○	○	○	○	○
Let your child use a tablet (e.g., iPad, Playbook, etc.,) on his/her own	○	○	○	○	○
Let your child use a cellphone/smartphone on their own	○	○	○	○	○
Let your child use the television on his/her own	○	○	○	○	○
Encourage your child to use devices such as Leapfrog, V-tech etc.	○	○	○	○	○
Let your child select the software/program to play with	○	○	○	○	○
Select the software/program for your child	○	○	○	○	○

Lives of Young Children - Online Survey

Reminder

* Reminder * You are answering the following questions about your child between the ages 2 and 6 years of age (you specified this particular child earlier in the survey)

Lives of Young Children - Online Survey

41. We are trying to find out what help children need when using computer technologies - what support did you find you most needed to give your child?

42. Rate how important each of the following goals are to you when your child uses technology

	(0) N/A	(1) Not at all important	(2)	(3) Somewhat	(4)	(5) Very Important
Building hand-eye coordination	○	○	○	○	○	○
Strengthening reflexes	○	○	○	○	○	○
Building Social Skills	○	○	○	○	○	○
Building Problem Solving Skills	○	○	○	○	○	○
Developing basic skills in: Math	○	○	○	○	○	○
Reading	○	○	○	○	○	○
Language	○	○	○	○	○	○
Science	○	○	○	○	○	○
Art	○	○	○	○	○	○
Crafts	○	○	○	○	○	○
History	○	○	○	○	○	○
Searching for Information	○	○	○	○	○	○
Fun/Entertainment	○	○	○	○	○	○
Developing skills for future school success	○	○	○	○	○	○
Occupying your child	○	○	○	○	○	○

Lives of Young Children - Online Survey

Specific Types of Software

43. Please indicate if your child uses any of the following software:

	Never	Previously used	A few times a year	A few times a month	A few times a week	Daily
Abracadabra TM	○	○	○	○	○	○
Arthur's Math Games TM	○	○	○	○	○	○
Arthur's Reading Race TM	○	○	○	○	○	○
Bailey's Bookhouse TM	○	○	○	○	○	○
Blue's Clues (reading)TM	○	○	○	○	○	○
Boohbah Movin' & Groovin' TM	○	○	○	○	○	○
Caillou Four Seasons of Fun TM	○	○	○	○	○	○
Caillou Thinking Skills Games TM	○	○	○	○	○	○
Clifford Reading TM or Clifford Phonics TM	○	○	○	○	○	○
Curious George TM	○	○	○	○	○	○
Disney's Phonics Quest TM	○	○	○	○	○	○
Dora the Explorer the Lost City TM	○	○	○	○	○	○
Dr. Seuss' TM	○	○	○	○	○	○
Jump Start (reading)TM	○	○	○	○	○	○
JumpStart Numbers TM	○	○	○	○	○	○
Math Learning System TM	○	○	○	○	○	○
Mickey's Software (reading)TM	○	○	○	○	○	○
Mighty Math Zoo Zillions TM	○	○	○	○	○	○
Millie's Math TM	○	○	○	○	○	○
Millie & Bailey Reading)TM	○	○	○	○	○	○
Reader Rabbit (reading/phonics) TM	○	○	○	○	○	○
Reader Rabbit Personalized Math TM	○	○	○	○	○	○

	Never	Previously used	A few times a year	A few times a month	A few times a week	Daily
Schooltown Preschool TM	○	○	○	○	○	○
School Zone Flash Action On-Track Math TM	○	○	○	○	○	○
Sesame Street Letters or Let's Make a WordTM	○	○	○	○	○	○
Sesame Street Elmo's Reading BasicsTM	○	○	○	○	○	○
Starfall TM	○	○	○	○	○	○

Lives of Young Children - Online Survey

Other Software

44. If there is software (either cd's, dvd's, or Internet based software) that your child likes to use and it is not identified on the previous page, please list the software here.

45. From any of the software listed above or that you identified on the previous page, which ones would you say best help your child learn to read? (Please list the names of up to three of the most important ones)

46. From any of the software listed above or that you identified on the previous page, which ones would you say best help your child learn about math? (Please list the name of up to three of the most important ones)

Lives of Young Children - Online Survey

Favourite Games/ Software

47. Of the computer games or downloaded software your child has, which is YOUR CHILD'S favourite? (Pick one)

48. Of the computer programs or downloaded software your child has, which is YOUR favourite? (pick one)

Lives of Young Children - Online Survey

Reminder

* Reminder * You are answering the following questions about your child between the ages 2 and 6 years of age (you specified this particular child earlier in the survey)

Lives of Young Children - Online Survey

Purchase Influences

49. How much would each of the following influence your decision to purchase or download software for your child?

	(1) Not at all	(2)	(3) Somewhat	(4)	(5) A great deal
It is free	○	○	○	○	○
It is on sale	○	○	○	○	○
A friend recommended it	○	○	○	○	○
A librarian recommended it	○	○	○	○	○
A teacher recommended it	○	○	○	○	○
It says it offers good training	○	○	○	○	○
My child says his/her friends have it	○	○	○	○	○
It is professionally packaged	○	○	○	○	○
I know the manufacturer	○	○	○	○	○
I know the characters	○	○	○	○	○
It appears attractive	○	○	○	○	○
I have tried it out myself first	○	○	○	○	○
My child asks for it	○	○	○	○	○
There is scientific evidence supporting the software	○	○	○	○	○
The package or a review says there is evidence based support for using the software	○	○	○	○	○

Lives of Young Children - Online Survey

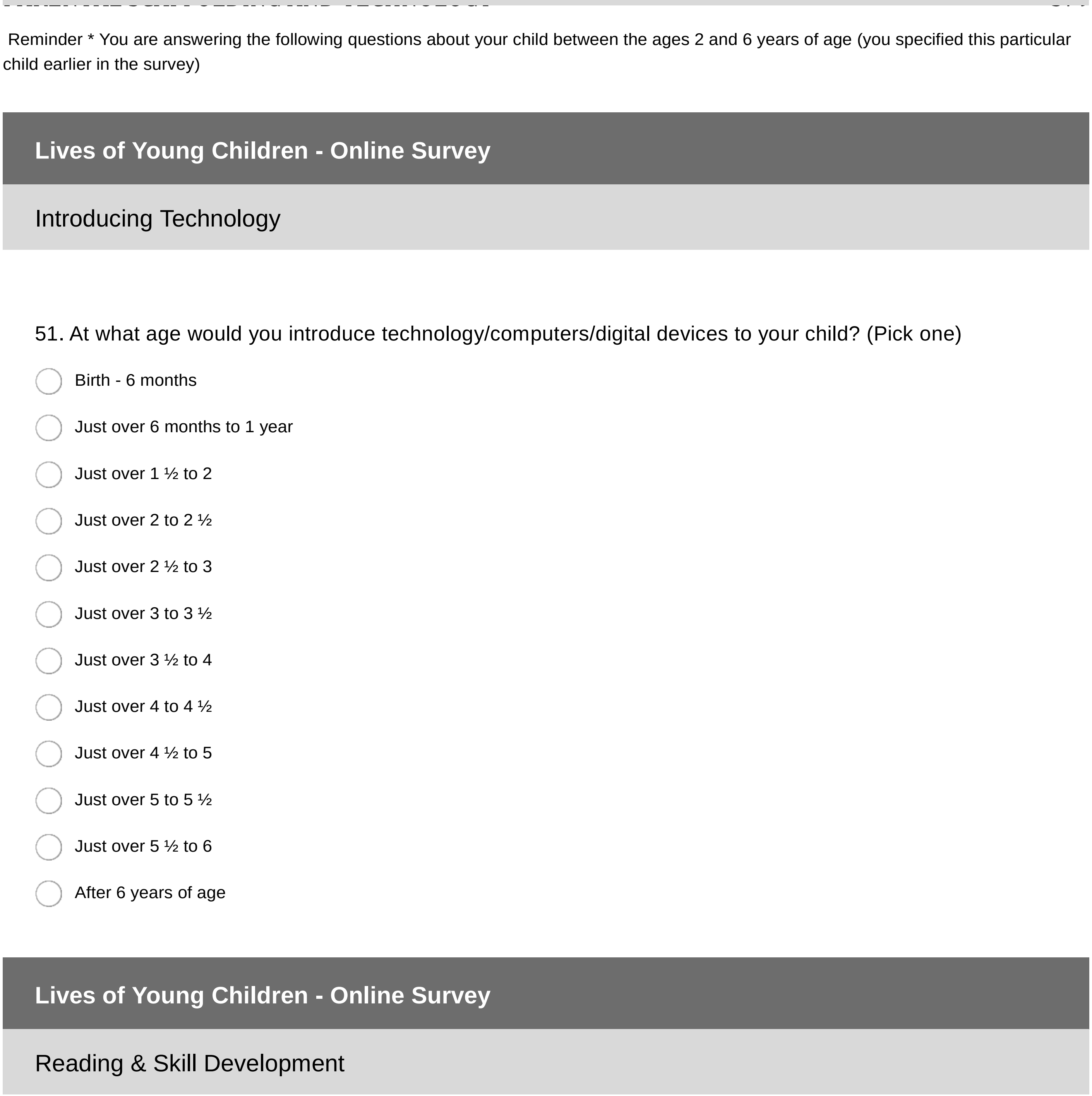
Endorsing Technology

50. How much would you endorse each of the following statements?

	(1) Not at all	(2)	(3) Somewhat	(4)	(5) A great deal
I worry about introducing technology too early.	○	○	○	○	○
I worry about introducing technology too late.	○	○	○	○	○
I worry about how people will judge me if I let my child use technology.	○	○	○	○	○
I worry about how people will judge me if I do not let my child use technology.	○	○	○	○	○
I worry about whether my child should be spending more time on the computer.	○	○	○	○	○
I worry about whether my child should be spending more time away from the computer.	○	○	○	○	○
I worry about protecting my child when he or she is on the computer.	○	○	○	○	○
I worry that teaching my child to type before she or he can write is bad.	○	○	○	○	○
I want to give my child a head start in life.	○	○	○	○	○
I believe technology (computers, iPad, etc) are important to introduce to my child.	○	○	○	○	○
I believe it is the teachers'/school systems' responsibility to teach my child computer skills.	○	○	○	○	○
I believe it is my responsibility to teach my child computer skills.	○	○	○	○	○

Lives of Young Children - Online Survey

Reminder



Reminder * You are answering the following questions about your child between the ages 2 and 6 years of age (you specified this particular child earlier in the survey)

Lives of Young Children - Online Survey

Introducing Technology

51. At what age would you introduce technology/computers/digital devices to your child? (Pick one)

○ Birth - 6 months

○ Just over 6 months to 1 year

○ Just over 1 ½ to 2

○ Just over 2 to 2 ½

○ Just over 2 ½ to 3

○ Just over 3 to 3 ½

○ Just over 3 ½ to 4

○ Just over 4 to 4 ½

○ Just over 4 ½ to 5

○ Just over 5 to 5 ½

○ Just over 5 ½ to 6

○ After 6 years of age

Lives of Young Children - Online Survey

Reading & Skill Development

52. How often do you read to your child?

○ Never

○ Several times daily

○ Once a day

○ Every other day

○ Once a week

○ Once a month

○ Once every couple of months

53. How important would you rate each of the following skills?

	(1) Not at all important	(2) Somewhat important	(3) Important	(4) Significantly important	(5) Very important
Reading	○	○	○	○	○
Math	○	○	○	○	○
Use of digital technologies	○	○	○	○	○

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Things we like to do

54. Which activities/programs does your child do and how often?

	Not at all	Every day	3 - 4 days a week	Twice a week	Once a week	Less than once a week
Hockey	○	○	○	○	○	○
Soccer	○	○	○	○	○	○
Swimming	○	○	○	○	○	○
Skating	○	○	○	○	○	○
Dance	○	○	○	○	○	○
Gymnastics	○	○	○	○	○	○
Early Years Centre	○	○	○	○	○	○
Library	○	○	○	○	○	○
Music	○	○	○	○	○	○
Shared Reading	○	○	○	○	○	○
Counting/Activities with Numbers	○	○	○	○	○	○
Singing	○	○	○	○	○	○
Watching TV/DVD	○	○	○	○	○	○
Free Play Inside	○	○	○	○	○	○
Free Play Outside	○	○	○	○	○	○
Arts/Crafts	○	○	○	○	○	○
Clubs	○	○	○	○	○	○

Other (please specify)

55. Of the following activities/programs, please indicate which of the following people is MOST likely to engage in the activity with your child either at home or outside your home.

	Yourself	Your partner/spouse	Grandparent	Older sibling	Other family members	Babysitter/nanny	Educational worker (daycare provider, preschool teacher)
Hockey	○	○	○	○	○	○	○
Soccer	○	○	○	○	○	○	○
Swimming	○	○	○	○	○	○	○
Skating	○	○	○	○	○	○	○
Dance	○	○	○	○	○	○	○
Gymnastics	○	○	○	○	○	○	○
Early Years Centre	○	○	○	○	○	○	○
Library	○	○	○	○	○	○	○
Music	○	○	○	○	○	○	○
Shared Reading	○	○	○	○	○	○	○
Counting	○	○	○	○	○	○	○
Singing	○	○	○	○	○	○	○
Watching TV/DVD	○	○	○	○	○	○	○
Free Play Inside	○	○	○	○	○	○	○
Free Play Outside	○	○	○	○	○	○	○
Arts/Crafts	○	○	○	○	○	○	○
Clubs	○	○	○	○	○	○	○

Other (please specify)

56. What does your child enjoy doing most for fun? (Please list 2 things)

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Mobile Technology

57. Do you let your child use mobile technologies (e.g., Cellphone/Smartphone, iPod, iPad, Playbook, Tablet Computer, etc.)?

○ Yes

○ No

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58. Do you download applications for your child to play with on mobile devices?

○ Yes

○ No

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59. Please check as many of the following reasons that reflect why you download these applications.

☐ Building hand-eye coordination

☐ Strengthening reflexes

☐ Building social skills

☐ Building problem solving skills

☐ Developing basic skills in math

☐ Developing basic skills in reading

☐ Developing basic skills in language

☐ Developing basic skills in science

☐ Arts & Crafts

☐ History

☐ Searching for information

☐ Fun/Entertainment

☐ Developing skills for future school success

☐ Occupying your child

☐ My child asked for it

☐ Other (please specify)

☐

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60. Please tell us why you chose to introduce your child to STATIONARY technologies. Please check all that apply.

	Yes	No	N/A
My child explored it accidentally	○	○	○
My friend(s) recommended using stationary technologies with my child	○	○	○
I was curious as to how my child would respond to it	○	○	○

There are many reasons for introducing a child to stationary technologies including the three above. Please list any reasons we did not mention which are true in your case.

61. Please tell us why you chose to introduce your child to MOBILE technologies. Please check all that apply.

	Yes	No	N/A
My child explored it accidentally	○	○	○
My friend(s) recommended using mobile technologies with my child	○	○	○
I was curious as to how my child would respond to it	○	○	○

There are many reasons for introducing a child to mobile technologies including the three above. Please list any reasons we did not mention which are true in your case.

62. How would you rate YOUR COMFORT LEVEL when using NEW/UNFAMILIAR technology?

	(1) Very uncomfortable	(2) Somewhat uncomfortable	(3) Somewhat comfortable	(4) Comfortable	(5) Very comfortable
Stationary technology (e.g., using new desktop computer/software)	○	○	○	○	○
Mobile technology (e.g., using a new tablet, smartphone, or other mobile software unfamiliar to you)	○	○	○	○	○

63. How comfortable are you when YOUR CHILD uses technology that is new/unfamiliar to you?

	(1) Very uncomfortable	(2) Somewhat uncomfortable	(3) Somewhat comfortable	(4) Comfortable	(5) Very comfortable
Stationary technology (e.g., using new desktop computer/software)	○	○	○	○	○
Mobile technology (e.g., using a new tablet, smartphone, or other mobile software unfamiliar to you)	○	○	○	○	○

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64. How was your child first introduced to technology? (Describe how the first introduction occurred)

☐

65. How often does your child use technology?

	Everyday	3 - 6 times a week	1 - 2 days a week	Less than once a week	Not at all	N/A
Stationary technology	○	○	○	○	○	○
Mobile technology	○	○	○	○	○	○

66. Considering your answer above, on average how much TIME per session does your child use technology?

○ 0 - 5 mins

○ 6 - 10 mins

○ 11 - 15 mins

○ 16 - 30 mins

○ 31 - 35 mins

○ 36 - 40 mins

○ 41 - 45 mins

○ 46 - 50 mins

○ 51 - 55 mins

○ 56 - 60 mins

○ 61 mins +

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67. One purpose of our study is to try to discover what parents do or feel they should do to help their child when their child is using technology. One end goal is to prepare a brief “how to” sheet for parents who are just beginning to introduce their children to computer technologies. We realize our survey may not capture what you found to be the most important supports that you needed to provide and/or still need to provide so that your child could use the technology for maximum benefit. We are hoping you will be able to share any advice or suggestions here. What supports do you or did you find you most needed to give your child?

68. In general, we want to know how parents introduce technology to children -- what works and what doesn't -- We are hoping you can share with us when you introduced technology and/or games on technology to your child what you thought worked and/or didn't work.

69. If we asked you to summarize what you think is critical about making the decision to use/buy technology or not use/buy it or about doing it right--what would you say?

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70. Specifically, which technologies does your child have access to at home?

71. Considering your response on how often you read with your child, on average how much time do you spend reading with your child during each time?

	Using a physical book	Using a device/technology
0 minutes	☐	☐
1 - 4 minutes	☐	☐
5 - 10 minutes	☐	☐
11 - 15 minutes	☐	☐
16 - 20 minutes	☐	☐
21 - 30 minutes	☐	☐
30 - 60 minutes	☐	☐
more than 1 hour	☐	☐

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Survey Complete. Thank you!

Thank you for participating, please copy and paste the following link so you can enter the draw for 1of 20 $50 prizes.

http://www.surveymonkey.com/s/ChildrenSurveyDraw

** Please press "Next". You have completed the survey! **

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Thank you! End of study

Thank for considering this study. If you feel you have accidentally arrived at the end of the study, you can re-enter the link you were given.

Appendix B: Room Layout