The University of Toledo
The University of Toledo Digital Repository

Master's and Doctoral Projects

2014

Enhancing engagement in storybook reading through thematically related toy play and repeated exposure in a small group storybook reading for a child with hearing impairment

Laura M. Kristoffersen

Follow this and additional works at: http://utdr.utoledo.edu/graduate-projects

Recommended Citation
Kristoffersen, Laura M., "Enhancing engagement in storybook reading through thematically related toy play and repeated exposure in a small group storybook reading for a child with hearing impairment" (2014). *Master's and Doctoral Projects.* Paper 596.
http://utdr.utoledo.edu/graduate-projects/596

This Scholarly Project is brought to you for free and open access by The University of Toledo Digital Repository. It has been accepted for inclusion in Master's and Doctoral Projects by an authorized administrator of The University of Toledo Digital Repository. For more information, please see the repository's About page.

Enhancing Engagement in Storybook Reading Through Thematically Related Toy Play and Repeated Exposure in a Small Group Storybook Reading for a Child with Hearing Impairment

Laura M. Kristoffersen

Research Advisor: Alexia E. Metz, Ph.D., OTR/L

Occupational Therapy Doctoral Program

Department of Rehabilitation Sciences

The University of Toledo

May 2014

This scholarly project reflects individualized, original research conducted in partial fulfillment of the requirements for the Occupational Therapy Doctorate Program, The University of Toledo.

Abstract

Children with hearing loss have significantly lower literacy levels throughout their lives than children with typical hearing, which impacts their ability to be successful in education, employment, and other occupations. Storybook reading during the preschool years is an effective means of improving critical emergent literacy skills that are essential to a child's ability to learn to read and write. This study is a follow-up to one by Pataki, Metz, and Pakulski (2013) that found that preschool-aged children who played with toys that are thematically related to a storybook had higher engagement during storybook reading in a one-on-one setting. The current study looked at whether this same method would be effective with a single preschool-aged child with hearing loss in a group setting and repeated readings of the same story. The participant was a 5-year-old male with bilateral hearing loss. The participant and two peers with typical hearing participated in six sessions of group play and storybook reading. During three of the sessions, the children played with toys that were thematically matched to the storybook, while in the other three sessions the toys and book did not correspond. The participant was randomly assigned to experience the matched condition first. The participant's engagement in the story was measured using the modified Child Behavioral Rating Scale (Pataki, Metz, & Pakulski, 2013). Results showed that the participant's engagement during the matched condition was significantly higher than during the unmatched condition, with a large effect size of 0.5. This study provides further evidence to support the findings of Pataki, Metz, and Pakulski (2013) that playing with thematically related toys can help to increase the engagement in storybook reading for preschool-aged children with hearing loss. It also provides a potential method for occupational therapists in clinical practice to track patient's progress and response to treatment, thereby providing increased evidence for support of therapy methods.

Introduction

The findings of a recent study by Pataki, Metz, and Pakulski (2013) suggested that preceding storybook reading by playing with toys that are thematically related to the book enhances engagement for children with hearing loss. The present study expanded on this technique in a small group setting over repeated sessions. The following reviews the literature regarding how hearing loss affects reading development, the efficacy of repeated joint storybook reading for emergent literacy, and the emerging role of occupational therapy in using play to promote literacy development.

Risk of Low Literacy in Individuals with Hearing Impairment

Children with hearing loss are at much higher risk for low literacy levels than children with typical hearing (Easterbrooks, Lederberg, Miller, Bergeron, & Connor, 2008; Yoshinaga-Itano, Sedey, Coulter, & Mehl, 1998). Many children with hearing loss experience delays in language, social, emotional, and behavioral development, and academic achievement (Yoshinaga-Itano et al., 1998; Mellon, Ouellette, Greer, & Gates-Ulanet, 2009). This disparity between children with typical hearing and children with hearing loss persists even though amplification devices are available and early intervention is common (Mellon et al., 2009). In fact, students with hearing loss graduate with mean reading scores at the fourth grade level (Qi & Mitchell, 2012). The effect of low literacy levels on a person's life is pervasive, impacting critical domains such as employment and access to health care. As the job market in the United States continues to have higher education requirements, the need for strong literacy skills increases (Kirsch, Braun, Yamamoto, & Sum, 2007). Obtaining medical care and managing health conditions often requires a higher level of literacy than the fourth grade level (Austermiller, 2012; Walsh & Volsko, 2008).

Research has consistently shown joint storybook reading between parents, teachers, or other adults with preschool-aged children to be important for the development of the emergent literacy skills that are necessary for the acquisition of conventional reading abilities (DesJardin, Ambrose, & Eisenberg, 2009; Whitehurst & Lonigan, 1998; Crowe, 2000; Bus, van Ijzendoorn, & Pellegrini, 1995). Connecting the text to the child's life, pointing to the words during reading, and asking complex questions are integral factors that determine the degree to which a child benefits from joint reading experiences (DesJardin et al., 2009). However, parents of children with hearing loss tend to engage their children in these interactions less during joint reading than parents of children with typical hearing (Kaderavek & Pakulski, 2007b; Crowe, 2000). A prospective study by Ceh, Bervinchak, and Francis (2013) looked at factors that may predict emergent reading skills in children receiving cochlear implants before the age of two months. They found that although the participants had a mean receptive language delay of 11.7 months, as compared to peers with typical hearing, they did not have significantly lower emergent reading skills. However, the factor that had the most significant effect on participants' language development was parents' reading behaviors at home. The study found that parents' frequent and interactive reading with their children with cochlear implants had significant positive effects on their children's language and early reading skill development.

Emergent Literacy

Emergent literacy is the development of "skills, knowledge, and attitudes" that are foundational for standard reading and writing skills (Whitehurst & Lonigan, 1998, p. 849). These skills typically develop during the preschool years through natural exposure to social contexts that involve literacy without formal instruction (Whitehurst & Lonigan, 1989). Among the components of emergent literacy that are especially relevant when working with children with

hearing loss are oral language, phonological awareness, and understanding of print concepts (DesJardin et al., 2009).

Amongst children with typical hearing, those who develop strong language skills usually have less difficulty transitioning to text-based literacy (Mayer, 2007). These oral language skills develop naturally as children are continuously exposed to conversation among people with mature language abilities (Mayer & Wells, 1996; Mayer, 2007). In contrast to children with typical hearing, children with hearing loss are more likely to have language delays (Kaderavek & Pakulski, 2007b; Yoshinaga-Itano et al., 1998; Mayer, 2007), which can prevent the development of age-appropriate literacy skills (Mayer, 2007). Phonological awareness is "the knowledge of sound structure and systematic patterns of oral language" (DesJardin et al., 2008, p. 23), and includes such abilities as rhyming, elision, segmenting, blending, word and syllable awareness, and alliteration (Easterbrooks et al., 2008; DesJardin et al., 2009). Phonological awareness allows children to understand the relationship between sounds and letters that is necessary to read unfamiliar words (DesJardin et al., 2009) and is the foundation for the way children with typical hearing make the connection between oral language and printed text (Mayer, 2007). Children who have stronger phonological awareness skills learn to read more quickly (Whitehurst & Lonigan, 1998; Wagner, Torgesen, & Rashotte, 1994). In general, children with hearing loss are at risk for delayed or poor phonological awareness abilities because they do not have the same level of access to auditory information as children with typical hearing (Kaderavek & Pakulski, 2007a). Children with hearing loss do have the ability to develop phonological skills (Kaderavek & Pakulski, 2007a; Miller, 2005) though they do tend to test at levels comparable to younger children with typical hearing (DesJardin et al., 2009).

Mayer (2007) describes the development of print knowledge in terms of three levels. In the first level, children begin to distinguish between drawing and writing. The second level involves recognizing the general properties of text, including the fact that there are separate words, the appropriate length of words, and typical combinations of letters. In both the first and second levels, there is little difference in development between children with hearing loss and children with typical hearing. The differences begin to appear during the third level of development, when children begin to make connections between oral and written language. Children with typical hearing use their phonological knowledge to interpret written text, but because children with hearing loss typically have poorer phonological awareness, they have more difficulty in this stage. In keeping, a study by Most, Aram, and Andorn (2006) found that phonological awareness was positively correlated with children's ability to recognize printed words.

Storybook reading. Storybook reading with preschool-aged children has been shown to contribute to the later development of reading abilities (Kaderavek & Pakulski, 2007b; Kaderavek & Sulzby, 1998; Bus et al., 1995). Specifically, joint storybook reading has been shown to help with oral language development (Kaderavek & Pakulski, 2007b; Crowe, 2000; DesJardin et al., 2009), print awareness, and complex semantic language abilities (Crowe, 2000). Aram, Most, and Mayafit (2006) also found that joint storybook reading between mothers and children with hearing loss predicted the children's phonological awareness and receptive vocabulary.

There is more involved in joint storybook reading than simply reading the story out loud. How the practice affects children's language and emergent literacy skills is dependent on several factors, including how engaged children are in the reading. Engagement in reading can be

described as literacy orientation: a child's level of interest, persistence, and attention during a literacy activity (Kaderavek, Guo, & Justice, 2014). A study by Kaderavek, Guo, and Justice (2014) found that the literacy orientation of preschool-aged children during group storybook reading predicted improved alphabet knowledge and emergent reading skills. In addition, children who demonstrate higher levels of engagement in storybook reading have been shown to learn more from the experience and demonstrate higher reading levels (Kaderavek & Pakulski, 2007a; Morrow, 1983). Children with hearing loss often present low literacy orientation during storybook reading (Kaderavek & Pakulski, 2007a).

Reading in group settings. Preschool children are often read to in groups, at school or story time at the library, for example. Evidence suggests that children's engagement in storybook reading in a group setting may differ from a one-on-one setting. Cassidy and Vukelich (1977) examined the relationship between group size and the effect of a listening instruction program in kindergarten children. The study measured the children's reading comprehension during storybook reading before and after the instruction program. The children who participated in listening instruction programs in large groups (15 children) and medium-sized groups (7 or 8 children) demonstrated listening comprehension similar to children in a control group who did not receive listening instruction. Only the children who had received the instruction in a one-on-one setting showed significant listening comprehension improvement. Martinez and Roser (1985) examined the effects of repeated readings of storybooks in a one-on-one situation and a preschool classroom setting. They found that children listening to a book read aloud in a classroom responded to the repeated readings of the book in different ways than the child in the one-on-one setting. Although the children spoke more with repeated readings in both settings, the one-on-one joint book reading elicited fewer questions and more comments, whereas there

was no change in the number of questions asked in the classroom setting. Furthermore, the inclusion of typical peer models in social and academic settings has been shown to have a positive effect on the learning and behavior of children with disabilities (Robertson & Weismer, 1997; Garfinkle & Schwartz, 2002). The current recommendation for educational placement of children with hearing loss is in inclusive classrooms where all domains can be addressed, so called *developmental synchrony* (Mellon et al., 2009).

Repeated exposure. Past research suggests that children benefit from repeated readings of the same storybooks. Children tend to ask more complex questions and demonstrate a deeper understanding of a story after repeated readings of the same book (Kaderavek & Pakulski, 2007b; Yaden, 1988; Crowe, 2000; Martinez & Roser, 1985). With repeated readings, children tend to "reduce labeling behavior and increase comments on story content" (Kaderavek & Pakulski, 2007b, p. 52), comment more often (Martinez & Roser, 1985), ask questions about story meaning (Yaden, 1988), engage in retelling the story (Crowe, 2000), and initiate more active comments as opposed to simply answering questions (Martinez & Roser, 1985). A study by Kaderavek and Pakulski (2007b) showed that repeated one-on-one readings of manipulative books with children with hearing impairment resulted in increased engagement as compared to a single reading of a manipulative book.

Play

Cawthorne (1975) describes play as the primary means preschool-aged children use to learn, and toys and games as the way children begin the reading process. Play has been shown to be vitally important for children's development in several ways that may support their acquisition of reading and other literacy skills. Mellon and colleagues (2009) state that play "provides the foundation for social, cognitive, and language development" (p. 225). Symbolic

play and language develop in parallel during early childhood with each area enabling further development in the other (Mellon et al., 2009). The link between play and language development appears to be especially important for encouraging development in children with hearing loss because it is how children instinctively communicate (Smith & Landreth, 2004). Several studies (Vukelich, 1994; Christie & Enz, 1992) have capitalized on the link between play and literacy by incorporating elements of language and literacy into a child's play environment. This literacy-rich play helps children gain a greater understanding of ideas and to use their language in a significant way (Easterbrooks, Lederberg, & Connor, 2010). Mellon and colleagues (2009) suggest a play-based educational approach as an important component of an environment that promotes developmental synchrony. Kaderavek and Pakulski (2007b) emphasize the importance of maintaining the fun aspect of reading, especially in the early stages of emergent literacy development. This is particularly important for children with hearing loss because it is helps to maintain interest in reading. In particular, Kaderavek and Pakulski (2007b) examined the engagement level of children with hearing impairment during joint storybook reading with a narrative book and with a book that had manipulative elements such as flaps, dials, and textures. They found that children had higher orientation to the manipulative books—comparable to that with toy play, perhaps because manipulative books provided a nonverbal means for the child to engage with the story.

Although there is a significant amount of research that supports play as an important tool for the development of literacy, many parents are reluctant to make time for play because it does not seem serious enough to have any real educational value (Byrne, Deerr, & Kropp, 2003). However, play is a child's primary learning tool and the "means by which emergent literacy is fostered" (p. 42).

Occupational Therapy

The work of Pataki, Metz, and Pakulski (2013) introduced a novel role for occupational therapy in supporting emergent literacy in children with hearing impairment. Occupational therapy uses *occupations*, which are activities that are meaningful and purposeful for a person, to promote health, enhance function, overcome disability, and improve quality of life. The idea of play as an intervention method to promote engagement was described by Mary Reilly, an occupational therapy theorist. Reilly (1974) posited that curiosity drives the play of children and described play as progressing through three stages that express "higher level of excitement" and require "a corresponding need for more control" (p. 146). The first stage of play is called exploratory behavior and occurs when a child encounters a new situation. This stage is characterized by deep intrinsic motivation and a desire to explore. When exploratory behavior occurs in a safe context, a child develops feelings of hope and trust. The second stage, competency behavior, is when a child is driven by the desire to master his or her environment. This involves repetitive practice and allows a child to develop self-confidence and self-reliance. In the third stage, achievement behavior, play is primarily extrinsically motivated by the prospect of winning or losing. This stage involves higher levels of excitement and risk-taking behavior, and is when the hope, trust, and self-confidence acquired in the first two stages develop into courage. These stages describe the way play enables a child to explore, understand, and gain mastery over his or her environment, while also developing essential social, emotional, and cognitive skills.

A child's primary occupation is play and play is the natural means by which a child learns. It is therefore within the scope of occupational therapy practice to utilize children's natural engagement in play to springboard interest in reading. Furthermore, the promotion of

literacy skills for all children, including children with hearing loss, is a concern for occupational therapists (Bell & Swinth, 2005; Swinth & Handley-More, 2004) because of it is essential for nearly everything a person does, including reading books, bills, road signs, food labels, medicine bottles, grocery lists, bus schedules, job applications, and many more tasks.

Meaning. *Meaning* defines a person's reasons for engaging in his/her occupations and is therefore central to occupational therapy theory. Nelson (1988) describes meaning as "the individual's interpretation of the occupational form" (p. 635), which "refers both to the perceptual sense it makes to the individual as well as to the cognitive associations elicited in the individual" (p. 635). Kielhofner (1998) explains that the meaning experienced by a person in a specific context is highly individualized depending on the person's life experience. Studies within occupational therapy have shown engagement and performance are increased when meaning is enhanced (Lin, Wu, Tickle-Degnen, & Coster, 1997). Sakemiller and Nelson (1997) conducted a study with two children with hypotonic cerebral palsy to determine whether increasing meaning for the children through the introduction of a game would increase their functional vertical neck and back extension during exercises. For both participants, increasing the meaning through the inclusion of the game also increased their performance. Many other studies have been done with adults that have shown that increasing the meaning of an occupation will increase an individual's performance (Nelson, Konosky, Fleharty, Webb, Newer, Hazboun, Fontane, & Licht, 1995; Sietsema, Nelson, Mulder, Mervau-Scheidel, & White, 1992; Yoder, Nelson, & Smith, 1989; Thomas, 1996).

The present study. Pataki, Metz, and Pakulski (2013) tested the use of thematically related toy play to enhance engagement in reading in preschool children with hearing loss. The results suggested that play with themed toys prior to one-on-one storybook reading increased

engagement in the story compared play with toys unrelated to the story. Following play with toys based on the theme of the storybook, the participants demonstrated "increased interaction with the reader, increased participation, satisfaction, and more positive emotion" during the storybook reading (p. 16). While this study provided preliminary evidence that thematically related toy play can enhance engagement in storybook reading, the method in which it was conducted limits its broad application to practice.

In the study by Pataki, Metz, and Pakulski (2013), participants engaged in one-on-one play and storybook reading with the researcher. Easterbrooks, Lederberg, & Connor (2010) describe the importance of supportive literacy environment in the school, as well as in the home, as essential for the development of reading abilities in children with hearing impairment. Children interact with storybooks differently when the reading occurs in a small group setting, as opposed to a one-on-one setting (Martinez & Roser, 1985; Cassidy & Vukelich, 1977). Therefore, this study will examine the effect of themed toy play on engagement in subsequent storybook reading among children with hearing impairment when the reading took place in small groups, as is commonly found in school settings.

Secondly, Pataki, Metz, and Pakulski (2013) measured engagement in storybook reading in single sessions; however, reading the same book multiple times has been shown to increase a child's understanding of the story's plot and themes, including questions of causality and prediction of future events, as well as improved understanding of vocabulary and sentence structure (Crowe, 2000; Kaderavek & Pakulski, 2007b; Yaden, 1988; Martinez & Roser, 1985). This study will also explore how repeated readings paired with themed toy play affect the degree to which children with hearing impairment are engaged in the story.

This study expanded on the work of Pataki, Metz, and Pakulski (2013) by exploring the hypothesis that themed toy play will also enhance engagement in subsequent storybook reading when the book is read repeatedly to a small group of children with hearing loss.

Method

Research Design

The research design was a counterbalanced design. The order of conditions was randomly assigned.

Participants

Participants sought for this study were children with hearing loss between the ages of 3 and 6 years who have not begun kindergarten and had no other major medical diagnoses (determined by parent report). We recruited through the University of Toledo Speech, Language, and Hearing Clinic, preschools, daycare centers, and speech language centers in the Northwest Ohio and Southeast Michigan region.

The study also sought children between the ages of 3 and 6 who had not yet begun Kindergarten and who have typical hearing in order to provide peer models for the participants with hearing loss. Data regarding engagement in the story from participants with typical hearing was not included in the analysis.

We utilized the cognitive, language, and motor portions of FirstSTEP Screening Tool (Miller, 1993) to determine developmental delays that would disrupt engagement in play. This test, which is designed to be administered in approximately 15 minutes, involves 12 games that the administrator plays with the child. Each game tests a different cognitive, language, or motor skill. The 12 skills tested are quantitative reasoning, picture completion, visual position in space, problem solving, auditory discrimination, word retrieval, association, sentence and digit

repetition, visual-motor integration, fine motor planning, balance, and gross motor planning. Miller (1993) reported the test-retest and interrater reliability measurements of the FirstSTEP Screening Tool. Test-retest reliability was tested in a study with a random sample of 86 children. The test was administered to each child one to two weeks apart, and the percent agreements for the domains were Cognitive .85, Language .93, and Motor .91. Interrater reliability for the FirstSTEP Screening Tool (Miller, 1993) was determined through a study with 43 children and two independent raters. The correlation coefficients for the domains were Cognitive .95, Language 1.00, and Motor .91.

Miller (1993) also reports on factor analysis, concurrent validity, and the ability of the FirstSTEP Screening Tool (Miller, 1993) to discriminate between different clinical groups. The factor analysis identified three factors for the test: Cognitive, Language, and Motor. Concurrent validity was established with several standardized assessments for preschool-aged children. These assessments include the Miller Assessment for Preschoolers (Miller, 1988) (r = .71 for overall scores), the Wechsler Preschool and Primary Scale of Intelligence – Revised (Wechsler, 1989) (r = .82 for overall scores), the Bruininks-Oseretsky Test of Motor Proficiency (Bruininks, 1978) (r = .65 for overall scores), and the Test of Language Development Primary-Second Edition (TOLD-P:2) (Newcomer & Hammill, 1988) (r = .61 for the Language domain of the FirstSTEP Screening Tool (Miller, 1993) and all scales of Test of Language Development-Primary, 2nd Edition ([TOLD-P:2],Newcomer & Hammill, 1988)). Miller (1993) reports on four studies done in which children with identified delays in cognitive, language, or motor development, or with social-emotional problems, were screened using the FirstSTEP Screening Tool (Miller, 1993). The results found that the FirstSTEP Screening Tool (Miller, 1993) is sensitive to detecting children with all four developmental delays.

To describe our study population and peer models, parents/legal guardians (caregivers) were asked to complete a questionnaire regarding race and Hispanic origin as classified by the United States Census Bureau (Humes, Jones, & Ramirez, 2011); socioeconomic status as designated by the Hollingshead four factor index (Hollingshead, 1975); age and gender of participant; ages and genders of siblings. We also asked the type, severity, and time of diagnosis of hearing loss; and reading practices in the home (see Appendix B). To avoid confounds resulting from familiarity with study materials, we also asked caregivers to report participants' favorite books and toys. None reported favorite books or toys that were the same as those used in the study.

Materials

Books. Two different books were used in this study, and the group was read each of them. The books are illustrated. They have characters and a plot line. The books were determined to have language appropriate for preschool aged children, including children with hearing loss, which is the intended population. These books were determined to be significantly similar based on the number of words, mean length of utterance, and type-token ratio. The two books used were "It's the Bear!" by Jez Alborough (1994) and "Widget" by Lynn Rossiter McFarland (2001). "It's the Bear!" (Alborough, 1994) is about a boy who goes on a picnic in the woods with his mother where they encounter a bear who wants to eat their lunch. "Widget" (Rossiter McFarland, 2001) is about a stray dog that pretends to be a cat to fit in with a kind woman's six cats but later becomes a hero by being a dog.

Toys. Two sets of toys were used for this study. There was one set of toys that related thematically to "Widget" (Rossiter McFarland, 2001). These toys included four stuffed dogs that resemble the dog in the book, four stuffed cats, an old woman doll, four pet food bowls, and a

backdrop that looks like a farm or country home. The second set of toys was unrelated to either book, and included a set of stuffed animals and backdrop that fit a jungle theme. These animals included lions, monkeys, zebras, and leopards.

Procedures

Informed consent was obtained from the children's caregivers. The children were asked for assent with the statement "would you like to play and read a storybook with some friends?" Assent was documented by the researcher.

After providing informed consent, caregivers were asked to complete the questionnaire. The children were seen individually for conducting the FirstSTEP screening. The group attended six sessions. Sessions were held twice a week for three weeks at the University of Toledo. After the final session, each child was given a small, inexpensive plush toy to keep worth approximately $2.

The group was held at the Health and Human Services building on the University of Toledo's main campus in a 131-by-168-inch carpeted playroom set off any main hallways. The room has concrete walls, is ventilated, has one large west-facing window, and contains a child-sized table and chairs. Caregivers were able to watch through an observation mirror and listen via overhead microphone. The observation room was also separated from the main hallway of the building. At the beginning of each session, the children spent 15 minutes playing with either the themed or non-themed toys. They were allowed to play without guidance from the researcher, although the researcher was available to ensure safety, adherence to standard classroom rules, to answer questions, and to engage upon child invitation. With five minutes remaining in play time, the children were given verbal and visual notification (holding up the book and five fingers to indicate five minutes) that story time would initiate soon. Following the

free play period, the participant and peer models were directed to assist with putting away the toys and to gather to listen to a storybook being read to them. Each child was allowed to hold onto one toy while he listened to the storybook. The children sat on the floor in front of the researcher, who was also sitting on the floor, to listen to the story. The researcher read the storybook out loud using the same pace and inflection for each reading and showed each illustration to all of the children after finishing a page. The researcher did not ask any questions or make any additional comments about the story, but answered any questions asked by the children.

Throughout each session, the researcher redirected the children if they were behaving in a destructive or distracting manner to play or storybook reading through verbalization and/or gesture. Each session was videotaped from two angles.

Conditions. In the *Matched* condition, toys that corresponded to the theme of "Widget" (Rossiter McFarland, 2001) were used for free play prior to storybook reading. In the *Unmatched* condition, the toys that did not correspond to the theme either storybook were used for free play prior to reading "It's the Bear!" (Alborough, 1994). Each condition lasted for three consecutive sessions. The group was randomly assigned to experience the matched condition first and the unmatched condition second.

Measurement

The engagement in storybook reading was measured using the modified Child Behavioral Rating Scale (CBRS, Pataki, Metz, & Pakulski, 2013). The CBRS was first developed by Mahoney and Wheeden, (1998) as a means of describing a child's engagement while playing alone and while playing with a teacher. The original CBRS included seven items: Persistence, Attention to Activity, Involvement, Initiation: Activity, Compliance/Cooperation, Initiation:

Teacher, and Affect. These items were adapted from scales previously reported by Meisels and colleagues (Meisels, Plunket, Roloff, Pasick, & Stiefel, 1986) and Egeland and Sroufe (1981). The CBRS was modified as per the recommendation of Dr. Mahoney (personal communication, October 17, 2008) to ensure sensitivity for the research question. The modified CBRS is comprised of two Subscales: Attention and Socio-emotional. The Attention Subscale includes the items of attention to activity, involvement, and cooperation, while the Socio-emotional Subscale encompasses the items joint attention and affect. Attention to activity is a measure of how well the child pays attention to the story being read. Involvement is a measure of how intensely the child is engaged in the storybook reading. Joint attention measures the quality of interactions with the adult. Affect refers to the child's general emotional state during the activity. Each of these five categories is rated on a 5-point Likert scale ranging from very low (1) to very high (5). Ratings have been operationally defined for each item (see Appendix C). The participant's behavior was rated at the level that described his behavior during storybook reading.

Data Analysis

Each storybook reading session was videotaped and the engagement was measured for each of the six sessions using the CBRS. The data collected in the first session of each condition was excluded from analysis to account for the novelty of the story affecting the level of engagement in the reading. The measurement was done by the researcher. A second graduate student in the Occupational Therapy Doctorate program was trained to in the use of the CBRS and rated the research videos independently. The inter-rater reliability was measured using a linearly weighed Kappa statistic. The agreement was substantial to excellent for all CBRS subscales (Attention to Activity, .75; Involvement, .86; Cooperation, .78; Joint Attention, 1; Affect, .79).

All scores for the individual CBRS items for the second and third session in each condition were pooled for comparison between the Unmatched and Matched condition using a Wilcoxon signed-rank test. Rather than utilizing the value of α as an indicator of significance, we report the effect size (*r)* as this may avoid the confound of autocorrelation in single subject data analysis (Fisch, G.S., 2001; Brossart, Parker, & Olson, et al. 2006)

Results

One participant and two peer models were recruited for this study. The participant was a boy aged five years and one month with mild to moderate sensorineural hearing loss. He was diagnosed with hearing loss at the age of 1 year and wears hearing aids in both ears. The participant's primary methods of communication are gestures and an augmentative and alternative communication device. The participant scored 0 on all items of the FirstSTEP assessment due to refusal to participate. This gives him a score than is more than 3 standard deviations below the norm for his age group. His results must be interpreted with caution, however, because his refusal to participate may not reflect his actual abilities. He did demonstrate some delayed gross motor skills, as evidenced by difficulty with jumping and parent report. The two peer models included a boy aged three years and ten months and a boy aged five years and six months. Both had typical hearing. (See Table 1 for demographic information and Table 2 for pre-literacy factors in the home.)

The children were randomly assigned to experience the matched condition with "Widget" (Rossiter McFarland, 2001) first and the unmatched condition with "It's the Bear!" (Alborough, 1994) second. The participant's CBRS item scores for the second and third session in each condition are shown in Figure 1. His mean CBRS item score in the Matched condition was 2.7 (±0.8) and his mean score for the Unmatched condition was 2.1 (±0.7). A Wilcoxon signed-rank

test was conducted due to non-normal distribution of the data, which indicated that the increased engagement in the Matched condition represents a large effect size of 0.5.

The participant's behavior was largely consistent within each condition, and can generally be described as distractible but cooperative. During the matched condition, he generally sat facing the researcher as she read the book, with intermittent periods of looking at the book and occasionally pointing at pictures. In both sessions 2 and 3, the participant pointed at the same picture, indicating that he was paying some attention and was especially interested in that one picture. The participant generally indicated his disinterest in the story by initiating interactions with the two other children, by playing with the toy he was holding, or by standing up and starting to walk away. During the matched condition, the participant demonstrated high levels of cooperation when redirected by the researcher. His lowest scores were in the Attention to Activity and Involvement subscales, as indicated by rarely directing his eyes toward the book or initiating interaction with either the book or the researcher, and by frequently engaging in distracted behaviors.

During the unmatched condition, the participant demonstrated less involvement with the story and lower levels of cooperation. Although he generally stopped interacting with the other two children when the researcher redirected them, the participant frequently started the behavior again shortly afterwards. The two peer models also demonstrated increased levels of interaction with each other and with the participant during the unmatched condition, which was likely distracting for the participant. Although there were a couple of instances where the participant pointed at the book during the unmatched condition, he generally demonstrated decreased attention to the book by looking at it less frequently. In one instance, the participant had spent a couple of minutes in physical play with one of the other children, and upon redirection from the

researcher, he spent a couple more minutes playing with his toy in such a way as to be distracting to the other children. When the researcher redirected him for a second time, he turned around and immediately pointed to a picture in the book. Although the picture appeared to catch his attention and interest in that moment, it could not be indicative of high levels of attention or involvement overall due to coming immediately after a period in which he was highly distracted.

Discussion

The results of this single subject study indicate that the participant did have a higher level of engagement in the storybook reading during the matched condition, as compared with the unmatched condition. This indicates that for this participant, playing with toys that relate to the theme of the storybook may have increased his interest to pay attention when the book was read aloud to him in a small group setting. As a single-subject design, the results of this study cannot be generalized to apply to all preschool-aged children with hearing loss. However, it does suggest a number of possible research avenues that can be pursued as a result.

The strong effect size for the participant's increased engagement in the Matched session combined with the positive results of Pataki, Metz, and Pakulski (2013) provide support for implementation of this strategy across settings. Pataki, Metz, and Pakulski (2013) found that preschool-aged children with hearing loss had higher engagement in storybook reading after playing with matched toys in a one-on-one setting. The current study has found similar results for one child in a small group setting. These consistently positive results indicate that playing with toys that relate to the theme of a storybook prior to reading time has the potential to be an effective means of encouraging the development of emergent literacy skills among children with hearing loss. This suggests that preschool-aged children with hearing loss may struggle to find meaning in stories that are read to them when the elements of the story are unfamiliar. Their

hearing loss creates a barrier between the words of the story and their understanding. By playing with themed toys prior to reading the story, children with hearing loss will have a more immediate connection with the story. This will increase the meaning they find in the story and in the storybook reading experience, and provide them with more motivation to focus their attention on the book.

This is consistent with other research that has found that children benefit the most from joint storybook reading experiences when the adult engages the child by asking questions about the story and connecting it to the child's experience (DesJardin et al., 2009; Ceh, Bervinchak, & Francis, 2013). These types of behaviors that help to connect the child and the story are a means of increasing the meaning of the story for the child, and therefore the child's engagement in the story. Increased engagement with storybook reading has been shown to correlate with higher emergent literacy skills and higher reading levels (Kaderavek, Guo, & Justice, 2014; Kaderavek & Pakulski, 2007a; Morrow, 1983). Playing with thematically related toys prior to storybook reading follows this in that it provides children with hearing loss, and potentially children with typical hearing, another avenue through which to connect to the story and be more engaged with the reading.

The results of this and previous studies provide a potential role for occupational therapists working in preschools. By collaborating with preschool teachers and speech language pathologists, occupational therapists can help create a storybook reading experience for preschool students with hearing loss intended to maximize the meaning they find in the experience, and therefore their engagement with the story. In the clinic, occupational therapists can work with speech language pathologists to help parents of preschool-aged children with

hearing loss understand the need for their child to find meaning in the storybook reading experience and how to increase that meaning.

Limitations

This study had a number of limitations. The first is the use of a single subject, which prevents the results from being generalized to other preschool-aged children with hearing loss. A second limitation is that all three of the children in the study were male. In a preschool setting, it is much more likely that there will be both male and female children, which could change the dynamics of the group. Similarly, one of the peer models in this study was the brother of the participant. The participant may have interacted differently with the peer models and with the researcher than had he been in a group without someone he with whom he was so familiar. As the study design was intended to mimic a preschool reading group setting, having a sibling in the group may have detracted from the realism of the setting.

Another limitation was that the participant experienced the matched condition first and the unmatched condition second. Without having any data for a participant experiencing the conditions in the opposite order, it is not possible to know that the participant's increased engagement during the matched condition was not due to the relative novelty of the experience. By the fifth and sixth sessions, the participant was familiar with the toy play and storybook reading process and so may have been more easily bored.

Ideas for Future Research

This study provides a basis for several future research avenues. The first would be to replicate this study with more participants. It would be helpful to have several different groups experiencing the conditions in different orders, as well as having both male and female participants. Another possibility would be to pursue this line of research in preschool classrooms

with classroom teachers reading the stories. This would provide a more realistic setting, and the result would be more generalizable to other preschool-aged children with hearing loss. It would also be important to explore how occupational therapists could implement this method for increasing engagement in storybook reading for preschool-aged children with hearing loss in various settings. For example, occupational therapists would most likely work in a consultative role for the implementation of this method in a preschool setting. A study could examine the effectiveness of occupational therapists working as consultants with preschool teachers and speech language pathologists in the inclusion of themed toy play and storybook reading in the classroom.

It would also be interesting to explore whether this method for increasing engagement in storybook reading would work with other populations who are at risk for low literacy rates. If themed toy play can increase the meaning preschool-aged children with hearing loss find in a book, it could also increase meaning for other populations, such as children with physical or cognitive disabilities, children from low socioeconomic backgrounds, and children for whom English is not their primary language.

Another important research avenue suggested by this study is the utilization of single-subject data to document the progress of individual occupational therapy clients. By running statistical tests suitable for a single-subject design on measurements collected throughout a client's treatment, clinicians may be able to establish evidence regarding progress in therapy. Evidence-based practice involves research evidence and theory, as well as clinical experience and expertise (Sudsawad, 2006; Zimolag, French, & Paterson, 2002). Therefore, by having statistical data regarding a client's progress in therapy, this method may help to promote the clinical expertise aspect of evidence-based practice.

Conclusions

The issue of decreased literacy levels among children with hearing loss is one that must be addressed in order to provide children with hearing loss with the same opportunities for occupational engagement throughout their lifetime as children with typical hearing. Storybook reading has been shown to be an effective means of developing the emergent literacy skills essential to the eventual development of reading and writing skills in preschool-aged children with typical hearing. As engagement in storybook reading is an important aspect of the experience, increasing the engagement of children with hearing loss is an important step towards aiding their development of emergent literacy skills. The present study demonstrated that enhancing the meaning of the occupation through playing with toys matched to the theme of a book was effective at increasing the engagement of one preschool-aged child with hearing loss during group storybook reading. This is an important step towards determining the role of occupational therapy in helping children with hearing loss develop the literacy skills necessary to engage in educational, work, and leisure occupations throughout their life. Additionally, this study has demonstrated a potential for the use of measurement and single subject statistical approaches to enhance evidence-based practice. This method could help determine the effectiveness of a treatment plan for an individual patient. Although this study has limitations, it provides an important next step in the exploration of occupational therapy's role in improving the engagement in storybook reading for preschool-aged children with hearing loss, and it demonstrates a potential method increasing the level of evidence-based practice among occupational therapists.

Acknowledgments

I would like to extend special thanks to Alexia Metz, Ph.D., OTR/L for her support and assistance throughout this study. I would also like to thank Lori Pakulski, Ph.D., CCC-A for her assistance with study design and participant recruitment, Rachel Martinez for her help with inter-rating, and all the children and their parents who participated in this study and made it possible.

References

Alborough, J. (1994). *It's the bear!* Cambridge, MA: Candlewick Press.

Aram, D., Most, T., & Mayafit, H. (2006). Contributions of mother-child storybook telling and joint writing to literacy development in kindergartners with hearing loss. *Language, Speech, and Hearing Services in Schools, 37*, 209-223.

Austermiller, K. (2012). *Readability level of Parkinson's disease websites in Australia, Canada, New Zealand, and United States*. Unpublished manuscript, Department of Rehabilitation Sciences, University of Toledo, Toledo, Ohio.

Bell, B., & Swinth, Y. (2005). Defining the role of occupational therapy to support literacy development. *School System Special Interest Section Quarterly, 12*, 1-4.

Brossart, D.F., Parker, R.I, Olson, E.A., & Mahadevan, L. (2006). The relationship between visual analysis and five statistical analysis in a simple AB single-case research design. *Behavior Modification*, *30,* 531-563.

Bruininks, R. H. (1978). *Bruininks-Oseretsky Test of Motor Proficiency*. Circle Pines, MN: American Guidance Service.

Bus, A. G., van Ijzendoorn, M. H., & Pellegrini, A. D. (1995). Joint book reading makes for success in learning to read: A meta-analysis on intergenerational transmission of literacy. *Review of Educational Research, 65*, 1-21.

Byrne, M., Deerr, K., & Kropp, L. G. (2003, September). Book a play date: The game of promoting emergent literacy. *American Libraries, 34*, 42-44.

Cassidy, A. M., & Vukelich, C. (1977). The effects of group size on kindergarten children's listening comprehension performance. *Psychology in the Schools, 14*, 449-454.

Cawthorne, E. O. (1975, April). Toys and games: The first reading tool. *School Library Journal, 21*, 24-27.

Ceh, K. M., Bervinchak, D. M., & Francis, H. W. (2013). Early literacy gains in children with cochlear implants. *Otology & Neurotology, 34*, 416-421.

Christie, J. F., & Enz, B. (1992). The effects of literacy play interventions on preschoolers' play patterns and literacy development. *Early Education and Development, 3*, 206-220.

Crowe, L. K. (2000). Reading behaviors of mothers and their children with language impairment during repeated storybook reading. *Journal of Communication Disorders, 33*, 503-524.

DesJardin, J. L., Ambrose, S. E., & Eisenberg, L. S. (2009). Literacy skills in children with cochlear implants: The importance of early oral language and joint storybook reading. *Journal of Deaf Studies and Deaf Education, 14*, 22-43.

Easterbrooks, S. R., Lederberg, A. R., & Connor, C. M. (2010). Contributions of the emergent literacy environment to literacy outcomes for young children who are deaf. *American Annals of the Deaf, 155*, 467-480.

Easterbrooks, S. R., Lederberg, A. R., Miller, E. M., Bergeron, J. P., & Connor, C. M. (2008). Emergent literacy skills during early childhood in children with hearing loss: Strengths and weaknesses. *Volta Review, 108*, 91-114.

Egeland, E., & Sroufe, A. (1981). Developmental sequelae of maltreatment in infancy. *New Directions for Child Development: Developmental Perspectives on Child Maltreatment, 11*, 77-92.

Fisch, G.S., (2001). Evaluating data from behavioral analysis: Visual inspection or statistical models? *Behavioural Processes, 54,* 137-154.

Garfinkle, A. N., & Schwartz, I. S. (2002). Peer imitation: Increasing social interactions in children with autism and other developmental disabilities in inclusive preschool classrooms. *Topics in Early Childhood Special Education, 22*, 26-38.

Hollingshead, A.B. (1975). *Four Factor Index of Social Status.* A.B. Hollingshead. Department of Sociology. Yale University, New Haven, CT.

Humes, K.R., Jones, N.A., & Ramirez, R.R. (2011). *Overview of Race and Hispanic Origin: 2010.* 2010 Census Briefs. US Census Bureau, Washington, D.C.

Kaderavek, J. N., Guo, Y., & Justice, L. M. (2014). Validity of the Children's Orientation to Book Reading rating scale. *Journal of Research in Reading.* Advance online publication. doi: 10.1111/j.1467-9817.2012.01528.x

Kaderavek, J. N., & Pakulski, L. A. (2007a). Facilitating literacy development in young children with hearing loss. *Seminars in Speech and Language, 28*, 69-78.

Kaderavek, J. N., & Pakulski, L. A. (2007b). Mother-child story book interactions: Literacy orientation of pre-schoolers with hearing impairment. *Journal of Early Childhood Literacy, 7*, 49-72. doi: 10.1177/1468798407074835

Kielhofner, G., & Barrett, L. (1998). Meaning and understandings in occupational forms: A study of therapeutic goal setting. *American Journal of Occupational Therapy, 52*, 345-353.

Kirsch, I., Braun, H., Yamamoto, K., & Sum, A. (2007). *America's perfect storm: Three forces changing our nation's future*. Princeton, NJ: Educational Testing Service.

Lin, K., Wu, C., Tickle-Degnen, L, & Coster, W. (1997). Enhancing occupational performance through occupationally embedded exercise: A meta-analytic review. *Occupational Therapy Journal of Research, 17*, 25-47.

Mahoney, G., & Wheeden, C. A. (1998). Effects of teacher style on the engagement of preschool aged children with special learning needs. *Journal of Developmental and Learning Disorders, 2*, 293-315.

Martinez, M., & Roser, N. (1985). Read it again: The value of repeated readings during storytime. *The Reading Teacher, 38*, 782-786.

Mayer, C. (2007). What really matters in the early literacy development of deaf children. *Journal of Deaf Studies and Deaf Education, 12*, 411-431.

Mayer, C. & Wells, G. (1996). Can the linguistic interdependence theory support a bilingual-bicultural model of literacy education for deaf students? *Journal of Deaf Studies and Deaf Education, 1*, 93-107.

Meisels, S. J., Plunkett, J. W., Roloff, D. W., Pasick, P. L., & Stiefel, G. S. (1986). Growth and development of preterm infants with respiratory distress syndrome and bronchopulmonary dysplasia. *Pediatrics, 77*, 345-352.

Mellon, N. K., Ouellette, M., Greer, T., & Gates-Ulanet, P. (2009). Achieving developmental synchrony in young children with hearing loss. *Trends in Amplification, 13*, 223-240.

Miller, L. J. (1993). *First step: Screening test for evaluating preschoolers*. San Antonio, TX: The Psychological Corporation Harcourt Brace Javanovich.

Miller, L. J. (1988). *Miller Assessment for Preschoolers* (MAP). San Antonio, TX: The Psychological Corporation.

Miller, P. (2005). Reading comprehension and its relation to the quality of functional hearing: Evidence from readers with different functional hearing abilities. *American Annals of the Deaf, 150*, 305-323.

Morrow, L. M. (1983). Home and school correlates of early interest in literature. *Journal of Educational Research, 76*, 221-230.

Most, T., Aram, D., & Andorn, T. (2006). Early literacy in children with hearing loss: A comparison between two educational systems. *Volta Review, 106*, 5-28.

Nelson, D. L. (1988). Occupation: Form and performance. *American Journal of Occupational Therapy, 42*, 633-641.

Nelson, D. L., Konosky, K., Fleharty, K., Webb, R., Newer, K., Hazboun, V. P., Fontane, C., & Licht, B. C. (1995). The effects of an occupationally embedded exercise on bilaterally assisted supination in persons with hemiplegia. *American Journal of Occupational Therapy, 50*, 639-646.

Newcomer, P. L., & Hammill, D. D. (1988). *Test of Language Development Primary* (2nd ed.). Austin, TX: Pro-Ed.

Pataki, K.W., Metz, A.E., & Pakulski, L. (2013). The effect of thematically related play on engagement in storybook reading in children with hearing impairment. *Journal of Early Childhood Literacy.* Advanced online publication. doi: 10.1177/1468798413480516

Qi, S. & Mitchell, R. E. (2012). Large-scale academic achievement testing of deaf and hard-of-hearing students: Past, present, and future. *Journal of Deaf Studies & Deaf Education, 17*, 1-18.

Reilly, M. (Ed.). (1974). *Play as exploratory learning*. Beverly Hills, CA: Sage Publications.

Robertson, S. B., & Weismer, S. E. (1997). The influence of peer models on the play scripts of children with specific language impairment. *Journal of Speech, Language, and Hearing Research, 40*, 49-61.

Rosa, E. D. (2011). The creative role of playfulness in development. *Infant Observation, 14*, 203-217.

Rossiter McFarland, L. (2001). *Widget*. New York: Farrar Straus Giroux.

Sakemiller, L. M., & Nelson, D. L. (1997). Eliciting functional extension in prone through the use of a game. *American Journal of Occupational Therapy, 52*, 150-157.

Sietsema, J. M., Nelson, D. L., Mulder, R. M., Mervau-Scheidel, D., & White, B. E. (1992). The use of a game to promote arm reach in persons with traumatic brain injury. *American Journal of Occupational Therapy, 47*, 19-24.

Smith, D. M., & Landreth, G. L. (2004). Filial therapy with teachers of deaf and hard of hearing preschool children. *International Journal of Play Therapy, 13*, 13-33.

Sudsawad, P. (2006). Definition, evolution, and implementation of evidence-based practice on occupational therapy. In G. Kielhofner (Ed.), *Research in occupational therapy: Methods of inquiry for enhancing practice* (656-662). Philadelphia, PA: F. A. Davis Company.

Swinth, Y. L., & Handley-More, D. (2004). Supplementary lesson 8: Handwriting, keyboarding, and literacy: What is the role of occupational therapy? In Y. L. Swinth (Ed.) Occupational Therapy in School-Based Practice: Contemporary Issues and Trends. Online Course, American Occupational Therapy Association, Bethesda, MD.

Thomas, J. J. (1996). Materials-based, imagery-based, and rote exercise occupational forms: Effect on repetitions, heart rate, duration of performance, and self-perceive rest period in well elderly women. *American Journal of Occupational Therapy, 50*, 783-789.

Wagner, R. K., Torgesen, J. K., & Rashotte, C. A. (1994). Development of reading-related phonological processing abilities: New evidence of bidirectional causality from a latent variable longitudinal study. *Developmental Psychology, 30,* 73-87.

Walsh, T. M., & Volsko, T. A. (2008). Readability assessment of internet-based consumer health information. *Respiratory Care, 53*, 1310-1315.

Wechsler, D. (1989). *Wechsler Preschool & Primary Scale of Intelligence – Revised* (WPPSI – R). San Antonio, TX: The Psychological Corporation.

Welcome, K. M. (2010). *The effect of thematically related toy play on engagement in storybook reading in children with hearing impairment*. Unpublished manuscript, Department of Rehabilitation Sciences, University of Toledo, Toledo, Ohio.

Whitehurst, G. J. & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development, 69*, 848-872.

Yaden, D. (1988). Understanding stories through repeated read alouds: How many does it take? *The Reading Teacher, 41*, 556-560.

Yoder, R. M., Nelson, D. L., & Smith, D. A. (1989). Added-purpose versus rote exercise in female nursing home residents. *American Journal of Occupational Therapy, 43*, 581-586.

Yoshinaga-Itano, C., Sedey, A. L., Coulter, D. K., & Mehl, A. L. (1998). Language of early- and later-identified children with hearing loss. *Pediatrics, 102*, 1161-1171.

Zimolag, U., French, N., & Paterson, M. (2002). Striving for professional excellence: The role of evidence-based practice and professional artistry. *Occupational Therapy Now, 4*, 8-10.

Appendix A

Parental Questionnaire

Date: _____ Participant number:_____

1. Your child's date of birth:
2. Your child's gender:
3. Does your child have a hearing impairment? ☐ Yes ☐ No
   a. If so, at what age was your child diagnosed?
   b. What is your child's level of impairment?
      ☐ Mild hearing loss
      ☐ Moderate hearing loss
      ☐ Severe hearing loss
      ☐ Profound hearing loss
   c. What type of hearing loss does your child have?
      ☐ Sensorineural hearing loss
      ☐ Conductive hearing loss
      ☐ Mixed hearing loss
      ☐ Don't know
   d. Does your child have any of the following?

☐ Hearing aid	☐ Cochlear implant
☐ Right ear	☐ Right ear
☐ Left ear	☐ Left ear
☐ Both ears	☐ Both ears

   e. What is your child's primary method of communication?

☐ Spoken language ☐ Sign language

4. Does your child have any other developmental or medical problems? If so, what are they?

5. Please list the genders and ages of any other children in the home.

6. Please list any other adults in the home and their relation to the child.

7. With whom does your child read?

☐ Parent/Caregiver ☐ Siblings ☐ Friends ☐ Teacher ☐ Other _____

8. How often is your child read to?

☐ 0-1 times/week ☐ 2-4 times/week ☐ more than 5 times/week

9. How many children's books do you have in your home?

☐ 0-5 ☐ 5-10 ☐ more than 10

10. What types of books are read to your child?

☐ Storybooks ☐ Learning books ☐ Sound books

☐ Books with flaps and other interactive parts ☐ Books with pictures only

11. Do you ask your child questions during reading time? ☐ Yes ☐ No
If yes, what types of questions do you ask? (check all that apply)

☐ Questions about content/characters/storyline

☐ Questions about vocabulary/words

☐ Questions about pronunciation

☐ Questions about what will happen next

12. Does your child usually ask questions during reading time?

☐ Yes ☐ No

The following information is being asked in order for us to accurately describe the group of people who participated in our study. This information will be kept strictly confidential.

Indicate the race of the **child participant**. Please mark any of the following which apply: [_] White [_] Black or African American [_] American Indian or Alaska Native [_] Asian [_] Native Hawaiian or other Pacific Islander [_] Some Other Race	Please indicate whether the **child participant** is: [_] Not of Hispanic, Latino, or Spanish origin [_] Of Hispanic, Latino, or Spanish origin
Please provide responses about **yourself** in this column	Please provide responses about **any other adult** living in the home, such as your spouse or committed partner in this column
Level of school completed, select one: [_] Less than seventh grade [_] Junior high school (9th grade) [_] Partial high school (10th or 11th grade) [_] High school (private, parochial, trade, or public) [_] Partial college or specialized training [_] Standard college or university [_] Graduate professional training	Level of school completed, select one [_] N/A (i.e. you are single, widowed, divorced) [_] Less than seventh grade [_] Junior high school (9th grade) [_] Partial high school (10th or 11th grade) [_] High school (private, parochial, trade, or public) [_] Partial college or specialized training [_] Standard college or university [_] Graduate professional training
If employed, please list current job title:	If employed, please list current job title:

Appendix B

Modified Child Behavior Rating Scale (CBRS)

ATTENTION

1. Attention to Activity: (Flitiness/Stay With-It-Ness)
This scale assesses the extent to which the child attends to the storybook while being read to. While the child may or may not be actively involved in the interaction, the child rated as demonstrating high attention remains in the interaction for an extended duration. The quality of the child's participation may be characterized as highly involved or uninvolved. The child may or may not appear to derive satisfaction from the interaction. A child rated as low in attention may briefly participate in the interaction and then physically remove himself, engage briefly in something else, or ask questions not pertaining to the storybook. A child receiving a low rating in attention may frequently avoid listening to the reader, never seeming to attend to the storybook for more than a few seconds at one time.

- **Rating of [1]: Very Low –** The child never attends to the storybook for more than a few seconds. He or she may be completely distracted during the interaction by walking away, looking around the room, or engaging in something else in the room.
- **Rating of [2]: Low –** The child can be described as generally inattentive during the storybook interaction. Although the child sometimes attends to the storybook, he or she is more inactive and avoidance of reading, asks questions not pertaining to the story, or engaged in other activities.
- **Rating of [3]: Moderate –** The child attends to the storybook about as often as he or she does not. He has extended periods of time in which he participates in the storybook interaction as well as periods in which he engaged in avoiding or changing activities.
- **Rating of [4]: High –** The child "stays with" the storybook interaction during the majority of the session. He may have periods in which he is attentive but these are short-lived and limited in number.
- **Rating of [5]: Very High –** The child "stays with" the storybook interaction throughout the session. The child participates in the interaction without periods of inattention.

2. Involvement: (Distractibility – Looking Around)
This scale reflects the intensity with which the child is involved in the storybook interaction. The child who is high in involvement is actively involved through the majority of the reading. This child appears to be highly motivated to engage in the interaction. He or she participates in the interaction and seems to derive satisfaction from the activity. The child who is low in involvement is either passively involved during the interaction, attempts to avoid participation, is highly distractible during the storybook reading, or asks questions not pertaining to the story. This child may "stay" with the interaction but seems to derive little satisfaction from his or her involvement. This child may frequently leave the area.

- **Rating of [1]: Very Low –** This child obviously does not derive satisfaction from his involvement in the storybook reading. The child shows a great deal of neutral affect as well as some distress or avoidance of the interaction by walking away or looking around. The child may be greatly distracted by other things in the room and not pay attention to the reader or storybook.
- **Rating of [2]: Low –** This child, for the most part, does not derive satisfaction from his participation in storybook reading. He may show largely neutral affect and may appear passive during the interaction. The child may overtly demonstrate uninvolvement by being distracted during the majority of the interaction or asking questions not pertaining to the story being read.
- **Rating of [3]: Moderate –** The child derives some satisfaction from the interaction. There are sustained periods in which he seems interested in the storybook or uses gestures or vocalizations to express satisfaction with the interaction. There are also extended periods in which the child is disinterested in the interaction.
- **Rating of [4]: High –** The child can be described as highly involved. During the majority of the session, the child appears to derive satisfaction from his participation in the activities by asking questions, pointing to pictures, wanting to turn the pages, or eager to find out what is next in the story.
- **Rating of [5]: Very High –** The child is highly involved throughout the session. This child appears to be highly motivated to engage in the interaction. He or she derives a great deal of satisfaction from participating in the interaction. The child seems very interested in the storybook, pays attention by listening and looking at the book, asks questions, points to pictures, wants to turn the pages, and interested in how the story ends.

4. Cooperation: (Does Child Avoid at All?)
The degree to which the child attempts to comply with the requests or suggestions of the adult is measured using this scale. A child scoring high in compliance will make an effort to do what the adult asks or will respond quickly to the adult's subtle or overt suggestions. A child scoring low in compliance may refuse to cooperate with the adult. This child may actively avoid the interaction by playing with other materials or simply by ignoring the adult's suggestions and engaging in other activities.

- **Rating of [1]: Very Low –** The child may overtly demonstrate refusal to cooperate by throwing or pushing away the book, ignoring the adult's suggestions, engaging in another activity, or vocalizing interest in another activity.
- **Rating of [2]: Low –** While the child may occasionally attempt to cooperate with the adult's suggestions, the child is not cooperative for the majority of the interaction**.**
- **Rating of [3]: Moderate –** The child attempts to cooperate with the adult's requests or suggestions about as often as he or she does not cooperate.
- **Rating of [4]: High –** The child usually attempts to cooperate with the adult's requests or suggestions. He or she may occasionally refuse to cooperate but for the majority of the time attempts to follow the adult's suggestions or requests.
- **Rating of [5]: Very High –** The child consistently attempts to cooperate with the adult's request or suggestions. He or she responds quickly to both overt and subtle requests or suggestions.

Socio-Emotional

1. Joint Attention

The extent to which the child initiates interaction with the adult is measured using this scale. The child receiving a high rating has frequent and lengthy bouts of eye-contact to the storybook and other sharing behaviors such as vocalizations. This child tries to engage the adult by asking questions, pointing to the pictures, or using gestures and facial expressions. A child scoring low in attention to adult may rarely have eye contact with the book or attempt to share experiences or engage the adult by asking questions or through gestures and facial expressions.

- **Rating of [1]: Very Low –** The child never attempts to share experiences with the adult. He or she never has periods of eye-contact with the storybook or attempts to engage the adult by asking questions.
- **Rating of [2]: Low –** The child occasionally attends to the adult by listening and looking at the storybook. For the most part, however, the child does not attempt to share experiences with the adult.
- **Rating of [3]: Moderate –** The child attends to the adult approximately half of the time. He or she demonstrates periods of eye-contact with the storybook or other sharing behaviors, but equally demonstrates periods of inattention.
- **Rating of [4]: High –** The child attends to the adult for the majority of the interaction. He or she is often observed as looking at the book, being interested in the story, facial expressions, and sometimes attempts to initiate engagement with the adult through asking questions.
- **Rating of [5]: Very High –** The child has frequently and lengthy bouts of eye contact to the storybook. The child listens and concentrates very intently. He or she often asks questions or vocalizes while reading the story. The child is characterized by his frequent attempts to involve the adult.

2. Affect

This scale reflects the child's general emotional state during the interaction. A child receiving a high score overtly demonstrates positive attitude and enjoyment whether it be directed toward the adult or the storybook itself. A child scoring low on this scale frequently demonstrates a negative attitude during the interaction. He may cry, attempt to hit the adult, ask to do another activity, or ask to see his guardian.

- **Rating of [1]: Very Low** – The child demonstrates or indicates negative attitude, such that he or she does not want to be read to.
- **Rating of [2]: Low –** While the child does not demonstrate a negative attitude throughout the interaction, there are several sustained periods in which the child acts as though he or she does not want to be read to.
- **Rating of [3]: Moderate –** The child, in general, displays low intensity enjoyment. This child can be generally characterized as bored during the interaction.
- **Rating of [4]: High –** For the most part, the child can be described as having a positive attitude, such that he or she is happy to be read to.

- **Rating of [5]: Very High –** The child often vocalizes, laughs, or smiles when interacting with the adult or storybook. The child indicates or demonstrates that he or she is happy to be read to. He or she never demonstrates negative attitude.

Table 1.
Demographic Characteristics of Participant and Peer Models

	Race	Education Level of Caregiver	Education Level of Other Adults in Home
Participant	White, non-Hispanic	Graduate Professional Training	Partial College or Specialized Training
Peer Model 1	White, non-Hispanic	Graduate Professional Training	Partial College or Specialized Training
Peer Model 2	White, Hispanic	Less than Seventh Grade	Standard College of University Degree

Table 2.
Pre-Literacy Factors in the Home

	Child Reads With	Frequency of Reading	Number of Children's Books in the Home	Types of Books Read to Child	Does Parent Ask Child Questions During Reading	Does Child Ask Questions During Reading
Participant	Parent/Caregiver Siblings Teacher Grandparents	More than 5 times per Week	More than 10	Storybooks Learning Books Sound Books Books with Interactive Parts Books with Only Pictures	Yes Questions about: Vocabulary/words Pronunciation	No
Peer Model 1	Parent/Caregiver Siblings Grandparents	More than 5 times per Week	More than 10	Storybooks Learning Books Sound Books Books with Interactive Parts Books with Only Pictures	Yes Questions About: Content/characters/storyline Vocabulary/words Pronunciation What will happen next	Yes
Peer Model 2	Parent/Caregiver Siblings Teacher	More than 5 times per Week	More than 10	Storybooks Learning Books	Yes Questions About: Content/characters/storyline Vocabulary/words Pronunciation What will happen next	Yes

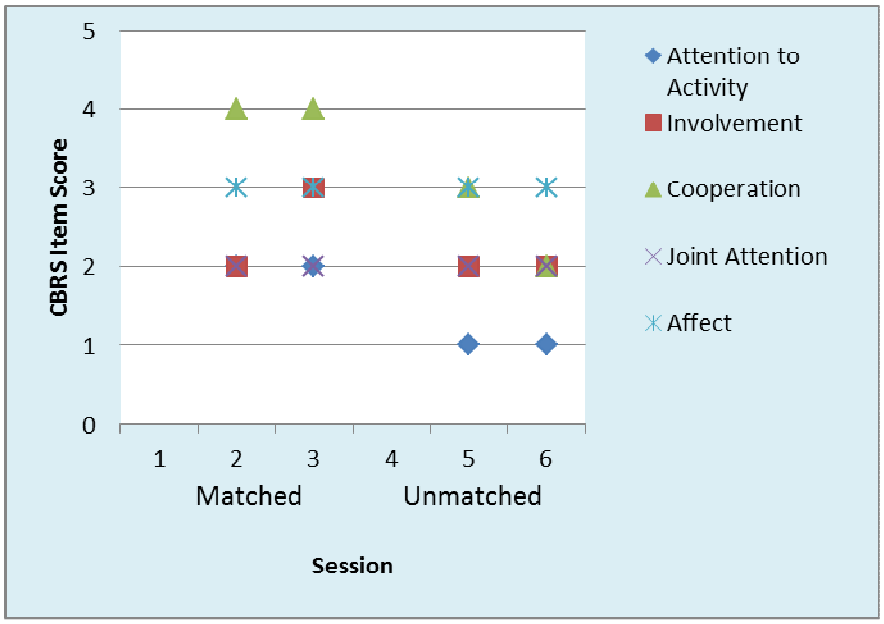

Figure 1. The participant's scores on each of the 5 CBRS subscales are displayed for the matched and unmatched conditions. Scores from the first session in each condition are not included. Results show significantly higher scores for the matched condition.