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The Effects of Book Format on Parent-Child Interaction during Joint Book Reading

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By

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ABSTRACT

Technology is a part of our society and is ever changing. Therefore, it is important to examine the effects that such innovations have on parent-child interactions, especially those that have been shown to promote children's early literacy learning and future school success. This study was conducted in the context of a larger project, The Family Reading Project, which investigated parent-child engagement in joint reading activities using mobile devices. This research compared parent and child behaviors when reading traditional books versus reading e-books to determine if book format had any effect on parent-child interaction. The results of this study were that parent and child verbal and nonverbal behaviors did differ across the two book formats. In particular, traditional print book reading sessions contained more verbal and nonverbal exchanges between the parent and child regarding book content, which are known to support children's early literacy attainment.

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DEDICATION

      I dedicate this work to my amazing parents Bill and Donna Biddle. Unfortunately, neither of them could physically be here to see me through this process yet I know they were watching over me and my family as I traveled along this journey. Thank you Mom and Dad for the countless hours you spent on your knees praying for me while you lived your days on this earth. I know I am here because of those prayers, your love, and your sacrifice. I am so grateful for Godly parents who never quit believing in me or who I could be, for always lending a listening ear, words of wisdom and always having a smile on your face no matter the circumstance, Dad, you are and always were my hero! In honor of all you have done for me, I dedicate my hard work over the past three years to both of you.

TABLE OF CONTENTS

LIST OF TABLES

CHAPTER 1

INTRODUCTION

The United States today is facing a crisis in literacy and literacy education. According to results of the most recent Nation's Report Card: Reading 2011, (National Center for Education Statistics, 2011) only 34% of children in the 4th and 8th grades were reading at the proficient level or above. A previous report by The National Early Literacy Panel (Shanahan & Lonigan (2010) stated 37% of fourth grade students in the United States were not even achieving basic reading levels, with a large proportion of these students being from disadvantaged homes. When compared with other nations, students' scores in the United States ranked 6th (Mullis, Martin, Foy, & Drucker, 2012).

Statement of the Problem

An explosion of electronic books is being marketed toward even the youngest children in the United States with little research being done that examines the impact such technology has on children's development. Current research rarely concentrates on the impacts of electronic books on children under the age of 5 nor the impact technology has on the powerful interactions that occur between very young children and their parents during learning activities. The American Academy of Pediatrics [AAP] (2013) media–use guidelines gives strong recommendations to practitioners and parents to safeguard young children from the potential negative impacts of the misuse of technology. One recommendation of the AAP (2013) in regard to media use stresses the importance of limiting children's engagement with screen time. The AAP (2013) reports children learn best through interaction with other people rather than screens and that screen time should be avoided for infants and children under two years of age. The quality of screen interaction for children over two years of age is a concern due to the lack of research that supports the quality of learning that occurs when children engage with media

(Eagle, 2012). As a result of these concerns, the continued investigation of non-electronic alternatives such as traditional print books becomes an important issue for many parents, pediatricians, and educators.

Literacy is an essential skill necessary for success in today's society, and many literacy programs have been set up by state and federal institutions to combat illiteracy. In addition, research suggests that the occurrence and quality of joint book reading between an adult partner and a child is essential to children's later literacy attainment (Wasik & Bond, 2001). Empirical studies have investigated the relationship between the interaction that occurs between a parent and child when engaging in joint book reading and the literacy and language benefits that are attained by young children in these powerful interactions. Most of these studies have focused on maternal reading styles when reading print books with their children and the impacts on children's subsequent language acquisition and literacy skills (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Reese & Cox, 1999; Wasik & Bond 2001; Whitehurst, Arnold, Epstein, Angell, Smith, & Fischel, 1994). In particular, dialogic reading, a reading style in which parents interact with the child by engaging them in content related conversation and asking the child questions, has been associated with substantial positive changes in young children's language and vocabulary development (Zevenbergen & Whitehurst, 2003; Zevenbergen, Whitehurst, & Zevenbergen, 2003). Due to the importance of parent-child reading interactions in relation to children's literacy development, it is essential we understand how such interactions are impacted when parents and children engage in reading electronic books as opposed to print books.

Statement of Purpose

Previous studies have examined the implications of using digital technologies to facilitate children's literacy and language development (Eagle, 2012; Maynard, 2010), but most studies

have focused on the child's interactions with the device and have not examined the quality of interaction in the shared reading experiences of younger children and their parents. The purpose of this descriptive study was to use observational methods to document parent-child interaction, conversation and engagement in the shared reading experience when reading print books as compared to e-books.

Research Questions

This study focused on five research questions to address the relationship between book format, parent-child interaction, and child engagement with the story.

1. Are there differences in the way parents interact in conversation (e.g., asking questions, elaboration of the story) with their preschool-age children when reading traditional print books as compared with e-books?

2. Are there differences in the way children interact in conversation (e.g., asking and answering content related questions, commenting on story content, making content related connections) when reading traditional print books as compared with e-books?

3. Are there differences in parent-child engaged interaction (e.g., parent or child offers or responds to prompts to engage one another in the interaction) or affect in the shared reading experience across the two formats (print books and e-books)?

4. Are there differences in child book engagement (e.g., child points to and/or looks at a book to follow along or looks away or is disinterested in book) in the shared reading experience across the two formats (print books and e-books)?

5. Are there differences in parent-child interaction related to control (e.g. pushing, pulling book or other's hand away, negative statements related to physical control of book) across the two book formats (print books verses e-books)?

CHAPTER 2

REVIEW OF THE LITERATURE

Theoretical Perspective

Three human developmental theories form the theoretical perspective of this study. The first theory is Vygotsky's sociocultural theory (Vygotsky, 1978), which describes how the child's interactions with other people (parents, caregivers, and peers) and the culture are responsible for the development of higher order thought processes. The second is Bandura's Social Learning theory (Bandura, 1989) which explains how children learn through observing and imitating the actions that others model. Third is Sigel's (1979, 1986) distancing theory, which suggests that parents serve as facilitators in the parent-child interaction in ways that help the child think beyond the scope of what can be seen or is readily available to him/her in the immediate environment.

Vygotsky's Socio-Cultural Theory. Vygotsky's socio-cultural theory (1978) asserts that it is the interchange between the child and a more capable other person that facilitates the child's cognitive advances. More specifically, Vygotsky (1978) and neo-Vygotskians, Rogoff (1990) and Wertsch (1984) further expanded upon this idea with the concept of scaffolding that refers to the facilitative interactions that occur between a child and an adult in which the adult provides support for the *child's* learning to perform a task they could not have accomplished on their own (Wood, Bruner, & Ross, 1976). Rogoff and Wertsch (1984) related this concept of scaffolding to Vygotsky's Zone of Proximal Development (ZPD), which he describes as the distance between a child's current level of performance and the child's potential performance with the assistance of a more capable person. Vygotsky's (1978) theory involves three basic assumptions about cognitive development. The first assumption is that natural and cultural paths

of development are responsible for the development of human cognition. The second assumption states that this development is dependent upon socio-cultural and historical facets of the child's environment. The third assumption suggests that the child's cognitive abilities are greatly impacted by psychological tools formulated by a network of symbols, which are acquired through human interaction.

Vygotsky (1978) suggests that this process is gradual, and that the transition to higher mental functioning is facilitated by interaction with another person. This process is quite evident in preschoolers, who are in the early stages of developing mental functions in interaction with adults or older peers. The interactive process of joint book reading provides parents with opportunities for cultivating new concepts within the child's ZPD by building on their child's current knowledge and assisting the child in making connections to their personal life experiences and the storybook content. Vygotsky's (1978) theoretical framework gives rise to a new level of understanding for how communicative initiations, engagement, and the reading instrument itself affect children's developing literacy skills during parent-child joint book reading interactions. The current study emphasizes the parental role of scaffolding the child in the joint book reading experience, as well as the role of technology and/or books as cultural tools to facilitate (or not to facilitate) both the parent-child interaction and the child's development (Vygotsky, 1978; Rogoff, 1990).

Bandura's Social Learning Theory. Bandura's social learning theory departed from traditional behavioral theories and emphasized that children learn through observing and imitating the behaviors of others in their social environment (Bandura, 1989). Bandura proposed that children observe and interpret the behaviors of significant people in their environment, i.e., those for whom they have a high regard and who may or may not have rewarded them for their

actions. These observations influence children's social cognitive processes that change as they grow and develop. Therefore, it is proposed that children imitate their parents' behaviors and engage in behaviors that are shared with their parents. If children witness a parent reading and enjoying the activity or engage in joint book reading experiences with a parent, they themselves will be more likely to read and view the activity as enjoyable. However, if children witness their parents having a negative outlook on books and reading or never taking pleasure in the activity, and have not engaged in shared reading experiences with their parents, they may take on a negative view of reading themselves.

Sigel's Distancing Theory. In line with a socio-cultural learning perspective is Sigel's Distancing Theory (1979, 1986) that further builds on the salience of adult mediation that takes place during social interactions, such as joint book reading, that occur between a child and an adult facilitator. Sigel proposes that parents use strategies that require the child to think past their immediate experiences and make use of mental representation, thereby placing varying cognitive demands on the child. Sigel refers to these strategies as distancing strategies that can be displayed either verbally or non-verbally. Verbal distancing strategies, such as the use of open-ended questions, allow the child to be an active participant in the parent-child interaction while non-verbal strategies such as arranging the physical environment (materials or routines) stimulate problem solving and assist the child in engaging in representational thinking (Sigel, 1979; Sigel & Cocking, 1977).

The process of engaging in representational thinking or creating a mental substitution for something that is unseen, was also described by constructivist theorist Piaget (1952) as a higher order thought process that stems from the child assimilating what they observe in their environment into already existing structures and accommodating those structures to make room

for the demands placed upon them from the environment. Sigel's (1979, 1986) distancing

hypothesis is similar to that of the Piagetian idea of disequilibrium in the child's existing

knowledge: A change will ensue that will ultimately result in a learning experience for the child.

Sigel proposes that parents use distancing strategies during communicative interactions with

their children to present a discrepancy for the children in their existing knowledge by presenting

them with a new concept. This disequilibrium in the child's existing knowledge requires him or

her to use higher-order thought processes to resolve the discrepancy.

Sigel's Distancing Theory (1979, 1986) expands upon the importance of social influence

on children's development and provides further evidence for the impact adult mediation can have

on improving children's cognitive and social development. Studies of parent-child joint book

reading have supported the idea that parents mediate the gap that exists between the text and

what children already may know or understand by asking open-ended questions that help the

child think past what is observable and thereby support their children's cognitive growth by

enhancing their children's understanding (De Temple & Beals, 1991; Goodsitt, Raitan, &

Perlmutter, 1988; Martin & Reutzel, 1999; Van Kleeck & Beckley-McCall, 2002).

Parent-Child Interaction Factors

The importance of parent-child communicative interactions during the early years has

been well documented in research and has been strongly linked to skills children need for

reading readiness (Whitehurst, Falco, Lonigan, Fischel, DeBaryshe, Valdez-Menchaca, &

Caulfield, 1988; Adams, 1990; Zevenbergen & Whitehurst, 2003). Parent-child interaction

factors that contribute to children's later language and literacy attainment are examined further in

the next section.

Brain Basis for Social Learning. Humans are extremely social creatures with an innate ability to recognize, respond to, and behave based on socially pertinent information. The study of social cognition attempts to examine and describe how the behaviors, thoughts, and feelings of individuals are influenced through interactions with others (Allport, 1985; Fiske, 1995). In examining the brain basis for social learning, researchers have investigated the specialized cognitive, social, and computational skills which some believe to be preprogrammed in infants. Infants present unique abilities which allow them to discriminate human faces from other patterns (Morton & Johnson, 1991) and imitate human facial and bodily gestures (Meltzoff & Moore, 1977). An increase in social behaviors of infants emerge as infants are exposed to face-to-face interactions with adults that provide opportunities for active turn- taking to occur in these dyadic interactions (Murray & Trevarthen, 1985). Furthermore, the process infants go through to include unfamiliar objects or persons into their social interactions has led researchers to examine how shared attention within the interactions of the infant and caregiver or object transcends into triadic interactions consisting of the infant, caregiver, and other persons or objects at the same time (Trevarthen & Hubley, 1978).

Origins of Social Interaction. Developmental research has begun to examine the neural mechanisms that underlie language development in connection with these early social cognitive abilities. Infant social interaction begins immediately after birth as infants engage in face-to-face communication with adults (Kuhl, 2004; Saffran, Werker & Werner, 2006). In any form of interpersonal communication, the persons involved exhibit shared control of the communication by anticipating what the other person knows and will do. In order to do this, even infants must be able to demonstrate a conscious decision to act and act with intentionality, which Trevarthen (1979) termed as *subjectivity*. Subjectivity implies infants grasp the difficulties of relating

objects and situations to themselves and predict consequences. This indicates that the infant or person engaged in the communication is capable of focusing attention on things or others, relating consequences to actions, while also anticipating other actions. This form of subjective or perceived control refers to the infants or persons beliefs as to how much control is available in the context (Skinner, 1986).

In this first form of social interaction, infants must be able to modify this subjective control which is their perceived beliefs about the control that is afforded them, to the subjectivity of others, or the control afforded to others in the context. Trevarthen (1979) referred to this as primary intersubjectivity. Primary intersubjectivity involves a very early form of conversation that contains a nonverbal give and take, a turn-taking in social responding, that is the beginning of communication. Infant intersubjectivity is suggested to be an innate awareness that is specifically sensitive to the subjective states of others. This ability to include others into their own awareness of self has been shown to play an important role in the child's subsequent cultural and language learning (Trevarthen & Aitken, 2001).

Joint Attention. Later, infants engage in a communication style in which they not only interact face-to-face with an adult but also are capable of joint attention - that is the ability of the infant to interact with people and objects together (Trevarthen, 1979). This form of social interaction, which includes joint attention to objects in the world, is known as secondary intersubjectivity and is an important milestone in an infant's intentional communication as it is one of the earliest forms of referential communication and cultural learning (Trevarthen, 1979; Tomasello, 1995).

Joint attention has been displayed by infants through social interactions such as social referencing- a phenomenon in which infants look back or reference adults when introduced to a

novel object or situation. In this social referencing behavior, the infant seeks to understand the adult's reaction to an object or situation in order for the infant to form an idea of how he/she should react to the object or situation (Campos & Sternberg, 1981). Infants' uses of intentional gestural communication (i.e., pointing) in order to direct the attention of adults is an important social behavior that precedes early linguistic communication (Tomasello, 1995; Carpenter, Nagell, Tomasello, Butterworth & Moore, 1998).

Interactions consisting of joint attention such as joint book reading between an infant and parent require the infant to look from the book to the parent's face and then back to the book as well as follow the gaze direction or point of the parent to look at the book. The gestural communication of infants in which the purpose of the gestures is to request the parent to do something or which exists with the sole purpose of directing the parent's attention to someone or something of mutual interest was examined by Bates, Camaioni and Volterra (1975). This research has paved the way for understanding how underlying brain systems jointly influence one another throughout development as well as the salience of parent-child interactions during these types of reciprocal interactions. Reciprocal interactions between a parent and child during joint book reading experiences have long been credited for positive literacy and learning outcomes for children as well as future school success (Adams, 1990, Ortiz, Stowe, & Arnold, 2001). Engaging in these types of early language and literacy experiences fosters effective reading comprehension among school-aged children and young adults (Dickinson, Griffith, Golinkoff, & Hirsh-Pasek, 2012), and reading comprehension has been found to be a critical component for future and long-term academic success.

Joint Book Reading

Early parent-child joint reading interactions have been linked to children's later language growth and literacy achievement. Research suggests that children's later literacy outcomes are strengthened by early parent-child reciprocal reading interactions and that parents' reading to their children plays a vital part in children's later literacy achievements (Adams, 1990). Book reading interactions in which parents read to infants and toddlers have been shown to provide a setting that fosters language development while also building solid, affective bonds between the parent and child that help to optimize child learning outcomes. It is through engaging in these types of warm, nurturing, and responsive reciprocal interactions that children learn to regulate their attention and establish a positive regard for book reading (Dickinson et al., 2012). Child interest and parental reading styles that occur during joint book reading interactions have been examined in an effort to determine factors involved in the parent-child relationship when reading together that can influence children's later literacy success (Ortiz, et. al, 2001). Research suggests that child interest in reading is crucial to children's later literacy and school achievements due to the fact that children who show more interest in reading tend to engage in more literacy related experiences than children with less interest (Scarborough & Dobrich, 1994).

Subsequent research has examined parental reading styles and quality of book reading interactions as a determining influence on children's interest in reading and engagement in literacy related activities, and suggests that parents' book reading behaviors and quality of book reading interactions support children's language and literacy development more so than frequency of book reading interactions (Bus, vanIJzendoorn, & Pellegrini, 1995). In fact, programs that have been put into action in different countries that not only provide parents with

books to read to their young children but also equip parents with effective strategies to use during joint book reading interactions consistently have been found to be effective methods of fostering language acquisition and refining children's early reading success (Dickinson et al., 2012). The predictive relationship between children's language and vocabulary attainment by two years of age and later language achievement and school success, in conjunction with the establishment of a positive regard for book reading at an early age, have been documented as key features of joint book reading interactions that lay a foundations for later learning competencies to emerge (Fletcher, Perez, Hooper, & Claussen, 2005; Dickinson et al., 2012).

  Dialogic Reading. Parental reading styles that afford children the opportunity to be an active participant in the reading interaction while providing prompts that connect the child to the story and offer expansions to the story support the development of expressive language skills in young children (Blom-Hoffman, O'Neil-Pirozzi, & Cutting, 2006). Most studies concerning joint book reading interactions focus on children's linguistic gains as a result of parental speech pragmatics and quality of parental styles of reading (Arnold, et al., 1994; Reese & Cox, 1999; Wasik & Bond, 2001; Whitehurst et al., 1994). Joint book reading, is one way parents help provide opportunities for children to acquire essential pre-reading skills (Blom-Hoffman, et al., 2006). How parents read to children is as important as the how often they read to children. In fact, numerous studies have identified elements of parental scaffolds, both verbal and non-verbal, during joint reading experiences (such as labeling objects on a page or asking open ended questions) that contribute to significant gains in children's emergent literacy skills in areas such as vocabulary acquisition and reading comprehension (Ninio, 1983; Ninio & Bruner, 1978; Whitehurst et al., 1988). The types of scaffolds parents provide, including engaging children in conversation that is focused on storybook content, promote children's engagement in the book

reading interaction (Whitehurst et al., 1988). Children's engagement during shared reading interactions is influenced by the types of tasks and materials (i.e. pointing at pictures in book) as well as the verbal scaffolding that is involved in the reading interaction and contributes to children's emergent literacy outcomes (Kaderavek & Justice, 2005; Wasik & Bond, 2001).

More specifically, dialogic reading is an evidenced-based method of joint book reading in which the adults engage children in conversation and ask children questions about the content of the story. Unlike standard reading, which consists of the adult reading the text and sporadically accepting contributions from the child, dialogic reading requires substantial interaction between the adult and the child (Huebner & Payne, 2010). In fact, a specific way parents interact dialogically when engaged in joint reading experiences is through the offering of prompts that encourage the child to make connections from the book content to the child's own emotional experiences (Zevenbergen, & Whitehurst, 2003). In this way, children's ability to link past or even future experiences to print they are hearing read in a book helps children to relate print knowledge and other emergent skills with the social interaction of the reading experience (Beals, De Temple, Tabors & Snow, 1991). A central reading technique associated with dialogic reading is the PEER sequence, in which the adult:

- Prompts the child to speak about the book

- Evaluates the child's response

- Expands the child's response by rephrasing and providing additional information

- Repeats the prompt given.

This method has been associated with substantial positive changes in young children's language and vocabulary development (Zevenbergen & Whitehurst, 2003; Zevenbergen et al., 2003).

Dialogic reading has been shown to improve children's oral vocabulary skills and to promote later success in reading and other academic areas (Morgan & Meier, 2008). Through engaging in an interactive reading style which draws on children's personal experiences and encourages children to be active participants in the story telling process, parents can aid children in story comprehension (Purdy, 2008). While many parents know that reading to their child is important, some lack the knowledge and skills to engage in reading activities in ways that prepare children for future reading and academic success (Huebner & Payne, 2010).

Parent Facilitation of Child Learning during Joint Book Reading. Much of how children learn types of speech pragmatics or how to use their language effectively and appropriately is demonstrated in joint book reading activities (Ninio & Bruner, 1978). Moerk (1972) described specific examples of parent-child interactions that suggest that the mother's role in the interaction is that of a facilitator, in which specific utterances provide opportunities for corrections and expansions to the child's articulations. Verbal interactions that take place between mothers and their preschool aged children have shown that mothers provide language that is geared towards their children while adjusting their language behaviors according to their child's language skills (Snow, 1972). Verbal exchanges that occur during joint book reading interactions with young learners and their parents provide opportunities for important communicative initiations that increase the vocabularies of children (Justice & Ezell, 2002) while providing opportunities for children to benefit from the reciprocal interactions that occur during conversations with other people (Bruner, 1983).

Through communicative interactions during joint book reading, parents model for young children the process of interpreting aspects of the environment and their own actions through verbal language. Parents facilitate advances in the child's language skills by pointing, labeling,

and making comments on shared topics (Ninio & Bruner, 1978) as well as by asking questions and supplying necessary corrections (Moerk, 1972). The verbal and gestural interactions between the parent and child during joint book reading contribute to a type of "scaffolding dialogue" that increases in complexity as the child develops increasing skills and abilities (Ninio & Bruner 1978, p. 37).

Van Kleeck (2004) describes two types of talk that that are demonstrated when parents and children engage in joint book reading experiences. Immediate talk consists of talk that is more concrete whereas non-immediate talk consists of talk which is more abstract and leads to higher expanding levels. Examples of non- immediate talk during joint book reading interactions include making connections to personal experiences, thinking beyond what can be seen or observable and making predictions or inferences about book content. This dialogue between parents and children during joint book reading interactions is shown to support children's cognitive, literacy, and language development (De Temple, 2001).

Sigel, McGillicuddy-Delisi, and Johnson (1980) described teaching behaviors, or distancing strategies, which parents use during interactions with their children that support children's developing representational competence. Representational competence refers to the child's ability to use mental representation to reproduce events in the past, think ahead to predict future events, and consider alternative choices for present events (Sigel, Flaugher, Johnson, & Schauer, 1980). These types of distancing behaviors not only support children's representational competence but also engage the child in using higher-order thought processes; however these can also have a negative impact on the child's understanding if the new concept presented by the parents is beyond the child's competence. This can lead to frustration on the part of the child due to an inability to understand and hence impedes the child's ability to learn. Therefore, parent's

abilities to effectively match their teaching strategies to their children's developmental level (or stay within the ZPD in Vygotsky's terms) are crucial in order for the parent to support the child's learning during the interaction (Sigel, 1979 & 1986).

Commonly, during joint reading activities, the parent- child dyad will engage in conversation revolving around the pictures, or asking and answering questions about the story content (Bus, 2001). Through joint book reading interactions, children not only gain familiarity with books but also the opportunity to initiate and engage in dialogue that enables them to relate new concepts and vocabulary to their own experiences and knowledge of the world (Eagle, 2012). Joint book reading provides parents with crucial opportunities in which they can employ these types of distancing strategies during conversations about the book, which can foster children's representational thinking and future cognitive abilities (Sigel, 1979 & 1986).

Parent- Child Engagement and Affect during Joint Book Reading. The parent plays a vital role in making the book an enjoyable experience for the child thus impacting the child's view on books and reading as a positive or negative experience (Bus, 2001). Parents provide a source of emotional support that can predict the outcome of children's enjoyment during book reading interactions (Bus, & van Ijzendoorn, 1988). The quality of parent-child interaction is also affected by social emotional factors during the book reading interaction. Martin, Crnic, and Belsky (2003) found that 36-month old boys exhibited more social looking, that is looking at their mother's face, during positive emotional events as opposed to negative events. Positive, affective, interactions with parents during joint book reading has been shown to be one of the most crucial factors necessary for children to show interest in reading in later school years (Baker, Mackler, Sonnenschein, and Serpell, 2001).

Sigel (1979) suggested that dialogue between a parent and child during such interactions must engage the child in order for learning to occur and that parental behaviors involved in the interaction must be suitable and pertinent to the situation. Research has documented the importance of parents' awareness of their children's interests as a factor in engaging children in the interaction (Sigel, 1986). In line with this, Skinner (1986) found that a mother's sensitive responsiveness to her child's initiations led to greater levels of child engagement.

One factor that has been studied in the emotional involvement between parent and child during book reading interactions is the quality of attachment. Secure parent-child attachment relationships have been shown to contribute to the quality of joint book reading interactions by providing more positive emotional involvement between the parent and child in the book reading interaction (Bus & van IJzendoorn, 1997). In addition, infants with secure attachment relationships were more engaged, more compliant, and less distracted during joint storybook interactions with their mothers. Parents of children who displayed secure attachment relationships typically exhibited more supportive and nurturing behaviors during the storybook reading, enabling the child to sustain attention and focus (Bus & van IJzendoorn, 1997; Bus, Belsky, van IJzendoorn & Crnic, 1997). In general, parental behaviors of warmth, supportiveness, responsiveness, and encouragement during joint book reading interactions are associated with positive child behaviors of attention and enthusiasm (Frosch, Cox, & Goldman, 2001).

Parents who are more attuned to their child and sensitive to the child's signals will be more likely to maintain the attention of the child in the interaction thereby maintaining the child as an active participant in the activity (Rocissano, Slade Lynch, 1987). Moreover, Tomasello and Farrar (1986) found a link between the way in which parents guide their child's attention

during the book reading interaction and size of child's vocabulary. For example, book reading interactions in which parents are able to sustain and direct their child's attention to the story when they are providing label references have been shown to increase the likelihood that the label has been learned by the child (Tomasello & Farrar, 1986; Valdez-Menchaca & Whitehurst, 1988).

Parental orientation toward joint book reading can affect the child's engagement with and enjoyment of the reading activity. Children of parents who demonstrate a skills orientation toward reading (believing that acquiring literacy skills involves hard work and teaching using such measures as flashcards) will show less engagement in and enjoyment of reading than children whose parents have an entertainment orientation (engaging in activities while reading and enjoying reading storybooks with their children) (Sonnenschein et al., 1997).

Parent Control and Joint Book Reading. Parents with an authoritarian parenting style typically display control strategies that are intrusive, manipulative, and punitive. These strategies tend to undermine the child's autonomy (Kochanska, 1997). With regard to book reading, these behaviors include restricting the child from touching the book and result in less attention to the story by the child (Bus & van IJzendoorn, 1997). Sigel (1979) described the impacts of parental control in the parent-child interaction in his statement "High parental control with a minimum opportunity for behaving in an active self-directed way reduces the child's opportunity for functioning as a thinker" (p. 82). Sigel proposed that parenting style can have a direct effect on children's cognitive functioning. For example, parents who exhibited teaching styles which were highly instructional with high parental control were less likely to be aware of their children's interests and or abilities, less likely to engage children in the interaction, and less likely to support the children's independent or creative thinking. Parents who exhibited these teaching

behaviors were also more likely to have children who had deficits in their linguistic and cognitive abilities (Sigel, 1986).

Parents who exhibit power- assertive control that is confrontive (a balance between freedom and control) but not coercive (restrictive and punitive), have children who engage in reflective thought, and display more self-assertiveness (Baumrind, 2013). In a discussion regarding the nature of adult-child interactions when engaged in a task such as joint book reading, Park and Moro (2006) describe how some parents see their role as that of a teacher who is to instruct the child, a learner, in how to achieve a goal that is set by someone else and the learner is not encouraged to be an active participant in the learning experience. Eagle (2012) suggested this form of adult-initiated and adult-sustained dialogue is a poor means of supporting young children's learning. Alternatively, child-initiated dialogue, in which the child is an active participant in the conversation, promotes a form of interaction where a more knowledgeable partner (the parent) and less knowledgeable partner (the child) communicate, with the parent serving as a support to assist the child's learning (Eagle, 2012). The issue of parental control and parental modes for interacting with young children is important when discussing joint book reading considering that the relationship between the parent and child may impact the quality of the book reading experience (Bus & van IJzendorn, 1988, 1997; Bus et al., 1995).

A study by Roberts and Barnes (1992) examined mothers' distancing strategies in relation to their children's cognitive development. They found that mothers who exhibited highly instructional parenting behaviors inhibited their children's development of problem solving abilities. Other studies that have examined the effect of parenting behaviors on children's cognitive outcomes supported the notion that mothers who used distancing strategies promoted children's independent thinking and cognitive growth (Shure & Spivack, 1979). Skinner (1986)

suggested that children of mothers with high levels of involvement and control during joint activities were less engaged and exhibited lower levels of problem solving ability.

Children's Engagement with Book Content. Children's interest and engagement in book reading is generally considered to be important in children's later literacy achievement, although research support for this claim is inconclusive (Ortiz, et al., 2001). The French philosopher Sartre (1964) described his first literacy experience as taking place in his grandfather's library, where his mother read him books after he showed interest in learning about the content of what was inside the books. He noted that he would read them numerous times by memorizing the book content word for word. In today's society, joint book reading between a child and parent is highly encouraged and recognized by researchers, teachers, pediatricians, parents, and even national campaigns as an activity that leads to children's later language and literacy development. As a result, joint reading has become a common daily routine in many homes. Researchers such as Sulzby (1985) have examined the progress children make in attaining literacy skills before formal reading instruction begins leading many other researchers to explore the relationship between a child's interest in book reading and engagement with books and later literacy attainment (Bus et al., 1995; Scarborough & Dobrich, 1994, Wells, 1986).

One theory surrounding children's curiosity with books and the factors that lead to children becoming engaged in book content suggests that it may be a biological trait for exploration that comes from a natural interest in stories and the acquisition of information. Crain-Thoreson and Dale (1992) examined children's story reading engagement during joint book reading interactions from ages 20 months to 4 ½ years in an effort to predict children's future literacy outcomes. They determined that children's story engagement was a better predictor of literacy achievement than types of parental behaviors during the reading interaction

or the frequency of the book reading experiences. Thus, Crain-Thoreson and Dale (1992) suggested that story engagement may serve as an independent factor in the outcomes of children's literacy that is not fully accounted for by children's exposure to books and reading.

Children's interest in books is also moderated by having parents who read books to them from an early age. Children who have not had parents read to them from an early age have been shown to display less interest in reading books than children who have had this foundational experience (Arnold et al.,1994).

In an observational study of 396 kindergarteners, Morrow (1983) observed children in classrooms over an 8-week period in an effort to examine the literacy interest of children. Children's level of literacy interest was assessed using a scale that reflected how often children engaged in recreational literacy activities at school and how long they sustained their attention with books during the book reading events. Children's scores on standardized reading readiness tests were then compared with the level of recreational reading interest children displayed. Morrow found that children who displayed the highest literacy interest in books were more likely to exhibit good pre-literacy skills, whereas children who displayed the lowest literacy interest in books typically exhibited poor pre-literacy skills. Furthermore, parents of the children who displayed high literacy interest reported that their children engaged with books for enjoyment or entertainment on a daily basis, as compared with children with low literacy interest who sought out books for enjoyment or entertainment only 2 to 3 times per week.

While literature on children's literacy outcomes is abundant, the evidence for factors responsible for children's interest and engagement with books is not consistent (Lonigan, 1994; Morrow, 1983; Scarborough & Dobrich, 1994). Factors suggested to play a role in fostering children's interest and engagement with books include parents' reading styles and behaviors,

frequency of book readings, and the quality of book reading interactions; however, there has not been any consensus regarding a method for measuring child engagement (Ortiz et al., 2001). Throughout the literature, children's likeliness to choose an activity and their persistence in an activity once it has started has been used to assess child engagement. In regard to child engagement specifically with book reading, children's verbal and non-verbal behaviors such as looking and pointing at the book, proximity of their bodies to the book, and conversation related to book content have been examined and used as a measure of engagement in many reading intervention programs (e.g., Scarborough, Dobrich, & Hager, 1991; Lonigan et al.,1994). While these measures of engagement have not been specifically tied to the quality of parent-child reading interactions, the interest of children in books at an early age is predictive of later literacy outcomes (Ortiz et al., 2001).

Electronic Books and Literacy. Over the past decade, more and more children's electronic toys and games are geared toward supporting young children's literacy and language development. The idea that devices can be designed to enhance children's learning is reflected in the increasing number of digital technologies marketed for young children (Eagle, 2012). Technological toys and devices are now made with mechanisms that speak letters and or words that correspond to a child's actions, giving children independence and potentially omitting the need for adult assistance (Snow, Burns & Griffin, 1998). In considering how and when to incorporate these technological devices in ways that are age appropriate, the National Association for the Education of Young Children (NAEYC) has provided guidelines. The NAEYC (1996) defines Developmentally Appropriate Practice (DAP) as the process by which professionals make decisions about the welfare and education of children, with the child as an active participant in his learning. The NAEYC position statement regarding technology states

that with the appropriate guidance, technological tools can be utilized and developed for learning; however, the NAEYC and Fred Rogers Center (2012) and the American Academy of Pediatrics (2011) both caution educators and parents regarding the passive use of technology with children in ways that are not educationally sound or developmentally appropriate. Furthermore, NAEYC and Fred Rogers Center (2012) stress that any form of screen media is inappropriate if it is used to replace active play and engagement in interactions with other children or adults.

One of the most recent technological tools to support learning, particularly literacy, is the electronic storybook. E-books can be found on various technology platforms, from CD's and the internet to other popular technologies such as the iPad, Nook or the Kindle (Korat & Shamir, 2012). Digital technology has become a normal part of the younger generation's daily lives in various cultures and languages (Korat & Shamir, 2007). Due to the prevalence of digital media marketed toward children today, recent studies have begun to examine the impact of using e-books on young children's language and literacy development (De Jong & Bus, 2003; Fisch, Shulman, Akerman & Levin, 2002; Kim & Anderson, 2008; Smith, 2001).

A recent study by Korat and Or (2010) examined mother-child conversations during joint reading of e-books compared to print books. This study concluded that book format accounted for differences in the initiations, expanding talk, and responses of the mother and child. Traditional print book readings provided more initiations and responses by the mother as well as more expanding talk. A previous study by Kim and Anderson (2008) also found that e-books and print books showed differences in conversations between the adult reader and the child during joint reading experiences. E-books with narration were shown to impede parental mediation of

the text that typically occurs in joint book reading and also showed fewer conversations about the written text leaving the e-book to serve as more of a listening tool.

Joint e-book readings also differ based on the style of e-book, comparing commercial e-books (containing hot spots, sounds, and interactive features) with educational e-books (more like traditional print books without the distracting multimedia features). The dialogue that occurs between the parent and child in the reading interaction with educational e-books elicits more discussion of word meaning than commercial e-books. In addition, while the educational e-books contained scaffolding features built into the books offering parental support in the reading interaction, traditional print book readings still resulted in more mediation and expanding talk by the parents than the electronic book forms (Korat & Or, 2010).

Regarding children's part in the conversation, in a recent study by Moody, Justice, and Cabell (2010) children exhibited increased persistence with the book when engaged in joint e-storybook readings yet demonstrated twice as many labeling references during joint print storybook readings. This finding is of interest, because previous research has shown that children who are more active conversational participants in the reading process benefit more in language and literacy skills than those who exhibit less active participation in conversation in joint reading activities (Whitehurst et al., 1988). The increase in children's labeling references suggests that children were more active in the conversation during traditional print readings than in the e-storybook readings (Moody et al., 2010).

The quality of interaction between the parent and child during joint book reading experiences can also differ according to parental beliefs, customs, and familiarity with various book formats (print books, CD-Rom books, and e-books) used in the joint reading experience (Kim & Anderson, 2008; Eagle, 2012, Smith, 2001). Parental beliefs as to the appropriate use of

electronic book formats as well as parents' own traditions and practices concerning electronic book forms can also influence the nature of the parent-child interaction (Eagle, 2012). Some parent beliefs regarding the appropriate way to utilize the e-book during joint e-book reading lead the parent to revert to an instructional mode, assuming the role of the teacher rather than a conversational partner. This type of interaction thereby decreases the opportunity for interaction between the child and parent that would be more child-directed and exploratory which has been shown by research to be the most beneficial in promoting child engagement and learning (Eagle, 2012).

There has been very little investigation of parent-child control when reading with e-books as compared with traditional books. In a study of parent-child interaction when using Electronic Learning Aids, however, Eagle (2012) found that conflict could arise when the parent's conception of "what to do" with the device differed from the child's goals. In addition, Roskos, Burstein, and You (2012) examined children's engagement with e-books in the preschool setting. They compared engagement levels and teacher control versus child control for e-books presented on a computer touch screen versus those on handheld devices (iPad or iPod). They found that while touch screen interactions were predominantly teacher-led, e-book reading sessions on handheld devices were child-led. Thus, children may expect to be in control when using a hand-held device, creating the potential for conflict in a joint reading experience. Roskos et al. (2012) also found that children's engagement with the book (looking at, touching and listening to the e-book) increased for the hand-held devices where the child had more control.

Regarding children's engagement with the book and book content, some studies have argued that the interactive nature of e-books increases the child's involvement, making the child an active partner in the reading process (Fisch et al., 2002; Smith, 2001). Other studies suggested

that commercial e-books are not suitable for advancing young children's literacy due to the emphasis on graphics, colorful animations, and sounds that can distract young children from story comprehension (De Jong & Bus, 2003; Shamir & Korat, 2006).

Studies that have examined the effectiveness of electronic books in supporting young children's literacy development have shown mixed results (Korat & Shamir, 2007).   Many of the e-books for young children incorporate enhanced features such as sound effects, animation, music, and oral reading of the text by a narrator as well as written text that are not present in the printed version of the storybooks (Korat & Shamir, 2012). Reading e-books that do not require adult assistance can increase the child's engagement with the book, by interacting with hot spots, turning pages, and so on. However, studies by Trushell & Maitland (2005) indicated that these child- led e-storybooks with interactive features such as cued animations and sound effects can be a distraction from the storyline and decrease children's recollection of book content. The support and scaffolding that is provided by the parent in the joint book reading interaction (for example prompts, facilitation of the story, and feedback given to the child) can be hindered in e-book readings due to the fact that the child may not need or want adult assistance (Trushell, Burrell & Maitland, 2001; Trushell & Maitland,2005).

Children's level of story reading engagement involves two main behaviors, verbal and non-verbal. Verbal indicators of engagement are defined by verbal responses during book reading such as commenting, replying to questions, making book-related connections to life experiences, laughing, and making noises. Non-verbal behaviors such as visual gaze, body movement (including facial expressions and gestures) and touching are also noted as indicators of children's engagement or interest in storybook content. Verbal and non-verbal behaviors of children when reading books across different formats have been studied in an effort to

understand how young children's interest and engagement with books varies according to book format. Roskos et al. (2012) found that children showed higher levels of persistence in e-book readings but displayed more types of parent-child communication that increased child literacy outcomes in traditional book readings.

While the existing literature provides some evidence of young children's varying interactions with parents and books during shared reading experiences across book formats, much more research is needed in order to determine the effects of book format on parent-child interactions, children's engagement with books, and overall child literacy outcomes. For example, if the enhanced features that are so prevalent in e-books were eliminated, would e-books elicit the same levels and kinds of parent-child interaction that are known to support emergent literacy? This research question forms the heart of the current study. The answers this research may provide could have powerful implications for families and others engaged in joint reading with young children. This descriptive study provides observations of parent-child and child-book interactions across the two book formats (traditional print books and electronic books) in an attempt to examine the differences in verbal and non-verbal parent-child interaction and child-book interaction. In order to control as many factors as possible so that book format was the only factor varying between conditions, the electronic books used in this study had almost no interactive features except page turns. In addition, there was no voice-over narration in the e-books, so that e-books in this study were identical to traditional books except for format.

Hypotheses

Based on previous research, the current study posits the following hypotheses:

Hypothesis 1*:* Parents will engage in more dialogic reading strategies with their children when reading print books as compared with e-books.

Hypothesis 2*:* Children will engage in more content- related conversation with parents when reading print books as compared with e-books.

Hypothesis 3*:* There will be more parent-child engaged interaction and positive affect in the joint reading experience when reading print books as compared with e-books.

Hypothesis 4*:* There will be more child focus on control of the device/book itself when reading e-books as compared with print books.

Hypothesis 5*:* There will be more parent- child conversation related to control when reading e-books as compared to print books**.**

CHAPTER 3

METHOD

The present study investigated the behavior of parents and their three-year-old children while using two different book formats (traditional print books and e-books). This descriptive study used observational methods to examine parent-child interaction and engagement in the shared reading experience across the two formats.

Background

It is important to note that this study was conducted in the context of a larger project, The Family Reading Project, which investigated parent-child engagement in joint reading activities using mobile devices. Forty-two families with three-year-old children were recruited through local libraries and childcare facilities to participate in the Family Reading Project. The goal of the Family Reading Project was to evaluate the effectiveness of a children's character in the e-books, designed to enhance child engagement and model dialogic reading strategies for the parents. In the Family Reading Project, half of the families read enhanced e-books with the children's character present and half read the same e-books, but in a straightforward presentation (plain e-books), with no children's character present. Parents and children read traditional print books together for 10 minutes during the first session as a pretest, then read electronic books together for 20 minutes once a week for 6 to 8 weeks (the intervention), and then read traditional print books together again for 10 minutes in the final session (the posttest). One of the goals of the Family Reading Project was to compare reading behaviors of lower and middle income families, so recruitment efforts were made to sample both populations. There were 42 families recruited to participate in the Family Reading Project, 14 with annual income < \$25,000, 14 with annual income \$25,000-\$50,000, and 14 with annual income > \$50,000. Throughout the course of the project, there were differential drop-out rates for families in different income brackets. By

the end of the study, there were only 27 families remaining. Of these, 6 were in the lowest

income bracket, with 11 in the middle group, and 10 in the upper level.

The current study was carved out of the Family Reading Project using its existing design,

methodology and data. See Figure 1 for a schematic representation of the current study design as

nested within the design of the Family Reading Project. Only those families who read the plain

e-books (i.e., the control group in the Family Reading Project) were included in the current

analysis so that book format would be the primary difference between the two groups. In order to

create as fair a comparison as possible between e-book and traditional book reading sessions,

two sessions from each reading format were selected for analysis. The first and second (i.e., pre-

and post-) sessions for traditional print books were analyzed, along with the second and third e-

book sessions. A decision was made not to use the first e-book session, since participants were

still acquainting themselves with the technology. For the purposes of the current study, the first

five minutes of each of these four reading sessions were included in the analysis.

Pretest 10 minutes print books	Session 1 20 minutes enhanced e-books	Session 2 20 minutes enhanced e-books	Session 3 20 minutes enhanced e-books	Sessions 4-8 20 minutes enhanced e-books	Posttest 10 minutes print books
	Session 1 20 minutes plain e-books	Session 2 20 minutes plain e-books	Session 3 20 minutes plain e-books	Sessions 4-8 20 minutes plain e-books	
First 5 minutes Session 1 print books		First 5 minutes Session 1 e-books	First 5 minutes Session 2 e-books		First 5 minutes Session 2 print books

Figure 1. Family Reading Project design, with current study design highlighted in gray.

Participants

Participants were recruited through several preschool programs and two local public libraries in Northwest Arkansas. Of the 42 families who agreed to participate in the Family Reading Project, only 27 completed the full 6-8 week protocol. Of those 27 families, 13 were in the plain e-book condition, so the sample for the current study consisted of those thirteen parents and their three -year-old children. One of the 13 families had to be dropped from the study because the mother read from the book in English but carried on conversation with her child in Russian. The final sample for this study consisted of 12 families.

One of the original goals of the Family Reading project was to compare reading behaviors of lower versus middle income families, but due to a differential dropout rate for lower income families this analysis had to be dropped. Of the 12 families included in the current study, four had a yearly income of less than $25,000, five families earned between $25-$50,000, and three families earned more than $50,000. There were 10 Caucasian families in the study, one Asian family and one Hispanic family. The education levels of parents varied, with one parent being a high school graduate, six parents having had some technical or college experience, and 5 parents having college or graduate degrees.

Measures

Demographic Questionnaire. The demographic questionnaire for this study included standard demographic questions along with a question asking parents how often they spent time reading books with their children (see Appendix D).

Social Behavior Coding Scheme. A social behavior and social interaction coding scheme, adapted from SOCSI: System for Observation of Children's Social Interactions, developed by Brown, Odom, & Holcomb (1996), was developed and used for this study. See

complete coding scheme in Appendix C. Coding categories focused on behaviors of Child (C)

and Parent (P) on each page of the book. Duration of interaction and number of words spoken

by each participant were recorded for each page, as was the presence or absence of distracting

events.

Codes were organized in four broad categories with verbal and nonverbal components in

each category. For verbal codes, the unit of analysis was an utterance, operationally defined by

Sato (1990) as a "stream of speech under a single intonation contour bounded by pauses."

The first broad category, Book Content, contained subcategories of behaviors that focused on the

types of parent and child verbalizations associated with dialogic reading (e.g., P or C asks a

question about the content of the book, P or C either verbally or nonverbally responds to a

question about the content of the book, P reinforces reading text on the page by pointing at text

as it is being read). The second broad category, Affect, contained subcategories of positive and

negative affect and positive and negative reinforcement (e.g., P or C makes any statement,

positive or negative, regarding emotional response, P or C smiles or laughs, P compliments or is

critical of C's response, answer, or behavior). The third broad category contained subcategories

focused on Attention/ Engagement of the Parent and/ or Child during the reading activity (e.g., P

or C offers or responds to prompts for engagement in the interaction, P or C is disengaged in the

interaction by making an off task comment or question). The last broad category, Control of

Book/ Device, contained subcategories that examined the physical control of the book or device

(e.g., negotiating page turns and positive or negative comments over physical control of the

device).

Procedures

A research protocol for the larger Family Reading Project was sent to and approved by the University of Arkansas Institutional Review Board for the use of human subjects in this study in accordance with IRB policies and procedures (see Appendix A). Upon receiving IRB approval, a letter containing a full description of the study with risks and benefits along with a consent form for parent and child to participate in the study was distributed to prospective participants and returned to researchers either in person or via email. A modification to the IRB protocol was made to add Jennifer Bowman's name as a researcher, identifying information, and signature (see Appendix B).

In both this study and the larger study, the first reading session consisted of families reading one or more of three traditional print books (*Mr. Gumpy's Outing* by John Burningham, *In the Tall, Tall, Grass* by Denise Fleming, and *The Little Mouse*, *the Red Ripe Strawberry, and the Big Hungry Bear* by Don and Audrey Wood). Parents were instructed to read any and all books as many times as they or the child wanted and were read instructions about the study from a script that included a sentence about the importance of engaging in conversation and asking questions when reading with their child. The first five minutes of this reading session were coded for analysis in this study.

The parent-child dyads were then asked to read e-books together on a mobile device. The e-books consisted of 5 Sesame Street books on a Nokia N8 smart phone *(Abby in Wonderland, 100*th *Day of School, Big Block Party, Color Carnival*, and *The Monster at the End of this Book*). See Figure 2 for a sample screen from one of the e–books. As previously noted, the e-books had minimal functionality. There were no animations, no music, nor voice-over narration. They simply displayed each page of the book with on-screen text and enabled page

turns from one page to the next. The minimal functionality was an intentional decision so that the primary difference between the two conditions in the study was whether the book was presented on paper in the traditional format or on screen in the e-book format.

Parents were instructed to read any and all books as many times as they or the child wanted and were read instructions about the study from a script that included a sentence about the importance of engaging in conversation and asking questions when reading with their child. Parents were also given a demonstration by researchers on how to open and close books, turn pages, select new books and enlarge text boxes on the mobile device. Parents who attended the first reading session with their children were asked to come back once a week over the next 6 to 8 weeks to read e-books with their children on the mobile device. The first five minutes of the second and third e-book reading sessions were coded for analysis in this study. The final session consisted of parent- child dyads reading the same traditional print books as in the first reading session. The first five minutes of this reading session were coded for analysis in this study. All reading sessions were recorded using a digital video camera so that parent and child behaviors could be coded and analyzed.
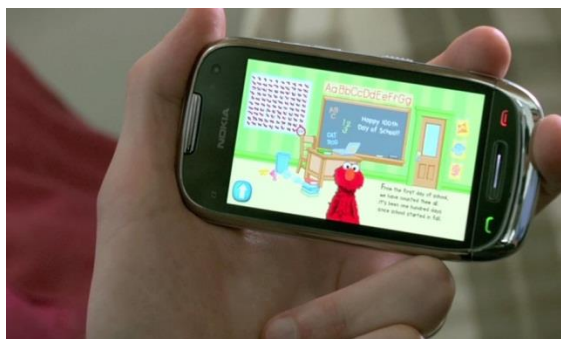
Figure 2. Sample e-book screen.

Coding. Before coding began, all three researchers involved in the coding process went through a training process that lasted several weeks. Each researcher coded the same transcript and then they compared their results and discussed disagreements. This process was repeated

several times until the researchers were using the coding scheme consistently. The researchers then coded the same transcripts individually to establish inter-rater reliability. Transcripts of the first five minutes of one traditional print book reading session and one e-book reading session were coded by two researchers for parent and child verbal and non-verbal behaviors across all of the coding categories during the reading interaction. Krippendorfs Alpha, referred to as Krippendorf's α, was used for calculating inter-coder reliability. This measure is regarded as the strongest, most accurate, and best suited among all existing measures as a standard for inter-coder reliability due to the fact that Krippendorff's alpha can be used regardless of the number of observers, sample size, or levels of measurement in a study (Hayes & Krippendorff, 2007). A macro especially written for SPSS and SAS by Hayes & Krippendorff (2007) calculates Krippendorff's alpha, because it cannot be calculated by standard statistical programs. When used in this study, across all of the verbal and nonverbal coding categories, inter-coder reliability was high, $\alpha = .89$.

Researchers then coded verbal and nonverbal behaviors for the first five minutes of each of four reading sessions for each family. Traditional print book sessions 1 and 2 and e-book reading sessions 2 and 3 were coded. All coded transcripts were then used to conduct an analysis examining the differences in parent-child interactions between the two book formats (print books and e-books) for each category of verbal and nonverbal behavior. For each measure coded and analyzed, the number of occurrences in each of the two sessions for a format were added together to create a total number of occurrences of that behavior over the two sessions for that format.

CHAPTER 4

RESULTS

The data analysis of this research study examined the differences in verbal and non-verbal parent-child interactions when reading traditional print books versus e-books. The first analysis examined the influence of condition (book format) on parents' verbal and nonverbal interactions with the child in each of the four broad categories (Book Content, Affect, Attention and Engagement, and Control of Book/ Device) of the coding scheme.

Parent Verbal and Nonverbal Analyses

This first set of analyses examined the differences in the way parents interacted with their children when reading traditional print books versus e-books. A set of analyses that examined children's verbal and nonverbal behaviors when interacting with parents when reading traditional print books versus e-books was also conducted and will be described in detail in the next section.

Total Parent Utterances. Paired sample *t*-tests were conducted to compare total parental utterances during the reading interaction in both sessions across the two book formats. There were more total parent utterances during print book sessions ($M = 150.67$, $SD = 41.65$) than during e-book sessions ($M = 110.08$, $SD = 46.42$), with a significance level $t (11) = 3.23$ p $< .01$) as seen in Table 1.

Table 1

Mean Scores for Total Parental Utterances, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Total Utterances	150.67	110.08	p $<.01$

Book Content. Paired samples *t*- tests were conducted comparing each of the following parent measures for print book sessions versus e-book sessions.

Total number of utterances about book content, and subcategories of this measure included:

- Number of concrete questions parent asked

- Number of descriptive questions parent asked

- Number of times parent assists child in making a connection between an event in the story and a real life experience

- Number of parental answers/responses to questions

- Number of parental statements or comments about book content

- Number of times parent asks for clarification or repetition of what child said

- Number of times parent repeats or clarifies something the child said

- Number of time parent prompts or helps the child answer a question

- Number of times parents uses nonverbal response to answer question or respond to comment

- Number of times parent points or uses child's hand to point to text being read

- Number of times parent gives a nonverbal prompt for child to respond

With regard to parental talk about book content across the two book formats, total number of parental utterances with regard to book content for print book sessions (M = 67.75, SD = 6.05) was significantly greater than total parental utterances with regard to book content during e-book sessions (M = 40.83, SD = 3.78; t (11) = 5.72, p < . 001) Parents' nonverbal actions related to book content, such as pointing to something in the book, were also significantly greater for print book sessions (M = 7.33, SD = 5.00) when compared with e-book sessions (M = 2.83, SD = 2.95; t (11) = 2.57, p < .03), supporting the verbal findings (see Table 2).

Table 2

Mean Scores for Parent Verbal and Nonverbal Behaviors regarding Book Content, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Total Utterances about Book Content	67.75	40.83	$p < .001$
Total Nonverbal Actions Related to Book Content	7.33	2.83	$p < .03$
Concrete questions	21.92	13.58	$p < .01$
Answer/ Response	5.70	3.75	$p < .07$
Comment or Statement	17.5	9.25	$p < .02$
Clarification/Repetition	11.58	6.92	$p < .03$
Points to Text	7.33	0.17	$p < .01$

Subsequent analyses showed that several of the subcategories of verbalizations about book content were responsible for the greater number of total utterances about book content in book sessions than e-book sessions. In both reading sessions, there were significantly more concrete questions asked by the parents in the print book condition ($M = 21.92$, SD $= 11.31$), than in the e-book condition ($M = 13.58$, $SD = 6.44$); $t (11) = 3.28$, $p < .01$). Furthermore, the number of parental utterances in which parents repeated or clarified something they or the child had said was also significantly greater for print book sessions ($M = 11.58$, $SD = 8.85$) than e-book sessions ($M = 6.92$, $SD = 5.68$); $t (11) = 2.57$ $p < .03$ (see Table 2).

Also within the category of book content, the number of parent comments or statements regarding book content was significantly greater for print book sessions ($M = 17.50$, $SD = 11.92$) than e-book sessions ($M = 9.25$, $SD = 4.05$), $t (11) = 2.76$ $p < .02$. In addition, the number of parental answers or responses to children's questions was significantly greater (with marginal significance) for print book sessions ($M = 5.67$, $SD = 3.47$); than e-book sessions ($M = 3.75$, $SD = 1.60$); $t (11) = 2.04$, $p < .07$ (see Table 2).

Only one of the subcategories related to book content proved to be significant for parent's nonverbal language during reading interactions when comparing print book sessions to e-book sessions. Parents pointed to the text when reading with the child significantly more often in print book sessions ($M = 7.33$, $SD = 13.41$) than in e-book sessions ($M = 0.17$, $SD = 0$ .39); t (11) = 1.89, p < .1 (see Table 2).

Affect and Attention/Engagement. Results of paired samples t – tests suggested that parents were more likely (with marginal significance) to express positive affect in print book sessions ($M = 1.17$, $SD = 1.85$) than e-book sessions ($M = 0.08$, $SD = 0$ .29); t (11) = 2.17 p < .06 as seen in Table 3. There were no other significant differences in parents' verbal or nonverbal expression of affect for print book sessions when compared with e-book sessions.

Paired-samples t-tests were conducted to examine potential differences in parents' dialogue prompting attention or engagement between the two book formats. There were no significant differences found for print book sessions versus e-book sessions.

Table 3

Mean Scores for Parent Utterances about Affect, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Total Utterances related to Positive Affect	1.17	0.083	p < .06

Physical Control of Book/Device. Paired samples t –tests were conducted on parental utterances related to physical control of the book or device for print books versus e-books. The number of parental utterances related to page turns was significantly greater for e-book sessions than print book sessions (e-book sessions ($M = 8.25$, $SD = 9.81$) versus print book sessions ($M = 1$ .08, $SD = 2.57$), t (11) = -3.11, p < .01 as shown in Table 4. Positive utterances related to page turns, such as P or C says "Let's turn the page now" or "I want to turn the page" were also

greater for e-books sessions ($M = 6.42$, $SD = 9.66$) versus print book sessions ($M = 1.00$, $SD = 2.59$), t (11) = -2.38, p <.04. There was also a significant difference in the number of negative utterances by parents related to physical control of the book or device, with scores for print book sessions ($M = 0 .000$, $SD = 0.000$) actually showing no negative utterances regarding physical control of the book/device compared with e-book sessions ($M = 1.50$, SD 1.83); t (11) = -2.83, p < .02, as shown in Table 4.

Table 4

Mean Scores for Parent Utterances and Parent Nonverbal Actions Related to Physical Control of the Book/ Device, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Total Utterances about Page Turns	1.08	8.25	p < .01
Negative Utterances about Physical Control of Book or Device	0.000	1.50	p < .02
Positive Utterances about Page Turns	1.00	6.42	p < .04
Nonverbal Actions related to Negative Physical Control of Book or Device	0.000	2.00	p < .05
Successful Page Turns	46.50	12.83	p < .05

Paired samples t–tests related to parents negative nonverbal actions related to physical control of the book or device, such as pulling book or e-book away from child or struggling to see pictures/ words in book or device across the two book formats supported the verbal results, showed that parents' negative nonverbal actions were significantly greater for e-book sessions ($M = 2.00$, $SD = 2.83$) when compared with print book sessions ($M = 0.00$, $SD = 0.00$) t (11) = -2.45, p < .05. A subcategory of physical control of the book or device related to parents' nonverbal actions with regard to page turns across the two book formats is successful page turns (turning the page at the appropriate time) when reading the print book and e-books with the child. Parents completed significantly more successful page turns in print book reading sessions

(M = 46.50, SD = 15.79) when compared with e-book sessions (M = 12.83, SD = 11.34); t (11) = -2.45, p < .05 also shown in Table 4.

Child Verbal and Nonverbal Analyses

The next analysis examined the differences in the way children interacted with their parents when reading traditional print books versus e-books. A set of analyses parallel to those described in detail in the previous section was conducted with regard to children's verbal and nonverbal behaviors.

Total Child Utterances. Paired samples t-tests were conducted to compare the total number of child utterances that occurred across the two book formats in each of the book reading sessions. The total number of child utterances in print book sessions (M = 98.08, SD =32.48) was significantly greater than total child utterances in e-book sessions (M = 67.25, SD = 24.74); t (11) = 3.24, p < .01 as shown in Table 5.

Table 5

Mean Scores for Total Child Utterances across Book Format, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Total Utterances across Book Format	98.08	67.25	p < .01

Book Content. Paired sample t–tests showed that the total number of child utterances related to book content was significantly greater for print book sessions (M = 37.83, SD = 9.520) versus e-book sessions (M = 23.92, SD = 6.37; t (11) = 4.52, p < .01). With regard to the subcategories of book content, the number of child answers to questions and/ or responses was also significantly higher for the print book sessions (M = 22.25, SD = 6.50) when compared to e-book sessions (M = 14.92, SD = 4.93); t (11) = 4.05, p < .01. In addition, the total number of child comments or statements made in relation to book content was significantly greater for

print book sessions ($M = 9.83$, $SD = 5.64$) versus e-book sessions ($M = 4.75$, $SD = 4.27$); t (11)

$= 2.69$, p $<.05$ as shown in Table 6.

Table 6

Mean Scores for Child Utterances about Book Content, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Total Utterances Related to Book Content	37.83	23.92	$p < .01$
Answer/ Response	22.25	14.92	$p < .01$
Comment/Statement	9.83	4.75	$p < .05$

Affect and Attention/Engagement. There were no significant differences in the

number of child verbalizations expressing affect or related to attention/ engagement with book

reading for the print book sessions versus the e-book sessions. There were also no significant

results with regards to child nonverbal behaviors related to attention/ engagement with book

reading for print book sessions versus e-book sessions. However, children's nonverbal

expressions of positive affect (smiling, laughing, hugging, kissing) were significantly greater for

e-books ($M = 5.33$, $SD = 5.47$) than for print books ($M = 1.50$, $SD = 1.17$); t (11) = -2.22, p <

.05, as shown in Table 7.

Table 7

Mean Scores for Child Nonverbal Actions Related to Affect, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Positive Affect	1.50	5.33	$p < .05$

Physical Control of Book/Device. The final analysis of child utterances was a paired

samples t–test comparing comments about physical control of the book or device across the two

book formats. The number of negative child statements related to the physical control of the

book or device (such as not being allowed to hold the book or being able to see the pictures)

was higher for e-book sessions (*M* = 0.500, *SD* = 0 .674) than print book sessions (*M* =.000, *SD*

= .000); *t* (11) = -2.57, p <.05, as seen in Table 8.

Table 8

Mean Child Utterances Related to Physical Control, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Negative Physical Control	0.000	0.500	p < .05

Children's negative nonverbal actions with regard to physical control of the book or

device (such as pushing away parents hand or struggling with book or device to see pictures)

were significantly greater (with marginal significance) for e-book sessions (*M* = 1.42, *SD* =

2.23) than for book sessions (*M* = 0.00, *SD* = 0.00); *t* (11) = -2.20, p < .06, supporting the verbal

results. A subcategory of physical control of book and/or device related to the child's nonverbal

actions with regard to page turns across the two book formats is inappropriate page turns

(turning pages inappropriately before parent is done reading) was significantly greater in e-book

sessions (*M* = 0.58, *SD* = 0.67) when compared to print book sessions (*M* = 0.00, 0.00); *t* (11) =

-3.02, p < .05 as shown in Table 9.

Table 9

Mean Child Nonverbal Actions Related to Physical Control, Print Book and E-book Sessions

	Print Book	E-book	Signif Level
Negative Physical Control	.000	1.42	p < .06
Inappropriate Page Turns	0.00	0.58	p < .05

CHAPTER 5

DISCUSSION

The present study investigated the effects of two book formats (print books versus e-books) on verbal and nonverbal aspects of the parent-child interaction during joint book reading with three-year-old children. This study examined both verbal utterances and nonverbal behaviors of the parent and child during reading interactions. A major contribution of this study compared to previous literature is that the functionality of e-books was paired down to an extent that made them comparable to the functionality of print books. In other words, the e-books merely presented illustrations and text on screen with no voice over narration or interactivity of any kind other than page turns. This is important because previous studies have suggested that decreased parent-child interaction may result from the fact that e-books have lots of voice-over audio which could be in competition with the parent speaking to the child, and, to the author's knowledge, this is the first study to test that assertion.

In this chapter, the results of this study are examined with regard to the hypotheses proposed in Chapter Two. It was hypothesized that parents would engage in more dialogic reading strategies (strategies like asking questions and making comments related to story content, which have shown to increase children's understanding of the story and vocabulary development) with their children when reading print books as compared with e-books, and that children would engage in more content- related conversation with parents when reading print books as compared with e-books. Both of these hypotheses were supported by the results. The total number of utterances related to book content was greater for both parent and child in the print book condition when compared to the e-book condition.

In particular, both the parent and child in the reading interactions engaged in more answers and/or responses as well as comments and/or statements related to book content such as common with dialogic reading styles, in the print book condition. Parental clarification and or repetition of what the child said, the number of concrete questions asked, and the number of comments or statements related to book content were significantly greater ($p < .05$) for print book condition compared to e-book condition. For children, the number of comments or statements related to book content and the number of answers or responses related to book content were significantly greater with print books than with e-books.

Previous studies have attributed similar findings to the fact that e-books have lots of voice-over audio which could be in competition with the parent speaking to the child. This study is the first to the author's knowledge, to document that the extra interactivity and enhanced features of e-books are not solely responsible for parents engaging in fewer dialogic reading strategies or children engaging in more content related conversation during joint reading interactions when reading e-books. It has been suggested that the very features of e-books that are designed to capture the child's attention and maintain engagement may compete with or replace the kind of parent-child interaction that is so effective at supporting emergent literacy. The results of this study show that even without games, animations and other potentially distracting features, there is still less parent-child conversation about book content with plain e-books than with print books.

One possible explanation for lower levels of interaction around book content when reading e-books with children is that there was more verbal and nonverbal communication concerning physical control of the e-book than was present in the print book condition. This could indicate that the parents and children are attending more to the physical workings of the

device than to the book content. Parents and children both bring expectations to their interactions with digital devices, and these expectations impact their interactions in the context of digital artifacts (Eagle, 2012). Since previous studies of parent-child book reading have suggested that parents mediate the gap that exists between the text and what children may know through the use of open-ended questions (De Temple & Beals,1991; Van Kleeck & Beckley-McCall, 2002), to the extent that their interaction focuses on other topics, the potential for children's learning is reduced (Eagle, 2012). Sigel's Distancing Theory (1979, 1986) provides a context for interpreting these results, emphasizing the importance of the social influence of adult mediation during reciprocal interactions such as joint book reading, in which the parent's scaffolding, or mediation, contributes to gains in children's cognitive and social development.

In addition to more verbal interaction focused on book content, parents also engaged in more pointing to the text, in the print book condition. Research by Reese and Cox (1999) described positive effects of shared reading experiences on preschool aged children's emergent literacy in which knowledge of print is a skill they described as necessary for children to obtain. This often can be done through the parent pointing to the text as they are reading with the child, which in this study occurred more frequently with print books. Thus, while many studies have documented the importance of dialogic reading in children's later literacy attainment fewer studies have examined the difference in verbal and nonverbal interaction when reading electronic books in comparison to traditional print books (Hargrave & Senechal, 2000; Heubner & Meltzoff, 2005). In this study, behaviors associated with dialogic reading were found to occur significantly more often when parents and children read print books together than when they read e-books.

Parent and child affect, attention and engagement were also examined during reading interactions using the two book formats. It was hypothesized that there would be more parent-child engaged interaction and positive affect in the print book condition, but that children would be less engaged with book content in the e-book condition due to distractions from the device itself. Parents' use of dialogue to prompt children's engagement in the reading interaction did not differ significantly across the two book formats. However, differences in parents' affect during reading interactions across the two book formats did approach significance, and children's affect differed significantly across book formats as well. There were no significant differences in children's attention to the book across formats, but the fact that they engaged in less content-related conversation with the e-book supports the hypothesis that they would be less engaged with book content in this condition.

Parents exhibited more positive affect through verbal expressions such as "This is fun" or "I like this book", during print book condition when compared with e-book condition. While results of this study showed parents' verbal expressions of positive affect being greater for print books, children's nonverbal expressions of positive affect (smiling, hugging, laughing, and or kissing) were greater for the e-book condition. It is interesting to note that parents and children showed opposite patterns here, with parents displaying more positive affect in the print book condition and children showing more positive affect in the e-book condition, as these conflicting emotions in and of themselves have potential to influence parent-child interaction during joint reading.

One component of this study that not many other studies have examined is consideration of the physical control of the book /device that is used during the reading interactions. Parent and child verbal and nonverbal behaviors reflecting control of the book or e-book including positive

and negative talk and behaviors that were related to turning pages as well as holding the book or device and any struggle that may have occurred in the reading interaction in regard to seeing the pictures or the text were examined.

It was hypothesized that there would be more parent- child conversation related to control of the book or device in the e-book condition when compared with the print book condition. This hypothesis received support in the results with both the child and parent expressing no negative talk related to physical control of the book but both expressed negative talk related to control of the device in the e-book condition. Negative talk included any negative statement related to physical control of the device such as not being able to see the words or text, or "No" and "don't do that".

Parents' negative nonverbal actions related to control included pushing or pulling the book or e-book away or pushing the other persons hand away. Both parents and children showed no occurrence of any negative nonverbal actions for the print book condition yet both parent and child exhibited negative control behaviors in the e-book condition.

Another aspect of conversation about control that was examined was talk about page turns during the reading interactions. The results of this study showed a much greater amount of talk centered on turning pages with regard to inappropriate page turns, successful page turns, and positive or negative statements about page turns in the e-book condition compared with the print book condition. Parent talk was significantly greater for total number of utterances concerning page turns and specifically for positive words spoken concerning page turns in the e-book condition. Results concerning child talk about page turns showed no significant differences between the print book and e-book condition but there were significant differences in children's

nonverbal page turn behavior. Children showed significantly more inappropriate page turns in the e-book condition than in the print book condition.

This finding is important in conjunction with the results for parent verbal and nonverbal findings related to negative physical control of the book or device. The presence of more negative talk and negative nonverbal behaviors concerning physical control of the book or device that occurred in the e-book condition may have been related to children turning pages in the book by swiping their finger across the screen before the parent had finished reading the text on the page. When this occurred it led to parents taking control of the device and becoming frustrated with getting back to the appropriate page. Eagle (2012) proposed that an adult's conception of appropriate use when using digital technologies with children can impact the nature of the social interaction between the adult and child and thereby have an effect on children's learning outcomes. In particular, Eagle suggests that the most beneficial mode of interaction to support and enhance child learning outcomes between a parent and a young child is one that is child-directed and exploratory thereby preparing the child for more instructional modes of interaction such as common when children go to school. However, in analyzing parent's and preschool age children's joint use of digital technology, Eagle (2012) expressed concern for the instructional mode of interaction that characterized the parent-child interactions with parents taking on the role of instructing the child on how to behave appropriately in the situation. These concerns relate to theories of social interaction such as Sigel's Distancing Theory and Vygotsky's Socio-Cultural Theory, both of which suggest that if the child does not have a reciprocal role in interaction with an adult it can negatively impact child learning outcomes.

Thus the dynamics of the parent – child interaction during joint reading have been affected by the introduction of an electronic book. Given the vast amount of research that has

supported the importance of conversation related to book content that occurs between the parent and child when reading together, the fact that a large amount of conversation is centered on physical control of the device rather than book content when reading with e-books raises a legitimate concern.

Limitations and Future Research

A major limitation of this study was the sample size and limited demographics of the sample. The small sample size and limited diversity of the participants make it impossible to conclude that these results would hold true with a larger number and more diverse group of participants. Future research should explore the effects of book format on parent-child interaction with a broader and more diverse sample of parent-child dyads now that an effect of book format has been demonstrated with a small, heterogeneous sample in reading interactions. Furthermore, future research may benefit from analyzing the impact of these effects on low and middle to high income families in order to see if parent's income or educational level had a significant outcome on the findings.

Another limitation of this study was that the electronic books read by participants were not the same as the printed books, given that this was a secondary analysis in a study that was originally designed to study a different research topic. Future research should consider using the same book titles for both the printed and electronic books in order to limit bias in results that may be a result of differences in either support for conversation in the specific books being read or parents' and children's familiarity with the books being read.

Conclusion

The quality of parent-child interaction during joint book reading can have significant impacts on children's story comprehension and attainment of early literacy skills. This study

demonstrated that book format can have an effect on the quality of the parent-child interaction that occurs during joint book reading interactions, thereby also possibly affecting the literacy skills that are derived from the reading experience. The results of this study showed that the verbal and nonverbal interaction between the parent and child during joint book reading varies significantly depending on book format.

In particular, conversation related to book content, of the kind that is associated with dialogic reading strategies which promote emergent literacy skills, was more likely to be found in traditional print book readings than e-book readings. The conversation between the parent and child in the e-book condition was more focused on turning pages and physical control of the e-book device itself whereas print book conversations were more focused on book content. Ultimately, the results of this study showed that interaction containing language and behaviors related to dialogic reading strategies appeared more often in conversation between the parent and child when reading print books. This finding supported two of the research hypotheses that stated parents would engage in more dialogic reading strategies such as asking questions about book content and children would engage in more content related conversation when reading print books.

The design of the e-book used in this study intentionally omitted features such as voice-over narration, animations with sound, and games – the "bells and whistles" that previous researchers suggest could be a source of distraction for young readers or could discourage parents from reading the text and talking about book content (Doty, Popplewell, & Byers, 2001; De Jong & Bus, 2003), in an effort to document whether that explanation is accurate, or whether even a plain e-book book with no special interactive features or voice-over would also have an impact on parent-child reading interaction and attention to book content. Research on joint

reading by adult and child indicates that such experiences provide children with significant social interactions in which children can initiate and engage in conversation about the book, thereby making connections between their own experiences in the world and new concepts and vocabulary encountered in the book (Eagle, 2012). The impact that using e-books may have on parent-child reading interactions brings to light salient concerns regarding how these devices should be used with young children, as well as the desirability of continuing to engage children in joint reading with print books.

Non-immediate talk, which is defined by De Temple (2001) as talk that requires children to recall personal experiences, develop comments or questions, and draw inferences or make predictions, has been found to support children's language and cognitive development (Whitehurst et al., 1988). This type of talk was examined by Smith (2001) for parent–child dyads reading a print book and a CD- ROM book. Smith concluded that the nature of the parent-child interaction differed based on the format of the book being read, with more talk focused on story content when reading print books. The results of the present study confirm Smith's findings, suggesting that parent-child conversation and ultimately children's literacy attainment can be impacted by book format, due to the type of talk associated with print books compared to e-books. This finding is central to the present study's focus on parent-child interaction during joint book reading experiences, with regard to not only parents' and children's perceptions of appropriate and expected use of the electronic device during joint book reading interactions but also the change that occurs within the reading interaction between the parent and child with e-books as compared with print books.

It has been clearly documented through previous research that young children benefit in numerous ways from engaging in joint book reading interactions with parents. Past research has

shown that cognitive gains experienced by children who have engaged in joint book reading interactions using traditional print books include improvements in acquisition of language skills, increased vocabulary development, developing emergent literacy skills, and later school success, as well as improved understanding about written language and concepts about print which contribute to children's attitudes toward reading (Wells, 1986, Sulzby, 1985, Fletcher et al., 2005). Snow and Nino (1986) suggested that joint book reading interactions involving print books also afforded children the most prominent means for supporting their socio-emotional development, by enabling children to gain understanding of their social world and increase language skills through conversations about the stories being read in an environment that was warm, nurturing, and responsive. The present study examined parent-child joint book reading interactions with e-books as compared with print books, and documented significant differences in parent-child interaction in the two conditions. The impact of book format on parent-child interaction during joint reading is critical to the relevance of the present study for families and early childhood educators.

Since the present study and previous studies found changes in parent-child conversations during joint book reading interactions involving e-books, with more talk being centered on use of the device rather than book content, it is important that parents and early childhood educators are made aware of the implications that e-books may have on the rich verbal interactions that are normally present in joint reading experiences. Less talk about what is happening in the story leads to fewer opportunities being afforded to children in which they can make meaningful connections between the story and real life experiences. Providing opportunities for children to make these meaningful connections during joint book reading interactions have been proven to support children's developing emergent literacy skills and later learning outcomes. Previous

research on parental beliefs regarding appropriate interaction with electronic books during joint book reading has shown that parents assume a more instructional mode of interacting with the child rather than being an interactive partner conversing with the child (Eagle, 2012). This change in parent-child interaction and conversation has been suggested to decrease the opportunity for engagement between the parent and child, thereby also decreasing child engagement and learning that may occur during book reading interactions (Eagle, 2012). Children's perceptions of control of electronic devices such as the ones used in joint book reading interactions have also been suggested to create a potential for conflict in the parent-child reading interaction due to children's previous experiences of solitary control when using such electronic devices (Roskos et al., 2012). Conversation related to use of the device, such as who will turn pages or hold the device, can take the place of talk that is related to book content, decreasing the opportunity for the rich, verbal interactions that are known to support children's learning and attitudes toward reading.

These research results are applicable for early childhood educators and other early care professionals who work with young children and families in providing knowledge about essential reading behaviors necessary for children to improve literacy skills and how book formats can affect those reading behaviors. It is useful to refer back to the French philosopher Sartre's (1964) description of his first literacy experiences. He describes the parent-child interaction during joint book reading where his mother read him books after he showed interest in learning about the content of what was inside the books. In this illustration, Sartre had developed an interest in the books and the books' contents in the context of the warm, nurturing, interaction he recalls having with his mother as she read the books to him. This anecdote provides an interesting context for considering the results of this study, in that it brings to light both the parent's and child's

perceptions of appropriate and expected use of the books as well as the mother's warmth and role in scaffolding the reading process that resulted in the child having a positive regard toward reading. The common practice of using technology to provide solitary entertainment and learning opportunities to young children, through the distinct game-like features that are typically associated with these devices, brings about expectations for both parties involved in the interaction that is different from that of traditional print book reading. In Sartre's illustration, the child's interest in the books and their content was not only prompted by his mother's introducing them but also by her role as a warm and caring interactive partner. Their interaction supported and refined his interest through her scaffolding of the reading process, which he gladly welcomed. There was no other factor competing for his interest and attention, such as voice-over narration or animations. There also was no other intended purpose or use of the books, such as to play games that prompted his interest; it was strictly to inquire of and learn about the books' contents.

This research documents the differences that occur in both parent-child conversation and nonverbal interactions when joint reading occurs in different book formats. The results of this research demonstrate that the different expectations parents and children bring to reading e-books versus reading traditional paper books can play an important role in influencing their verbal and nonverbal interactions while reading together, with significantly less interaction around book content occurring when reading e-books. These results provide a basis for cautioning early childhood educators and parents who use e-books with young children to make sure they talk about book content even when using e-books, and to make sure they continue reading traditional print books together as well.

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Appendices

Appendix A: IRB Protocol

UNIVERSITY OF ARKANSAS INSTITUTIONAL REVIEW BOARD
PROTOCOL FORM

The University Institutional Review Board recommends policies and monitors their implementation, on the use of human beings as subjects for physical, mental, and social experimentation, in and out of class. . . . Protocols for the use of human subjects in research and in class experiments, whether funded internally or externally, must be approved by the (IRB) or in accordance with IRB policies and procedures prior to the implementation of the human subject protocol. . . Violation of procedures and approved protocols can result in the loss of funding from the sponsoring agency or the University of Arkansas and may be interpreted as scientific misconduct. *(see Faculty Handbook)*

Supply the information requested in items 1-14 as appropriate. **Type** entries in the spaces provided using additional pages as needed. In accordance with college/departmental policy, submit the original **and** one copy of this completed protocol form and all attached materials to the appropriate Human Subjects Committee. In the absence of an IRB-authorized Human Subjects Committee, submit the original **and** one copy of this completed protocol form and all attached materials to the IRB, Attn: Compliance Officer, OZAR 118, 575-3845.

1. Title of Project

Can Mobile Technologies Help Parents Boost their Children's Learning? (Family Reading Study)

2. (Students **must** have a faculty member supervise the research. The faculty member must sign this form and all researchers and the faculty advisor should provide a campus phone number.)

	Name	Department	Email Address	Campus Phone
Principal Researcher	Glenda Revelle, Ph.D.	HESC	grevelle@uark.edu	575-2192
Co-Researcher				
Co-Researcher				
Co-Researcher				
Faculty Advisor				

3. Researcher(s) status. Check all that apply.

X Faculty   Staff   Graduate Student(s)   Undergraduate Student(s)

4. Project type

   X Faculty Research   Thesis / Dissertation   Class Project   Independent Study /
        Staff Research   M.A.T. Research   Honors Project   Educ. Spec. Project

5. Is the project receiving extramural funding?

   X Yes.   Specify the source of funds   **Nokia University Cooperation Grant**

6.Brief description of the purpose of proposed research and all procedures involving people. Be specific. Use additional pages if needed. (**Do not** send thesis or dissertation proposals. Proposals for extramural funding must be submitted in full.)

   Purpose of research:

The proposed research investigates the hypothesis that parent-child engagement in joint reading activities using a mobile device can increase young children's literacy skills. Research has consistently shown that children who do not already have an adequate start in literacy development by the time they reach school rarely learn to read on schedule, and continue to have difficulty throughout elementary school, as almost 90 percent of children identified as poor readers at the end of first grade are still identified as poor readers at the end of fourth grade.

In particular, children from lower income families are at significantly greater risk with regard to reading than children from middle or higher income families. Young children from lower income families are less likely to have books and other print materials available for them in their home environment. Furthermore, in low income families parents speak less to their children and use less complex sentences when contrasted with more affluent families. It has been estimated that *by the age of three* children from affluent families have heard 30 million more words than children living in poverty, and this differential experience is reflected in preschool vocabulary level which in turn predicts third grade reading comprehension.

It has been demonstrated that engaging with parents in shared reading experiences can help improve the literacy skills of young children. The most improvement is seen when adults engage young children in "dialogic reading," a style of reading picture books with young children in which adults ask children questions and engage them in conversation about what is happening in the book while they are reading together. Research has shown that dialogic reading facilitates children's language and vocabulary development, and that when low income parents are trained to engage in dialogic reading with their young children the children showed marked improvement in vocabulary and expressive language abilities.

I have collaborated with Nokia Research and Sesame Workshop to build an Interactive Rich Reading mobile application that is designed to support parents in learning how to engage their young children in dialogic reading. This application incorporates an animated, interactive social agent (the Elmo® character from Sesame Street®) as part of the book reading experience. When touched, Elmo asks questions or makes comments about the story, modeling dialogic reading techniques for adults. The goal of the proposed research is to evaluate the effectiveness of Interactive Rich Reading application (and specifically the Elmo character's role as a model) in teaching the parent how to engage the child in more conversation while reading.

Forty families with three-year-old children will be recruited to participate in the study. The families will come into the research setting 12 times over the course of 12 weeks. While in the research setting, half of the families will be provided with a Nokia mobile device equipped with the Interactive Rich Reading

application with the Elmo character and half of them will be provided with a Nokia mobile device equipped with an application that enables them to read the same books as with the Interactive Rich Reading application but without the dialogic reading support of the Elmo character. All families will be provided with traditional paper books to read as well. Families will receive a free children's book to take home and keep for each week that they participate.

Parents and children will be observed reading traditional books together before and after the study time period. Their book reading sessions will be videotaped, and coded for parent and child conversation while reading. Data will be examined for increases in parental use of dialogic reading techniques and/or increases in children's use of expressive language across the study conditions. It is hypothesized that increases will be greater for families who used the application with the Elmo character than for families who used the reading app without Elmo. These results would provide strong evidence that parent-child engagement in carefully structured joint reading activities using a mobile device can significantly impact children's literacy development, providing a "boost" to children who need it most when learning to read.

Procedures involving people:

7. Estimated number of participants (complete all that apply)

__40__	_____	__ ___	__40_
Children	Children	UA students	Adult
under 14	14-17	(18yrs and older)	Non-Students

8. Anticipated dates for contact with participants:

First Contact May 2012   Last Contact August 2012

9. Informed Consent procedures: The following information must be included in any procedure: identification of researcher, institutional affiliation and contact information; identification of Compliance Officer and contact information; purpose of the research, expected duration of the subject's participation; description of procedures; risks and/or benefits; how confidentiality will be ensured; that participation is voluntary and that refusal to participate will involve no penalty or loss of benefits to which the subject is otherwise entitled. See *Policies and Procedures Governing Research with Human Subjects*, section 5.0 Requirements for Consent.

   X Signed informed consent will be obtained. **Attach copy of form**.
     Modified informed consent will be obtained. **Attach copy of form**.
     Other method (e.g., implied consent). **Please explain on attached sheet**.
     Not applicable to this project. **Please explain on attached sheet**.

10. Confidentiality of Data: All data collected that can be associated with a subject/respondent must remain confidential. Describe the methods to be used to ensure the confidentiality of data obtained.

There is no personal identifying information stored with the videos or in the data set. All subjects are identified only by a Research ID # assigned to them for the purposes of this research. The only descriptive data regarding subjects included in the data set is age and gender.

11. Risks and/or Benefits:
    Risks: Will participants in the research be exposed to more than minimal risk?   Yes **X** No
               Minimal risk is defined as risks of harm not greater, considering probability and magnitude, than those ordinarily encountered in daily life or during the performance of routine physical or

psychological examinations or tests. Describe any such risks or discomforts associated with the study and precautions that will be taken to minimize them.

Benefits: Other than the contribution of new knowledge, describe the benefits of this research.

Applying the results of this research has the potential to help narrow the gap in preparation for learning to read among
children from poverty backgrounds vs. children from more affluent families.

12. Check all of the following that apply to the proposed research. Supply the requested information below or on attached sheets:

○ A.   Deception of or withholding information from participants. Justify the use of deception or the withholding of information. Describe the debriefing procedure: how and when will the subject be informed of the deception and/or the information withheld?

○ B.   Medical clearance necessary prior to participation. Describe the procedures and note the safety precautions to be taken.

○ C.   Samples (blood, tissue, etc.) from participants. Describe the procedures and note the safety precautions to be taken.

○ D.   Administration of substances (foods, drugs, etc.) to participants. Describe the procedures and note the safety precautions to be taken.

○ E.   Physical exercise or conditioning for subjects. Describe the procedures and note the safety precautions to be taken.

X F.   Research involving children. How will informed consent from parents or legally authorized representatives as well as from subjects be obtained? **Consent letter and form are attached. The research involves only observation and videotaping of parent child behavior, and children will be with their parents at all times during the research sessions.**

○ G.   Research involving pregnant women or fetuses. How will informed consent be obtained from both parents of the fetus?

○ H.   Research involving participants in institutions (cognitive impairments, prisoners, etc.). Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.

○ I.   Research approved by an IRB at another institution. Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.

○ J.   Research that must be approved by another institution or agency. Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.

13. Checklist for Attachments

The following are attached:

X Consent form (if applicable) or

X Letter to participants, written instructions, and/or script of oral protocols indicating clearly the information in item #9.

○ Letter(s) of approval from cooperating institution(s) and/or other IRB approvals (if applicable)

○ Data collection instruments

14. Signatures

I/we agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects/respondents are protected. I/we will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I/we agree to request renewal of approval for any project when subject/respondent contact continues more than one year.

Principal Researcher _____ May 7, 2012 Date

Co-Researcher _____ Date

Co-Researcher _____ Date

Faculty Advisor _____ Date

Parent Information letter for Family Reading Project

May 15, 2012

Dear Parents, Caregivers, and Guardians,

We would like to invite you and your child to participate in a Family Reading research project being conducted at your child's preschool center by researchers from the University of Arkansas. The purpose of the study is to help us better understand how new technologies might help parents and young children read together in a way that helps children learn literacy skills.

You will be asked to bring your child to the center for a half-hour session once a week for 12 weeks. We ask that it be the same parent who comes with the child each week. At each session you and your child will read books together - regular paper books and e-books on a mobile phone that you will be given to use during the session. **At each session your child will receive a free book to take home and keep.**

We would like to video tape you and your child during the study so that we can examine parent-child book reading behavior with the books and e-books. The tapes will only be seen by our staff of researchers. Your family name will not be revealed to anyone, the tapes will be titled using ID numbers only.

We expect this experience to be fun and interesting for you and your child, and we do not expect any risks. You and/or your child may decide to stop taking part at any time and without giving any reason.

If would like to participate in our study with your child, please sign the attached Consent Form and return it to _____ by _____.

Thank you for your cooperation. We greatly appreciate it. If you have any questions, please feel free to contact me at 479.575.2192. If you have any concerns or complaints about the study, you may contact the University of Arkansas Research Compliance officer, Iroshi (Ro) Windwalker at 479.575.2208 or irb@uark.edu.

Sincerely,

Glenda Revelle, Ph.D.
Associate Professor
Human Development and Family Sciences
University of Arkansas

Consent Form for the Family Reading Study

I have read the letter about the Family Reading research project that will be conducted at my child's preschool center. I understand that my child and I will be asked to come to the center and read together for a half-hour session once a week for 12 weeks, and that our reading sessions will be videotaped. I understand that even if I agree to participate with my child we may decide to stop at any time.

Please check ONE of the lines below:

_____   My child and I **will** participate in the study.

_____   My child and I **will not** participate in study.

_____   _____
Child's Name   Child's date of birth

_____   _____
Parent's Name   Parent's Signature

_____
Date

Please return to _____ **by** _____.

Appendix B: IRB Protocol Approval

UNIVERSITY OF
ARKANSAS

Office of Research Compliance
Institutional Review Board

May 14, 2012

MEMORANDUM

TO: Glenda Revelle

FROM: Ro Windwalker
                               IRB Coordinator

RE: New Protocol Approval

IRB Protocol #:   12-05-695

Protocol Title: *Can Mobile Technologies Help Parents Boost their Children's*
                               Learning? (Family Reading Study)

Review Type: ☒ EXEMPT   ☐ EXPEDITED   ☐ FULL IRB

Approved Project Period: Start Date: 05/14/2012 Expiration Date: 05/13/2013

Your protocol has been approved by the IRB. Protocols are approved for a maximum period of
one year. If you wish to continue the project past the approved project period (see above), you
must submit a request, using the form *Continuing Review for IRB Approved Projects*, prior to the
expiration date. This form is available from the IRB Coordinator or on the Research Compliance
website (http://vpred.uark.edu/210.php). As a courtesy, you will be sent a reminder two months
in advance of that date. However, failure to receive a reminder does not negate your obligation
to make the request in sufficient time for review and approval.   Federal regulations prohibit
retroactive approval of continuation. Failure to receive approval to continue the project prior to
the expiration date will result in Termination of the protocol approval. The IRB Coordinator can
give you guidance on submission times.

This protocol has been approved for 80 participants. If you wish to make *any* modifications
in the approved protocol, including enrolling more than this number, you must seek approval
prior to implementing those changes.   All modifications should be requested in writing (email is
acceptable) and must provide sufficient detail to assess the impact of the change.

If you have questions or need any assistance from the IRB, please contact me at 210
Administration Building, 5-2208, or irb@uark.edu.

210 Administration Building • 1 University of Arkansas • Fayetteville, AR 72701
Voice (479) 575-2208 • Fax (479) 575-3846 • Email irb@uark.edu

The University of Arkansas is an equal opportunity/affirmative action institution.

Appendix C: IRB Protocol Modification

RSSP Project Number

UNIVERSITY OF ARKANSAS INSTITUTIONAL REVIEW BOARD PROTOCOL FORM

The University Institutional Review Board recommends policies and monitors their implementation, on the use of human beings as subjects for physical, mental, and social experimentation, in and out of class. . . . Protocols for the use of human subjects in research and in class experiments, whether funded internally or externally, must be approved by the (IRB) or in accordance with IRB policies and procedures prior to the implementation of thehuman subject protocol. . . Violation of procedures and approved protocols can result in the loss of funding from the sponsoring agency or the University of Arkansas and may be interpreted as scientific misconduct. (see Faculty Handbook)

Supply the information requested in items 1-14 as appropriate. Type entries in the spaces provided using additional pages as needed. In accordance with college/departmental policy, submit the original and one copy of this completed protocol form and all attached materials to the appropriate Human Subjects Committee. In the absence of an IRB-authorized Human Subjects Committee, submit the original and one copy of this completed protocol form and all attached materials to the IRB, Attn: Compliance Officer, OZAR 118, 575-3845.

1.   Title of Project

Can Mobile Technologies Help Parents Boost their Children's Learning? (Family Reading Study)

2.   (Students must have a faculty member supervise the research. The faculty member must sign this form and all researchers and the faculty advisor should provide a campus phone number.)

	Name	Department	Email Address	Campus Phone
Principal Researcher	Glenda Revelle, Ph.D., Faculty	HES		
Co-Researcher	Jennifer Bowman, Grad Student	HES		
Co-Researcher				
Faculty Advisor				

3.   Researcher(s) status. Check all that apply.

X Faculty   Staff   X Graduate Student(s)   Undergraduate Student(s)

4.   Project type

X Faculty Research   X Thesis I Dissertation   Class Project   Independent Study I
Staff Research   M.A.T. Research   Honors Project   Educ. Spec. Project

5.   Is the project receiving extramural funding?

No   X   Yes. Specify the source of funds   Nokia University Cooperation Grant

F G. Research involving pregnant women or fetuses. How will informed consent be obtained from both parents of the fetus?

F H. Research involving participants in institutions (cognitive impairments, prisoners, etc.). Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.

F   I. Research approved by an IRB at another institution. Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.

F   J. Research that must be approved by another institution or agency. Specify agencies or institutions involved. Attach letters of approval. Letters must be on letterhead with original signature; electronic transmission is acceptable.

13. Checklist for Attachments

The following are attached:
X Consent form (if applicable) or
X Letter to participants, written instructions, and/or script of oral protocols indicating clearly the information in item #9.
F Letter(s) of approval from cooperating institution(s) and/or other IRB approvals (if applicable)
F Data collection instruments

14. Signatures

I/we agree to provide the proper surveillance of this project to insure that the rights and welfare of the human subjects/respondents are protected. I/we will report any adverse reactions to the committee. Additions to or changes in research procedures after the project has been approved will be submitted to the committee for review. I/we agree to request renewal of approval for any project when subject/respondent contact continues more than one year.

Principal Researcher ·   Date   May 7, 2012

Co-Researcher   Date 8/ 27/2012

Co-Researcher   Date

Co-Researcher   Date

Faculty Advisor   Date

UNIVERSITY OF ARKANSAS

August 30, 2012

MEMORANDUM

TO:	Glenda Revelle Jennifer Bowman
FROM:	Ro Windwalker IRB Coordinator
RE:	PROJECT MODIFICATION
IRB Protocol #:	12-05-695
Protocol Title:	*Can Mobile Technologies Help Parents Boost their Children's Learning?* *(Family Reading Study)*
Review Type:	☒ EXEMPT ☐ EXPEDITED ☐ FULL IRB
Approved Project Period:	Start Date: 08/30/2012 Expiration Date: 05/13/2013

Your request to modify the referenced protocol has been approved by the IRB. **This protocol is currently approved for 80 total participants.** If you wish to make any further modifications in the approved protocol, including enrolling more than this number, you must seek approval *prior to* implementing those changes. All modifications should be requested in writing (email is acceptable) and must provide sufficient detail to assess the impact of the change.

Please note that this approval does not extend the Approved Project Period. Should you wish to extend your project beyond the current expiration date, you must submit a request for continuation using the UAF IRB form "Continuing Review for IRB Approved Projects." The request should be sent to the IRB Coordinator, 210 Administration.

For protocols requiring FULL IRB review, please submit your request at least one month prior to the current expiration date. (High-risk protocols may require even more time for approval.) For protocols requiring an EXPEDITED or EXEMPT review, submit your request at least two weeks prior to the current expiration date. Failure to obtain approval for a continuation *on or prior to* the currently approved expiration date will result in termination of the protocol and you will be required to submit a new protocol to the IRB before continuing the project. Data collected past the protocol expiration date may need to be eliminated from the dataset should you wish to publish. Only data collected under a currently approved protocol can be certified by the IRB for any purpose.

If you have questions or need any assistance from the IRB, please contact me at 210 Administration Building, 5-2208, or irb@uark.edu.

Appendix D: Social Behavior Coding Scheme

Social Behavior Coding, Family Reading project

Coding categories will focus on behaviors of Child (C) and Parent (P) on each page of the book. Each page will be coded for duration and number of words spoken by each participant. Interactions about the book just read (e.g., Did you like that book?, That was a funny one) and interactions in between books (e.g., Which one should we read next?, Let's read this one) will be coded b/b for between books.

Codes are in four broad categories, with Verbal and Nonverbal components in each category. The number of occurrences of each subcategory by each participant per page will be recorded.

Coding Category/Subcategory	Category Definition

1. BOOK CONTENT

Verbal

Reading text on page A,S,N	P reads text from the page of the book. A=All or almost all, S=Some, N=None
C Repeats Text? C/rt	Does C repeat one or more words that P reads from the book? Yes/No
C Interrupts? C/I	Does C interrupt P's reading of text on page? (Includes talking over each other while P is reading) Yes/No
Concrete Question P/cq; C/cq	P or C asks a question about the content of the book that can be answered in one word or with a point (e.g. Where's the bunny? What's this? What does the cat say? All yes/no questions) (record #)
Descriptive Question P/dq; C/dq	P or C asks for a description about the content of the book, more than one word answer (e.g., What's he doing? What happened? What's he thinking? Why is he doing that?) (record #)
Making Connections P/mc; C/mc	P or C draws a connection between something that's happening in the book and something from their own lives (e.g., We caught fireflies once at Grandma's house, remember? Did we see any of these animals when we were at the zoo?) (record #)

Comment/Statement P/cs; C/cs | P or C makes a declarative statement <u>about the content of the book</u>, that is not in response to a question (e.g., I wonder what is going to happen next, Look at that strawberry!, That looks yummy!) (record #)

Answer/Response P/ar; C/ar | P or C verbally responds to a question or statement <u>about the content of the book.</u> (record #)

Request for clarification/repetition P/rc; C/rc | P or C asks the other to repeat/clarify something the other has said (e.g., What did you say? He saw a what?) (record #)

Clarify/Repeat P/cr; C/cr | P or C repeats or clarifies something the other or they themselves said. (e.g., Oh, you don't like snakes?,   Right, we did that once.) (record #)

Prompt or Help C with Response P/pcr | P prompts C to respond or helps child answer a question. (record #)

Unintelligible P/u; C/u | P or C says something unintelligible. (record #)

Nonverbal
Answer/Response NVP/ar;NV C/ar | P or C uses nonverbal response to answer question or respond to comment (e.g., nods head, points to a picture in the book). (record #)

Reinforce Reading text on page NVP/rr | P points (or uses C's hand to point) to text as it is being read. (Yes/No)

Prompt C Response NVP/pcr | P gives nonverbal prompt for C to respond (e.g., nudge, head nod, point at C, point at book, looks at C for response) (record #)

2. AFFECT

Verbal
Positive Affect P/pa; C/pa | C or P makes any statement or asks question regarding positive emotional response (e.g., I like this book, do you?, Oh boy, I can't wait!, This is fun!, I love you.) (record #)

Negative Affect P/na; C/na | C or P makes any statement or asks question regarding negative emotional response (e.g., I'm tired of this, I don't like this book, can we stop now?, can we read something else?) (record #)

Positive Reinforcement P/pr	P compliments C (e.g., Good job!, That's right!). (record #)
Negative Reinforcement P/nr	P corrects C or is critical of C's response (e.g., No-that's wrong; No, that's not right; No, it's this one over here) (record #)

Nonverbal

Positive Affect NVP/pa; NVC/pa	Did C or P express positive affect through nonverbal gestures, (smiling, laughing, hugs, kisses, etc.) (Yes/No)
Negative Affect NVP/na; NVC/na	Did C or P makes any expression of negative affect through nonverbal gestures (e.g., C tries to wiggle out of P's lap or walks away, frowning, audible sighing, "dirty" looks, crying). (Yes/No)

3. ATTENTION/ENGAGEMENT

Verbal

Prompt Attention/Engagement P/pe	P tries to engage or re-engage C in the interaction (e.g., Look here, Bobby?, Susie, come read with me, Do you want to read with me?, let's keep reading, Where are you going?, C'mon, let's look at the book now, Listen to the story) (record #)
Off-taskP/ot;C/ot	C or P makes an off-task comment or asks an off-task question (e.g., What are you eating?, Can you wait to go to the bathroom?, We'll get a snack later). (record #)

Nonverbal

Attention/Engagement NVP/ae; NVC/ae	C points at book or looks at book to follow along; C and/or P look at each other (record #)
Prompt Atten/Engage NVP/pe; NVC/pe	P or uses physical gestures (e.g., P holds up book and/or points to book, to try to get C's attention there, P taps C's leg) or P physically re-directs distracted C's attention back to the book experience (e.g., P picks C up or guides back to position by the book/camera). (record #)
Disengaged/Off-task NVC/do	C seems disinterested, distracted, looks away, not engaged in reading or interacting with P. (record #)

Distracting Event Occurs DE	Parent's phone rings, child needs potty break, baby starts crying. Yes/No

4. CONTROL OF BOOK/DEVICE

Verbal

Time for Page Turn – Positive P/ppt; C/ppt	P or C asks question or makes statement related to upcoming page turn (e.g. Let's turn the page now, Can I turn the page?, I want to turn the page, Go ahead and turn the page now.) (record #)
Time for Page Turn – Negative P/npt; C/npt	P or C makes a negative statement related to upcoming page turn (e.g., No, it's not time to turn the page; No, I'm not finished reading yet; Why can't I turn it?) (record #)
Successful Page Turn P/spt; C/spt	P or C makes positive statement related to completed page turn (e.g., Good Job, you turned the page!, Thanks for turning the page, I turned the page for you) (record #)
Inappropriate Page Turn P/ipt; C/ipt	C turns page before P is finished reading or to an out of sequence page, and P comments or questions (.e.g., Not yet!, That's the wrong page, What page were we on?) (record #)
Physical Control – Positive P/ppc; C/ppc	P or C asks question or makes statement related to physical control of book/device (e.g., Can I hold it?, Do you want to hold it?, I'll hold it for you) (record #)
Physical Control – Negative P/npc; C/npc	P or C makes negative statement related to physical control of book/device. Include struggle over text box. (e.g., I can't see the words when you hold it like that, No don't do that – I can't see the pictures, I can't read it if you do that) (record #)

Nonverbal

Successful Page Turn NVP/spt; NVC/spt	P or C turns page at appropriate time. (Yes/No)
Inappropriate Page Turn NVP/ipt; NVC/ipt	C turns page inappropriately. (Yes/No)
Turn Pages to Repair NVP/rpt	P turns pages or prompts C to turn pages back to recover from inappropriate page turn. (Yes/No)

Prevent Page Turn NVP/ppt; NVC/ppt

P holds page down or holds C's hand to prevent C from early page turn, C tries to prevent P from turning page. (Yes/No)

Physical Control-Negative NVP/npc; NVC/npc

P and C struggle over physical control of book/device. (pushing/pulling book or device, pushing other's hand away) Include struggle over text box (repeatedly tapping screen). Yes/No

Appendix E: Demographic Questionnaire

Family Reading Project

Thank you for agreeing to participate in the Family Reading Project. Please note that all of the information you provide will remain confidential.

This survey must be filled out by the person who will be reading with the child on each visit.

Please place an x in the brackets [   ] next to your response. When you have completed the questionnaire, please save the file and send it back to us as an e-mail attachment as soon as possible.

1) Are you a:

    [   ] Mother or female primary guardian of a child between the ages of 2 and 4
    [   ] Father or male primary guardian of a child between the ages of 2 and 4
    [   ] Other relationship with the child who will participate. Please specify:

2) How many children (ages 0-18 years) in total are you raising in your home?

    [   ]One
    [   ]Two
    [   ]Three
    [   ]Four
    [   ]Five
    [   ]Six or more

3) Is your household a:

    [   ] Single-parent family
    [   ] Two-parent family

4) Are you employed full-time, part-time, unemployed, retired, or a full-time homemaker?

    [   ]Employed Full-time
    [   ]Employed Part-time
    [   ]Unemployed
    [   ]Retired
    [   ]Full-time homemaker
    [   ]Other. Please specify:

5) What is your race or ethnic background?

    [   ]White

[   ]African-American or Black
[   ]Hispanic or Latino
[   ]Asian-American
[   ]Multi-racial
[   ]Other. Please specify:

6) What was the last grade of school you completed?

[   ]Some high school
[   ]High school graduate
[   ]Special or technical training
[   ]Some college
[   ]2 year college graduate (Associates Degree)
[   ]4 year college graduate (Bachelor's degree)
[   ]Some graduate study
[   ]Graduate degree (Master's, PhD, JD, MD)

7) What is your household's annual income?

[   ] Less than $15,000
[   ] $15,000 - $25,000
[   ] $25,000 - $50,000
[   ] More than $50,000

8) How old is the child who will participate in this project?

[   ] 2 1/2
[   ] 3
[   ] 3 1/2
[   ] Other. Please specify:

9) Is the child a boy or girl?

[   ] Boy
[   ] Girl

10) How often do you read books with your child?

[   ] Every day
[   ] Two or three times a week
[   ] Once a week
[   ] Less than once a week
[   ] Never

Your name:

Your child's name:

Please e-mail your completed survey as soon as possible to   grevelle@uark.edu. Thank you!