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The Effect of Thematically Related Toy Play on Engagement in Storybook Reading in Children with Hearing Impairment

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Abstract

OBJECTIVE: This study examined whether themed toy play increased subsequent engagement in storybook reading in preschool children with typical hearing and with hearing impairment.

METHOD: This study employed a counterbalanced experimental design. In all sessions participants played with toys first and then were read a storybook. In the experimental condition, the toys matched the theme of the book, and in the control condition they did not. Conditions were presented in random order. Storybooks had language at the early preschool level and had characters, plots, and illustrations. Twenty-three preschool-aged children participated, 12 with typical hearing and 11 with hearing impairment. Engagement during storybook reading was measured using the Child Behavior Rating Scale (CBRS; Mahoney, 1998), consisting of five Items: Attention to Activity, Involvement, and Cooperation (Attention subscale) and Affect and Joint Attention (Initiation subscale).

RESULTS: Comparisons between the two conditions, across participants, showed near significant increases in Involvement and Joint Attention, and a trend toward increased Initiation Subscale in the Matched condition. Playing with toys that matched the theme of the storybook selectively enhanced engagement, particularly the Affect Item and the Initiation Subscale of the CBRS, in participants with hearing impairment.

CONCLUSIONS: Play with thematically related toys prior to reading leads to increased interaction with the reader, increased participation, satisfaction, and more positive emotion during reading for children with hearing impairment. Implementing this approach is simple, and fun for school and home settings.
Children with hearing impairment often have difficulties in developing early literacy skills, including limited attention when being read to, decreased print awareness, and low story comprehension (Bodner-Johnson & Sass-Lehrer, 2003; Mogford, Gregory, & Keay, 1979). Impairment in these early skills can translate into poor reading skills in later childhood and throughout life. Accordingly, the average reading level of high school graduates with hearing impairment is at the 4th grade level (Traxler, 2000). Therefore, reading at an early age is just as, if not more, important for children with hearing impairment. Reading supports language development and comprehension, but these might be reduced if the child does not find reading engaging. Early research has supported toy play as an early reading tool (Cawthorne, 1975) which may contribute to the observed enhancement in reading engagement in children with hearing impairment when presented with storybooks with manipulative components (Kaderavek & Pakulski, 2007b).

This study sought to expand on previous work by exploring the potential for therapeutic occupation to enhance the experience of storybook reading for children with hearing impairment in order to improve engagement in early literacy occupations. We begin with a review of the literature related to children with hearing impairment and their literacy difficulties; a variety of different techniques of storybook reading used with children with hearing impairment; the use of play to engage children with hearing impairment in reading for comprehension; and the use of therapeutic occupation to enhance engagement.

**Children with Hearing Impairment**

According to the American Speech-Language-Hearing Association, 31.5 million Americans have a hearing impairment, with 12.5 million who use hearing devices (Castrogiovanni, 2008). Hearing devices consist of a variety of hearing aid devices or cochlear implants. A hearing aid is a small electronic device that amplifies sound into the ear (Mosby’s
Medical Dictionary, 2006). Hearing aids can be worn inside the ear, behind the ear, or be implanted, for example the Bone Anchored Hearing Aid. A cochlear implant is an electronic device that is surgically implanted into the cochlea. Unlike hearing aids, cochlear implants directly stimulate the auditory nerve, which translates the signal into sound. There are external and internal components to a cochlear implant: externally, the microphone picks up the sound and sends it to the transmitter; the transmitter itself which lies on the scalp; and internally the receiver, which is under the scalp and sends a coded signal to the nerve via the cochlea.

Methods of communication with children with hearing impairment range from exclusive use of sign language to total communication to auditory-verbal. Total communication implies the use of a visual mode of communication, such as sign language, along with spoken communication. Auditory-verbal stresses reliance on listening skills when some hearing is intact or an amplification device is used. In this approach, neither sign language nor speech reading is used. Parents who are also hearing impaired usually communicate with their children through sign language (Meier, 1991). Recent studies have shown considerable reduction in the number of families who use sign language; a significant decline in total communication; and a significant increase in spoken language due to the impact of early identification and early intervention (Sorkin & Zwolan, 2004; Office of Special Education and Rehabilitative Services, 2007; Brown, 2006). Hearing screens are now done at birth, so hearing impairments are identified very early in the child’s life allowing early intervention. This enhances the child’s development and minimizes the potential for developmental delay. Early intervention can include cochlear implants, which can be received as young as 12 months old. More than 90% of hearing impaired children have hearing parents so it is not surprising that they choose spoken communication.
However, there are still a number of families who choose total communication method (OSERS, 2007).

Families who communicate through sign language may not use storybook reading to expose their children to written language (Kaderavek & Pakulski, 2007b). It has also been observed that parents without hearing impairment do not read often to their children with hearing impairment because parents struggle to connect the text and review vocabulary (Moores, 1996). When comparing hearing mothers who read to their child with typical hearing and hearing mothers who read to their children with hearing impairment, there are notable differences.

According to Mogford, Gregory, and Keay (1979), when both mothers and children have intact hearing there is more complex discussion and feedback during reading, whereas when mothers with intact hearing read to their children with hearing impairment, they just labeled pictures. These mothers reported that it was hard to keep their children’s attention for a long period of time and that they felt it was inappropriate to read to the children when they cannot understand what they are saying.

The decreased exposure to books and book-reading at young ages appears to have lasting effects on the reading abilities of people with hearing impairment. Traxler (2000) documented that the average reading level of hearing impaired high school graduates is at the 4th grade level. Current research emphasis is focused on methods that will improve the quality and quantity of exposure to books and book-reading in preschool children with hearing impairment in order to support the later development of literacy. According to the National Information Center for Children and Youth with Disabilities (2004), “Children who are hard of hearing will find it much more difficult than children who have normal hearing to learn vocabulary, grammar, word order, idiomatic expressions, and other aspects of verbal communication” (p. 3).
Emergent Literacy

Emergent literacy is early, ongoing development of children’s reading and writing (Clay, 1967; Hall, 1987; Mason & Allen, 1986; Teale & Sulzby, 1986). It is the process of exploratory reading and writing experiences of children before they learn to formally read and write (Hanser, 2010). According to Kaderavek and Sulzby (1998b), emergent literacy encompasses the behaviors, concepts, and skills concerning reading and writing of young children that develop into conventional literacy. Emergent literacy includes storybook interactions with adults (Kaderavek & Pakulski, 2007a); print awareness (the recognition that written text has meaning and knowledge that print is read left-to-right and top-to-bottom); using nonalphabetic visual cues; and understanding book-related words such as author, title, and sentence (Justice & Kaderavek, 2004). Emergence of these qualities, beginning in children from birth and continuing to age 6, greatly influence development of skilled reading ability. Literacy learning begins long before children are able to formally read and write (Hanser, 2010). It starts at an early age, as infants, toddlers, and young children actively engage in a range of experiences with oral and written language. Emergent literacy is based on the belief that all children are ready for literacy from a very early age. Neuman and Roskos (1990) indicated that children use literacy on their own to explore their environment, interact with others, and to express themselves.

According to Teale and Sulzby (1986), there are four principles that apply to the earliest stages of literacy learning. The first principle is that literacy learning begins at or even before birth. Many parents create environments filled with books, crayons, print-rich toys, and reading routines, some even read to their children in utero. Heath (1983) indicated that some children have more than 1,000 hours of early print-based interactions by the time they start school. The second principle is that reading, writing, speaking, and listening abilities develop simultaneously.
Development in reading, writing, speaking, and listening can affect the development in other areas. These are connected through emergent literacy experiences such as shared storybook reading. During shared reading, children learn the purpose of books, the purpose of the reader, provides time to bond with the caregiver, and gives them the opportunity to interact through asking questions, commenting, and identifying pictures. Therefore, shared reading allows children the ability to develop important receptive language concepts as well as the abilities to write, speak, and listen. Teale and Sulzby (1986) indicate that the ability to actively engage in these four important skills results in their success in learning. The third is that the forms of print are just as important as the functions of print. Finally, the fourth principle is central to the hypothesis of this study: literacy learning occurs when children are actively engaged.

**Storybook Reading**

Reading aloud gives children the opportunities to actively participate and ask questions in storybook reading (Arnold, 2003). It is especially important for children with hearing impairment to learn literacy before kindergarten because it is harder for them to develop language when they have a hard time hearing and understanding. Developing literacy early on will help improve reading and minimize difficulties in reading when compared to their typically hearing peers.

The type of book read to children with hearing impairment also has an impact on their learning strategies. Kaderavek and Pakulski (2007b) conducted a study of two different types of storybooks, narrative and manipulative. Narrative storybooks have a plot or storyline with text and pictures. Manipulative storybooks have physical components to engage the child such as flaps or dials that enhance the text. They found that children demonstrated a higher level of engagement to the manipulative storybooks than the narrative storybooks. As a measure of engagement, Kaderavek and Justice (2005) examined the mean length of utterances (a measure
of the complexity of discussion about the book) and how many questions were asked in four mother-and-child dyads. Each mother and 4-5 year old child read two book genres: narrative only and narrative plus manipulative storybooks. After a novelty phase, all four children had greater mean length of utterances and asked more questions when read the manipulative storybook. The increase in these verbal skills, the increase of mean length utterances and asked questions, indicates that the children were more engaged possibly because a manipulative storybook is more similar to a toy for a child. An alternative reasoning could be because the language demand is lower and the child has more of a sense of control (L. Pakulski, personal communication, June 4, 2008). In either case, it seems as though the manipulative book has purpose and meaning to the child, which therefore increase engagement. This concept is very important for the current study—if reading has personal meaning and purpose, the child’s engagement during storybook reading will be greater.

Another type of book facilitates literacy and learning in hearing impaired children called the experience book (Pakulski and Kaderavek, 2004a). The experience book is based, in part, on the Language Experience Approach (LEA). The experience book is made by teacher, parent, or therapist and includes events from the child’s life with pictures, texts, objects, and keepsakes. Hearing impaired children demonstrated great interest in this type of book, especially when coupled with role play. Pairing LEA with storybook reading, children provided more accurate story retellings, which is an important indicator of academic performance (Roberts, Good, & Corcoran, 2005). For example, one family read the story *Jack and the Beanstalk*, then role-played the story, and completed activities related to the story (e.g. planting beans, estimating growth and recording results), all of which were recorded in photographs and drawings with narratives, generated by the children with parent help. When the children were asked to retell the
story, they were able to do so in a sophisticated way that reflected age-appropriate story grammar and vocabulary. This suggests that the LEA enhances children’s literacy and the motivation to read.

In an exploratory study, Neuman and Roskos (1990) examined how changes in the play environment might influence the nature of children’s print activities in play. The researchers redesigned two preschool classrooms into a literacy-enriched play environment. First, they separated classroom areas with features such as cupboards, tables, or screens. Then they created four separate play areas: post office, library, office and kitchen, as well as added props. Next they increased the amount of labeling in the environment using a variety of print and symbolic forms. After these classroom modifications, the researchers noted more purposeful, connected reading and writing behaviors in preschoolers. Their results demonstrate that literacy in play became more powerful, more connected, more interactive, and more role-defined.

**Toy Play**

It is vital to promote emergent literacy at an early age, perhaps even before experience books, high-level open-ended questions, and literacy enriched environments would be appropriate. According to Cawthorne (1975), play is how preschool children learn, and toys and games are their first reading tools. She says “toys and games are not just play; play is work and practice for children, the basis of reading readiness” (p. 24). Child librarians, Byrne, Deer, and Kropp (2003) further suggest that hands-on playful experiences when listening, being read to, handling books, and speaking also enhance emergent literacy. Yet despite the suggestion that emergent literacy can be supported through play, they observe that it is difficult for parents and caregivers to make time for play, additionally noting that some parents perceive play as not being work because it is fun and they believe it has little intrinsic learning value. There are two reports
of programs aimed at utilizing the power of play in enhancing early reading: In their “Do It Yourself” program, Byrne et al. (2003) teach parents how to incorporate play into their daily lives, and Cawthorne (1975) offered a service where parents could try out different toys and games with their children to see what they might enjoy before purchasing where each game or toy was selected to focus on a specific skill. Traditional library story hours also have the effect of turning reading into different kinds of games (Arnold, 2003). This reading time has encouraged language skills through songs, rhymes, finger-plays, and clapping out the syllables of the words. Overall, the basic literacy skills are learned when actively involved and engaging in fun, age-appropriate occupations.

**Play in Occupational Therapy**

Occupational therapy is the use of occupation as a therapeutic method. Occupation is doing something with meaning and purpose. Therefore the profession of occupational therapy is based on the use of occupation to promote health, enhance function, overcome disability, and achieve a higher quality of life. The results of a study by Bazyk, Michaud, Goodman, Papp, Hawkins, and Welch (2009) suggest that fully integrated occupational therapy services in kindergarten classrooms significantly improve emergent literacy. Mary Reilly (1974), a prominent occupational therapy theorist, has explored play in occupational therapy. According to Reilly, struggle for mastery within one’s environment is intermeshed with play. Mastery through play helps develop skills, interests, abilities, and habits of cooperation and competition needed for competence in adulthood. Through play, children learn rules, the concept of roles, socialization, communication, creativity, adaptation, and cognition (Parham & Primeau, 1997). Reilly (1974) was known for her view on play as exploratory. She said that children interact with the environment or explore leading to the sense of curiosity, which energizes and motivates the
child to play. Reilly expressed this exploratory drive of curiosity in three stages: exploratory behavior, competency behavior, and achievement behavior. Exploratory behavior occurs in early childhood with novel, unfamiliar situations and engagement in the environment is intrinsically motivated by curiosity. When a child engages in exploratory behavior in a safe environment, hope and trust are formed. Competency behavior reflects motivation for self-actualization, an inborn urge. This motivation produces feelings of joy, interest, and pride. Self-reliance and self-confidence are formed in this stage. Achievement behavior is undertaken because of the expectations of success or failure and is extrinsically motivated. In this stage of play, children compete with themselves and others. The hope, trust, self-confidence and self-reliance gained in earlier stages all convert into courage. Overall, children learn the skills needed in adulthood, when their occupational roles change as they experience different situations and expectations through play (Parham & Primeau, 1997).

Occupational forms, or all the physical aspects of an occupation, of children include toys and books. Children are typically engaged when they play with toys. Play is used often in occupational therapy; it is one of the three primary occupational performance areas in occupational therapy (Couch, 1996). Couch, Deitz, & Kanny (1998) studied the roles of play in occupational therapy practices of preschoolers three to five years old. Two hundred twenty-four pediatric occupational therapists completed questionnaires addressing their use of play in therapy, use of play assessments, and the different factors that influence play in school-based and non school-based settings. When asked the importance of play for motivating a child to participate in therapy, 91% confirmed that play was very important. Ninety-two percent reported that they use play as a modality to obtain psychosocial, sensory, or motor results in their patients. In regards to assessing play behaviors, 62% stated that they do, while 38% reported they do not.
Pediatric occupational therapists said they use more assessed play behaviors in non-school based settings (79%) rather than school-based settings (54%). The majority of the therapists reported that play is most commonly used as a modality instead of developing role behaviors.

**Engagement**

Mahoney and Wheeden (1999) describe engagement with others as the following: initiation of different activities, compliance, initiation of interaction and affect. They define engagement when playing alone as persistence, attention to activity, and involvement. To be engaged, a child needs to participate in the activity with these qualities mentioned. In past literacy studies, Kaderavek and colleagues have used the term “orientation”, which is defined as the child’s level of engagement or interest (Kaderavek and Pakulski, 2007b; Kaderavek & Sulzby, 1998a; Kaderavek & Sulzby, 2001). In several relevant studies, these authors used a 4-point rating scale *Kaderavek-Sulzby Rating of Orientation to Book Reading* (KS-ROB; Kaderavek & Sulzby, 2001), to document children’s responsiveness and motivation towards participating in literacy events. In the current study, the term “engagement” is used.

In their study of manipulative and narrative books, Kaderavek and Pakulski (2007b) hypothesized that the use of manipulative books, as compared to narrative-only books, would increase orientation to storybook reading to the level of orientation demonstrated for toy play. After repeated exposure to toys and books, the results demonstrated that children with hearing impairment had a higher level of orientation to the manipulative book when compared to the narrative book, and the level of engagement in toy play and manipulative book reading were not significantly different from each other. It should be noted, however, that the engagement for toy play saturated on the rating scale used indicating a possible ceiling effect that may occlude detection of differences. One possibility for the similar levels of engagement in manipulative
book reading and toy play is that the manipulative storybook is very similar to a toy because it contains flaps, movable objects, and dials to turn to encourage the child’s participation in storybook reading. An alternative suggestion is that the manipulative book gives the child a sense of control over the interaction. While not mutually exclusive, these two possibilities have not been explored in controlled studies. In either case, this study suggests that when children experience things that are meaningful and purposeful to them, such as manipulative books, toys, and interaction with the reader, they become engaged and interested, supporting improved development of literacy and language.

Meaning

Meaning is a central principle of occupational therapy theory. If a person does not have meaning in the occupations they participate in, they will not be as beneficial to him or her. Nelson and Thomas (2003) define meaning as “the entire interpretive experience engaged in by an individual encountering an occupational form” (p. 101). It is a lived, felt experience that takes place within a person. The physical and sociocultural aspects of an occupation and the skills a person possesses combine to produce an internal interpretation, or meaning. When a person has meaning in their occupations, it is likely that a sense of purpose, or motive, results. Therefore, reading has to give a child a sense of meaning and purpose for him or her to enjoy it. In order for a child to be engaged and attentive in storybook reading, the book has to be one of interest.

Aubin, Hachey, and Mercier (1999) suggest that meanings of daily occupations influence subjective quality of life. They looked closely at patients with a severe mental illness, schizophrenia. Participants were interviewed by the researcher and then completed a self-report questionnaire in which they listed the occupations they performed each half-hour. Each occupation was then rated on a Likert scale from 0-5 on perceived competence, importance, and
pleasure. In addition, quality of life was measured by a self-administered questionnaire. The results demonstrated that participants had a better quality of life when they enjoyed their occupations and when they felt competent.

Yoder, Nelson, and Smith (1989) found that when an occupation has enhanced meaning, the subjects are more engaged and perform the occupation for a longer duration. They observed female nursing home residents in two situations: an enhanced-meaning occupation and in a rote exercise. Both groups were given a bowl of cookie dough and water and were told to stir the cookie dough as long as they could while the researcher covertly counted their repetitions and the duration of their participation. The enhanced-meaning group was given vanilla; they had a plate of homemade cookies in their view and a pan of cookies ready to be baked on the table; and they were also invited to have a cookie after the occupation. On the other hand, the rote exercise group was just given additional water to stir in and had no cookies in their atmosphere. As a result, the enhanced-meaning group produced more repetitions and stirred the cookie dough longer. This suggests that when an occupation has more meaning and purpose, an individual will perform better.

**Present Study**

We explored whether themed toy play can enhance subsequent engagement in storybook reading. We tested whether engagement in storybook reading is higher if it is preceded by play with toys that are thematically related to the book such that the play enriches the context and meaning for the storybook, similar to the enriched environment provided in Yoder, Nelson, and Smith’s study (1989). Because this hypothesis has not been explored in any population, we included both children with typical hearing and children with hearing impairment.
Method

This study employed a counterbalanced experimental design. In each of two sessions, participants engaged in toy play followed by being read a storybook. In the experimental condition, the toys matched the theme of the book. In the control condition, the toys did not match the theme of the book. We measured participants’ engagement in storybook reading through behavioral rating.

Participants

Twenty-three preschool-aged children participated. Data collection spanned January 2009 to January 2010 and occurred at four locations including a human-subject research laboratory at the university, a private-pay preschool in Toledo, and two state preschool programs specialized for children with hearing impairment in Ida, Michigan and Cleveland, Ohio. At each location, the data collection occurred in a small room or corner of a room with few distractions. Child appropriate furniture, a rug or floor mat, and a bean bag chair were present. Caregivers or classroom teachers could observe as desired. Twelve of the participants (8 boys, 4 girls) had typical hearing (TY). Of these, six each participated in the laboratory and at their preschool. Eleven of the participants (6 boys, 5 girls) had hearing impairment (HI). Of these, nine participated at the two preschool programs for children with hearing impairment, one at the private-pay preschool, and one in the laboratory. All parents or legal guardians (caregivers) gave informed consent before participation began. They also completed a questionnaire on reading practices as well as three forms: Parent/Teacher Form, Adaptive Behavior Checklist, and Social Emotional Scale. Families received a cash incentive of $10 after participation. Procedures were approved by the Institutional Review Board of The University of Toledo.
Amongst the participants with hearing impairment, eight had been identified within one month of birth and the remaining three between the ages of two and three. The type of impairment was reported by caregivers as sensorineural for five participants, conductive for one, and mixed for two. Three caregivers did not know or did not report the type of hearing impairment. Regarding the degree of hearing impairment, three reported mild or mild-moderate loss, one moderate, six severe/profound loss, and one did not report. One of the participants with HI wore one hearing aid; six wore bilateral hearing aids; two had bilateral cochlear implants; and two used no amplification.

The two groups of participants did not differ in age (average ± standard deviation 3.6±0.5 for TY and 3.7±0.5 for HI, p>0.05). Caregivers provided demographic information used to derive scores of socioeconomic status (SES) with the Hollingshead Four-Factor Social Index of Social Status (Hollingshead, 1975) which takes into account the level of education and occupation of each adult wage earner. Scores range from 8 to 66. Families in the TY group had a higher SES (56.7±9.2, mean±SD) than families in the HI group (35.2±15.5, p<0.01). All of the children with HI who enrolled in this study attended preschool programs.

Caregivers answered questions about their reading practices with their children. One hundred percent of caregivers in both groups reported reading to their children. Seven caregivers in each group reported that others, such as siblings, friends, and teachers read with their child. Ninety-two percent and forty-six percent of caregivers in the TY and HI groups, respectively, reported that their child is read to five or more times a week. The remaining caregivers reported that their child is read to two times a week. None reported not reading or reading only once a week to their child. To assess for differences, we assigned a score of 0 to reading less than twice a week, 1 to reading two to four times a week, and 2 to reading five or more times a week. The
score was 1.9±0.3 (mean±SD) for TY and 1.5±0.2 for HI, representing a significant difference using an unpaired t-test (p<0.05). We presented four categories of books and asked if they were read to the child. The following percentage of caregivers reported affirmatively for the TY and HI groups respectively: sound books 42% and 64%, books with flaps 50% and 64%, learning books 67% and 91%, and storybooks 100% and 91%. We presented three types of questions that can be asked of children during reading. The following percentage of caregivers reported affirmatively for the TY and HI groups respectively: questions about word pronunciation 17% and 46%, questions about vocabulary/word meaning 67% and 27%, and questions about the content/story 75% and 64%. Pearson’s chi-square test did not reveal any differences in distribution of category of book or questions asked between the two groups.

To assess for developmental differences, participants completed two assessments: the FirstSTEp (Miller, 1993) and Pearson’s Preschool Language Scale, 4th edition Screening tool (PLS-4 Screen, Zimmerman, Steiner, & Pond, 2005). The FirstSTEp Screening Tool screens for any developmental delays that would decrease a child’s ability to engage meaningfully in play (Miller, 1993). It tests children between the ages of 2 years, 9 months to 6 years, 2 months, with normative data by 5-month divisions. The scoring is based on a pass/fail rating for the 12 subtests. The FirstSTEp has high reliability with internal consistency of .89 and inter-rater reliability of .91. This tool also holds construct, content, and discriminant validity (Miller, 1993). The examiner administered portions of the FirstSTEp to assess a child’s abilities in three domains: cognitive, language, and motor. Raw scores are converted to normative scores according to the child’s age. The average domain score is 10 with a standard deviation of 3. The sum of these three domain scores is then converted to a composite score. The average composite score is 50 with a standard deviation of 10.
Three caregiver reports provide a wider view of the child’s functioning. The Social-Emotional scale asks caregivers to report the frequency of behaviors reflective of confidence, mood, cooperation, and communication. The Adaptive Behavior Checklist asks caregivers about the child’s abilities in self-care, social interactions, and community functioning. The Parent/Teacher Scale asks about general behaviors of the child. The raw score of these are similarly converted to normative scores (average 10, standard deviation 3) according to the child’s age. Table 1 reports the FirstSTEP normative scores for participants in each group. The children in the HI group did not present with any developmental concerns as their normative scores were all within one standard deviation of the mean with the exception of the Parent/Teacher Scale. However, when compared to the TY group, the HI group did have significantly lower scores. This resulted from the TY group having high scores. This suggests that the children in the HI group should not have any barriers to participation and engagement in play and storybook reading.

Many children with hearing impairment demonstrate language delays. Language comprehension was assessed for descriptive purposes through the PLS-4 Screen (Zimmerman, Steiner, & Pond, 2005). The PLS-4 Screen tests between the age range of three to six years, eleven months. Scoring is determined by pass/fail rating for 6 subtests. This assessment has high reliability with test-retest stability of .86 and also holds content validity. It also has high classification accuracy of .84, with sensitivity of .82 and specificity of .79.

The PLS-4 indicates whether a child has functional language skills in the areas of language, articulation, connected speech, and social/interpersonal skills. It also screens for difficulties with stuttering and voicing. It sets criteria for passing in each area according to the child’s age. The pass rates for each group are reported in Table 2. One participant with HI
refused participation in the PLS-4. Though fewer participants in the HI group passed in most sections, Pearson’s chi-square test did not reveal any significant differences in the distribution of pass rates between the two groups.

Caregivers of all participants reported that their child could attend to a single task for at least 5 minutes.

**Materials**

Three storybooks were used in this study so that no one book would have an inordinate influence on the outcome of the study. The books were “It’s the Bear!” by Jez Alborough (1994), “Widget” by Lynn Rossiter McFarland (2001), and “Gorgeous!” by Caroline Castle (2000). Each book had characters and a plot line. Each was illustrated. The language of the books were analyzed to ascertain that they were appropriate for the language level of our intended population (preschoolers, including those with hearing impairment) and to maximize similarities between them.

Factors evaluated included length as measured by the number of words, mean length utterance (MLU, a reflection of grammatical complexity), and type-token ratio (TTR), which indicates the frequency of unique words or the diversity of words. Table 3 reports the characteristics of the books. The first researcher (KW) read the books according to a standardized procedure which included reading in an engaging manner, using an appropriate voice when reading specific characters, using appropriate facial features, allowing the children to turn the pages, but not pausing to ask questions. If the child interrupted with questions, the reader answered them and returned to reading the book.

We used three sets of toys matched thematically with the three individual books. For the book “It’s the Bear!” (Alborough, 1994) the set included a stuffed toy bear, a picnic basket with
play food such as a pie, a stuffed boy doll, and a forest scene mounted on the wall. These toys matched well to the story which is about a boy and his mother who go on a picnic when they receive an unexpected visit from a bear. For the book “Widget” (Rossiter McFarland, 2001), the set of toys consisted of a stuffed dog, a cat, a brush, a stuffed old woman doll, two small animal food bowls, and a farm house scene mounted on the wall. This storybook is about a dog that pretends to be a cat to fit in and thus the toys match well. The third set of toys for the book “Gorgeous!” (Castle, 2000), contained stuffed zebras (a mother and baby), a stuffed lion, a jungle made of green florist foam with artificial palm and fern leaves, and a jungle scene mounted on the wall. The theme of this storybook is about a baby zebra that encounters a lion and learns not everything in the world is gorgeous from his mother.

It was important that the books and toys be equally novel to all participants. Therefore, the caregivers were asked whether any of the books or toys were familiar to or a favorite of their child before participation.

**Procedure**

Participants attended two sessions. In the TY group, the time between sessions was 12.6±4.5 days (mean ± SD). In the HI group, the time between visits was 18.7±3.9 days, no difference. The FirstSTEp was performed at the start of the first session, and the PLS-4 at the start of the second. Participants were then invited to play with the researcher for 15 minutes. Each participant was asked to open the toy box to see what was inside. This gave the participants the chance to take out the toys and direct their own play. The researcher responded to the child’s initiation of play. If the child did not initiate play, the researcher tried to engage them in meaningful play through asking questions or pretend play allowing the child to feel more comfortable and follow suit. For example, with the toy set for “It’s the Bear!” (Alborough, 1994)
the researcher asked the child what is in the picnic basket, what he or she would want to eat, and typically what he or she would find in a forest. Some common play themes seen with this storybook consisted of making lunch, eating, and sharing the play food. Typical play themes with the toy set from “Gorgeous!” (Castle, 2000) included mommy and baby zebra sleeping in the bushes, hiding from the lion in various places, and swimming/drinking in the pond. Frequent play themes with the play set from “Widget” (Rossiter McFarland, 2001) were brushing the dog and cat, having the woman feed the dog and cat in their food bowls, and playing hide and seek in the barn. The researcher also asked the participants about the scenery mounted on the wall, such as identifying the scene, objects, or colors. Cues were given when 5 minutes of play remained. After the 15 minutes, the researcher assisted the child in putting away the toys. He/she was allowed to hold onto one toy if he/she desired. Then, the researcher read the storybook according to the outlined procedure. The child was videotaped during storybook reading.

The condition of the first session, whether toys were Matched or Unmatched to the theme of the book, was randomly determined and the second session was held in the opposite condition. The two storybooks, out of the three possible, were also randomly selected for the two visits. Finally, the remaining set of toys to be used in the Unmatched condition, out of two possible, was randomly selected.

**Measurement**

To measure the engagement of participants during storybook reading, we utilized The Child Behavioral Rating Scale (CBRS, Mahoney and Wheeden, 1998). Mahoney and Wheeden (1998) developed and used this scale in their study of how a teacher’s style of interaction effects engagement in a child with a disability. Kim and Mahoney (2004) subsequently found this scale to be sensitive in their study of engagement in children with and without disabilities while their
parents played with them. As written (Mahoney, 1998), the CBRS includes two subscales: Attention and Initiation. The Attention Subscale includes four Items: Attention, Persistence, Involvement, and Cooperation. The Initiation Subscale includes three Items: Initiation of Activity, Joint Attention, and Affect. After consultation with the author, we modified the CBRS for use in this study (G. Mahoney, personal communication, October 17, 2008). We excluded the items Persistence and Initiation. Persistence measures the level to which the child makes an effort to participate. Our rational for excluding Persistence was that listening to storybook reading requires passive engagement and behavior indicative of persistence would be difficult to observe. Initiation was excluded as the researcher initiated storybook reading at a standard time after toy play was finished. Thus, the utilized Attention Subscale included the Items Attention to the Activity, Involvement, and Cooperation. Attention to the Activity assesses the extent to which the child attends to the storybook while being read to. Involvement measures how much interest the child has in the activity. Cooperation measures the level to which the child obeys the requests or suggestions of the adult. The Initiation Subscale included the Items Joint Attention and Affect. Joint Attention measures the quality of the child’s interactions with the adult. Affect measures the child’s mood during the engagement. Each item was rated on a Likert 5-point scale from very low (1) to very high (5) while viewing videotaped reading sessions. See Appendix A for the Likert rating definitions used in this study. Scores are derived for each Item, Subscale, and CBRS Total.

Engagement was rated for the whole session, using whole points only. A child who receives a score of 25 demonstrates the following: stays with the storybook throughout the whole session, pays attention by listening and looking, points to pictures, wants to turn the pages, asks questions, and interested in how the story ends. He or she also cooperates with the adult in
transitioning from toy play to storybook reading and vocalizes, laughs, or smiles when interacting with the adult and/or storybook.

**Data Analysis**

Differences in group characteristics were determined through student’s t-tests and Pearson’s chi-square tests. Scores on the CBRS Items, Subscales, and Total are our primary outcome measurement. The distribution of these scores deviated from normal. In particular, there was little variance in the item Cooperation resulting in kurtosis and skew in the distribution of that variable. As a result, nonparametric tests of significance were utilized. Our experimental design produces is well suited for analysis by 2X2 ANOVA; however, there is no nonparametric equivalent to this test (Pett, 1997). Accordingly, we tested between group differences with a Mann-Whitney U test and within group differences with a Wilcoxon Signed Rank Test. Significance was determined at the $\alpha<0.05$ level. No correction for multiplicity was employed as our *a priori* intent was to test each variable independently. CBRS data are reported as mean ± standard error.

As there were differences in some of the descriptive measures, using Spearman’s rho, we assessed for correlation between CBRS scores and the following descriptive factors: SES, the score for the frequency of reading, and FirstSTEp domain scores. There were no significant correlations.

Interrater reliability was assessed by having a second rater score 20% of the videos. The Interrater was trained to 90% accuracy within one point on the 5-point Likert scale using representative examples. The Interrater was blind to the hypothesis of the study, viewed only the storybook reading, and was blind to the condition of the toy play that preceded. Interrater reliability is reported as a linearly weighted Kappa statistic (Cohen, 1968).
Results

One participant in the HI group was unable to attend the second session. One participant in the HI group refused participation in the second session. As a result only 9 participants with HI were used in analysis of results.

In general, engagement measured by the CBRS was high in this study for all participants in both conditions (n=42). On the 1-5 Likert Scale of the CBRS, the Attention Item was 4.64±0.1, Involvement was 4.21±0.1, and Cooperation was 4.95±0.03. The mean score on the Attention Subscale was 13.81±0.2, where the highest score is 15. The Joint Attention and Affect Items had mean scores of 4.26±0.1 and 4.38±0.1 respectively. The mean score on the Initiation Subscale was 8.64±0.2, where the highest score is 10. The mean CBRS Total score was 22.4±0.3, where the highest score is 25.

Data from both groups of participants were pooled to allow for testing of the main hypothesis that thematically related play would enhance engagement in storybook reading. Comparisons between the two conditions for CBRS Items, Subscales, and Total scores showed near significant increase in Involvement and Joint Attention (p=0.052 for each) and a trend toward increased Initiation Subscale scores (p=0.074) in the Matched compared to the Unmatched condition. See Table 4 for the means, variance, and statistical results.

To probe for the validity of the construct of engagement as measured by the CBRS, we assessed correlation amongst the Items using Spearman’s rho. In the Matched condition, all Items of the CBRS correlated positively and significantly with one another (see Table 5). In contrast, in the Unmatched condition, correlations were varied, weaker, and less significant (see Table 6). Taken together, the trend toward higher engagement and the higher correlation amongst measures in the Matched condition suggests that the CBRS is discriminate in measuring
engagement in children during storybook reading. This suggests that it is a valid and sensitive measure for this study.

We have used the CBRS as a measure of behaviors indicative of engagement. Figure 1 depicts the average and variance of CBRS scores of participants in the TY and HI groups in both experimental conditions, Unmatched and Matched. There were no differences between the TY and HI group in either the matched or unmatched condition for the CBRS Items, Subscales and Total score. There was no effect of the condition on the engagement of children in the TY group. In contrast, scores for engagement were higher in the Matched condition, compared to the Unmatched condition for children in the HI group. Scores for the Affect Item were significantly higher (4.1±0.2, 4.6±0.2 for Unmatched and Matched respectively, p<0.05), scores for the Joint Attention Item trended higher (4.0±0 and 4.6±0.2 for Unmatched and Matched respectively, p=0.059), and accordingly, scores in the Initiation Subscale (Affect and Joint Attention Items summed), were significantly higher (8.1±0.2 and 9.1±0.5 for Unmatched and Matched, respectively, p<0.05). There were no differences in other CBRS scores for the HI group. Taken together, these indicate that play with thematically related toys prior to reading leads to increased interaction with the reader and more positive emotion during reading. The nonparametric nature of the data precluded testing the significance of the interactions observable in the graphs.

Though the order of conditions was randomly determined, there was still the prospect that first and second visits would differ in a consistent manner that would bias our results. We compared CBRS scores from the first to the second visit in both group and found no effect. Similarly, toys and books were randomly assigned to participants; however, it could have been the case that one particular toy or book was more engaging for the participants. This was
assessed through three-way Wilcoxon signed rank tests in each condition. There were no differences in CBRS scores according to either the toy or the book utilized.

For videos rated by both the researcher and a trained assistant, scores were within one point for 100% of videos for the Attention to Activity, Involvement, Joint Attention, and Affect Items. For the Cooperation Item, 89% of videos were rated within one point and one video was scored with a difference of two between the raters. The weighted Kappa statistic for Attention to Activity was 0.64, representing substantial agreement (Landis & Koch, 1977); for Involvement 0.24, fair agreement; for Cooperation 0.67, substantial agreement; for Joint Attention 0.19, slight agreement; and for Affect 0.43, moderate agreement. Disagreements between raters did not demonstrate any consistent bias.

Discussion

We examined whether themed toy play increased subsequent engagement in storybook reading in preschool children with typical hearing and with hearing impairment. In the Matched condition, compared to the Unmatched condition, we found near significant increases in Involvement (the level of satisfaction and participation in the storybook interaction), and Joint Attention (the level of interaction with the reader and the level of interest in the storybook). We also found a trend towards increased scores on the Initiation Subscale (Affect and Joint Attention) in the Matched condition. However, none of these results reached statistical significance.

When comparing children with typical hearing and children with hearing impairment, we found no differences in either condition. The condition had no effect on engagement in children with typical hearing when analyzed alone. In contrast, the experimental condition did have an effect in children with hearing impairment. Specifically, the Affect Item and the Initiation
Subscale were higher in the Matched condition for participants with hearing impairment. Taken together, the implication is that enhancing the context and meaning of the story through play with thematically related toys playing before reading leads to increased interaction with the reader, increased participation, satisfaction, and more positive emotion during reading for children with hearing impairment. Though it appears as though this method may have been helpful for our whole sample of preschoolers, it was particularly effective in the group with hearing impairment. In implementing this approach in home and school settings, it is likely that the child’s enhanced engagement would also be rewarding for the reader. Therefore, future studies might explore whether this approach would be effective in increasing the frequency with which families of children with hearing impairment read together. Other suggestions for future research include testing this approach in group/classroom settings, and exploring whether the enhanced engagement in storybook reading translates into improved retention of the story and complexity of language used to discuss the story.

When children experience things that are meaningful and purposeful to them, they become engaged and interested. This can support improved development of literacy and language. This was evident in Kaderavek and Pakulski study (2007b) with manipulative books and in the present study with themed toys and interaction with the reader. Manipulative books and themed toys were seen as enjoyable and meaningful objects, and both created higher engagement than the opposite conditions (narrative books, non-themed toys). Both of these studies follow the fourth principle from Teale and Sulzby (1986): literacy learning occurs when children are actively engaged. A key component to children’s active engagement rests on their ability to physically interact with print materials (Hanser, 2010).
This approach suggests a novel role for occupational therapists in enhancing literacy in children with hearing impairment. Occupational therapists are experts in the therapeutic use of play. This new intervention is not only simple, but also fun by utilizing pretend play, an important component for child development. Every child has the potential to achieve some level of literacy, but the development of that potential depends on the opportunities provided within the child’s environment (Hanser, 2010).

Recent findings suggest that when implementing this intervention in school settings, it might be best provided through consultative approach. In a study by Bazyk, Michaud, Goodman, Papp, Hawkins, and Welch (2009), occupational therapy services were fully integrated into two kindergarten classrooms. They found that these services demonstrated significant improvement in emergent literacy in both children with and without disabilities. The majority of services provided by occupational therapists in this study were providing parent and teacher consultation. Occupational therapy practitioners can work with parents, educators, and other caregivers to create high engaging, meaningful opportunities that help achieve real and lasting literacy (Hanser, 2010).

**Limitations**

There are some limitations to consider with this study. There is a risk of false negative findings due to the sample size; however, the risk of false positive findings was minimized through conservative treatment of the data. There were differences in the characteristics of the two populations, specifically SES and reading practices. Overall, the participants with hearing impairment did have lower SES and less reading done at home, but preschool attendance may have buffered these as evidenced by similar engagement scores of those with typical hearing. There was a ceiling effect in Cooperation rating due to the fact that most participants were
compliant in the transition from toy play to storybook reading and followed the reader’s
directions, therefore given a score of a 5 in both sessions. Sensitivity may have been increased by
asking participants about their interest in sitting for a storybook after play, once they had been
shown what the book was to be about.

Although it appears to be valid, as evidenced by internal correlation, the CBRS presented
some restrictions in conveying engagement. As described, a single rating was given to the whole
session of storybook interaction. Furthermore, only whole point ratings were utilized. We may
have had more sensitive detection of changes in engagement by utilizing half points. For
example, one subject demonstrated interest and enjoyment in the storybook, asked questions,
laughed, turned the pages, and pointed to pictures, but before the last two pages were finished,
the subject stood up and engaged in another activity. This subject would have received a score of
5 in each category, but because she was not engaged throughout the whole session, she was
given a 4 in Attention and Involvement. Lastly, the interrater reliability may be improved
through better description of observable behaviors. For example, a child may not ask questions,
be highly engaged in a way that is palpable to the reader but not detectable on videotape.

Conclusion

Our results demonstrate how thematically-related play may lead to increased interaction
with the reader, increased participation, satisfaction, and positive emotion, particularly in
children with hearing impairment for whom early engagement in literacy is crucial to long term
success. It is the role of the occupational therapist to consult with teachers and parents on this
simple but meaningful intervention.
References


study of two children with hearing loss. *Communication Disorders Quarterly,* 25, 179-188.


Participants with typical hearing (TY) and hearing impairment (HI) were read storybooks after playing with toys that were either matched to the theme of the story or unmatched. Engagement was measured through the CBRS Items, Subscales, and Total Scores. Differences were tested with Mann-Whitney U tests for between groups and Wilcoxon Signed Rank Test for within subjects comparisons; *p<0.05. A., B., C., CBRS Attention to Activity, Involvement, and Cooperation Items did not differ between groups or by condition within groups, respectively; D. CBRS Attention Subscale (sum of Items A-C) did not differ between groups or by condition within groups; F. and G. CBRS Affect Item and Initiation Subscale (Affect and Joint Attention summed) were significantly higher in the Matched condition for participants with HI but not for participants with TY (p<0.05); there were not differences between groups; and H. The CBRS Total score was not different between groups or by condition within groups. *p<0.05
### Tables

Table 1, FirstSTEp normative scores, Mean ± standard error, *p<0.05, **p<0.01

<table>
<thead>
<tr>
<th>Domain</th>
<th>TY</th>
<th>HI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cognitive Domain</td>
<td>13.5±0.7</td>
<td>10.9±0.8**</td>
</tr>
<tr>
<td>Language Domain</td>
<td>13.8±0.6</td>
<td>9.6±1.0**</td>
</tr>
<tr>
<td>Motor Domain</td>
<td>13.3±0.4</td>
<td>10.1±1.1**</td>
</tr>
<tr>
<td>Composite Score</td>
<td>64.9±2.0</td>
<td>49.1±3.3**</td>
</tr>
<tr>
<td>Social Emotional</td>
<td>13.6±1.4</td>
<td>8.3±1.6*</td>
</tr>
<tr>
<td>Adaptive Behavior</td>
<td>13.7±0.7</td>
<td>12.8±0.8</td>
</tr>
<tr>
<td>Parent/teacher report</td>
<td>10.9±0.6</td>
<td>7.5±0.9**</td>
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</table>
Table 2. Number and percent of participants meeting passing criteria for each area of the PLS-4.

<table>
<thead>
<tr>
<th>Measure</th>
<th>TY (of 12)</th>
<th>HI (of 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>12 (100%)</td>
<td>9 (90%)</td>
</tr>
<tr>
<td>Articulation</td>
<td>12 (100%)</td>
<td>9 (90%)</td>
</tr>
<tr>
<td>Connected Speech</td>
<td>12 (100%)</td>
<td>8 (80%)</td>
</tr>
<tr>
<td>Social/Interpersonal Skills</td>
<td>11 (92%)</td>
<td>9 (90%)</td>
</tr>
<tr>
<td>Stuttering</td>
<td>11 (92%)</td>
<td>10 (100%)</td>
</tr>
<tr>
<td>Voice</td>
<td>11 (92%)</td>
<td>6 (60%)</td>
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</table>
Table 3. Storybook characteristics

<table>
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<tr>
<th>Book</th>
<th>Words</th>
<th>MLU</th>
<th>TTR</th>
</tr>
</thead>
<tbody>
<tr>
<td>It’s the Bear!</td>
<td>325</td>
<td>6.6</td>
<td>0.5</td>
</tr>
<tr>
<td>Widget</td>
<td>344</td>
<td>6.02</td>
<td>0.44</td>
</tr>
<tr>
<td>Gorgeous!</td>
<td>404</td>
<td>7.5</td>
<td>0.36</td>
</tr>
</tbody>
</table>
Table 4. CBRS scores in the Matched and Unmatched Conditions

<table>
<thead>
<tr>
<th></th>
<th>Unmatched</th>
<th>Matched</th>
<th>Z</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Attention to activity</td>
<td>4.7±0.1</td>
<td>4.6±0.1</td>
<td>-0.264</td>
<td>0.792</td>
</tr>
<tr>
<td>Involvement</td>
<td>4.0±0.1</td>
<td>4.4±0.1</td>
<td>-1.941</td>
<td>0.052</td>
</tr>
<tr>
<td>Cooperation</td>
<td>4.95±0.05</td>
<td>4.95±0.05</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Attention Subscale</td>
<td>13.7±0.2</td>
<td>12.95±0.3</td>
<td>-0.963</td>
<td>0.336</td>
</tr>
<tr>
<td>Joint Attention</td>
<td>4.1±0.1</td>
<td>4.4±0.1</td>
<td>-1.941</td>
<td>0.052</td>
</tr>
<tr>
<td>Affect</td>
<td>4.3±0.1</td>
<td>4.5±0.1</td>
<td>-1.155</td>
<td>0.248</td>
</tr>
<tr>
<td>Initiation Subscale</td>
<td>8.4±0.2</td>
<td>8.9±0.3</td>
<td>-1.788</td>
<td>0.074</td>
</tr>
<tr>
<td>CBRS Total</td>
<td>22.1±0.3</td>
<td>22.9±0.5</td>
<td>0</td>
<td>1</td>
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</table>
Table 5. Correlations in CBRS Items in the Matched Condition, Spearman’s rho, *p<0.05, **p<0.01

<table>
<thead>
<tr>
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<th>Involvement</th>
<th>Cooperation</th>
<th>Joint Attention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement</td>
<td>0.564**</td>
<td>--</td>
<td>--</td>
<td>--</td>
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<tr>
<td>Cooperation</td>
<td>0.554**</td>
<td>0.473*</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Joint Attention</td>
<td>0.6**</td>
<td>0.726**</td>
<td>0.484*</td>
<td>--</td>
</tr>
<tr>
<td>Affect</td>
<td>0.529*</td>
<td>0.791**</td>
<td>0.498*</td>
<td>0.839**</td>
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</table>
Table 6. Correlations in CBRS Items in the Unmatched Condition, Spearman’s rho, *p<0.05, **p<0.01

<table>
<thead>
<tr>
<th></th>
<th>Attention to Activity</th>
<th>Involvement</th>
<th>Cooperation</th>
<th>Joint Attention</th>
</tr>
</thead>
<tbody>
<tr>
<td>Involvement</td>
<td>0.526*</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Cooperation</td>
<td>-0.132</td>
<td>0.028</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Joint Attention</td>
<td>0.192</td>
<td>0.391</td>
<td>0.073</td>
<td>--</td>
</tr>
<tr>
<td>Affect</td>
<td>-0.135</td>
<td>0.347</td>
<td>0.458*</td>
<td>0.369</td>
</tr>
</tbody>
</table>
Appendix A

Child Behavior Rating Scale

ATTENTION SUBSCALE ITEMS

1. Attention to Activity: (Fittiness/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 rate 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 inattentive 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 ask 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/or interested in how the story ends.

3. **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.
INITIATION SUBSCALE ITEMS

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.