PARENT COMMUNICATION DURING SHARED READING WITH GIRLS WITH RETT SYNDROME: THE IMPACT OF PRINT REFERENCING

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ABSTRACT

Allison L. Dennis: Parent Communication During Shared Reading With Girls With Rett Syndrome: The Impact Of Print Referencing
(Under the direction of Karen A. Erickson)

Shared reading is an engaging activity that can be used to facilitate communication between parents and their children. This is true for children with and without disabilities. The current study describes the communication that mothers used during shared reading with their daughters with Rett syndrome when reading unfamiliar books before and after the mothers learned to use a print referencing strategy (Justice & Ezell, 2004; Sim & Berthelsen, 2014). Three mother and daughter dyads were recorded six times each while engaging in their typical style of shared reading using unfamiliar electronic books. Then, mothers were taught a print referencing strategy, and their communication during shared reading was, again, recorded six times while reading unfamiliar, electronic books. The shared reading interactions were transcribed and analyzed for similarities and differences across conditions. The results suggest that teaching mothers of girls with Rett syndrome a print referencing strategy to use during shared reading significantly increases the use of print referencing. It was also determined that other forms of communication were not negatively affected by the introduction of the print referencing strategy. This study demonstrates that the well-researched strategy called print referencing can be added to shared reading with girls with Rett syndrome without negatively impacting parental communication.

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CHAPTER 1

The purpose of the current study was to identify the language and communication mothers use during shared reading of unfamiliar, electronic books with girls with Rett syndrome before and after mothers learned a print referencing strategy. Shared reading provides an important context to support language and is a common activity between parents and their children. For children with Rett syndrome, a genetic disorder characterized by difficulties with purposeful use of hands, cognitive abilities, motor planning, communication, and language (IRSF, 2014), supporting language and communication development are especially important. Identifying the language used by mothers of girls with Rett syndrome, during multiple conditions of shared reading, has the potential to lead to information about the things parents can and should say to support cognitive, communication, and language development in their daughters.

Shared reading is an engaging activity that parents and children can complete together to help develop emergent language and literacy skills (National Early Literacy Panel, 2004). During shared reading, parents can use their child's interests to capture and sustain attention for the purpose of supporting interaction. This activity is particularly useful for parents because it requires little training and no formal materials. There are several different approaches to shared reading but each has the common element of an adult and child interacting around a text. Dialogic reading (Whitehurst et al., 1988) is probably the most widely known approach to shared reading.

Shared Reading

There has been a great deal of research conducted with young children to determine the effects of shared reading on language and literacy development. As a result, shared reading is an activity that is used regularly with children without disabilities (Hargrave & Sénéchal, 2000; Justice, Kaderavek, Fan, Sofka, & Hunt, 2009; Price, van Kleeck, & Huberty, 2009; van Kleeck, 2008) and is recommended for early childhood educators and parents (National Early Literacy Panel, 2004). Shared reading has proven to be successful when delivered one-on-one or in small groups (Hargrave & Sénéchal, 2000), with a parent (Gettinger & Stoiber, 2014) or teacher (Liboiron & Soto, 2006), in school settings (Liboiron & Soto, 2006) and in home settings (Leech & Rowe, 2014). While the research supports shared reading as an intervention with many different reading partners, the fact that parents can do it successfully ultimately increases the learning opportunities for children.

Parents as partners in shared reading. As mentioned, one of the benefits of shared reading is that parents can successfully use it with their children (Gettinger & Stoiber, 2014). This is the case for children with disabilities (Hargrave & Sénéchal, 2000; Jordan, Miller, & Riley, 2011; Skotko, Koppenhaver, & Erickson, 2004) and without disabilities (Price, van Kleeck, & Huberty, 2009). The main purpose of shared reading is to promote interaction about and around the text to build language, communication, and emergent literacy understandings. The role of the parent is to facilitate the interaction, which provides a platform to scaffold skills that are critical to literacy acquisition (Bellon-Harn & Harn, 2008). Examples include: (a) labeling objects in the illustration (e.g., “That is a big goldfish!”); (b) talking about what is going on in the book (e.g., “I wonder how much that goldfish weighs?”); (c) referencing the print (e.g., “Every sentence starts with a capital letter.”) (Justice et al., 2009); and (d) making real life

connections to the story (e.g., “My friend Karen has a big goldfish at her house.”). Since parents are familiar and well informed regarding their child’s experiences, the opportunity to make connections is more likely to occur than it might with other adult reading partners. To maximize shared reading outcomes, parents must work to scaffold the shared book reading experience and facilitate a safe and supportive environment in which the child feels comfortable exploring new skills and possibly making mistakes (Liboiron & Soto, 2006). To facilitate this, much of the previous research related to shared reading has been conducted in home settings with parents who have an established rapport with their child (Bellon-Harn & Harn, 2008; Skotko et al., 2004).

In their work on shared book reading, Justice and Kaderavek (2003) discussed the fact that “adult-child interactions during storybook reading are reciprocal, dynamic, and mediated by children’s maturing linguistic capabilities” (p. 395). It follows that reading every word on the page from start to finish is often not the best way to read with young children (Bellon & Ogletree, 2000), as it minimizes interactions between the child and the reader. Instead, the parent should engage the child through commenting and responding to the child’s initiations. In fact, it is important that the parent attempt to engage the child in multi-step communication exchanges, meaning back and forth interactions regarding the things that engage the child’s interest. In order for the child to have a truly reciprocal and dynamic interaction with the adult, the two must establish a common respect for one another. Thus, the selection of parents as the reading partner for repeated book readings is quite effective.

Parent communication during shared reading. Research regarding parent communication during shared book reading has been conducted with parents and children with a range of abilities (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Cronan, Cruz, Arriaga, &

Sarkin, 1996; Skotko et al., 2004). Specific information about the things that parents say during shared reading is valuable when determining the types of communicative interactions that influence child outcomes. There are certain types of words, comments, questions, etc. that contribute to or detract from the overall benefit of shared reading for children.

A variety of coding systems have been used to categorize the way parents communicate during shared reading. For example, during shared reading of unfamiliar storybooks, parents have been categorized as describers, collaborators, and comprehenders (Haden, Reese, & Fivush, 1996). Parent communication has also been described when reading expository texts as compared to storybooks (Hammett-Price, van Kleeck, & Huberty, 2009). During expository readings, parents engaged in increased instances of comments that were extratextual (i.e., use of language not found in the book) and offered feedback (i.e., praise and reinforcement in response to child language). Coding parent communication by style and context increases the opportunity for researchers to understand how parents provide models of language during shared reading.

Parent communication during shared book reading has been explored from a variety of perspectives including children of different ages, genders, and abilities using a variety of texts and methods for coding the language parents use (Leech & Rowe, 2014; Pellegrini, Brody, & Sigel, 1985; Vandermaas-Peeler, Sassine, Price, & Brilhart, 2011; Walsh & Blewitt, 2006). This existing body of research influenced and informed the coding system for the current study.

Print referencing during shared reading. One specific shared reading intervention with an increasing research base is print referencing. This is an intervention that is designed to increase attention to print. However, when print referencing is used during shared reading there are several positive effects on child outcomes including: (a) oral language (Allor & McCathren,

2003; Catts & Kamhi, 2005; Hargrave & Sénéchal, 2000); (b) phonological awareness (Allor & McCathren, 2003); and (c) print awareness (Catts & Kamhi, 2005).

The main focus of the research on print referencing has been child outcomes, but there is reason to believe that print referencing might influence the things that parents say during shared reading (Justice & Ezell, 2004; Sim & Berthelsen, 2014). Research does indicate that print referencing leads to increases in parent behaviors such as: (a) discussing the book; (b) making comments about words and letters on the page; (c) posing questions about words about letters; (d) pointing to the words when talking about the story; (e) tracking the words when reading; (f) commenting about rhyme; (g) commenting about words having the same beginning or ending sound; and (h) talking about the letters (Sim & Berthelsen, 2014). Research shows that print referencing increases visual attention to print and positively supports a variety of literacy outcomes for children (Allor & McCathren, 2003; Catts & Kamhi, 2005; Hargrave & Sénéchal, 2000), but more needs to be known about the potential impact print referencing has on parent communication during shared reading.

Shared reading and children with disabilities. While research on print referencing has not been conducted with children with development disabilities, shared reading has been widely studied with children with a range of developmental disabilities (Bellon-Harn & Harn, 2008; Liboiron & Soto, 2006; Skotko et al., 2004). Not unlike the research conducted with students without disabilities, the effects of shared reading on children with disabilities have been observed with a variety of participants and reading partners, in a variety of settings (Gettinger & Stoiber, 2014; Hargrave & Sénéchal, 2000; Leech & Rowe, 2014; Liboiron & Soto, 2006). Similarly, shared reading with children with disabilities supports the development of the same emergent

literacy and language skills that are developed with children without disabilities (Hargrave & Sénéchal, 2000; Jordan et al., 2011; Skotko et al., 2004).

Parent communication during shared reading with children with disabilities. Multiple studies have been conducted to investigate the language that parents use during shared reading with children with disabilities (e.g., Bellon-Harn & Harn, 2008; Liboiron & Soto, 2006; Light, Binger, & Smith, 1994; Skotko et al., 2004). Several studies have also explored the roles that parents take in shared reading interactions with their children. For example, in a study conducted by Light, Binger, and Smith (1994), mothers of children with developmental disabilities were found to dominate the conversation with directives when engaging in shared reading with their children. Other researchers, such as Liboiron and Soto (2006), found that parent communication with their children with disabilities reflected a more equal, conversational interaction. Parents accounted for 53.3% of the total interaction while the child accounted for the other 46.7% of the interaction. The communication strategies the parents in Liboiron and Soto's study used included: (a) questions; (b) cueing; (c) print references; (d) expansions; (e) cloze procedures; and (f) binary choices. These studies provide important information regarding parent communication during shared reading with children with disabilities, but additional research is essential.

One of the specific populations that has been the focus of early work on shared reading is Rett syndrome. The current study was designed to build on this research and explore the possible effects of parent communication during shared reading interactions before and after the introduction of a print referencing intervention with a group of children with developmental disabilities known to benefit from shared reading.

Shared book reading with children with Rett syndrome. Multiple studies have investigated parent communication during shared book reading, but only one has explored what

this looks like for parents and their girls with Rett syndrome (Koppenhaver, Erickson, & Skotko, 2001; Skotko et al., 2004). This study investigated the impact of unfamiliar storybooks, hand splints for the girls, interactions with and without the use of picture communication systems, and changes in the nature of the shared reading interaction before and after parent training.

One aspect of shared reading that Skotko et al. (2004) explored was the communication that mothers used during shared reading with their daughters with Rett syndrome. The researchers coded videos of shared readings that occurred in each stage of the study focusing on parent communication and behavior. Researchers determined that over the course of 4 months, the mothers decreased the number of directives used and increased instances of comments that were coded as prediction, inference, question, confirmation, and requesting clarification. The overall positive effects of shared reading on children increased when meaningful parent communication expanded. This study demonstrated that parent communication is an important factor in successful shared book reading. Although the findings from this research were important, the research was conducted nearly 2 decades ago, and it did not address the use of print referencing as an important component of shared reading. The current study aimed to gather additional information about the ways that parents engage in shared reading with their children with Rett syndrome, specifically the language that parents use while sharing unfamiliar books before and after being taught a print referencing strategy.

Purpose

The purpose of the current study was to identify the types of communication that mothers used when engaging in shared book reading with their children with Rett syndrome. More specifically, the study was designed to investigate differences in communication that mothers used when engaging in shared reading with unfamiliar books before and after learning a print

referencing strategy. This research involved three mothers and their daughters. The children were between the ages of three and eight and had a confirmed diagnosis of Rett syndrome. The mothers interacted with their daughters in natural settings using electronic books provided by the researcher.

An audio recording of the mother-daughter interaction was taken during each shared reading session. The recordings were transcribed and instances of parent communication were coded to determine the similarities and differences in parent communication while reading unfamiliar books, pre- and post-print referencing. Evaluating this condition may provide additional information about the factors that influence parent communication during shared book reading with girls with Rett syndrome.

The following research questions guided the investigation:

- *What is the function of what mothers say to their daughters with Rett syndrome while engaging in shared reading with unfamiliar electronic books*?
- *What is the function of what mothers say to their daughters with Rett syndrome while engaging in shared reading of unfamiliar electronic books after learning a print referencing strategy?*
- *Are there significant differences in each of the functions of communication that mothers use during shared reading before and after learning to implement a print referencing strategy?*

Currently, there is very little research regarding parent communication with daughters with Rett syndrome, and there is only one known study that investigated parent communication during shared reading with girls with Rett syndrome. However, there is a strong body of research to show that parent communication during shared reading with typically developing children,

and children with disabilities other than Rett syndrome can have a positive effect on child outcomes. In fact, the extant research suggests that parent communication during shared reading can improve cognitive and social outcomes for girls with Rett syndrome.

CHAPTER 2

REVIEW OF THE LITERATURE

The current study is focused on the communication between mothers and their daughters with Rett syndrome during shared reading interactions. Specifically, the study investigated things mothers said to their daughters while reading unfamiliar electronic books before and after learning a print referencing strategy.

Rett Syndrome

Rett syndrome, which occurs almost exclusively in females, is a neurological disorder that is caused by a genetic mutation that is typically identified between 6-18 months of age. Rett syndrome is characterized by a gradual deterioration of hand use and language loss (American Psychiatric Association, 2000). It is estimated that Rett syndrome affects approximately 1 in 10,000 females worldwide (Amir & Zoghbi, 2000). Although extremely rare, Rett syndrome can also occur in males. Prior to this onset of symptoms, parents and caregivers report normal development typically including the development of some speech and walking (Cass, Reilly, Owen, & Wisbeach, 2003); however, the onset of Rett syndrome is marked by a regression in or loss of these previously acquired skills.

Children with Rett syndrome experience difficulties with brain functions, which impact cognitive, emotional, and motor functions (IRSF, 2014). Early on, Rett syndrome is characterized by reduction in social interaction, communication, and play. As a child with Rett syndrome continues to grow, there is often a near or complete loss of speech and functional use

of hands. Children with Rett syndrome typically have apraxia, a disorder that effects planned movements, which is exacerbated by the fact that children with Rett syndrome typically engage in repetitive, nonfunctional hand movements (Smeets, Pelc, & Dan, 2011). These physical challenges can impair the child's ability to engage in her immediate surroundings. Furthermore, children with Rett syndrome often exhibit irritability and are frequently misdiagnosed as being on the Autism spectrum based on these characteristics (Matson, Fodstad, & Boisjoli, 2008). The characteristics of Rett syndrome can make interacting with others and engaging in educational activities very challenging. Additionally, health issues are a pervasive problem among children with Rett syndrome. These issues include seizures, respiratory problems, difficulty sleeping, and feeding complications (Neul, et al., 2010).

Although children with Rett syndrome can experience intellectual delays, their abilities are thought to be much higher than previously reported (Bylers & Symons, 2013). This is based on medical and educational research, advances in technology, and changes in assessment practices. Current research describes children with Rett syndrome who engage in purposeful and intentional communication (Hetzroni & Rubin, 2006; Skotko, Koppenhaver, & Erickson, 2004). Some individuals with Rett syndrome retain their ability to speak a few words or phrases, and in rare cases they may speak in sentences; however, the typical modes of communication for individuals with Rett syndrome continue to include gestures, vocalizations, and body positioning (Coleman, Brubaker, Hunter, & Smith, 1988). Therefore, parent communication provides a much-needed model and typically guides the communication exchanges and development among this population of children.

Parent Communication

The ways that parents communicate with their children impact the ways that children develop socially, emotionally, and academically (Mol, Bus, de Jong, & Smeets, 2008). Parent communication includes any means of passing information back and forth between parent and child including speech, sign language, gestures, pictures, communication devices, facial expressions, and vocalizations (Buijzen & Valkenburg, 2008). Although research has confirmed the importance of parent communication, the term "communicate" has been defined in many different ways in the research literature. Many studies of parent communication focus on two types of communication patterns: concept-oriented communication that emphasizes negotiation, individual ideas, and opinions, and socio-oriented communication, which emphasizes obedience and harmony (Carlson & Grossbart, 1988; Chaffee, McLeod, & Atkin, 1971). These studies suggest that some parents use a co-construction style of communication (concept-oriented) while others communicate in a more directive way (socio-oriented).

Language outcomes are of particular importance when parents communicate with young children. The language support that occurs during the early years of development has long lasting effects on performance. As such, parent-child communication has been the focus of numerous descriptive and intervention studies. For example, an intervention developed by Yoder and Warren (2002) examined the ways that parent communication can maintain child initiated requests and comments using Responsivity education and Pre-linguistic Milieu Training (RPMT). They found that parent participation in an educational session increased the probability that parents would respond to child communication acts. Thirty-nine dyads of parents and their toddlers or preschoolers with intellectual disabilities were randomly assigned to intervention and control groups. Parents in the intervention group were specifically taught RPMT, which is an

intervention aimed at using child centered play to teach intentional requesting and commenting (Yoder & Warren, 1998). Child-parent dyads were randomly assigned to the RPMT or control groups. Observational data were collected using: (a) the Communication and Symbolic Communication Scales (Prizant & Wetherby, 1993), (b) experimenter-child play sessions, and (c) parent-child sessions (Yoder & Warren, 1998). The resulting data were recorded and transcribed. What researchers found was that RPMT accelerated language growth compared to the control group. Additionally, RPMT facilitated more frequent and proportional parent responses to child comments. When parents increased their language modeling, there were increases in verbal responses from their children. These communication exchanges were most successful when parents relied on all types of communication behaviors from the child (e.g. gestures, eye gaze). The parents' use of RPMT helped children to generalize, maintain, and increase child initiated comments.

The ways that parents communicate responsiveness to their child's emotional signals (Cassidy, 1994) and the way parents establish routines in which to communicate their intentions (Siller & Sigman, 2002) are two characteristics of the social environment that influence the success of parent-child communication exchanges. For example, parents who consistently respond to infant communication attempts tend to have children who develop strong attachments and exhibit empathetic and pro-social behaviors, while inconsistent parent responses to infant communication attempts lead to insecure attachments (Kestenbaum, Farber, & Sroufe, 1989). This is true for both typically developing children and children with disabilities (Siller & Sigman, 2002). Similarly, parents who follow their child's interests during communication exchanges facilitate the development of joint attention (Adamson & Bakeman, 1984).

Establishing a shared point of interest, or joint attention, is the first step in successful parent-child communication.

Joint attention describes a shared focus in a shared context between a child and adult. According to Shaffer (1992), joint attention describes "an encounter between two individuals in which the participants pay joint attention to, and jointly act upon, some external topic" (p. 101). Since children rely on adults to help interpret the world, this joint attention is an important early means of engaging in communication activities. During infancy adults begin facilitating joint attention using objects and activities, or by sharing ideas (Smith, 1992). In a study of joint attention in New Zealand, 200 children, less than 24 months old, were observed for one hour on two separate days. A running record was kept to determine the communication interactions between the child and a caregiver. Researchers found that joint attention occurred most frequently during toy related play, followed by caregiver activities (e.g. dressing, diaper changing), and book reading. Book reading was an effective strategy for improving joint attention because it provided the framework for a meaningful interaction and a clear focus of shared attention. This activity led to more child initiated comments than other common activities. Specifically, the number of child-initiated comments was positively correlated with the number of adult-initiated comments. Furthermore, increasing the overall number of communication exchanges between the adult and child led to increased instances of joint attention (Smith, 1992).

Parents also support emotional development through their communication styles. This was shown in a study that examined styles of parent communication behaviors during discussions about emotionally charged topics (Leibowitz, Ramos-Marcuse, & Arsenio, 2002). Parents who used communication that addressed the child's emotions while showing nondirective responsiveness (e.g., "That clown you saw at the circus made you laugh didn't it?")

influenced that child's understanding of the emotional experiences. Parents who communicated in a directive way (e.g., "You were scared of that dinosaur. You don't want to see those again.") did not succeed in helping the child understand emotionally charged topics and develop emotional openness (Bretherton, 1991; Cassidy, 1994). Interestingly, a failure to communicate anything resulted in the same outcome as communicating in a directive way.

Directiveness and other aspects of parent communication behavior have been compared between parents of typically developing children and parents of children with developmental delays. For example, Siller and Sigman (2002) conducted a longitudinal study that examined communication between caregivers and children who had been diagnosed with autism, children who had been identified as having developmental delays, and children who were classified as being typically developing. The parent communication behaviors they found included variations of avoidance, intrusiveness, hindrance, reciprocity, co-construction, and support of child emotions. Researchers observed the same parent communication behaviors across parents of each of the three groups. The amount of time that mothers spent with their child during engaging activities, the mother's use of language to identify and label objects, and the frequency of utterances with various pragmatic functions were all found to be common parent communication behaviors regardless of the abilities of the child.

Variations in parent communication styles have also been studied across different environments and with children of different ages. For example, observational investigations of parent communication during interactions with their children have been conducted in contrived settings such as university laboratories. In one of these contrived studies, Leibowitz, Ramos-Marcuse, and Arsenio (2002), presented parents with a set of pictures depicting various emotions (i.e., happiness, sadness, anger, fear). Parents were then asked to discuss an event that involved

the child and one of the target emotions. Parents were intentionally given vague directions regarding the task in an attempt to decrease researcher interference. The observations suggest that parents who used child-referenced emotions, exhibited little to no negativity, and followed the child's interests had children who were more likely to reciprocate. This, in turn, increased the opportunity for parents to co-construct dialogue with their children.

Similarly, a university laboratory was used to observe caregiver communication behaviors during non-structured play activities (Siller & Sigman, 2002). Parents were instructed to play with their children and one of ten preselected toys. Parent communication behaviors were initially recorded during two separate sessions. Follow-up observations took place after one year, ten years, and sixteen years. At each time interval, parent communication behaviors were transcribed and coded. Specific parent communication behaviors that were observed and recorded included indicating behaviors (e.g., pointing, nodding, gestures, avoidance) and verbalizations. At the one-year follow-up, children's communicative gains were small and could not be predicted by the parents' communication; however, a significant correlation was found between non-demanding parent utterances and child language outcomes at the ten-year and sixteen-year follow-up. This coding system and subsequent analysis led the researchers to conclude that caregivers who used non-demanding communication behaviors (both verbal and nonverbal) during the baseline observation continued to practice the same behaviors at each follow-up. Furthermore, non-demanding communication behaviors were positively correlated with child communication outcomes at the last two measurement points.

Mirroring a child's interest and communication in a non-demanding way is an effective way to increase child outcomes including joint attention, the quality of verbal and nonverbal communication, and cognitive clarity (Siller & Sigman, 2002). In general, research consistently

shows that following the child's interest is a useful method of parent communication. This can include mirroring or simple pointing, showing, and talking about an object.

Based on a theory proposed by Oppenheim and Waters (1995), parents can also engage their children in communication exchanges through a narrative format. A study conducted by Leibowitz, Ramos-Marcuse, and Arsenio (2002) supported this assumption by showing that parents who engaged in open emotional conversations that had the structure of a story or narrative, had children who spoke more coherently about their emotions to parents as well as other adults. Similarly, as part of a larger study, Kelly and Bailey (2013) examined the co-constructed narratives of 31 mother-child dyads. Mother-child communication exchanges about topics such as illness, hospitalizations, birthday parties, a Chuck-E-Cheese visit, and a roller coaster ride, were transcribed and analyzed. Maternal supports during conversations with their children were categorized by: (a) narrative additions, (b) the use of event prompts, and (c) the use of detail prompts. Data analysis revealed that maternal scaffolding had a significant effect on child response regardless of age. Additionally, mothers' additions significantly increased the children's ability to make their own additions to the co-constructed narratives. When mothers modeled narrative communication behaviors they provided language information to the child and increase the likelihood that communication will be on-topic and reciprocal.

Research has investigated parent-child communication exchanges in a range of contexts; however, a relatively limited set of parent behaviors (e.g., pointing, nodding, gestures, avoidance), utterances (emotion words, negative comments), communicative acts (negotiation, reinforcement, demands), and scaffolding behaviors have been studied (Buijzen & Valkenburg, 2008; Leibowitz, Ramos-Marcuse, & Arsenio, 2002; Siller & Sigman, 2002). Findings suggest that the context and topic of conversation influence the frequency of the full range of these

parent communication behaviors. One context that is of particular importance in the current investigation is shared book reading. It provides a focused context within which parent communication directly influences children. The following section describes the work that has been done to understand parent-child communication exchanges during shared book reading.

Shared Reading

In 1985, the Commission on Reading of the National Institute of Education called shared book reading "the single most important activity for developing the knowledge required for eventual success in reading" (p. 23). In 2009, the report of the National Early Literacy Panel confirmed the positive impact shared reading had on multiple language outcomes for a broad range of children. According to Justice and Ezell (2004), shared book reading is "the interaction that occurs when a child and adult look at or read a book together." It is a broad concept that refers to interactive reading without specific comprehension instruction. Furthermore, shared book reading is a reliable instructional practice that supports emergent literacy development (e.g., oral language, phonological awareness, print awareness) in children with and without disabilities (Hargrave & Sénéchal, 2000; Justice, Kadervavek, Fan, Sofka, & Hunt, 2009; Liboiron & Soto, 2006; Skotko et al., 2004).

Children without disabilities typically develop emergent literacy understandings before they start school or soon after they begin formal schooling (Catts & Kamhi, 2005). Oral language, phonological awareness, and print awareness are all literacy skills that are developed during the emergent literacy stage. These skills can be developed in isolation; however, it is significantly more meaningful for children to develop these skills during language-based activities that are grounded in text, such as shared reading (Bellon & Ogletree, 2000).

Successful shared reading is dependent on well-constructed exchanges between adults and children. When executed appropriately, shared reading is language-rich, child focused, and print based (Hargrave & Sénéchal, 2000; Justice et al., 2009; Liboiron & Soto, 2006; Skotko et al., 2004). Since reading is a language-based skill that shares many of the same components as oral language (Catts & Kamhi, 2005), the type of communication that adults use is critical to a child's oral language development. In fact, research indicates that a student's language competence is a strong predictor of later literacy skills (Mehta, Foorman, Branum-Martin, & Taylor, 2005). Parents of children with and without disabilities can capitalize on the opportunity to use effective parent communication to engage in shared reading as a means of supporting language development as well as other positive social and academic student outcomes (Khami & Catts, 1999).

A wealth of research exists to address the things that parents say and do as a means of communicating with their child during shared book reading. This body of research began by examining the communication behaviors of parents with typically developing children during shared reading. In the last two decades, this research has expanded to include children with disabilities. In the following sections, the current body of research will be examined to identify parent communication used during shared reading activities with children with and without disabilities.

Shared reading and children without disabilities. In their work on shared book readings with children without disabilities, Justice and Kaderavek (2003) discuss the importance of a balanced communication exchange that is driven by the child's interests. The adult must use communication that not only scaffolds the shared book reading, but also facilitates a safe and supportive environment (Liboiron & Soto, 2006). Much of the previous research related to

shared book reading has been conducted in home settings with parents and children who have an established rapport and a history of communication exchanges. Conducting research in home settings is one way to facilitate a safe and supportive environment where parents can model effective communication (Bellon-Harn & Harn, 2008; Skotko et al., 2004).

Research conducted with parents and their typically developing children has identified several important characteristics of parent communication during shared reading. These characteristics include modeling successful communication, supporting reciprocity (Allor & McCathren, 2003), articulating sounds and individual words, and modeling narrative discourse (Schickedanz, 1999). According to Clay (2013), language is a valuable source of information for literacy activities, and it follows that parent communication would support child language and communication development.

Shared book reading provides a platform for parents to exhibit communication, which scaffolds skills that are critical to literacy acquisition (Bellon-Harn & Harn, 2008). During shared book reading, critical aspects of parent communication appear to include: (a) labeling objects in the illustration (e.g., "I see a big, red boat."), (b) talking about what is going on in the book (e.g., "I wonder where that boat is going?"), (c) referring to real life connections to the story (e.g., "I rode on a boat last summer!"), and (d) referencing the print (Justice et al., 2009). Additionally, parents are most able to model useful communication when focused on engaging in communication with their children by commenting and responding to the children's initiations and interests rather than reading every page from start to finish (Bellon & Ogletree, 2000).

It is also important for parents to vary the semantic and pragmatic functions used while communicating with their children during shared reading. Research shows that developing semantic and pragmatic knowledge leads to a more complex understanding of language (Moats,

2010). These skills are important because semantics is the feature of language that regulates the meaning of words, while pragmatics refers to the ways in which language is used in context (Catts & Kamhi, 2005). When engaging in shared book reading, parents use communication to assist children in developing knowledge of semantics to determine word meaning (i.e., lexical semantics) and sentence meaning (i.e., sentential semantics). Parents can engage in think aloud processes during shared book reading to model how they make sense of words and sentences. Over time, children can apply this knowledge to real-life communication exchanges (i.e., situational pragmatics; Moats, 2010).

Shared reading has also been investigated in classroom settings with teachers reading one-on-one with children and with small groups of children. For example, in a study conducted by Hargrave and Sénéchal (2000), shared book reading was used in preschool classrooms with typically developing children. The goal was to determine if the intervention was beneficial for the expressive language of 36 preschool aged children. Classrooms were randomly assigned to two different groups and teachers of one group received a one-hour training regarding their communication that emphasized questioning, repeating, encouraging, and following the child during shared reading while the second group of teachers was instructed to engage in their typical method of shared book reading. All of the reading groups were exposed to the same ten books and each book was read twice for the benefit of repeated readings. The results of the intervention revealed that children with poor vocabularies benefited from shared book reading regardless of the intervention; however, significantly larger gains in expressive vocabulary were made in the group with teachers who participated in training. This information indicates that the communication refining process that occurred during the teacher training had a positive effect on the child participants' oral language. Although this particular study occurred in a teacher-student

exchange, it highlights the significant influence and potential benefits of adult communication in the context of shared reading.

Although some parents and teachers successfully engage in shared reading without training or specific supports, others appear to benefit from training and a structured approach. According to Huebner and Meltzoff (2005), shared reading is most effective when the adult involves the child. Whitehurst et al. (1988) were the first to describe Dialogic Reading as a framework for structuring shared reading and involving a child in shared reading to the greatest extent possible. Like other approaches to shared reading, Dialogic Reading emphasizes reading with a child as opposed to reading at or to a child. Dialogic Reading is characterized by techniques including asking questions, giving feedback, and adjusting language to the child's developmental level. The three main tenants of Dialogic Reading are: (a) use of illustrations to encourage child communication, (b) providing informative feedback by expanding or modeling what the child says, and (c) adapting and remaining aware of the child's needs (Mol, Bus, de Jong, & Smeets, 2008). Variations in parental reading style can affect the development of child language, thus Dialogic Reading provides a research proven structure to guide adult language during shared reading.

Dialogic Reading is somewhat formulaic and is often described using two mnemonics: PEER and CROWD. The process framework for Dialogic Reading is *PEER*. This stands for: *Prompt* the child to verbally participate, *Evaluate* the child's accuracy of response, *Expand* on the child's utterances, and *Repeat* the child's response. The purpose of PEER is to stimulate a child's language and activate the child's verbal involvement during shared reading. The second mnemonic, *CROWD*, refers to the types of prompts that should be used during Dialogic Reading. These prompts include: *Completion* (e.g. "This book is about the three little _____?"); *Recall*

(e.g. “How many blind mice were in the story?”); *Open ended* (“I love candy. Do you have a favorite type of candy?”); *Wh-* (e.g. Where was little bunny Foo Foo walking?”); and *Distancing* (e.g. “The dog in the book is named Clifford. I know you have a dog at home. What is your dog’s name?”). Combining PEER and CROWD provides adults with the help they need to conduct Dialogic Reading in a way that positively supports the child’s language development.

A Dialogic Reading intervention for “at risk” children was implemented in a study conducted by Brannon, Dauksas, Coleman, Israelson, and Williams (2013). These researchers used an approach called PARTNERS training (i.e. Parents as Reading Teachers Nightly Encouraging Reading Success) to assist parents in using Dialogic Reading. Thirteen families, with a child between 3 and 4 years old, participated in the study. Each received a 12-minute training video about Dialogic Reading along with children’s books, corresponding parent notes that reiterated the Dialogic Reading strategy and included sample questions parents could ask their children, and suggestions for vocabulary that could be introduced based on the specific books being used for the intervention. The subsequent intervention required parents to read 10-15 minutes a day for 12 weeks using Dialogic Reading strategies. Children were given a new book to read at the beginning of each week. Reading sessions were audio recorded and transcribed. Results indicated that children whose parents received the PARTNER intervention correctly named 61% more of the words they attempted than the children in the control group. The parent-child communication exchanges showed that parents who received PARTNER training increased the amount of Dialogic Reading questions they used over the course of the 12-week intervention. In a two year follow up, researchers found that parents who received the PARTNER training in the initial study used 90% more Dialogic Reading behaviors than the parents who did not receive the training.

Regardless of a child's current knowledge, shared book reading is a language rich activity that has been shown to support substantial growth in oral language development (Hargrave & Sénéchal, 2000). This is because adult communication during shared reading provides rich language that children can build upon. Regardless of disability status, when children engage in shared book reading, story related language and structures begin to appear in their oral language (Liboiron & Soto, 2006). Since shared book reading is designed to be conversational and centered around communication, it also teaches important concepts about language (Koppenhaver, Coleman, Kalman, & Yoder, 1991). This is the case for children with and without disabilities.

Shared reading and children with significant disabilities. It has long been believed that children with significant disabilities are unable to ever learn to read and write; however, this is an erroneous belief (Crowe, Norris, & Hoffman, 2000; Dale, Crain-Thoreson, Notari-Syverson, & Cole, 1996; Ezell, Justice, & Parsons, 2000). Beukelman, McGinnis, and Morrow (1991) assert, "persons may be judged to be non-literate simply because they have not been given the necessary access to educational opportunities that develop and enhance literacy" (p. 177). Research proves that children with significant disabilities acquire literacy at a slower rate than their same age peers (Allor, Mathes, Roberts, Cheatham, & Champlin, 2010); therefore, literacy instruction must be adjusted to accommodate these differences (Saint-Laurent, Glasson, & Couture, 1998). The term *accommodate* encompasses a range of elements (e.g. length of interaction, text format, mode of child response) including adult communication. Since educational opportunities happen at home as well as school, it is important for parents to also know how to accommodate their children's needs as they engage in communication exchanges during activities such as shared book reading in order to support their child's language learning.

Research has been conducted to determine the benefits of shared book reading on young children with a range of disabilities (Bellon-Harn & Harn, 2008; Kaderavek, Pentimonti, & Justice, 2013; Liboiron & Soto, 2006; Skotko et al., 2004). A study by Bellon-Harn and Harn (2008) explored shared reading as an intervention for a six-year-old girl with moderate cognitive disabilities. In condition one, shared reading was observed with scaffolding while condition two included scaffolding combined with access to an augmentative and alternative communication (AAC) device. Scaffolding consisted of three separate strategies: *wh*-questions, modeling, and expansion. Under both conditions, the parent consistently used modeling more than *wh*-questions and expansion. Total parent communication increased with the inclusion of AAC because, as the authors suggest, the device provided an additional language support. Within conditions, the complexity of parent comments increased across readings. The authors attributed this to the familiarity that resulted from repeated readings. Overall the parent primarily used modeling during shared reading, which in turn provided the child with more opportunities to engage in communication exchanges.

Kaderavek, Pentimonti, and Justice (2013) investigated the quality of adult shared book reading behaviors of teachers, parents, and children with language impairments. Participants included 16 children with communication impairments, and a teacher and parent for each child. Researchers found that teachers and parents were consistent in their style of book reading with no significant differences in adult communication from spring to fall. Teacher and parent communication was placed in three categories: abstract thinking, print/phonological skills, and elaborations. Teachers consistently used all of the behaviors more frequently than parents. However, it was noted that teachers support language in groups during which communication exchanges are not focused on a single child. As a result, teachers are more likely to communicate

in diverse ways to meet the needs of the children they teach. Conversely, parents carry the responsibility of modeling and initiating communication with a single child, which likely restricts the diversity of their communication. Differences aside, the most commonly used form of communication for both parents and teachers involved prompting children to think abstractly.

Shared reading between mothers and children with disabilities in the home setting has been examined. In a study conducted by Justice and Kaderavek (2003), shared reading interactions between 11 mother-child dyads were transcribed and analyzed to determine the language parents used with their children. This was a part of a larger study aimed at examining storybook interactions between parents and children with language impairments (see Justice, Kaderavek, & Grimm, 2003). Communication exchanges were captured four times a week for two weeks for this particular analysis. Maternal utterances were coded with the following codes: (a) introduces new topic; (b) maintains own topic; (c) supporting partner topic; (d) joint topic (adding to the partner's topic); (e) extension of joint topic; and (f) reinforcement. Results revealed that 42% of maternal comments introduced a new topic. The subsequent categories included supporting partner topic (18%), maintain own topic (17%), and joint topic (16%). Behaviors coded as an extension of the joint topic and reinforcement comments were used nominally. This indicated that shared book reading is an opportunity for mothers to introduce new topics and model language, using the support of the text.

As discussed earlier, Dialogic Reading is a strategy that structures shared reading. It is commonly used during shared reading with children with and without disabilities. For example, in a study conducted by Fleury, Miramontez, Hudson, and Schwartz (2014), a Dialogic Reading intervention was used with children with autism spectrum disorder. Three parent-child dyads were included, and intervention effectiveness was measured by session duration, on-task

behavior, verbal participation, and response to prompt type. Parents were observed during shared reading sessions with their child then trained on the PEER and CROWD strategies and asked to engage in shared reading sessions again. Dialogic Reading had little to no effect on on-task behavior, but sessions after the Dialogic Reading training lasted longer than the baseline shared reading sessions. Furthermore, the verbal participation of all three children increased; however, the prompts that elicited the most responses varied among children. Dialogic Reading was used to support parent communication during shared reading, extend the length of the shared reading, and increase the verbal participation of the children.

While other researchers have investigated interventions they called shared reading, their theoretical foundation, goals, and procedures do not reflect the definition of shared reading in the current study. For example, Mims, Browder, Baker, Lee, and Spooner (2009) stated that their goal for employing shared reading was "increasing emerging literacy skills in students with significant disabilities" (pg. 409). However, instead of emphasizing the interaction and language learning they, like Browder, Lee, and Mims (2011), utilized a task analysis method for the purpose of improving the students' ability to respond to comprehension questions. Participants in both studies were taught to respond correctly (e.g. touching an object, vocalization) to specific comprehension questions about the text. The goal was not to increase interaction or support the development of important emergent literacy understandings. The goal was to improve ability to respond to comprehension questions, which is quite different from the early language and literacy goals typical of most shared reading interventions.

A variety of studies have addressed the effects of parent communication during shared reading with children with and without disabilities. Findings consistently suggest that shared reading has a positive effect on child outcomes and is largely influenced by the parent

communication that occurs during this intervention. Refining the intervention strategy and examining possible differences in parent communication with specific populations of children will continue to influence the way best practice for shared reading is defined.

Girls with Rett syndrome. At this time a study by Skotko and colleagues (2004) is the only known study that addresses the issue of parent-child shared reading with girls with Rett syndrome. The authors reported the results in three different articles (Koppenhaver, Erickson, & Skotko 2001; Koppenhaver et al., 2001; Skotko et al., 2004), but the Skotko et al., (2004) report will be the focus here since it offers the most systematic analysis of the parent communication in the study.

Skotko et al., (2004) reported results for four females with a diagnosis of Rett syndrome, ages 3.6-7 years old, and their mothers. This study was as a part of a larger project aimed at understanding the way girls with Rett syndrome engage with text (e.g. attention to text, communication attempts) during shared book reading with a parent. The researchers addressed specific questions regarding the use of unfamiliar text under four conditions (i.e. baseline, hand splinting of girls, introduction of augmentative and alternative communication, print referencing intervention; see Koppenhaver, et al. (2001) for the most complete description of each condition). Each condition was investigated in one of four phases, which each spanned one month.

Parent communication was examined during each phase. Parents were not provided with information about specific strategies they could use to improve their use of simple voice output communication devices and extend their wait time when expecting a child's response until Phase IV. Prior to this final phase, they were also shown how the strategies worked with their own children and were given opportunities for guided practice and questions. The strategies parents

were asked to use during the final phase included: (a) attributing meaning to all communication attempts; (b) prompting the use of communication devices using natural comments, not directing; (c) providing sufficient wait time; and (d) asking questions and making comments that make use of the voice output communication device and symbols provided by the researchers. Although data on parent communication was collected during all four phases, it was only during the last phase that parents were provided instruction regarding their own communication during shared book reading.

Parent communication and behaviors were coded across all sessions using the following codes: (a) requests for attention, (b) pointing to symbols, (c) pointing in books, (d) labeling, (e) describing, (f) relating scenes to the child's life, (g) directives, (h) action in the book, (i) prediction or inference comments and questions, (j) emphasizing print or sound concepts, (k) confirming or requesting clarification, (l) behavior management, and (m) assisting the girl with turning book pages. The codes were then used to determine the parent communication behaviors that best predicted a girl's appropriate use of the voice output communication devices and symbols, as well as their labeling and commenting. At the conclusion of the four-month project, it was determined that there were no significant differences in the familiar and unfamiliar book reading conditions. For this reason, both conditions were collapsed into a single unit.

After participating in the parent training session, three of the mothers showed a dramatic decrease in the number of direct commands used while the number of prediction and inference comments increased. The fourth mother increased her use of prediction and inference comments while still using direct commands. Additionally, all four mothers increased the frequency of confirmation, praise and modeling by pointing to illustrations. The changes in parent communication behaviors resulted in the child's increased use of labeling and commenting.

During phase IV, overall communicative interactions increased and the focus on mothers directing their daughter's communication behaviors shifted to a dialogue between the two. Although mothers initially read the text with dramatic emphasis it was not until phase IV that all four mothers extended their communication behaviors to include pointing to picture symbols, asking prediction or inference questions, labeling illustrations, describing, and relating the text to the child's life. The results of the intervention revealed the addition of specific parent communication behaviors in phase IV resulted in increased engagement and meaningful communication for the child.

The use of print referencing. Print referencing can be described as an intervention in which adults point out specific features of print during shared reading. This can be accomplished using verbal communication behaviors such as commenting, questioning, or requesting. Non-verbal communication behaviors (e.g. finger tracking print while reading) can be also be used during print referencing (Justice, Pullen, & Pence, 2008). This intervention supports numerous literacy skills identified in the National Early Literacy Panel Report (NELP; National Early Literacy Panel, 2004), which makes print referencing a high priority activity to incorporate in shared reading (Breit-Smith, Justice, McGinty, & Kaderavek, 2009). For example, print knowledge, a predictor of later word recognition (NELP, 2004), is one of the skills specifically supported by print referencing. While print referencing is accepted as an important intervention, researchers cannot agree on the intensity and frequency of print referencing needed to promote positive impacts on children's literacy skills (Breit-Smith et al., 2009).

Shared reading is the most commonly used activity to facilitate print referencing. During shared reading, there are frequent opportunities for the adult to discuss and draw attention to print (Breit-Smith et al., 2009). Print referencing can be done by asking questions about print

(e.g., “How many L’s do you see on this page?”), commenting about print (e.g., “This word is dog.”), or tracking one’s finger along print while reading. In a study conducted by Justice, Kaderavek, Bowles, and Grimm (2005), print referencing embedded in the context of shared reading was used as an intervention for supporting print awareness. During the intervention, 23 teachers and 106 typically developing children were randomly assigned to condition one (i.e., shared book reading with print referencing) or condition two (i.e., shared book reading delivered as normal). Teachers who used the print referencing strategy were provided with a 1-day workshop. The intervention took place over the course of 30 weeks, with both groups reading the same books. The results of the intervention revealed that the children who received shared reading with print referencing had significantly higher gains in print concept knowledge (i.e., knowledge of the way that print is organized in various texts and the function it serves), alphabet knowledge (i.e., the names and distinctive features of individual alphabet letters), and name writing ability. Although print referencing during shared reading does not immediately result in word reading skills, the fact that it improves print knowledge contributes to later success in reading.

In a similar study of print referencing, Gettinger and Stoiber (2014) found the use of a print referencing intervention to have positive effects on child language outcomes. Baseline data were taken to determine teacher use of print referencing during shared reading. Interactions were also analyzed to determine levels of child engagement, alphabet knowledge, and knowledge of print concepts. Teachers then participated in a 60-minute training session. More specifically, teachers were taught the concept of *opportunities to respond*. Using the opportunities to respond concept during shared reading prompts children to attend to and interact with the book while providing explicit information about print and the alphabet. Observational data and post

intervention information revealed that teachers' post training use of print referencing reflected a large treatment effect. Child engagement increased by 25%, alphabet knowledge increased by an average of 5-6 letters, and concepts of print increased by an average of 4-5 concepts. Gettinger and Stoiber (2014) determined that adult use of print referencing with many opportunities to respond, had positive outcomes on child engagement and language.

When using print referencing during shared reading, researchers have paid particular attention to the books they select with particular consideration of features such as print and print saliency (Justice & Ezell, 2004; Justice et al., 2009; Justice, Skibbe, McGinty, Piasta, & Petrill, 2011). It appears that print referencing requires the selection of books with print that is salient, which means the print is not embedded in the illustration nor otherwise blends with the background of the page. This provides parents opportunities to communicate in a way that supports print knowledge during shared reading.

Book selection in shared reading. Book selection can impact parent communication behaviors during shared book reading. Researchers have used a variety of strategies to select books for shared reading including color and content of illustrations (Lovelace & Stewart, 2007), size of print, and interactive features (e.g. lift-up flaps; Ezell, et al., 2000). Books used during shared book reading with print referencing often include fictional characters, animals, or other high interest topics. Parent communication behaviors are highly influenced by the book being used; therefore, it is necessary to be thoughtful during the selection process. Familiar topics and themes provide parents with multiple opportunities to connect text to the child's personal experiences (Breit-Smith et al., 2009).

Familiar versus unfamiliar books. Parents using shared reading to support language and literacy development in their children need texts that interest and engage their children. Using familiar storybooks provides parents and children with text that includes frequently occurring and easy to predict words. McArthur, Adamson, and Deckner (2005) examined the change in parent communication, as unfamiliar books became familiar books through repeated readings. Parent communication focused on specific, tangible aspects of the text when the book was unfamiliar; however, their communication shifted to address a wider variety of topics when the text was familiar. Furthermore, parents reading familiar books asked more complex questions and pushed their children to think about less tangible aspects of the book. Familiarity with the book allowed parents and their children to engage in communication that extended beyond the text when reading familiar books.

In contrast, unfamiliar books are important because they provide parents with the opportunity to highlight unfamiliar vocabulary and support the acquisition of new vocabulary. Unfamiliar text offers parents the context to introduce new language, which can then be mirrored by the child (Hammett-Price, van Kleeck, & Huberty, 2009). A study conducted by van Kleeck, Gillam, Hamilton, and McGrath (1997) compared the quantity and complexity of parent language when reading familiar and unfamiliar books with their children. For this intervention, 35 children participated in a familiar and unfamiliar shared reading session with both their mother and father. Parent utterances were coded into the following categories: (a) story related, (b) related to print or book conventions, (c) management interaction, and (d) related the text to life. Researchers found that parents provided children with more input and demonstrated more variation in types of communication (e.g. labeling, identifying) when reading unfamiliar books as compared to reading familiar books. This suggests that parents communicated more and

elaborated on the text when the topic was new and less familiar to the child. Unfamiliar books can become familiar books after repeated readings, which may be part of the value found in repeated reading (Bedrosian, 1999).

Electronic versus paper books. As technology advances at a rapid rate, the question of electronic versus paper books has arisen in the research. It is agreed that good text is important for both formats of books. Important features include bold print, few words on each page, and illustrations that relate to the text (Justice & Kaderavek, 2003). The small amount of research available suggests that there are negative or neutral effects of electronic books on language development in children. For example, when children take charge of the actual mechanics of book reading, parents tend to use less language, and the interactive communication diminishes (Cheng & Tsai, 2014).

The way that technology is often used in society is to provide autonomy and independence; therefore, the use of electronic books may shift the goal of shared reading to focus on behaviors other than language (Hillman & Marshall, 2009). Parent communication becomes less of a focus as children learn how to maneuver a mouse or keyboard, or navigate a specific computer program. It is possible that parent's language becomes less rich when using electronic books and book related behaviors become the targeted skill; however, the long-term effects of electronic books have yet to be systematically researched (Parish-Morris, Mahajan, Hirsh-Pasek, Golinkoff, & Collins, 2013). Furthermore, the impact of electronic books has not been studied when parents maintain control over the mechanics and intentionally continue the communication exchange.

Although technology is rapidly evolving and becoming more present in educational environments, it is not possible to make any conclusions about the effects of using electronic

books during shared reading at this time. More research is needed to better understand the impact of electronic versus traditional paper books on the interactions parents have with their children. Regardless of the type of books used, it remains important to identify the language and communication parents are using during shared reading. This can be done through careful observation, transcription, and analysis of shared reading interactions between a parent and child.

Coding Parent Communication During Shared Reading

A number of coding systems have been employed to describe the language parents use during shared reading. For example, one study by Haden, Reese, and Fivush (1996) utilized a set of six codes to categorize language used by parents during shared reading with familiar and non-familiar books. The codes included: (a) descriptions, (b) predictions/inferences, (c) general knowledge, (d) print knowledge, (e) confirmations, and (f) other (i.e., off task comments). As stated previously, the researchers used these codes to determine that parents fell into three categories: describers, collaborators, or comprehenders. When reading unfamiliar books, describers used comments that emphasized vocabulary; collaborators primarily used confirmations and followed their child's interest; and comprehenders used predictions and inference questions as well as general knowledge comments. The researchers set out to compare parent language during reading of familiar and unfamiliar books, but there were no differences between the two conditions so the data were collapsed.

In a comparison of shared reading of storybooks and expository texts, Hammett-Price et al., (2009) used three primary codes to categorize parent utterances and determine similarities and differences across the different text types (i.e., storybooks, expository text). Their codes were: (a) print- and book-convention utterances; (b) feedback and acknowledgement utterances (including praise); and (c) book content related utterances. They found that parent-child dyads

that engaged in more talk, engaged in shared reading for longer periods of time. It was also determined that significantly more (approximately twice the amount) parent-child communication and extratextual comments occurred when reading expository text, which had more information and more diverse vocabulary than storybooks. When reading expository text, parents also provided children with more feedback and acknowledgement, which may have contributed to the child's confidence and willingness to participate. With both types of text, parents tended to use language that was slightly above the average expressive language abilities for children of the same age.

Summary

Parent communication can support language development in young children with and without disabilities. Shared book reading is a specific form of parent communication that promotes communication between parents and their children (Hargrave & Sénéchal, 2000; Skotko et al., 2004; Jordan, Miller, & Riley, 2011, Justice et al., 2009; Hammett-Price, et al., 2009). Girls with Rett syndrome need the same supports and opportunities as other children their age; however, their inability to use verbal communication alters their access to many of these learning opportunities. Shared book reading is one context that appears to support interaction between parents and children with Rett syndrome (Skotko et al., 2004). Prior to the current study, the impact of shared reading of electronic books with and without print referencing on parent communication has not been studied with children that have Rett syndrome. Observing mother-child dyads under these various conditions provided insight into what mothers say when engaging in shared book reading with their daughters with Rett syndrome, which may inform and ultimately be used to improve outcomes for girls with Rett syndrome as it increases understanding of the impact of print referencing on parent communication. The current

investigation drew upon the extant research spanning all forms of parent-child shared reading specifically focusing on unfamiliar book readings (Haden, et al., 1996; Skotko et al., 2004) and the impact of print referencing (e.g., Breit-Smith et al., 2009; Justice et al., 2008).

CHAPTER 3

METHODS

The purpose of the proposed study was to examine the communication of mothers when engaging in shared reading of electronic texts with their daughters with Rett syndrome before and after learning to use print referencing. Twelve shared reading interactions between each mother-daughter dyad were recorded for the purpose of the current study. Audio recordings were transcribed and each mother's communication was analyzed for trends as well as similarities and differences across conditions.

Research Questions

Research questions for the current study were developed to target variations of shared book reading with unfamiliar books, before and after implementing a print referencing strategy. The specific questions were:

- *What is the function of what mothers say to their daughters with Rett syndrome while engaging in shared reading with unfamiliar electronic books*?
- *What is the function of what mothers say to their daughters with Rett syndrome while engaging in shared reading of unfamiliar electronic books after learning a print referencing strategy?*
- *Are there significant differences in each of the functions of communication that mothers use during shared reading before and after learning to implement a print referencing strategy?*

Participants

Three girls with Rett syndrome, ages 36-96 months, and their mothers participated in the current study. Child participants were required to have a confirmed diagnosis of Rett syndrome. The age range was selected to ensure that the child participants would be in the same relative stage of Rett Syndrome development. The children had to have no known uncorrected vision or hearing loss. Participants were part of a larger study focused on the impact of print referencing on visual attention to print among girls with Rett syndrome. The dyads in the current study were the first three dyads to complete the protocol in the larger study.

Participants were recruited through the International Rett Syndrome Foundation. Specifically, multiple foundation liaisons were contacted and provided with an email, contact information and details of the study, which was shared with members via email, social media, and word of mouth. Interested families contacted the researchers of the larger study. The contact information was turned over to the researcher who made initial contact with each family, responded to questions they had, and secured consent before proceeding with coordinating completion of the study with each dyad.

Dyad descriptive information. The three children that participated in the current study were all Caucasian. Two dyads were located in the United States (one on the east coast, one on the west coast), while the third dyad was located in Canada. Each dyad consisted of a mother and her biological daughter. Each dyad was assigned a number with the mother and child in each dyad assigned the same number (i.e. Dyad 1 comprised child 1 and mother 1). Each of the mothers had completed college and two of the mothers had a professional background in the field of education. Two of the mothers worked full-time out of the home, and the third was a stay-at-home mother. Each of the child participants came from a family with siblings. Two

families had two children and one family had three children. Both parents in all dyads lived in the home. All three fathers were employed full time outside of the home. All three families received a range of therapy and support services in their homes and all three girls attended school or preschool each week. All three girls had complex communication needs and used or were learning to use an augmentative and alternative voice output communication device that they accessed via eye-gaze technology. Demographics are summarized in Table 3.1.

Table 3.1

Child Participant Demographics

	Age	Siblings	School	Communication Device
Child 1	62 months	1 – younger sister 1 – older sister	Full-time, public, kindergarten	Tobii Dynavox with eye gaze access
Child 2	49 months	1 – older sister	Part-time, private, preschool	Tobii Dynavox with eye gaze access
Child 3	74 months	1 – younger sister	Full-time, public, first grade	Tobii Dynavox with eye gaze access

Parent participation. Initial communication with parents consisted of an email confirming their interest and asking them to provide times they could be contacted by phone. The phone calls included an overview of the purpose, protocol, and commitment for the larger study. Parents were given the opportunity to ask questions about the study and provide information about their daughter with Rett syndrome. At the conclusion of the phone call, parents were asked if they were still interested in participating in larger study. Parents who confirmed interest were offered a hard copy or email copy of the consent form to sign and return.

Since the current study was designed to investigate the things the mothers were saying during shared reading, mothers were not specifically informed of this in order to mitigate influence on parent communication. However, mothers did know they were being recorded and that the

recordings were a part of the data being used. They also knew that the focus of the larger study was understanding how their child visually attended to print and pictures in the book during their shared reading interactions.

Measures

During the initial stage of the study, mothers were asked to complete the *Inventory of Potential Communicative Acts* (Sigafoos et al., 2000), which is a measure of pre-symbolic communication development. An interview, consisting of two measures including the *Activity Recall Literacy Orientation* (Needleman, Fried, Morley, Taylor, & Zuckerman, 1991) and *Parent Reading Belief Inventory* (DeBaryshe, 1993) was conducted. For the *Activity Recall Literacy Orientation* (Needleman et al., 1991), each mother provided feedback about her daughter's typical day including meal times, school, time with siblings, and therapies. The interview also gathered information about the child's preferred activities, interests, TV characters, etc. This information was useful in determining the types of books that would appeal to participants. The *Parent Reading Belief Inventory* (DeBaryshe, 1993) is a Likert scale questionnaire that probes the mother's beliefs about reading such as the importance of reading, her daughter's ability to read, her own interest in reading, and her daughter's potential to read in the future. Copies of these assessments are provided in Appendix A.

The researcher worked with parents to administer an adapted version of Clay's *Observation Survey of Early Literacy Achievement* (2013), which includes a measure of alphabet knowledge and print awareness (e.g. differences between words and letters, print has meaning, and the function of punctuation). This assessment was administered by the parents with live guidance from the research who was interacting with the mother-daughter dyad via Skype. The purpose of this assessment was to understand each child's print knowledge prior to starting the study.

Procedures

Upon completion of child assessments and parent interviews, a laptop computer was shipped to the home of each dyad. The researcher worked with mothers to help them become familiar with the computers, the software, and the procedure for completing a shared book reading using the electronic books. Mothers then used the computers to engage in shared reading with their daughters with Rett syndrome. Each reading was recorded automatically on the computer used to read the books.

Technology. The PC laptops provided to each family where shipped with charger, a Tobii PCEye Go, and a packet of parent information detailing the step-by-step process for: (a) turning the computer on; (b) attaching the PCEye Go; (c) signing in and using Skype (audio and video software); (d) starting the Minimal Eye Reader software; (e) selecting books from Tar Heel Reader bookshelf; and (f) closing down all programs and shutting down the computer. Laptops were pre-loaded with Skype and Minimal Eye Reader (records and saves audio from shared reading). Minimal Eye Reader is a software program that was developed at the University of North Carolina at Chapel Hill to automate the process of recording reading sessions and automatically saving them for later analysis. Minimal Eye Reader made it possible for mothers to click on a single shortcut icon on the computer's desktop to launch all of the required software and initiate the save process automatically. The use of the Minimal Eye Reader and directions for selecting Tar Heel Reader books was also described during interactions on Skype.

Shared reading procedures. Mothers interacted with their daughters in their home using digital books provided by the researcher through the Tar Heel Reader online library of books (http://tarheelreader.org). The library includes more than 50,000 books, but a bookshelf was created for the current study that included a total of 33 books. Dyad 2 was provided an additional

10 books after the mother requested specific topics that were of interest to her daughter. All of the books were created in collaboration with the researchers from the larger study to control for length, topic, and number of words per page. Mothers were asked to read a different unfamiliar book during each reading session. During the first six reading sessions, mothers were told to select a book from the electronic bookshelf and use their typical style of shared reading. The book titles and features of all books are described in Appendix B. The specific titles selected by each dyad read are provided in Table 3.2.

After completing the first six readings, mothers were taught a print referencing strategy (Justice et al., 2008). Teaching was conducted remotely using Skype. The print referencing parent development session consisted of a nine slide PowerPoint and three short videos depicting examples of print referencing during shared reading. The researcher led PowerPoint discussion lasted approximately 30 minutes, followed by a short video. Mothers were then provided links and asked to watch the other two videos before starting the second portion of the study.

Once mothers felt comfortable using the print referencing strategy, they completed a practice shared reading with their daughter. The practice session was not included in study data. Since the practice session was viewed remotely, necessary feedback regarding the print referencing strategy was given immediately. Upon completion of a successful use of print referencing strategies during training, mothers received a new set of books and completed the selection process again, reading six unfamiliar books.

Table 3.2

Electronic Books Selected for Shared Reading

	Book 1	Book 2	Book 3	Book 4	Book 5	Book 6
Dyad 1						
Pre Intervention	Hot Air Balloons	Swimming	Let's Start a Band	What to Wear	Puppies Grow	Martha the Cow
Post Print Referencing Intervention	Feel the Ocean Breeze	Flying on Airplanes	Spring Break	Balloon Rhymes	A Trip to the Zoo	Max and Maggie
Dyad 2						
Pre Intervention	Martha the Cow	A Trip to the Zoo	Spot and the Storm	Pet Party	Crazy Colors	If You Give a Bear Some Bacon
Post Print Referencing Intervention	Sammy Squirrel	My Friends Love to Eat	Strange Families	How to Clean a Dirty Dog	The Busy Spider	Will and Jack
Dyad 3						
Pre Intervention	Growing My Sunflower	Puppies Grow	Colors of Flowers	From Seed to Plant	Hot Air Balloons	On Sunday
Post Print Referencing Intervention	What to Wear	Feel the Ocean Breeze	The Busy Family	Let's Start a Band	Potatoes	A Good Friend

Coding. Audio files of shared readings were transcribed and then reviewed by the researcher to identify appropriate coding categories. The specific codes are defined in detail in Appendix C and include: (a) words, (b) words from text, (c) repetitive words from text, (d) extratextual words, (e) words generated on voice output device, (f) questions, (g) real life connections, (h) book driven directives, (i) disability management, (j) print referencing, (k) child initiations, and (l) response to child.

After the primary researcher coded all parent transcripts, one transcript from the before and after intervention condition was randomly selected for each dyad. A second researcher with a master's degree in education coded the randomly selected transcripts. The two sets of coded transcripts were compared point-by-point to determine interrater reliability. Average point-by-point agreement across all codes was 90.8% and ranged from a low of 79.4% (disability management) to 99.8% (extratextual utterance).

Analysis

Data from coded transcripts were used to determine the similarities and differences in parent communication while reading unfamiliar text before and after implementing print referencing. For each condition, the coded transcripts were analyzed to determine the total number of: (a) words, (b) words from text, (c) repetitive words from text, (d) extratextual words, (e) words generated on voice output device, (f) questions, (g) real life connections, (h) book driven directives, (i) disability management, (j) print referencing, (k) child initiations, and (l) response to child. The total length (in seconds) was also determined for each reading sessions so that codes could be converted to a common per second metric to support comparison across books, phase, and dyad.

These dependent variables were analyzed with reference to each of the research questions as described below:

- *What is the function of what mothers say to their daughters with Rett syndrome while engaging in shared reading with unfamiliar books*? Descriptive statistics were used to summarize mothers' communication during the first six readings of unfamiliar text, which occurred prior to the print referencing intervention.

- *What is the function of what mothers say to their daughters with Rett syndrome while engaging in shared reading after implementing a print referencing strategy?* Descriptive statistics were used to summarize mothers' communication across the six shared readings in the post print referencing condition.
- *Are there significant differences in each of the functions of communication that mothers use during shared reading before and after learning to implement a print referencing strategy?* Data collected during shared reading before and after mothers learned the print referencing strategy were compared using a series of Wilcoxon signed-rank tests.

Although quantitative data was analyzed as reported above, qualitative analysis was also necessary to fully describe parent communication as reflected in the extratextual coding.

CHAPTER 4

RESULTS

The purpose of this study was to examine the ways mothers communicate with their daughters with Rett syndrome when engaging in shared reading before and after learning to use print referencing. In this chapter, the results are presented relative to each research question for the group and dyads individually. First, more complete descriptions of each child participant is provided.

Child Participants

Before dyads began shared book reading, the researcher worked with the mothers to gather information about each child in order to establish a greater understanding of her literacy and communication skills at baseline. The mothers completed the *Inventory of Potential Communicative Acts* (Sigafoos et al., 2000), which is a measure of pre-symbolic communication development, and participated in an interview comprised of the *Activity Recall Literacy Orientation* (Needleman, Fried, Morley, Taylor, & Zuckerman, 1991), which gathers information about the daughter's typical day and interests, and the *Parent Reading Belief Inventory* (DeBaryshe, 1993), which looks at the mother's beliefs about reading (see Appendix A). The researcher also worked with parents to administer an adapted version of Clay's *Observation Survey of Early Literacy Achievement* (2013), which includes measures of alphabet knowledge and print awareness (e.g., differences between words and letters, print has meaning, and the function of punctuation). This assessment was administered by the parents with guidance from

the researcher who was interacting with the mother-daughter dyad via Skype. The purpose of this assessment was to understand each child's print knowledge prior to starting the study.

Child one. The child from Dyad 1 was reported to greet others and communicate pleasure by smiling, making vocalizations, and kicking her legs. She was reported to show displeasure by furrowing her brow, screaming, or clapping. She is also reported to use some gestures (e.g. putting her hands in her mouth when she is ready to eat) and eye gaze (e.g. looking at the remote when she wants to watch a movie). If uninterested in engaging with individuals or social settings, she often falls asleep. Letter identification and concept of print were difficult tasks to assess via Skype due to child 1's apraxia, which makes it extremely difficult for her to plan and execute observable responses even when she knows the answer. Nonetheless, she correctly identified 4 of 26 letters, and demonstrated concept of first and last, recognized an inverted picture, and identified where to begin reading.

Child two. The child from Dyad 2 is reported to make eye contact, smile, giggle, or use vocalizations and her voice output device to greet or communicate pleasure. In contrast, she is reported to close her eyes, turn her head, or whine to communicate displeasure or disinterest. She can independently navigate her voice output device using eye gaze technology and regularly uses a variety of page sets to communicate with both familiar and unfamiliar communication partners. The Tobii voice output device is her primary source of communication, and she uses it to do things like order food (e.g. "sweet potato French fries"), ask for more information (e.g. "I don't understand"), or direct a partner when playing a game (e.g. move a piece, draw a card). Working with her mother and the researcher over Skype, she correctly identified 25 of 26 letters and demonstrated concept of first and last, recognized an inverted picture, and identified where to begin reading.

Child three. The child from Dyad 3 is reported to communicate pleasure by smiling, making eye contact, leaning forward, and making vocalizations. She is reported to show displeasure by avoiding eye contact, pouting, or crying. She is reported to communicate using several words (e.g. mama), gestures (e.g. standing by the bathtub when she's ready for a bath), or her Tobii voice output device (e.g. "tired," "all done"), which she accesses via eye gaze technology. Working with her mother and the researcher, she was able to correctly identify 14 of 26 letters, but was uninterested in completing the concept of print task so it could not be completed.

Maternal Communication While Reading

The three mothers varied in the ways that they communicated during shared readings with their daughters with Rett syndrome. The mother from Dyad 1 made the fewest changes after the print referencing intervention, while the mother from Dyad 3 made the most noticeable changes. Mother 3 accomplished this by almost tripling her use of extratextual words after the print referencing intervention. Both pre- and post-print referencing intervention, the mother from Dyad 2 used the most spoken language. As a result, she asked the most questions and made the most comments. As described in more detail below, these differences remained when the data were standardized on a per-minute basis.

The mothers in the three dyads differed across most of the variables of interest in the current study. For example, the mother from Dyad 1 asked virtually no questions, while the mother from Dyad 2 asked an average of 50 questions per shared reading session, across all readings. In contrast, the mothers from Dyad 2 and Dyad 3 increased their reading times, while the mother from Dyad 1 decreased her reading time after implementing the print referencing

strategy. As expected, all three mothers increased instances of print referencing post intervention. More specific information regarding each mother and the group is provided below.

Maternal Communication During Shared Reading Before Print Referencing

Before the print referencing intervention, mothers read six unfamiliar books with their daughters with Rett syndrome. As a group, the average number of pages in the books they read was 14.56 pages (range 7 - 21). The average length of each book reading session was 417 seconds (SD = 87.49). The average number of extratextual words mothers used per reading session was 265.61 (SD = 320.64). These extratextual words include all words mothers produced that were not read verbatim from the text.

Prior to the print referencing intervention, the mothers from Dyad 1 and Dyad 3 communicated in similar ways during shared reading with their daughters with Rett syndrome. Both mother's rarely asked questions (Mother 1, $X = 2$; Mother 3, $X = 3.17$), made real life connections (Mother 1, $X = 1.67$; Mother 3, $X = 0.5$) or responded to their daughter's vocalizations (Child 1, $X = 3.17$; Child 3, $X = 2.67$; Mother 1, $X = 0.8$; Mother 3, $X = 0.5$), which yielded a response rate of 25.24% for Dyad 1 and 18.73% for Dyad 3. Mother 1 used slightly more extratextual words (Mother 1, $X = 57.67$; Mother 3, $X = 52$) and had a slightly longer average length of interaction (Mother 1, $X = 117$ seconds; Mother 3, $X = 80.83$ seconds). Neither mother from Dyad 1 or Dyad 3 utilized their daughters' voice output device or referenced the print during shared reading during the first half or the study.

The mother from Dyad 2 was different from the other mothers in the ways that she communicated during shared reading with her daughter with Rett syndrome. She used many more extratextual words ($X = 687.17$), which were reflected in various forms of communication. Primarily she asked questions ($X = 45.17$), responded to her daughter's vocalizations (Child, $X =$

21.17; Mother, $X = 19.0$) which yielded a response rate of 89.75%, and made real life connections ($X = 13.83$); however, she also gave book driven directives ($X = 8.0$), made references to print ($X = 6.67$) and modeled words on her daughter's voice output device ($X = 5.33$). As a result of the increased communication, the average length of interaction for Dyad 2 was much longer than the other two dyads ($X = 417$ seconds versus 117 and 80.83 seconds). Table 4.1 displays additional descriptive statistics for each of the variables of interest for the three mothers as a group and individually.

Table 4.1

Average (Standard Deviation) Frequency Count for Each Variable for the Group and Individual Mothers Pre Print Referencing Intervention

	Group	Dyad 1	Dyad 2	Dyad 3
	Pre	Pre	Pre	Pre
Words	352.39 (327.62)	143.83 (37.79)	782 (169.69)	131.33 (49.13)
Words from Text	87.17 (27.42)	86.5 (30.70)	94.83 (18.49)	80.17 (33.8)
Repetitive Words from Text	9.83 (15.28)	0.33 (0.82)	29.17 (10.98)	-
Extratextual Words	265.61 (320.64)	57.67 (35.61)	687.17 (163.63)	52.0 (40.16)
Voice Output Device	1.78 (3.46)	-	5.33 (4.23)	-
Questions	16.78 (21.92)	2.0 (2.68)	45.17 (12.7)	3.17 (3.71)
Real Life Connections	5.33 (7.25)	1.67 (0.82)	13.83 (6.85)	0.50 (0.55)
Book Driven Directives	3.39 (3.81)	1.33 (1.03)	8.0 (3.03)	0.83 (0.75)
Disability Management	1.06 (1.55)	0.17 (0.41)	2.0 (2.28)	1.0 (0.89)
Print Referencing	2.22 (4.45)	-	6.67 (5.65)	-
Child Initiations	9.0 (9.87)	3.17 (5.0)	21.17 (5.67)	2.67 (2.73)
Response to Child	7.12 (9.45)	0.8 (1.79)	19.0 (4.52)	0.5 (0.84)
Length of Interaction	204.94 (164.36)	117.0 (44.24)	417 (87.49)	80.83 (22.52)

Maternal Communication During Shared Reading After Print Referencing

After the print referencing intervention, mothers read six unfamiliar books with their daughters with Rett syndrome. As a group, the average length of the books they read was a little shorter than the books they read pre-intervention 12.44 pages (range 7 - 34). However, the average length of each book reading session increased by 137.83 seconds to 554.83 seconds (SD = 202.93). The average number of extratextual words also increased by 105.78 words to 371.39 (SD = 433.58).

After the print referencing intervention, the mother from Dyad 1made few changes. She asked an average of 2 questions before the intervention and that was reduced to an average of 1 question per reading after the intervention. She did, however, increase her use of extratextual words by an average of 27.66 to 85.33 (*SD* = 53.26), which lead to an increase in real life connections by an average of 1.16 (*X* = 2.83). Importantly, her use of print referencing increased from 0 to an average of 3 references to the print in each reading session. She still did not use her daughter's voice output device during shared readings. In contrast, the mother from Dyad 3 made the greatest number of changes post intervention. She almost tripled her use of extratextual words (*X* = 134.67), which was reflected in the other ways that she communicated. She asked double the number of questions (*X* = 6.33), and she made a significant effort to use the print referencing strategy which she had not used at all prior to the intervention (*X* = 14). Mother 3 also increased her rate of response to her child's initiations by (Child, *X* = 2.5; Mother, *X* = 1.17) which yielded a response rate of 46.8% which was a 28.07% increase. The total length of shared reading interactions also increased by an average of 57.34 seconds (*X* = 138.17). Although these two mothers communicated in similar ways prior to the print referencing intervention, the data

revealed that the print referencing strategy influenced the communication in Mother 3 in ways it did not appear to impact Mother 1.

The mother from Dyad 2 continued to be different from the other two mothers. Like Mother 3, she increased her use of extratextual talk by an average of 296.5 words (X = 983.67) after the print referencing intervention. She continued to ask lots of questions with an average increase of 9.5 (X = 54.67) questions per book, and she responded to her daughter's audible initiations (Child, X = 45.17; Mother, X = 40) which yielded a response rate of 88.55%. She modeled words on her daughter's voice output device (X = 5). Additionally, she increased her use of print referencing by an average of 12.83 (X = 19.5), real life connections by an average of 2.17 (X = 16), and book driven directives by an average of 1.67 (X = 9.67). Dyad 2 also increased their average length of interaction by an average of 137.83 (X = 554.83 seconds). Table 4.2 displays additional descriptive statistics for each of the variables of interest post-intervention for the three mothers as a group and individually.

Table 4.2

Group and Individual Dyad Performance Post Print Referencing Intervention

	Group	Dyad 1	Dyad 2	Dyad 3
	Post	Post	Post	Post
Words	437.89 (458.09)	147.5 (54.9)	983.67 (377.91)	182.5 (175.62)
Words from Text	67.33 (37.89)	64.17 (19.85)	89.5 (51.96)	48.33 (27.41)
Repetitive Words from Text	9.78 (13.94)	0.67 (1.63)	17.5 (7.09)	11.17 (20.84)
Extratextual Words	371.39 (433.58)	85.33 (53.26)	894.17 (346.08)	134.67 (152.24)
Voice Output Device	1.67 (3.11)	-	5.0 (3.58)	-
Questions	20.67 (27.53)	1.0 (1.10)	54.67 (21.03)	6.33 (5.89)
Real Life Connections	6.61 (7.95)	2.83 (2.93)	16.0 (6.54)	1.0 (1.67)
Book Driven Directives	3.72 (5.41)	1.0 (1.55)	9.67 (5.72)	0.5 (0.84)
Disability Management	4.83 (6.05)	0.83 (1.60)	11.17 (6.43)	2.5 (2.56)
Print Referencing	12.17 (8.78)	3.0 (1.79)	19.5 (4.23)	14.0 (8.46)
Child Initiations	15.89 (24.62)	-	45.17 (22.52)	2.5 (2.51)
Response to Child	13.72 (22.08)	-	40.0 (20.3)	1.17 (1.47)
Length of Interaction	260.00 (250.20)	87.0 (28.33)	554.83 (202.93)	138.17 (113.2)

Differences in Maternal Communication During Shared Reading Before and After Print Referencing

Question 3 was primarily addressed using the sign-test. This test is an alternative to the parametric paired-samples t-test and the non-parametric Wilcoxon signed-rank test. The sign test was required in the current study because most variables violated assumptions of normality required for parametric analyses like the pair-samples t-test and the distributions of the differences between the pre- and post-intervention variables were not symmetrical, which makes the Wilcoxon signed-rank test inappropriate. There were three variables for which the distributions of the differences between the pre- and post-intervention were symmetrical: real life connections; child initiations; response to child, but only real life connections met the

assumption of symmetrical distribution of the differences. Therefore, only real life connections was compared pre- and post-intervention using the Wilcoxon signed-rank test. All others were compared using the sign-test. All analyses were completed using SPSS for Mac (v24).

Wilcoxon signed-rank tests. The test for differences in use of real life connections was not significant ($Z = -1.55$, $p = .877$), which indicates that the three mothers did not have significant differences in their use of real life connections as a result of adding print referencing to their reading interactions.

Sign-test. One-tailed exact sign-tests were used to compare the differences in each of the remaining variables before and after the print referencing intervention. Table 4.3 provides a summary of the number of positive, negative, and tied paired differences across variables before and after the print-referencing intervention. Each row displays a total of 18 comparisons, six for each dyad. Each of the comparisons reflects the change from before and after the print referencing intervention. Positive changes indicate that the behavior appeared more frequently after the intervention than before. Negative changes indicate that the behavior appeared less frequently after the intervention, and ties indicate no change. Although table 4.3 displays variables where most of the changes were positive (e.g., disability management), these differences did not reach statistical significance due to the limited power of the overall study.

Table 4.3.

Number of Positive, Negative, and Tied Paired Differences Across Variables Before and After the Print Referencing Intervention

	Negative	Positive	Tie
Extratextual Words	8	10	-
Voice Output Device	4	2	12
Questions	9	8	1
Real Life Connections	8	8	2
Book Driven Directives	11	5	2
Disability Management	4	11	3
Print Referencing	-	18	-
Child Initiations	7	7	4
Response to Child	2	9	7

Overall, the print-referencing intervention led to statistically significant increases in the use of print referencing ($p < .001$), but there were not significant differences for the remaining variables (extratextual, voice output device, questions, book driven directives, disability management, child initiations and response to child). This indicates that maternal communication did not change after adding print referencing to their shared reading interactions except for the addition of print referencing.

Summary

All three mothers made changes to the way they communicated after implementing the print referencing strategy. The overall length of interaction was longer and mothers referenced

print significantly more than they did in the first half of the study, prior to completing the training for print referencing. No other significant changes were noted, however, individual mothers made changes in other forms of communication such as extratextual words and rate of response to child initiations. Although some of the changes aren't statistically significant, the data suggests that a brief training on the use of print referencing during shared reading with girls with Rett syndrome can lead to positive changes in parent communication.

CHAPTER 5

DISCUSSION

Shared reading is one of the most important activities that parents and children can engage in to support the development of emergent language and literacy skills (National Early Literacy Panel, 2004). Shared reading has been widely researched with typically developing children (Hargrave & Sénéchal, 2000; Justice, Kaderavek, Fan, Sofka, & Hunt, 2009; Price, van Kleeck, & Huberty, 2009; van Kleeck, 2008), and children with a range of disabilities (Bellon-Harn & Harn, 2008; Kaderavek, Pentimonti, & Justice, 2013; Liboiron & Soto, 2006; Skotko, Koppenhaver, & Erickson, 2004). The purpose of the current study was to identify the language and communication mothers use during shared reading of unfamiliar, electronic books with girls with Rett syndrome before and after mothers learned a print referencing strategy. The findings contribute to the research literature in a number of ways.

Key Findings Related to Previous Research

Shared book reading is the interaction that occurs between a child and adult while looking at or reading a book together (Justice & Ezell, 2004). During shared reading, parents use their child's interests to foster joint attention, which supports the interaction. Shared book reading is particularly useful for parents because it requires little training and no formal materials. During shared reading, parents are known to communicate in a variety of ways. The aspects of parent communication that appear to be most critical during shared reading include: (a) labeling objects in the illustration, (b) talking about what is going on in the book, (c) referring

to real life connections to the story, and (d) referencing the print (Justice et al., 2009). The mothers in the current study demonstrated these aspects of shared reading.

Parent communication. The literature base points to two specific types of communication styles used by parents. A co-constructed, concept-oriented style of communication (Carlson & Grossbart, 1988; Chaffee, McLeod, & Atkin, 1971) and a directive, socio-oriented style of communication (Bretherton, 1991; Cassidy, 1994). The mothers in the current study primarily used a concept-oriented style of communication when engaging in shared reading with their daughters with Rett syndrome. As a group, their interactions were characterized by negotiation, and efforts to understand the child's ideas and opinions. There were instances when mothers took a more directive, socio-oriented communication approach as their tried to get their daughters' to attend or otherwise sought harmony by calming and directing the girls, but the dominant form of communication was concept-oriented. The following is an example of one of the mothers engaging in a concept-oriented style of communication with her daughter.

Child 2: "*Time"* (voice output device)

Mother 2: *Yeah, time to do what?*

Child 2: "*Book"* (voice output device)

Mother 2: *Time for the book.*

Child 2: Vocalization; "*Silly"* (voice output device)

Mother 2: *Time for a silly book. Did you like this book too?*

Child 2: Vocalization

Mother 2: *Hmm. What did you think about this book?*

Child 2: Vocalization

Mother 2: *Did you like it?*

Child 2: Vocalization

In this instance, the mother's questions repeatedly focused on trying to understand her daughter's opinion and negotiating next steps they would take in their shared reading efforts. Although all three mothers did direct their daughters on occasion (e.g. look over here), their interactions and questions repeatedly focused on negotiating a shared understanding of their daughter's ideas and opinions through a concept-oriented style of communication.

Joint attention. Parents who establish a shared point of interest during communication exchanges facilitate the development of joint attention (Adamson & Bakeman, 1984). Parents can increase joint attention by maximizing the number of communication exchanges they have with their children (Smith, 1992) and mirroring their child's interest and communication in a non-demanding way (Siller & Sigman, 2002). There is an added level of difficulty in establishing joint attention using these and other strategies when interacting with children like those in the current study who cannot use speech, signs, or symbols to effectively communicate their interests. This put an additional burden on the mothers to determine subjects that might interest their daughters and focus on those topics. Joint attention was used by two of the mothers (Mother 2 & Mother 3) in the current study, while the third mother (Mother 1) was not observed making connections or focusing on the interest of the child. The following is an example of a mother constructing joint attention despite her daughter's lack of speech:

Mother 3: *Seeds need rain* (text). *You see the rain?*

Turns Page

Mother 3: *Ok. Seeds need sun* (text). *I see the sun.*

Turns Page

Mother 3: *Seeds grow into plants* (text). *Right? Are you reading your book? Thank you.*

Turns Page

Mother 3: *They get bigger and bigger* (text). *Yay. That's oregano, and thyme, and I don't know what else.*

The two mothers (Mother 2 & Mother 3) who engaged in behaviors that are known to promote joint attention used real life connections and background knowledge about their daughters to make comments and ask questions that might peak their daughters interest.

Semantic and pragmatic use of language. The importance of varying semantic and pragmatic functions of communication during shared reading has been noted in the literature. Varying semantic and pragmatic functions leads to a more complex understanding of language (Moats, 2010). A variety of variables were coded that would capture semantic and/. pragmatic use of language including, (a) extratextual words, (b) questions, (c) real life connections, (d) book driven directives, and (e) print referencing. Only one of the mothers (Mother 2) in the current study communicated semantic and pragmatic knowledge during shared readings with her daughter with Rett syndrome. The following is an example of her use of lexical semantics (i.e. determining word meaning):

Mother 2: *My uncles are lazy,* (text) *Is that funny? Do you know what lazy means? It means when you don't want to do anything. Do you see those lazy uncles? Yeah.*

When engaging in shared book reading, the mother (Mother 2) used semantics to convey word meaning (i.e., lexical semantics) and sentence meaning (i.e., sentential semantics). She also engaged in thinking aloud to model how they make sense of words and sentences.

Training and a structured approach. Many approaches to shared reading include structured training for the adult partner. Similar to the study by Brannon, Dauksas, Coleman,

Israelson, and Williams (2013), that used a 12-minute video to teach parents an approach to Dialogic Reading (a structured approach to shared reading), the current study taught parents a strategy to use during shared reading. The short (i.e. approximately 30 minute), virtual training delivered via Skype and PowerPoint proved to be enough to significantly increase the amount of print referencing that the mothers used during shared reading with their daughters with Rett syndrome. During the training, mothers were informed about the benefits of print referencing on typically developing children, and taught ways they could use print referencing during shared reading with their daughter. Importantly, the mothers were taught to use the print referencing strategies in addition to the natural interactions they were already having with their daughters during shared reading. The results suggest that the parents learned and implemented print referencing with minimal training and support without sacrificing other important features of their interactions (e.g., negotiating to understand ideas and opinions, establishing joint attention).

Scaffolding. Scaffolding is a strategy that has been widely researched during shared reading with children with and without disabilities (Bellon-Harn & Harn, 2008; Buijzen & Valkenburg, 2008; Leibowitz, Ramos-Marcuse, & Arsenio, 2002; Liboiron & Soto, 2006; Siller & Sigman, 2002). Scaffolding can take many forms but is always aimed at moving a child to higher and more independent level of learning. For example, Bellon-Harn and Harn (2008) used *wh*-questions, modeling and expansion to provide scaffolding to a child with disabilities during a shared reading intervention.

All three of the mothers in the current study used scaffolding during shared reading with their daughters with Rett syndrome, however, they used this strategy with significantly different frequency. One mother (Mother 2) in particular provided scaffolding for her daughter

consistently throughout shared readings both before and after the print referencing strategy. The following is an example of a shared reading interaction that includes scaffolding:

Mother 2: *I want to see the zebra with the black and white stripes* (text). *What do you think? You like zebra's too. Right? You like zebras too, my love. What do you think?*

Child 2: "*Animals"* (voice output device), Vocalization

Mother 2: *Yeah. Is there an animal at the zoo that you like? I wonder if we'll see…*

Child 2: "*Pig"* (voice output device)

Mother 2: *Oh, I think the pig is at the farm. But, you're right, there was something. What was that called? The African hog, right? That we saw. Hummm. Let's see. Maybe that will make it in the book. Let's turn the page to find out. I'm going to model turn page,* "*turn page"* (voice output device). *Let's turn the page to find out.*

This mother used *wh*-questions, modeling and expansion, common scaffolding strategies according to Bellon-Harn and Harn (2008), to get her daughter to think independently and make connections that would extend her reading experience beyond the content of the text. Additionally, this mother (Mother 2) used her daughter's voice output device as an additional support by modeling language on the device. This supports Bellon-Harn and Harn (2008), who found that access to an AAC device provides an additional language support.

Modeling language. Justice and Kaderavek (2003) have noted the importance of shared reading as an opportunity to model language. The simple act of reading a book together provides the opportunity to model language, so in this sense all three mothers in the current study were able to model language successfully. However, the extent to which the mothers in the current study modeled language beyond the text varied. One of the mothers (Mother 1) stuck primarily to reading the text, another mother (Mother 3) modeled additional language by asking questions

and making real life connections, while the third mother (Mother 2) used the shared reading opportunity to seek opinions, have her daughter recall knowledge from previous experiences, and model language on her daughter's voice output communication device. The three mothers provided examples of how modeling language can vary based on communication style.

Interactive exchanges. According to Justice and Ezell (2004), shared book reading is "the interaction that occurs when a child and adult look at or read a book together." All three mothers in the current study engaged in shared reading meeting this definition; however, their levels of interaction varied. The differences centered largely on the parent and child's use of the child's voice output communication devices. Two of the mothers (Mother 1 and Mother 3) elected not to use their daughter's voice output devices during shared reading while the third mother (Mother 2) made her daughter's voice output device available during all shared reading interactions. Mother 2s use of the device appeared to be supported by her confidence with using the device and corresponding technology. The use of the voice output device appeared to influence the interaction that took place between the Mother 2 and Child 2. The daughter used her device to make comments about the book, recall information about previous experiences, and respond to her mother's comments and questions. Below is an exchange where Child 2 uses her voice output device to engage in the shared reading interaction:

Mother 2: *Ah, <u>shoe family</u> (text). I wonder, if the…let's go back. I wonder if the toe family and the shoe family are friends.*

Child 2: *"Silly"* (voice outout device)

Mother 2: *That is silly. Yes.*

Child 2: *"Bad"* (voice outout device)

Mother 2: *It's bad? Is that a bad joke?*

Child 2: Vocalization

Mother 2: *Yeah. Oh my goodness. Let's see.*

While the sole burden of communication rested on the mothers whose daughters did not have access to their voice output devices during the shared readings (Mother 1 and Mother 3), the third child took on some of the burden through her use of the device. The shared interaction between Mother 2 and Child 2 likely contributed to the overall length of the shared reading interaction for Dyad 2 and the range of communication Mother 2 employed. It is possible that the other two children would have shared in the responsibility if they had access to their voice output devices during the shared reading interactions, but the fact that the mothers chose not to give them access to the devices leaves the possibility open to future investigation. It is certainly the case that Mother 2 was able to respond to and build on her daughter's communication, which was something the other two mothers did not have the opportunity to do during their shared reading interactions in the current study.

Length of interaction after intervention. In a study conducted by Fleury, Miramontez, Hudson, and Schwartz (2014), a structured reading intervention (i.e. Dialogic Reading) was used with children with disabilities and their parents. The parent participants were taught two specific strategies (i.e. PEER and CROWD) to be used during shared reading with their child with disabilities. Researchers found that the overall length of the shared reading sessions was longer after parents implemented the reading strategies. This was also the case in the current study. After mothers implemented the print referencing strategy the overall length of the shared reading interactions increased by an average of 137.83 seconds (i.e. 2 minutes and 18 seconds). A longer reading interaction provided the daughters with more language input. Additionally, mothers had more opportunity to use a variety of communication functions such as questions, real life

connections, or print referencing. The findings of the current study suggest that implementing a print referencing strategy increases the overall length of shared reading interactions between mothers and their daughters with Rett syndrome.

Electronic Books. Currently, the limited research on electronic books suggests that they decrease the amount of parent communication because children tend to take charge of the actual mechanics of reading electronic books (Cheng & Tsai, 2014). The autonomy provided by electronic books allows the child to navigate and experience the book without the assistance of a parent. However, the children in the current study were not physically able to take over the book reading experience. As such, there was no evidence that mothers found it difficult to communicate and interact with their daughters. In fact, the mothers maintained control over the book reading and interacted with their daughters, while also helping their daughters manage posture, breathing, and in some cases a voice output device. The use of electronic books was not compared with print books, but it appeared that the electronic books helped mothers manage the book reading interaction while having hands free to provide assistance to the children when needed. It is possible that that the use of paper books would have resulted in more parent communication as is reported in the literature regarding book sharing with children without disabilities (Hillman & Marshall, 2009); however, the fact that the dyads were successful with electronic books is especially encouraging given that, in the future, the girls in this study are likely to read many more electronic books than traditional print books.

Print referencing. The focus of the current study was print referencing, which is an intervention where the adult partner points out specific features of print during shared reading. Print referencing can be accomplished through both verbal and non-verbal communication behaviors (Justice, Pullen, & Pence, 2008). Much of the previous research on print referencing

focuses on child outcomes, however, the results of the current study indicate that implementing a print referencing strategy has positive effects on the mothers' communication during shared reading with their daughters with Rett syndrome. The intervention led to significant increases in the use of extratextual talk in the form of print referencing. These findings extend our knowledge about the effects of, and provide preliminary evidence to support the use of print referencing during shared reading with girls with Rett syndrome. This information can be embedded in the larger discussion regarding strategies that support the literacy development of girls with Rett syndrome.

Study Limitations

There are several limitations to the current study that may have affected the overall results. First, there was a limited number of participants. With only three mother daughter dyads, it is difficult to make inferences about the larger population of mothers reading with their daughters with Rett syndrome. Furthermore, the group was relatively homogenous with all of the mothers being white and college educated. Including dyads with greater socio-economic and ethnic diversity would likely yield a different set of results. Additionally, families were asked to volunteer for the current study and it is possible that families who choose to volunteer their time to participate in a literacy focused research project may already value literacy experiences more than families who chose not to participate. For these reasons, the results of the current study should be considered in light of the current participant demographics. Generalizations to a larger population should be made with caution.

Second, the electronic books created for the purpose of this study were not tightly controlled for length and number of words. Controlling for these variables was something that was decided against during the initial phases of the study in an effort to mirror typical shared

reading where children are offered books of different topics, lengths, and with a varying amount of text. The result was that the books read after the intervention were shorter and contained fewer words than those read in the first half. It is possible that the parents intentionally chose longer books at the beginning, but the need to read different books each time forced them to read shorter books in the second half of the study. This certainly could have impacted the full extent to which changes in communication could be captured. An effort was made to take length into account by standardizing all variables on a per minute basis, but it would be better to control length. In the future, replications and related studies should control for both the length of book and number of words.

Third, this study was limited by difficulties associated with any intervention designed to be carried out over several weeks with busy families with children who have multiple health and physical challenges. In all three families, the original time line of 4-6 weeks had to be extended. Because the child participants with Rett syndrome have health issues including seizures, respiratory problems, difficulty sleeping, and feeding complications (Neul, et al., 2010), which affect sleep and temperament, it was difficult for families to rely on a set schedule to complete shared reading. Although these health issues affected families in different ways, it was a pervasive issue that is likely to be the case when working with girls with Rett syndrome.

Finally, the use of audio rather than video recordings presented some limitations. The audio recordings may have limited the extent to which the entire interaction was captured. Since the focus of the current study was on mother's communication, the audio recording was sufficient in capturing their verbal output; however, in listening to the recordings it was apparent that there was some level of non-verbal communication that took place. For example, all of the girls had voice output communication devices, but only one mother used the device during book

reading. As a result, the other two children were relied solely on non-verbal communication. This fact may have impacted the mothers' communication and led to non-verbal responses on her part. Without video recordings, there is no way to gather such information. Furthermore, the absence of video made it impossible to measure the extent to which mothers pointed to words or images in the book. In the current study, it was not feasible to add video recordings that would capture the computer screen and maternal non-verbal communication, but future research should explore technologies that might make it feasible.

Implications and Future Directions

The results of this study have implications for ongoing efforts to support communication and literacy development among girls with Rett syndrome through shared book reading. The results suggest adding print referencing to shared reading interactions between mothers and their daughters with Rett syndrome did little to statistically impact mothers' communication as a group, but it did lead to meaningful differences for individual dyads. Furthermore, the intervention did lead to a dramatic increase in the use of print referencing. The results of the study also suggest several important considerations for current practice and possible directions for future research regarding shared reading, print referencing, and girls with Rett syndrome.

First, the process and technology used in the current study could be used in other applications. Using technology to interact with families from a distance allowed for an interaction that would not otherwise be possible. This process and technology is especially beneficial when working with families with children who have a low incidence disability since they may not be geographically near a research institution and face unusual burdens when attempting to travel to research institutions. Additionally, this process and technology could be used to distribute information to others, including teachers and teaching assistants who work

with children with Rett syndrome and other low incidence disabilities. The ability to access educational resources, like the print referencing parent development training used in the current study, from a distance might lead to improved services and supports for children with low incidence disabilities. Although the use of technology was not without challenges, the benefits of potentially accessing individuals across the world outweighs the potential trials.

Second, the current study involved only three mother-daughter dyads. Expanding the sample size in the future would allow for more sophisticated analyses and likely point to differences in variables other than print referencing. Additionally, having data from a larger sample size may reveal changes post intervention that were not apparent with the three dyads that participated in the current study. Future research should also seek to include families with diverse socioeconomic statuses, ethnic backgrounds, or parental levels of education. This may yield results that more accurately represent the larger population of families with daughters with Rett syndrome.

Finally, the current study was one part of a larger study investigating visual attention to print during shared reading among girls with Rett syndrome. Future research might combine the visual attention to print investigation with the current study to determine if changes in mothers' communication are directly related to changes in the daughters' visual attention to print during shared reading.

Final Conclusions

Shared book reading is a commonly used activity to support language, communication and literacy development. Shared reading has an evidence base for use with children without disabilities (Hargrave & Sénéchal, 2000; Justice et al., 2009; Price et al., 2009; van Kleeck, 2008) and with disabilities (Arnold, Lonigan, Whitehurst, & Epstein, 1994; Cronan, Cruz,

Arriaga, & Sarkin, 1996; Skotko et al., 2004). The purpose of the current study was to identify the types of communication that mothers used when engaging in shared book reading with their daughters with Rett syndrome. More specifically, the study was designed to investigate differences in communication that mothers used when engaging in shared reading with unfamiliar, electronic books before and after learning a print referencing strategy. The findings build on research regarding parent communication during shared book reading with girls with Rett syndrome (Koppenhaver, Erickson, & Skotko, 2001; Skotko et al., 2004) and extend our knowledge about the effects of print referencing on mothers' communication during shared reading with their daughters with Rett syndrome. Of particular interest is the fact that the print referencing strategy did not negatively affect mothers' communication, which may provide a basis for trying other language and communication directed interventions in future research. The fact that mothers could engage in a brief training session and then implement the print referencing strategy without negatively affecting their communication in general, provides a basis for researching other strategies that could be delivered to parents via a remote training to improve parent-child interactions and child outcomes. Future studies should include a larger and less homogenous sample, a tighter set of controls for the books used in the study, a longer timeline, and video recordings which may provide information that could not be captured by audio recordings alone.

APPENDIX A: CHILD ASSESSMENTS AND PARENT INTERVIEWS

The Inventory of Potential Communicative Acts (IPCA)

Word Identification Assessment

Adapted Version of Clay's *Observation Survey of Early Literacy Achievement*

Activity Recall Literacy Orientation

Parent Reading Belief Inventory

The Inventory of Potential Communicative Acts (IPCA)

The Inventory of Potential Communicative Acts (IPCA) consists of a series of questions designed to identify the behaviors that a person uses to communicate. For each question, you are asked to list behaviors that you have observed your child use. The IPCA also asks you to provide a concrete example of the circumstances under which you have observed your child using the behavior to communicate.
These examples should be as detailed as possible. In writing your examples, please provide information about when, where and how the behavior occurs. If your child does not seem to express one of the specific functions, then you should write "Does Not Do This" in that section.

For example, the first question asks you to: "Describe how your child greets you/others". For this question, you may have noticed that your child greets you by making eye contact, smiling, and extending her arms outward. Your specific example might be something like: "When I first see her in the morning and say 'Hello,' she always looks at me, smiles, and reaches out her arms."

Questions:

What is your child's name?

Please describe how your child greets you/others. Behaviors? Examples?

Please describe how your child indicates farewell to you or others. Behaviors? Examples?

Please describe how your child responds to her own name. Behaviors? Examples?

Please describe how your child demonstrates any other social conventions. Behaviors? Examples?

Please describe how your child seeks comfort. Behaviors? Examples?

Please describe how your child requests a cuddle/tickle. Behaviors? Examples?

Please describe how your child shows off. Behaviors? Examples?

Please describe how your child demonstrates attention-to-self other than showing off. Behaviors? Examples?

What does your child do if her routine is disrupted? Behaviors? Examples?

What does your child do if she is required to do something she doesn't want to do? Behaviors? Examples?

What does your child do if she doesn't like something? Behaviors? Examples?

What does your child do if her favorite toy/food is taken away? Behaviors? Examples?

What does your child do if an adult stops interacting with her (e.g. stops playing an activity)? Behaviors? Examples?

What does your child do to demonstrate other ways of rejecting or protesting? Behaviors? Examples?

Please describe how your child lets you know she wants an object (e.g. toy or book). Behaviors? Examples?

Please describe how your child lets you know she wants something to eat. Behaviors? Examples?

Please describe how your child lets you know she wants more of something. Behaviors? Examples?

Please describe how your child lets you know she wants T.V. or music. Behaviors? Examples?

Please describe other ways your child requests an object. Behaviors? Examples?

Please describe how your child lets you know she wants or needs help with dressing. Behaviors? Examples?

Please describe how your child lets you know she wants or needs help with a game. Behaviors? Examples?

Please describe how your child lets you know she wants or needs help with going to the toilet. Behaviors? Examples?

Please describe how your child lets you know she wants or needs help with other actions. Behaviors? Examples?

Please describe how your child lets you know she wants clarification (e.g., if she doesn't understand something you have said). Behaviors? Examples?

Please describe how your child lets you know she wants information about something (e.g., the name of something). Behaviors? Examples?

Please describe other ways your child lets you know she wants information. Behaviors? Examples?

Please describe how your child lets you know she is happy, pleased, enjoying something, or excited. Behaviors? Examples?

Please describe how your child lets you know she is unhappy, sad, or anxious. Behaviors? Examples?

Please describe how your child lets you know she is bored or disinterested. Behaviors? Examples?

Please describe how your child lets you know she finds something funny. Behaviors? Examples?

Please describe how your child lets you know she is frightened or surprised. Behaviors? Examples?

Please describe how your child lets you know she is in pain or feeling sick. Behaviors? Examples?

Please describe how your child lets you know she is angry or feeling frustrated. Behaviors? Examples?

Please describe how your child lets you know she is tired. Behaviors? Examples?

Please describe other ways your child lets you know about her mood. Behaviors? Examples?

Please describe how your child makes a choice between two or more objects (e.g. food, toys, or drinks). Behaviors? Examples?

Please describe how your child chooses what she wants to do. Behaviors? Examples?

Please describe how your child chooses to start/stop an activity. Behaviors? Examples?

Please describe other ways your child makes choices. Behaviors? Examples?

Please describe how your child reacts when someone talks to her. Behaviors? Examples?

Please describe how your child tells you yes, in response to a question. Behaviors? Examples?

Please describe how your child tells you no, in response to a question. Behaviors? Examples?

Please describe other ways your child answers, in response to a question (other than yes or no questions). Behaviors? Examples?

Please describe how your child imitates or attempts to imitate the communication reactions of other's speech (e.g. sentences, single words, or vocalizations). Behaviors? Examples?

Please describe how your child imitates or attempts to imitate the communication reactions of others' head nodding "yes." Behaviors? Examples?

Please describe how your child imitates or attempts to imitate the communication reactions of others' head nodding "no." Behaviors? Examples?

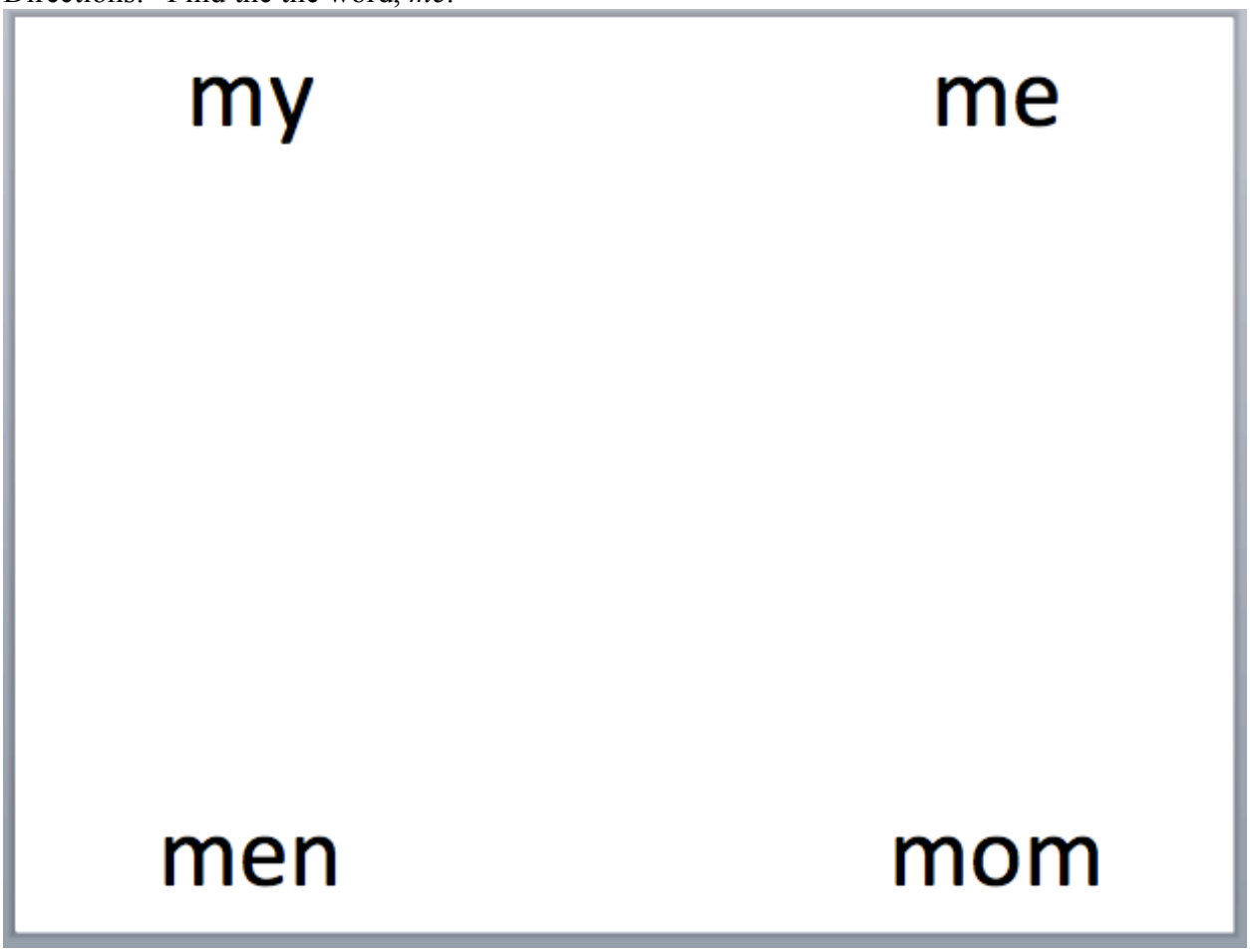
Please describe how your child imitates or attempts to imitate the communication reactions of others shoulder shrugging. Behaviors? Examples?

Please describe how your child imitates or attempts to imitate the communication reactions of others pointing. Behaviors? Examples?

Please describe other ways your child imitates or attempts to imitate the communication reactions of others. Behaviors? Examples?

Word Identification Assessment

Directions: “Find the the word, *me*.”



Adapted Version of Clay's *Observation Survey of Early Literacy Achievement*

CONCEPTS ABOUT PRINT: YES-NO RESPONSE	Date(s):
Directions	This form should be used with students who are unable to use their hands to manipulate the book, but can indicate YES/NO. Read the book, Follow the Moon or No Shoes, to the student (2000, Marie Clay, Heinemann Education). Have two blank large index cards or pieces of paper available to use for test items on Page 12.
Scoring	Circle the student's response to each Yes/No question. Circle NR for no response. Record the final score by circling 1 or 0 depending upon the yes/no responses required for the particular item.
Access Method: (circle one or more)	Use the student's most reliable yes/no response. Eye Gaze Partner Assisted Scanning Vocalizations Facial Expressions Body Movement Other:

Directions: Present the book to the student and say: *"I'm going to read you this story but I want you to help me."*

COVER				
Item 1: Orientation of the book.	**Do:** Show the student the back of the book.			
	Say: *"Is this the front of the book?"*	Yes	No	NR
	Do: Show the student the front of the book.			
	Say: *"Is this the front of the book?"*	Yes	No	NR
	Score: 1 point for the correct response to both questions.	**1**	**0**	
Comments:				

PAGES 2/3				
Item 2: Concept that print carries the message, not the picture.	**Do:** Point to the print.			
	Say: *"Do I start reading here?*	Yes	No	NR
	Do: Point to the picture.			
	Say: *"Do I start reading here?"*	Yes	No	NR
	Score: 1 point for the correct response to both questions.	**1**	**0**	
	Read: Text on page 2.			
Comments:				

PAGES 4/5				
Item 3: Directional rules of text.	**Say:** *"Show me where to start."*			
	Do: Point to the first letter on the top line.			
	Say: *"Do I start reading here?"*	Yes	No	NR
	Do: Point to the last letter on the bottom line.			
	Say: *"Do I start reading here?"*	Yes	No	NR
	Score: 1 point for the correct response to both questions.	**1**	**0**	
Item 4: Moves left to right on any line.	**Say:** *"Show me which way to go."*			
	Do: Run your finger right to left across the top line of text.			
	Say: *"Do I go this way?"*	Yes	No	NR
	Do: Run your finger left to right across the top line of text.			
	Say: *"Do I go this way?"*	Yes	No	NR
	Score: 1 point for the correct response to both questions.	**1**	**0**	
Comments:				

PAGE 8/9				
Item 5: Response to inverted print.	**Say:** *"Show me where to begin."*			
	Do: Leave the text in its inverted orientation. Point to the last letter in the bottom line.			
	Say: *"Do I start reading here?"*	Yes	No	NR
	Do: **Do:** Point to the first letter in the top line.			
	Say: *"Do I start reading here?"*	Yes	No	NR
	Do: Leave the text in its inverted orientation.			
	Say: *"Show me which way to go."*			
	Do: Run your finger right to left across the top line of text.			
	Say: *"Do I go this way?"*	Yes	No	NR

	Do: Run your finger left to right across the top line of text.			
	Say: *"Do I go this way?"*	Yes	No	NR
	Score: 1 point for the correct response to all questions.	**1**	**0**	
Comments:				

PAGE 10/11				
Item 6: A left page is read before a right page.	**Say:** *"Show me where I should start reading."*			
	Do: Point to the right page.			
	Say: *"Do I start here?"*	Yes	No	NR
	Do: Point to the left page.			
	Say: *"Do I start here?"*	Yes	No	NR
	Score: 1 point for the correct response to both questions.	**1**	**0**	
	Read text on pages 10 and 11.			
Comments:				

Activity Recall Literacy Orientation (Needleman, 1991)

15-min structured interview

1. I'd like you to remember all the things you did with (child's name) yesterday when s/he woke up in the morning until lunch time…. Now from lunchtime to dinner…. And from dinner to bedtime…. (Lead parent through day step by step, probe for specifics if they say "we played."

2. What are (child's name)'s three favorite things to do (excluding eating and sleeping)?

3. Sometimes parents have favorite things that they enjoy doing with their children. What are your favorite three things to do with (name of child)?

Parent Reading Belief Inventory

Barbara D. DeBaryshe
University of Hawai'i at Manoa Center on the Family
103 Miller Hall, Honolulu, HI 96822

Listed below are several statements about parent's attitudes and beliefs. Circle the answer that is closest to your feelings. Please answer each question in response to your preschool child. There are no right or wrong answers. Your own opinions are important to us.

1) As a parent, I play an important role in my child's development.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

2) There is little I can do help my child get ready to do well in school. *(reverse)*

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

3) My child learns many important things from me.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

4) I would like to help my child learn, but I don't know how. *(reverse)*

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

5) I am my child's most important teacher.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

6) Schools are responsible for teaching children, not parents. *(reverse)*

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

7) Parents need to be involved in their children's education.

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

8) When my child goes to school, the teacher will teach my child everything my child needs to know so I don't need to worry. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

9) Children do better in school when their parents also teach them things at home.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

10) I find it boring or difficult to read to my child. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

11) I enjoy reading with my child.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

12) I have good memories of being read to when I was a child.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

13) Reading with my child is a special time that we love to share.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

14) My child does not like to be read to. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

15) I feel warm and close to my child when we read

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

16) I have to scold or discipline my child when we try to read. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

17) I want my child to love books.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

18) I don't read to my child because he or she won't sit still. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

19) I read to my child whenever he or she wants.

Strongly Disagree Disagree Agree Strongly Agree

1 2 3 4

20) When we read I try to sound excited so my child stays interested. (two scales)

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

21) Children learn new words, colors, names, etc. from books.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

22) Reading helps children be better talkers and better listeners.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

23) My child knows the names of many things he or she has seen in books.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

24) When we read, I want my child to help me tell the story.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

25) I ask my child a lot of questions when we read.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

26) When we read, I want my child to ask questions about the book.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

27) When we read we talk about the pictures as much as we read the story

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

28) I read with my child so he/she will learn the letters and how to read simple words. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

29) Parents should teach children how to read before they start school. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

30) My child is too young to learn about reading. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

31) When we read, I have my child point out different letters or numbers that are printed in the book.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

32) I try to make the story more real to my child by relating the story to his or her life.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

33) Stories help build my child's imagination.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

34) My child learns lessons and morals from the stories we read.

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

35) Reading helps children learn about things they never see in real life (like Eskimos and polar bears).

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

36) My child learns important life skills from books (like how to follow a cooking recipe, how to protect themselves from strangers).

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

37) Even if I would like to, I'm just too busy and too tired to read to my child. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

38) I don't read to my child because we have nothing to read. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

39) I don't read to my child because there is no room and no quiet place in the house. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

40) I don't read to my child because I have other, more important things to do as a parent. *(reverse)*

Strongly Disagree Disagree Agree Strongly Agree
1 2 3 4

41) Some children are natural talkers, others are silent. Parents do not have much influence over this. *(reverse)*

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

42) Children inherit their language ability from their parents, it's in their genes. *(reverse)*

Strongly Disagree	Disagree	Agree	Strongly Agree
1	2	3	4

APPENDIX B: CHARACTERISTICS OF BOOKS DYADS READ

Title	Number of Pages	Number of Sentences	Number of Words
A Good Friend	11	2	17
A Trip to the Zoo	10	9	98
Balloon Rhymes	7	7	39
Colors of Flowers	10	14	79
Crazy Colors	16	18	106
Feel the Ocean Breeze	8	6	59
Flying on Airplanes	11	10	72
From Seed to Plant	17	16	81
Growing My Sunflower	7	6	35
Hot Air Balloons	15	15	126
How to Clean a Dirty Dog	12	14	68
If You Give a Bear Some Bacon	12	6	70
Let's Start a Band	12	12	49
Martha the Cow	21	10	88
Max and Maggie	10	9	63
My Friends Love to Eat	14	13	56
On Sunday	16	15	108
Pet Party	14	13	123
Potatoes	10	8	33
Puppies Grow	14	6	52
Sammy Squirrel	13	14	81
Spot and the Storm	14	13	84
Spring Break	11	9	54
Strange Families	15	14	34
Swimming	20	18	108
The Busy Family	11	10	36
The Busy Spider	34	34	178
What to Wear	12	11	96
Will and Jack	15	19	120

APPENDIX C: PARENT COMMUNICATION CODING MANUAL

To address the research questions, the following codes are used to examine transcripts of the shared reading between each mother-daughter dyad. For the purpose of this study, only the mother's communication is coded and analyzed. Each utterance is coded at the word or phrase level. Word-based codes include *Total Words, Words from Text, Repetitive Words from Text, Extratextual,* and *Voice Output* Device. Phrase-based codes include *Question, Comment, Real Life Connection, Book-Driven Directive, Disability Management,* and *Print Referencing.* In addition, maternal communication is coded for responsivity using the *Child Initiations* and *Response to Child codes*. The codes are not mutually exclusive; words and phrases may meet the criteria for multiple codes and therefore, can be coded multiple times.

Word-Based Codes

The following codes are applied at the word level; each individual word is coded according to the following categories and reported separately.

Total Words

The total words code is the sum of all the words generated (i.e., spoken, or initiated on the voice output device) by the mother during the shared book readings. This word count should include spoken language not directed at the daughter, but that occurs during shared book reading. An example is a mother stopping the reading to redirect another child in the home (e.g., "Please quiet down. This computer is recording.").

Words from Text

The words from text code is the sum of spoken words that result from reading aloud the written text of the book during the shared book reading interaction. The specific words are based

on the individual text selected for each reading. Note that these individual words also occur in natural speech, but are only counted when they are read from the text itself.

Repetitive Words from Text

The repetitive words from text code is the sum of all spoken words from the text read a second time. Only intentional repetitions of entire phrases and sentences are counted. The repetition of individual words or word combinations of words from the text are not counted.

Example:

Text: Balloons up in the air.

Words from Text: Balloons up in the air.

Extratextual: Oh wow, those are some big balloons.

Repetitive Text: Balloons up in the air.

Non-Example: [Explanation: The underlined words match the words from the text but occur as part of this natural speech rather than as a result of explicit repetition of the text itself.]

Text: Balloons up in the air.

Extratextual: Oh wow, those are some big balloons up in the sky.

Extratextual

The extratextual code is the sum of all words (i.e., spoken, or initiated on the voice output device) that are not text from the book.

Example:

Text: Grandpa is reading.

Extratextual: Your grandpa likes to read too!

Non-Example:

Text: Grandpa is reading.

Repetitive words from Text: Yeah. Grandpa is reading.

Voice Output Device

The voice output device code is the sum of all words that the mother generates on the child's voice output device. This code may not be applicable for all dyads as not all mothers had access to or used the child's device.

Examples: [Explanation: The underlined words are the words generated on the voice output device]

I I like like them.

Snow is not my favorite favorite.

I'm a little bit scared scared of spiders.

Non-Examples:

We should find that word on your device. (comment)

You like to say "no" on your device, don't you? (question)

You have the word doll on your things page. (real life connection)

Phrase-Based Codes

The following codes are applied at the phrase level; entire phrases are coded as a single unit.

Question

The question code indicates a complete question or single *word*, spoken or initiated on the voice output device, intended to elicit a response. Questions could include requests to make real life connections. Additionally, questions that may have been intended as rhetorical questions (i.e., those not intended to elicit a response) are included in this category as it is impossible to infer intent.

Examples:

Do you remember that swan we saw at the lake?

Are you having a hard time staying awake today?

Do you think this is a funny book?

Non-Examples:

I saw a swan at the lake. (comment)

Take a breath. (disability management)

Look at the fish. (book driven directive)

Real Life Connection

The real life connection code indicates a sentence, phrase, or single word, spoken or initiated on the voice output device, that makes a connection to the daughter's life (e.g., travel, pets, favorite foods, holiday traditions, etc.). References to a voice output device as it relates to the shared book reading is a real life connection. Real life connections can also be coded as comments or questions.

Examples:

Remember when we went swimming at grandma and grandpa's house?

You had the most beautiful Easter eggs this year!

Here is the word "boy" on your Tobii.

Non-Examples:

Do you like this book? (question, no connection)

I like sunflowers. (comment, this statement reflects mom's preference not the child's)

We need your glasses so we can read this book. (disability management)

Book Driven Directive

The book driven directive code indicates authoritative instruction related to the physical book. Book driven directives often include, but are not limited to, words such as "look," "let's," or "we."

Examples:

Look at the book.

Let's turn the page.

We are going to keep reading.

Non-Examples:

Let's get you better situated in your chair. (disability management)

I am going to turn the page. (comment)

We are almost finished. (comment)

Disability Management

The disability management code indicates a sentence, phrase, or single word intended to support or manage behaviors that are a direct result of the daughter's disability. Disability management includes, but is not limited to, posture, breathing, wait time, tired/sleepy, glasses, and use of technical equipment.

Examples:

Please take a breath.

Let's fix your glasses, so you can see better.

Sit up, up, up, please.

Non-Examples:

Let's focus and look over here. (disability management)

This little boy has glasses just like you. (real life connection)

You aren't listening today. (comment)

Print Referencing

The print referencing code indicates a sentence, phrase, or single word intended to direct the child attention to the print. This form of communication can include references to features of print (e.g., capital letters), punctuation (e.g., period, exclamation point), similarities across words (e.g., same beginning letter, same ending), etc. Any instance of print referencing also should be coded as a comment.

Examples:

Look, a capitol A. Apple starts with A.

Let's count how many Rs are in this sentence. You can count in your head and I will count out loud.

This sentence ends with a period.

Non-Examples:

This is a long book. (comment)

Look at the book. (book driven directive)

Wow, these are some gorgeous pictures. (comment)

Responsivity Based Codes

The following codes are applied when there is an opportunity for the mother to be responsive. These codes are coded at the phrase level, but reported in a ratio of opportunity to actual number of instances.

Child Initiations

The child initiations code indicates a sentence, phrase, or single word or sound, spoken or initiated on the voice output device, made by a daughter.

Examples:

Ahhhhh

Funny (voice output device)

*squeal

Response to Child

The response to child code indicates a sentence, phrase, or single word or sound, spoken or initiated on the voice output device, intended to answer or react to a communication attempt made by a daughter. The mother may respond to something obvious, such as a vocalization or use of the voice output device; however, it is important to read carefully because the mother may also respond to a smile, frown, or eye movement. This code should be determined based on something the mother states in her response. A response with elaboration should be coded as a response and a comment; however, a response without elaboration should only be coded as a response. A response can also be a question, comment, real life connection, or feedback. A response cannot be a book-driven directive, or disability management.

Examples:

Oh yeah! I think this book is funny too! (comment)

Wow. That's neat. (comment)

Yeah.

Mmmhummm.

Non-Examples:

*text

Additional Information

- Do not code incomplete thoughts (e.g., “I like a…”).
- Do code incomplete thoughts that end in complete thoughts “I like a….do you like a party?)

REFERENCES

Adamson, L. B., & Bakeman, R. (1984). Mothers' communicative acts: Changes during infancy. *Infant Behavior and Development*, *7*(4), 467–478. doi:10.1016/S0163-6383(84)80006-5

Allor, J. H., Mathes, P. G., Roberts, J. K., Cheatham, J. P., & Champlin, T. M. (2010). Comprehensive reading instruction for students with intellectual disabilities: Findings from the first three years of a longitudinal study. *Psychology in the Schools, 47*(5), 445-466. doi:10.1002/pits.20482

Allor, J. H., & McCathren, R. B. (2003). Developing emergent literacy skills through storybook reading. *Intervention in School and Clinic*, *39*(2), 72–79. doi:10.1177/10534512030390020201

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Amir, R. E., & Zoghbi, H. Y. (2000). Retts syndrome: Methyl- CpG-binding protein 2 mutations and phenotype-genotype correlations. *American Journal of Medical Genetics, 97*, 147–152. doi:10.1002/1096-8628(200022)97:2<147::AID-AJMG6>3.0.CO;2-O

Arnold, D. H., Lonigan, C. J., Whitehurst, G. J., & Epstein, J. N. (1994). Accelerating language development through picture book reading: Replication and extension to a video training format. *Journal of Educational Psychology*, *86*(2), 235. doi:10.1037/0022-0663.86.2.235

Bedrosian, J. L. (1999). Efficacy research issues in AAC: Interactive storybook reading. *AAC Augmentative and Alternative Communication, 15*(1), 45-55. doi:10.1080/07434619912331278565

Bellon, M. L., & Ogletree, B. T. (2000). Repeated storybook reading as an instructional method. *Intervention in School and Clinic*, *36*(2), 75–81. doi:10.1177/105345120003600202

Bellon-Harn, M. L., & Harn, W. E. (2008). Scaffolding strategies during repeated storybook reading: An sxtension using a voice output communication aid. *Focus on Autism and Other Developmental Disabilities*, *23*(2), 112–124. doi:10.1177/1088357608316606

Beukelman, D., McGinnis, J., & Morrow, D. (1991). Vocabulary selection in augmentative and alternative communication. *Augmentative and Alternative Communication*, *7*(3), 171–185. doi:10.1080/07434619112331275883

Brannon, D., Dauksas, L., Coleman, N., Israelson, L., & Williams, T. (2013). Measuring the effect that the partners' Dialogic Reading program has on preschool shildren's expressive language, *Creative Education, 4*(9), 14–17. doi:10.4236/ce.2013.49B004

Breit-Smith, A., Justice, L. M., McGinty, A. S., & Kaderavek, J. (2009). How often and how much? *Topics in Language Disorders*, *29*(4), 360–369. doi:10.1097/TLD.0b013e3181c29db0

Bretherton, I. (1991). New wine in old bottles. In M. Gunnar & L. A. Sroufe (Eds), *Concepts of self* (Minnesota Symposia on Child Psychology, Vol. 23). Hillsdale, NJ: Erlbaum.

Browder, Lee, & Mims (2011). Using shared stories and individual response modes to promote comprehension and engagement in literacy for students with multiple, severe disabilities. *Education and Training in Autism and Developmental Disabilities, 46*(3), 339-351.

Buijzen, M., & Valkenburg, P. M. (2008). Observing purchase-related parent-child communication in retail environments: A developmental and socialization perspective. *Human Communication Research*, *34*(1), 50–69. doi 10.1111/j.1468-2958.2007.00313.x

Bylers, B. & Symons, F. (2013). The need for unbiased cognitive assessment in Rett syndrome: Is eye tracking the answer? *Developmental Medicine and Child Neurology, 55*(4), 302-302.

Carlson, L., & Grossbart, S. (1988). Parental style and consumer socialization of children. *Journal of Consumer Research*, *15*(1), 77. doi:10.1086/209147

Cass, H., Reilly, S., Owen, L., & Wisbeach, A. (2003). Findings from a multidisciplinary clinical case series of females with Rett Syndrome. *Developmental Medicine and Child Neurology, 45*, 325–337. doi:10.1111/j.1469-8749.2003.tb00404.x

Cassidy, J. (1994). Emotion regulation: inèuences of attachment relationships. In N. Fox (Ed.), The Development of Emotion Regulation (pp. 228–249). *Monographs of the Society for Research in Child Development, 59*(2–3). Chicago: University of Chicago Press.

Catts, H. W., & Kamhi, A. G. (2005). *Language and Reading Disabilities* (2nd ed.). Boston: Pearson Education.

Chaffee, S., McLeod, J. M., & Atkin, C. K. (1971). Parental influences on adolescent media use. *American Behavioral Scientist*, *14*, 323-340. doi:10.1177/000276427101400304

Cheng, K. H., & Tsai, C. C. (2014). Children and parents' reading of an augmented reality picture book: Analyses of behavioral patterns and cognitive attainment. *Computers and Education*, *72*, 302–312. doi:10.1016/j.compedu.2013.12.003

Clay, M. (2013). *An observtion survey of early literacy achievement* (3rd ed.). Portsmouth, NH: Pearson.

Coleman, M., Brubaker, J., Hunter, K., & Smith, G. (1988). Rett syndrome: A survey of North American patients. *Journal of Mental Deficiency Research, 32*, 117-124.

Cronan, T. a, Cruz, S. G., Arriaga, R. I., & Sarkin, a J. (1996). The effects of a community-based literacy program on young children's language and conceptual development. *American Journal of Community Psychology*, *24*(2), 251–272. doi:10.1007/BF02510401

Crowe, L. K., Norris, J. A., & Hoffman, D. R. (2000). Facilitating storybook interactions between mothers and their preschoolers with language impairments. *Communication Disorders Quarterly, 21*(3), 131-146. doi:10.1177/152574010002100302

Dale, P. S., Crain-Thoreson, C., Notari-Syverson, A., & Cole, K. (1996). Parent-child book reading as an intervention technique for young children with language delays. *Topics in Early Childhood Special Education, 16*, 213-235. doi:10.1177/027112149601600206

DeBaryshe, B. D. (1993). Joint picture-book reading correlates of early language skill. *Journal of Child Language, 20*, 455-461. doi:10.1017/S0305000900008370

Ezell, H. K., Justice, L. M., & Parsons, D. (2000). Enhancing the emergent literacy skills of preschoolers with communication disorders: A pilot investigation. *Child Language Teaching and Therapy, 16*, 121-140. doi:10.1177/026565900001600202

Fleury, V., Miramontez, S., Hudson, R., Schwartz, I. (2014). Promoting active participation in book reading for preschoolers with autism spectrum disorder: A preliminary study. *Child Language Teaching and Therapy, 30*(3) 273–288. doi:10.1177/0265659013514069

Gettinger, M., & Stoiber, K. C. (2014). Increasing opportunities to respond to print during storybook reading: Effects of evocative print-referencing techniques. *Early Childhood Research Quarterly*, *29*(3), 283–297. doi:10.1016/j.ecresq.2014.03.001

Haden, C. a., Reese, E., & Fivush, R. (1996). Mothers' extratextual comments during storybook reading: Stylistic differences over time and across texts. *Discourse Processes*, *21*(2), 135–169. doi:10.1080/01638539609544953

Hammett-Price, L. H., van Kleeck, A., & Huberty, C. J. (2009). Talk during book sharing between parents and preschool children: A comparison between storybook and expository book conditions. *Reading Research Quarterly*, *44*(2), 171–194. doi:10.1598/RRQ.44.2.4

Hargrave, A. C., & Sénéchal, M. (2000). A book reading intervention with preschool children who have limited vocabularies: the benefits of regular reading and dialogic reading. *Early Childhood Research Quarterly*, *15*(1), 75–90. doi:10.1016/S0885-2006(99)00038-1

Hetzroni, O., & Rubin, C. (2006). Identifying patterns of communicative behavior in girls with Rett Syndrome. *Augmentative and Alternative Communication, 22*, 48–61. doi:10.1080/17461390500387320

Hillman, M., & Marshall, J. (2009). Evaluation of digital media for emergent literacy. *Computers in the Schools*, *26*(4), 256–270. doi:10.1080/07380560903360186

Huebner, C .E., & Meltzoff, A.N. (2005). Intervention to change parent-child reading style: A comparison of instructional methods. *Journal of Applied Developmental Psychology, 26*, 296-313. doi:10.1016/j.appdev.2005.02.006

International Rett Syndrome Foundation (2014). *What is Rett syndrome?* Cincinnati, OH.

Jordan, S., Miller, G. L., & Riley, K. (2011). Enhancements of Dialogic Reading for young children with Down syndrome. *Young Exceptional Children*, *14*(4), 19–30. doi:10.1177/1096250611425025

Justice, L. M., & Ezell, H. K. (2004). Print referencing: an emergent literacy enhancement strategy and its clinical applications. *Language, Speech, and Hearing Services in Schools*, *35*(2), 185–193. doi:10.1044/0161-1461(2004/018)

Justice, L. M., & Kaderavek, J. N. (2003). Topic control during shared storybook reading: Mothers and their children with language impairments. *Topics in Early Childhood Special Education*, *23*(3), 137–150. doi:10.1177/02711214030230030401

Justice, L. M., Kaderavek, J., Bowles, R., & Grimm, K. (2005). Language impairment, parent child shared reading, and phonological awareness: A feasibility study. *Topics in Early Childhood Special Education*, *25*(3), 143–156. doi:10.1177/02711214050250030201

Justice, L. M., Kadervavek, J. N., Fan, X., Sofka, A., & Hunt, A. (2009). Accelerating preschoolers' early literacy development through teacher-child storybook reading. *Language, Speech, and Hearing Services in the Schools*, *40*, 67–85. doi:10.1044/0161-1461(2008/07-0098)

Justice, L.M., Kaderavek, J.N., & Grimm, K. (2003). *Phonological awareness intervention for preschoolers with language impairment: Effectiveness of a home-based storybook reading program*. Unpublished manuscript.

Justice, L. M., Pullen, P. C., & Pence, K. (2008). Influence of verbal and nonverbal references to print on preschoolers' visual attention to print during storybook reading. *Developmental Psychology*, *44*(3), 855–866. doi:10.1037/0012-1649.44.3.855

Justice, L. M., Skibbe, L. E., McGinty, A. S., Piasta, S. B., & Petrill, S. (2011). Feasibility, efficacy, and social validity of home-based storybook reading intervention for children with language impairment. *Journal of Speech, Language, and Hearing Research, 54*, 523–538. doi:10.1044/1092-4388(2010/09-0151)

Kaderavek, J. N., Pentimonti, J. M., & Justice, L. M. (2013). Children with communication impairments: Caregivers' and teachers' shared book-reading quality and children's level of engagement. *Child Language Teaching and Therapy*, *30*(3), 289–302. doi:10.1177/0265659013513812

Kamhi, A. G., & Catts, H. W. (1999). Language and reading: Convergence and divergence. In H. W. Catts & A. G. Kamhi (Eds.), *Language and Reading Disabilities* (pp. 1-24). Boston: Allyn & Bacon.

Kelly, K. R., & Bailey, A. L. (2013). Duel development of conversational and narrative discourse: Mother and child interactions during narrative co-construction. *Merrill-Palmer Quarterly, 59*(4), 426-460. 10.1353/mpq.2013.0019

Kestenbaum, R., Farber, E. a, & Sroufe, L. A. (1989). Individual differences in empathy among preschoolers: relation to attachment history. *New Directions for Child Development*, (44), 51–64. doi:10.1002/cd.23219894405

Koppenhaver, D. a, Coleman, P. P., Kalman, S. L., & Yoder, D. E. (1991). The implications of emergent literacy research for children with developmental disabilities. *American Journal of Speech-Language Pathology*, *1*(1), 38. doi:10.1044/1058-0360.0101.38

Koppenhaver, D., Erickson, K., Harris, B., McLellan, J., Skotko, B., & Newton, R. (2001). Storybook-based communication intervention for girls with Rett syndrome and their mothers. *Disability and Rehabilitation*, *23*(3-4), 149–159. 10.1080/09638280150504225

Koppenhaver, D. A., Erickson, K. A., & Skotko, B. G. (2001). Supporting communication of girls with Rett syndrome and their mothers in storybook reading. *International Journal of Disability, Development and Education*, *48*(4), 395–410. 10.1080/10349120120094284

Leech, K. A., & Rowe, M. L. (2014). A comparison of preschool childrens discussions with parents during picture book and chapter book reading. *First Language*, *34*(3), 205-226. doi:10.1177/0142723714534220

Leibowitz, J., Ramos-Marcuse, F., & Arsenio, W. (2002). Parent child emotion communication, attachment , and affective carratives. *Attachment & Human Development*, *4*(1), 55–67. doi:10.1080/14616730210123157

Liboiron, N., & Soto, G. (2006). Shared storybook reading with a student who uses alternative and augmentative communication: A description of scaffolding practices. *Child Language Teaching and Therapy*, *22*(1), 69–95. doi:10.1191/0265659006ct298oa

Light, J., Binger, C., & Smith, A. (1994). Story reading interactions between preschoolers who use AAC and their mothers. *Augmentative and Alternative Communication*, *10*(December), 255–268. doi:10.1080/07434619412331276960

Lovelace, S., & Stewart, S. R. (2007). Increasing print awareness in preschoolers with language impairment using non-evocative print referencing. *Language, Speech, and Hearing Sciences in Schools, 38*, 16-30. doi:10.1044/0161-1461(2007/003)

Matson, J. L., Fodstad, J. C., & Boisjoli, J. A. (2008). Nosology and diagnosis of Rett syndrome. *Research in Autism Spectrum Disorders, 2*, 601–611. doi:10.1016/j.rasd.2007.12.001

McArthur, D., Adamson, L., & Deckner, D. F. (2005). As stories become familiar: Mother-child conversations during shared reading. *Merrill-Palmer Quarterly*, *51*(4), 389–411. doi:10.1353/mpq.2005.0025

Mehta, P. D., Foorman, B. R., Branum-Martin, L., & Taylor, W. P. (2005). Literacy as a unidimensional multilevel construct: Validation, sources of influence and implications in a longitudinal study in grades 1 to 4. *Scientific Studies of Reading, 9*(2), 85-116. doi:10.1207/s1532799xssr0902_1

Mims, P. J., Browder, D. M., Baker, J. N., Lee, A., & Spooner, F. (2009). Increasing comprehension of students with significant intellectual disabilities and visual impairments during shared stories. *Education and Training in Developmental Disabilities*, *44*(3), 409–420.

Moats, L. C. (2010). *Speech to Print* (2nd ed.). Baltimore: Brookes Publishing Co.

Mol, S. E., Bus, A. G., de Jong, M. T., & Smeets, D. J. H. (2008). Added value of dialogic parent–child book readings: A meta-analysis. *Early Education & Development*, *19*(1), 7–26. doi:10.1080/10409280701838603

National Early Literacy Panel. (2009) *Developing early literacy: Report of the National Early Literacy Panel.* Washington, DC: National Institute for Literacy.

National Early Literacy Panel. (2004, November). *The National Early Literacy Panel: A research assistant synthesis in early literacy development*. Paper presented at the National Association of Early Childhood Specialists, Anaheim, CA.

National Institute of Education (1985). *Becoming a nation of readers: The report of the Commission on Reading*. Washington, DC: United States Department of Education.

Needlman, R., Fried, L. E., Morley, D. S., Taylor, S., Zuckerman, B. (1991). Clinic-based intervention to promote literacy. *American Journal of Diseases of Children, 145*, 881-884. doi:10.1001/archpedi.1991.02160080059021

Neul, J. L., Kaufmann, W. E., Glaze, D. G., Christodoulou, J., Clarke, A. J., Bahi-Buisson, N., Percy, A. K. (2010). Rett syndrome: Revised diagnostic criteria and nomenclature. *Annals of Neurology, 68*(6), 944-950. doi:10.1002/ana.22124

Oppenheim, D., & Waters, H. (1995). Narrative processes and attachment representations: Issues of development and assessment. In E. Waters, B. Vaughn, G. Posada & K. Kondo-Ikemura (Eds), *Caregiving, cultural, and cognitive perspectives on secure-base behavior and working models: New growing points of attachment theory and research* (pp. 197–215). *Monographs of the Society for Research in Child Development, 60*(2–3). Chicago: University of Chicago Press.

Parish-Morris, J., Mahajan, N., Hirsh-Pasek, K., Golinkoff, R. M., & Collins, M. F. (2013). Once upon a time: Parent-child dialogue and storybook reading in the electronic era. *Mind, Brain, and Education*, *7*(3), 200–211. doi:10.1111/mbe.12028

Pellegrini, A. D., Brody, G. H., & Sigel, I. E. (1985). Parents' book-reading habits with their children. *Journal of Educational Psychology*, *77*(3), 332–340. doi:10.1037/0022-0663.77.3.332

Price, L. H., van Kleeck, A., & Huberty, C. J. (2009). Talk during book sharing between parents and preschool children: A comparison between storybook and expository book Conditions. *Reading Research Quarterly*, *44*(2), 171–194. doi:10.1598/RRQ.44.2.4

Prizant, B.M. & Wetherby, A.M. (1993). Communication in preschool autistic children. In E. Schopler, M. van Bourgondien & M. Bristol (Eds.). *Preschool issues in autism*. New York: Plenum.

Saint-Laurent, L., Glasson, J., & Couture, C. (1998). Emergent literacy and intellectual disabilities. *Journal of Early Intervention, 21*, 267-281. doi:10.1177/105381519802100307

Schickedanz, J. A. (1999). *Much more than the ABC's: The early stages of reading and writing*. Washington, DC: The National Association for the Education of Young Children.

Schaffer, H. R. (1992). Joint involvement episodes as context for development. In H. McGurk (Ed.). *Childhood social development.* Hillsdale, NJ: Lawrence Erlbaum.

Sigafoos, J., Woodyatt, G., Keen, D., Tait, K., Tucker, M., Roberts-Pennell, D., & Pittendreigh, N. (2000). Identifying potential communicative acts in children with developmental and physical disabilities. *Communication Disorders Quarterly, 21*(2), 77-86. doi:10.1177/152574010002100202

Siller, M., & Sigman, M. (2002). The behaviors of parents of children with autism predict the subsequent development of their children's communication. *Journal of Autism & Developmental Disorders.*, *32*(2), 77–89. doi:10.1023/A:1014884404276

Sim, S., & Berthelsen, D. (2014). Shared book reading by parents with young chidren: Evidence-based practice. *Australasian Journal of Early Childhood*, *39*(1), 50–55.

Skotko, B., Koppenhaver, D., & Erickson, K. (2004). Parent reading behaviors and communication outcomes in girls with Rett syndrome. *Exceptional Children*, *70*(2), 145–166. doi:10.1177/001440290407000202

Smeets, E. E. J., Pelc, K., & Dan, B. (2011). Rett Syndrome. *Molecular Syndromolgy, 2*, 113-127. doi:10.1159/000337637

Smith, M. (1992). Reading abilities of nonspeaking students: Two case studies. *Augmentative and Alternative Communication, 8*, 57–66. doi:10.1080/07434619212331276043

van Kleeck, A. (2008). School engagement trajectories and their differential predictive relations to dropout. *Psychology in the Schools*, *45*(7), 627–643.

van Kleeck, A., Gillam, R. B., Hamilton, L., & McGrath, C. (1997). The relationship between middle- class parents' book-sharing discussion and their preschoolers'. *Journal of Speech, Language, and Hearing Research, 40*, 1261–1271. doi:10.1044/jslhr.4006.1261

Vandermaas-Peeler, M., Sassine, B., Price, C., & Brilhart, C. (2011). Mothers' and fathers' guidance behaviors during storybook reading. *Journal of Early Childhood Literacy*, 12(4):415-442. doi:10.1177/1468798411417381

Walsh, B. a., & Blewitt, P. (2006). The effect of questioning style during storybook reading on novel vocabulary acquisition of preschoolers. *Early Childhood Education Journal*, *33*(4), 273–278. doi:10.1007/s10643-005-0052-0

Whitehurst, G. J., Falco, F. L., Lonigan, C. J., Fischel, J. E., DeBaryshe, B. D., Valdez-Menchaca, M. C., & Caulfield, M. (1988). Accelerating language development through picture book reading. *Developmental Psychology*, *24*(4), 552–559. doi:10.1037/0012-1649.24.4.552

Yoder, P. J., & Warren, S. F. (1998). Maternal responsivity predicts the prelinguistic communication intervention that facilitates ceneralized intentional communication. *Journal of Speech, Language, and Hearing Research, 41*, 1207–1219. doi:10.1044/jslhr.4105.1207

Yoder, P. J., & Warren, S. F. (2002). Effects of prelinguistic milieu teaching and parent responsivity education on dyads involving children with intellectual disabilities. *Journal of Speech, Language, and Hearing Research, 45*(6), 1158–1174. doi:10.1044/1092-4388(2002/094)