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The Parent’s Role: Shared Book Reading and the Child with ASD

A Dissertation submitted in partial satisfaction
of the requirements for the degree of

Doctor of Philosophy

in

Education

by

Leigh Ann Tipton

June 2014

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Dedication

I would like to acknowledge the support of the Doug Flutie Jr. Foundation during my graduate school career to further research in the field of autism. Most importantly, I wouldn’t have accomplished so much without the love and support of my family and friends.
The purpose of this study was to identify how autism-related child characteristics influenced mother-child interaction during a shared book reading activity. Coding systems designed to report parent and child behaviors during the task were utilized for this research. The children involved were required to meet criteria for autism spectrum disorder (ASD), be between the ages of 4 and 7 years, be at least minimally verbal, and have an IQ greater than 55. The results of a factor analysis identified a four-factor model of a parent-directed shared literacy task—clarification techniques, feedback techniques, teaching techniques, and evocative techniques. Both parent education and child social interaction skills were found to be significant predictors of the parent’s use of clarification techniques during the shared literacy task. Parent education and child IQ were both correlated with positive parenting; child IQ was negatively correlated with negative parenting. Results from chi-square analyses utilizing the dichotomized CBCL
externalizing behavior problems score, demonstrated that the presence of externalizing behavior problems was significantly related to children with less positive parents. A subset of the sample of children who had elevated problem behaviors and parents exhibiting less positive parenting was identified for future research in understanding whether the child or parent is influencing the relationship between child behavior problems and parenting behaviors.
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The Parent’s Role: Shared Book Reading and the Child with ASD

Shared literacy, family literacy, picture book reading, dialogic reading, and story time are all different terms used to describe shared book reading, a common parent-child activity that is believed to enhance child literacy outcomes. There are three primary areas of research in family literacy: description of early literacy, intervention in early literacy, and programs designed to increase the literacy skills within a family (Britto & Brooks-Gunn, 2001). The focus of this paper is on early literacy that is present within a parent-child dyad, independent of intervention techniques, with a child with autism spectrum disorder (ASD). Furthermore, the understanding of shared literacy is characteristically focused on prerequisite skills for reading, such as oral language and story development, rather than an exclusive focus on letter and word recognition (Snow, 1993). Thus, understanding the benefits of shared book reading and the influence of child characteristics upon the parent strategies during this interaction will be important.

As early as the 1970’s, investigators have reported strong associations between shared book reading and early language skills (Chomsky, 1972). The benefits of shared book reading are supported by developmental theory. Vygotsky’s theory of the Zone of Proximal Development (ZPD) suggests individuals have a level of performance that they can reach on their own, but with support, they are able to achieve a higher level of performance, as long as “scaffolding” is provided (Vygotsky, 1978). Scaffolding provides a child with support from a more skilled person, i.e., by providing an appropriate form of assistance within their “zone of proximal development”. Thus, this “zone” is the distance between independent skill level and the potential skill level with
the support of an adult. The book reading context allows parents to structure reading activities and to help their child achieve a higher level of skill (i.e., reading more advanced text or reading more fluently) than their child could achieve by him or herself (Anderson, Anderson, Friedrich, & Kim, 2010). Additionally, by participating in the activity with their child, parents increase child engagement by maintaining and supporting the child’s attention and cognitive skills, while engaging in an activity clearly within the child’s zone of proximal development across both preschool and early elementary years when children have various book reading skills. With repeated practice, this activity can create more opportunities for language and social development (Ruble, McDuffle, King & Lorenz, 2008).

Shared book reading also provides an opportunity for positive parent-child engagement and interaction as well as an opportunity to develop children’s oral language and vocabulary and increase understanding of story development (Britto & Brooks-Gunn, 2001; Evans, Williamson, & Pursoo, 2008; Senechal, LeFevre, Thomas, & Daley, 1998). The amount of time that parents spend reading with their children is associated with improvements in children’s expressive oral language and pre-academic skills (Britto & Brooks-Gunn, 2001; Buhs, Welch, Burt, & Knoche, 2011; Hart & Risley, 1995). Researchers have found an association between parents who participate in more shared reading activities with their children at home and positive outcomes, not only in their child’s literacy and language development, but also in their social skills and emotional control (Buhs et al., 2011; Bus, van Ijzendoorn, & Pellegrini, 1995; McWayne, Hampton, Fantuzzo, Cohen, & Sekino, 2004; Scarborough & Dobrich, 1994; Weigel, Martin, &
Bennett, 2002; Wood, 2002). This phenomenon may appear when children who read with their parents have the opportunity to strengthen emotional bonds, in addition to being exposed to and engaged in literacy related activities. Children who are more engaged in positive shared reading interactions are more likely to spend time reading alone, once these skills are acquired (Whitehurst & Lonigan, 1998). Children who take pleasure in a shared book reading activity increase their opportunities for social engagement and positive experiences in reading related activities prior to, or in addition to exposure to the school curriculum (Weigel et al., 2006). These emergent literacy experiences foster the building blocks of later literacy skills that are taught and developed in school.

**Home Influences**

Children begin primary school often on an uneven playing field as they enter with various formal educational experiences, and even more specifically, with differences in their home literacy environment. The family can be considered a key component in children’s early literacy development prior to entering school. Bronfenbrenner’s ecological model (1994) emphasizes the potential interactions between two or more settings and the development of the individual as influenced by the various Microsystems (e.g., home and school). This ecological perspective emphasizes that the influences of family and networks around an individual are additive and build as the system expands. Specifically, for a child learning to read, family literacy practices intersect with, and are influenced by home and community habits.

Burgess, Hecht, and Lonigan (2002) studied the home literacy environment for children ages four and five using a questionnaire that measured passive family activities
(e.g., watching TV), active activities (e.g., shared book reading), and type of environment (i.e., limiting or interactive). All of these activities were significantly related to the child outcomes of oral language, phonological awareness, letter naming skills, and word decoding. However, none of these involved observation of parent-child interactions. These rich early parenting practices are likely to support early literacy development in children by exposing them to written language and communication during shared book reading activities (Buhs, Welch, Burt, & Knoche, 2011; Snow, Barnes, Chandler, Goodman & Hemphill, 1991). Furthermore, parents are able to create educational opportunities at home by exercising control over their child’s leisure time, increasing exposure to adult conversations, and providing access to written material in the home (Snow et al., 1991). Many children develop an understanding of the function of written language prior to entering school by observing their family’s literacy practices (Van Steensel, McElvany, Kurvers, & Herppich, 2011). These children are given the opportunity to hear words and connect them to print, thus establishing the connection between spoken and written language. Emergent reading skills are practiced when a child “reads” a book to himself or to an animal or doll, demonstrating an understanding of the process of the activity (Evans et al., 2008; Teale, 1988). Finally, the nature of parent-child shared literacy activities prior to school entry prepare children for their future academic endeavors by connecting written and oral language skills to reading for comprehension (Bus et al., 1995).

Another important feature of shared book reading is its utility in fostering children’s language development. A critical time for understanding the nature of shared
book reading occurs prior to school entry. Although not focusing on language development specifically, shared book reading encourages dialogue between parent and child, in addition to increasing a child’s knowledge of textual language and vocabulary (Anderson et al., 2010). Upon entry in school, children are expected to learn their letters, that letters have sounds, that words are made up of letters, and that words have meaning. Results from a seminal meta-analysis found that parent-preschooler shared book reading was related to language growth, emergent literacy, and reading achievement. There was a medium effect size of $d=.59$ and shared book reading explained about 8% of the variance in child outcomes (Bus et al., 1995). The meta-analysis resulted in few studies concluding negative effects, and suggested that shared reading programs are beneficial to children’s outcomes, including increases in reading ability, vocabulary, and short-term memory (Bus et al., 1995; Wood, 2002). Wood (2002) reported the association between families participating in weekly or daily storybook reading and improved outcomes in their child’s reading skills, including higher levels of vocabulary and phonological awareness, in comparison to families who rarely practiced storybook reading. Research has also demonstrated that exposure to print materials in the child’s home prior to formal schooling (i.e., magazine, newspapers), family involvement in school activities, and playing educational games can be beneficial to children’s literacy development (Bennett, Weigel, & Martín, 2002; Britto & Brooks-Gunn, 2001; Buhs et al., 2011; Senechal, LeFevre, Thomas, & Daley, 1998).

In a review of the literature on pre-academic skills and parent-child reading experiences, Scarborough and Dobrich (1994) found that, on average, parents read to
their children 4.5 to 10.5 times per week. Such shared book reading activities accounted for 7% of the variance in preschool children’s emergent literacy skills (by beginning of kindergarten), 7% of the variance in oral language development, and 8% of the variance in reading achievement (Scarborough & Dobrich, 1994). Importantly, the context of shared book reading depends upon the social context between the adult and the child whereby children should benefit the most from book reading designed to increase child responses (Mol, Bus, de Jong, & Smeets, 2008). In reviewing research on the intervention of dialogic reading techniques, Mol and colleagues (2008) found that exposure to a story promoted language development (r=.29) and that parent-child book reading was more influential on reading outcomes for preschool aged children (d=.50) than for older elementary children. Thus, early literacy experiences in the home have an impact on a child’s emergent and developing literary skills, as well as on future academic outcomes.

Previous Foundational Research

The main facets that are observable and measureable in book reading activities are those which elicit and/or direct child language (i.e., questions and elaborations), and provide feedback (i.e., comments and corrections). The role in which parents provide the structure and support in order to develop children’s communication, social interaction, and story development are dependent upon the parent’s strategies. In home observations, multiple facets of parenting behavior can be observed, whereas in situationally derived (lab-based) settings, there are limitations to the parenting behaviors that are observable and natural. In situationally derived settings in which the parents are not provided direct intervention or specific instructions for reading with their child, observational schemes of
measuring the ways in which parents interact with their child are most useful. The following two bodies of literature provided foundational research on shared book reading research that guided the current project.

Whitehurst and colleagues (1988) conducted an early systematic study that examined the effects of shared book reading. The focus of this study included three general parenting principles of dialogic reading that were measured: evocative techniques, feedback, and progressive change. Evocative techniques included behavior that encouraged the child to talk about the book (i.e., questions), feedback included directions from the parent to expand or correctly model appropriate language, and progressive change included providing sensitivity to the child’s skills (Whitehurst, Falco, Lonigan, DeBaryshe, Valdez-Menchaca, & Caulfield, 1988). The parents in the experimental condition participated in a 4-week treatment program with instructions on how to provide child-directed speech during story time. The control group was not provided any explicit instruction other than to read to their children. All child participants were typically developing and between the ages of 21 and 35 months from intact middle-class families. Posttest results showed that parents in the experimental group used more repetitions (feedback) with their child and that the children used more phrases and had greater mean length of utterances (MLU). The parents in the control group used more yes/no questions and directives while reading. The amount of praise over time decreased in the control group, while praise increased in the experimental group. The positive results from this study, utilizing minimal intervention, demonstrated the importance of parents’ use of open-ended questions, repeating/expanding, and recasting the child’s
speech while providing praise and feedback contingent upon the child’s communication attempts.

Importantly, in the dialogic reading research that followed from the original study, the investigators used dialogic reading to identify ways in which the child takes the lead and parents help to become the active listener, questioner, and prompter in increasing the child’s language and storytelling (Whitehurst, Arnold, Epstein, Angell, Smith, & Fischel, 1994a). In an additional study of dialogic reading, researchers paired the shared book reading interaction with targeted phonemic instruction and found positive effects of emergent literacy instruction in Head Start (Whitehurst, Epstein, Angell, Payne, Crone, Fischel, 1994b). Specifically, significant effects were found in children’s emergent language and literacy skills even when researchers controlled for the effects of children’s pretest skills, caregiver intelligence, education, and frequency of shared book reading (Whitehurst et al., 1994b). The progressive change that Whitehurst and colleagues (1988) accounted for will be discussed in the parent interaction section of this paper.

A second seminal study conducted by Hart and Risley (1992) involved observations of family and child interactions in the natural home environment. The researchers observed parent behaviors in families with children from 9-36 months of age. Parenting behaviors of interest included parents’ effectiveness of communication, providing models to the child, providing feedback to the child, and prompting behavior from the child. All of these variables focused on the parental presence, interest, responsiveness, and restrictiveness with their child. Parent communication strategies
included the percentage of repeats, expansions, and extensions of the child’s utterances (as methods for providing positive feedback and encouragement for more speech), in addition to the percentage of questions directed to the child (to check for understanding). Results of a factor analysis indicated that parental repeats and questions loaded positively into the model, and prohibitions to the child loaded negatively. These factors were also significantly correlated with family socio-economic level (SES) and child IQ, i.e., low SES families demonstrated more prohibitions and fewer questions or repeats. Additionally, families of a child with low IQ used more labeling and more explanations about the story with their child (Hart & Risley, 1992). Thus, Hart and Risley (1992) were able to demonstrate the parenting behaviors commonly present in home, and for children who were lower functioning, the parents had to provide more structure and support for literacy activities; however, this study did not look at long term outcomes.

Thus, these two foundational studies demonstrated the two domains of language elicitation directed by parents and the parents’ use of feedback strategies provided to the child as a means of social interaction.

**Parent-Child Interactions for Enhancing Language and Literacy**

Parent involvement during shared book reading is critical for fostering the child’s expressive language and for scaffolding his/her understanding of the story. Parents can be influential in promoting the use of language, as they provide daily language models and have the opportunity to expand and increase the child’s exposure to language. Shared book reading provides parents the context to be more specific and sophisticated in their story-based language and teaching skills. Emergent literacy skills include more than
simply decoding abilities; they include oral language skills, print concepts, receptive and expressive vocabulary, and story comprehension (Crain-Thoreson & Dale, 1992; Reese & Cox, 1999). In a study of children ranging in age from 24 months to 4 ½ years, Crain-Thoreson and Dale (1992) found child engagement was more predictive than the number of parental or child utterances during the story task. Shared book reading provides a clear topic for parents to respond to their child and guide the questions to continue the story. Similarly, the child’s interest and behavior during this activity can substantially influence both engagement with the parent and subsequent literacy skills.

Pellegrini, Brody, and Sigel (1985) studied shared book reading between mothers, fathers, and their children, who were between the ages of four and five, with and without communication deficits. This research demonstrated that parents used simpler demands and used fewer conversation turns for children with communication deficits compared to those without communication deficits. Other findings revealed parents of children with communication deficits used simpler questions and statements to explain the story rather than to make higher order judgments about cause and effect at this age. Zevenbergen and Whitehurst (2003) utilized specific prompting questions by teaching the mnemonic CROWD: in order to teach the parents what types of questions to ask, Completion, to prompt part of the sentence and have the child compete it; Recall, to ask a question about previous events in the story; Open-Ended, to ask what is happening in the story; Wh-, to ask details about the story; and Distancing, to relate the story to outside experiences. Children were able to gain narrative skills with shared-reading, and parents were able to increase the reading interaction. These findings are significant in that parents adjusted
their interaction styles to meet the children’s developmental level and level of communication skills during shared book reading. Children learned to use higher order questioning when they were able to go beyond the immediate context of the story, and they were able to infer more meaning from the text than simply what was happening (Pellegrini et al., 1985).

While dialogic reading intervention (Whitehurst, et al., 1994a; Whitehurst, et al., 1994b; Whitehurst et al., 1988; Zevenbergen & Whitehurst, 2003) identified particular benefits for the development of expressive and receptive vocabulary in preschool children, it is just one method of reading to preschool children. Children also become more literate through their language interactions with adults, which may also provide opportunities for decontextualized language, or more explanatory talk about a story (Reese & Cox, 1999; Snow, 1993). For example, vocabulary surrounds story development, and some parents may use varied language to explain why characters do something or to explain other elements of the story’s plot. Haden, Reese, and Fivush (1996) studied middle class mothers of children between the ages of three and five in order to describe the maternal reading styles used. They found that children whose mothers used a higher order skill in seeking out more story meaning (or comprehension of the text) had increased vocabulary and comprehension scores 2 ½ years later, when compared to the children whose mothers relied on lower order skills in simply describing the story.

Most importantly, continued research is needed prior to school entry in order to identify early language developmental influences during the preschool period. Research
focusing on direct aspects of parent influences on the development of the child’s early language and literacy skills can help to inform later early intervention practices. Although various research groups outside of Whitehurst and his colleagues have studied parent-child shared book reading in different contexts and coding varied from study to study, the research identified some aspects of how parents can support their child’s language and literacy development in positive and responsive ways. In order to extend the previous research, it is important to note the Whitehurst et al., (1994a, 1994b) research was conducted with young children (ages 2-5) in low-income families and Head Start programs, whereas the work by Reese and Cox (1999) and Haden et al., (1996) have worked with preschool and early elementary aged children in middle class families. The current research project sought to combine the previous research by using a mixed income sample of preschool and kindergarten children with autism spectrum disorders. Furthermore, the research utilized a coding system most similar to Whitehurst and colleagues’ in order to demonstrate how parents of children with ASD, without direct intervention, utilize similar strategies during shared book reading.

**Book Reading and Literacy in ASD**

Currently, there is little research focusing on shared book reading activities for children with autism spectrum disorder (ASD); however, there is research on the reading skills of children with ASD and this research is important for understanding the influence of social-communication and behavior problems or anomalies specific to children on the spectrum. Poor oral language skills place children with ASD at higher risk for literacy failure than those children who do not have deficits in oral language (Bishop &
Snowling, 2004). The “Matthew effect” suggests that children who fail at early reading learn to dislike reading and continue to read less than their non-struggling peers; thus, the gap between adequate readers and poor readers grows larger over time (Stanovich, 1986). As a result of the Matthew effect, those children who are deficient in oral language and reading skills may also have limited exposure to written material. So, presumably, children with ASD who have difficulties with communication and/or reading might increase their risk for literacy failure, just like other peers with poor communication skills who do not have ASD.

A vast body of research has indicated phonological awareness is associated with early word reading and decoding abilities in young, typically developing children (e.g., Stanovich, Cunningham, & Freeman, 1984; Torgesen, Alexander, Wagner, Raschotte, Voeller, & Conway, 2001). Gabig (2010) compared typically developing children and those with ASD on early phonological awareness measures. In this study, 14 children with autism between the ages of 5 and 8 years old were matched to a control group of typically developing children of the same age. All children completed measures of oral language, word recognition, and phonological awareness. The children with ASD produced significantly lower receptive vocabulary scores and below average scores on phonological awareness. In contrast, however, the children with ASD scored comparably to those with typical development on word recognition, but the group, as a whole, demonstrated no significant correlations between word recognition and phonological awareness. In typical reading development, phonological awareness skills (PA) predict later word recognition (e.g., Torgesen et al., 2001; Wagner, Torgesen, & Raschotte, 1994).
This study must be interpreted with caution as a small sample limits the strength of the findings. The results of this study nevertheless supports the hypothesis of strong word reading skills in ASD, independent of higher order phonological and reading skills (Nation, Clarke, Wright, & Williams, 2006; Newman, Macomber, Naples, Babitz, Volkmar, & Grigorenko, 2007). This supports the findings of Newman and colleagues (2007) who found children with ASD possessed an imbalance in the ability to decode and sound out words (which is high) relative to the ability to comprehend those words in text (which is low) (Frith & Snowling, 1983; Grigorenko, Klin, Pauls, Senft, Hooper, & Volkmar, 2002). However, the understanding of word reading relies on the cause and effect knowledge of how sounds in our spoken words provide clues for written text and children with ASD may not grasp this connection in trying to connect their PA skills to word reading.

Some of the early work combining the disciplines of reading and ASD includes Frith and Snowling (1983). Their research included a sample of 40 children with ASD, and results revealed single-word decoding skills for both real-word and non-word reading in the normal range. Children with dyslexia, who also have difficulty in comprehension, have primary difficulty in phonological deficits. Thus, the foundation of literacy skills and average word-decoding is hypothesized to be intact in children with ASD and, unfortunately, the missing link between reading and comprehension has still not been identified.

Researchers have shown that children with ASD frequently demonstrate effective early reading and decoding strategies, but exhibit poor oral language and reading
comprehension (e.g., Nation et al., 2006; Newman et al., 2007; Whalon & Hart, 2011). In order to understand some of the reading outcomes for children with ASD, Nation and colleagues (2006) showed that 41 children between the ages of 6-15 with ASD had word reading and text accuracy skills in the average or above average range, but reading comprehension was below average. For 65% of the sample, reading comprehension scores were at least one standard deviation below the normal mean. Of those children with reading comprehension deficits, some had additional impairments in vocabulary, non-word reading, and oral language comprehension, suggesting that impairments in reading comprehension accompany language impairments more generally (Nation, Clarke, & Marshall, 2004; Nation et al., 2006). Children with ASD are described as having weakness in central coherence (i.e., getting the big picture), which can be manifested as difficulties integrating pieces of information into coherent wholes and an increased tendency to use local, detail specific processing (Happe & Booth, 2008; Happe & Frith, 2006). In comparing print-related achievements in young children with ASD to those of comparable language abilities, Lanter, Freeman, & Dove (2013) found print-related procedural competencies were stronger than conceptual competencies. Thus, children with ASD could formally read the text but struggled at grasping the conceptual understanding.

Even children with Asperger syndrome, which is a diagnosis which requires average or above intelligence and the presence of language skills, have shown at or above grade-level decoding skills but continued difficulties with understanding stories and grasping the “big picture” (Myles, Hilgenfeld, Barnhill, Griswold, Hagiwara, & Simpson,
2002; Whalon & Hart, 2011). However, in shared book reading activities these children’s reading skills may not impact the activity as much as their impaired social interaction and communication skills related to such an activity. In shared book reading, the parent-child interaction and storyline attempted by the parent are more important to maintaining the interaction while the child’s level of engagement and behaviors are directly related to the activity (Evans et al., 2008). This is important at even a pre-reading age for parents to help support the activity in order to expand what the child can do independently.

Targeted language development interventions are used for parents to help increase verbal responsiveness in children with developmental delays in language. By following the child’s focus of attention and providing feedback that is relevant to what the child is looking at, parents may increase the child’s attention and lessen cognitive demands for the child (McDuffie & Yoder, 2010). Tannock, Girolametto, and Sigel (1992) worked with mothers of preschool-aged children who were provided with a guide for how to use interaction-promoting strategies for working with their children. Such strategies included waiting for the child to respond, using language modeling strategies such as expansions of the child’s language, and working to follow the child’s lead rather than being directive. Findings from this study showed that mothers were more responsive, less directive, and provided clearer linguistic models by using strategies to promote reciprocal interactions and language development with their children. For children with autism, Venker, McDuffie, Weismer, and Abbeduto (2012) taught parents to “follow-in comment” on the child’s behavior, provide expansions upon the child’s language, prompt for child communication, and use linguistic mapping as ways to increase independent language
while reducing the number of redirections to an adult-led topic. Linguistic mapping and expansions are strategies for parents to use that are contingent upon the child’s speech in order to increase vocabulary and add new information. The children in this study were between the ages of two and six and family dyads were randomly assigned to an intervention (treatment) group or control group. Parents in the treatment group increased responsive behavior contingent upon their children’s speech; however, children’s spontaneous speech did not change after only a short period of intervention. McDuffie and Yoder (2010) worked with children between the ages of 18 and 60 months, and observed them in a free play session with their parents. Parent responsiveness was coded based on commenting, directives, responses to the child (linguistic mapping), repeats, and expansions. Findings revealed that parent strategies of repeats and expansions had a positive association with later child spoken language, thus demonstrating the importance of parents’ feedback for increasing children’s language.

A current single case design study demonstrated preliminary effects of the study of shared book reading with a child on the autism spectrum. Fleury, Herriott Miramontez, Hudson, and Schwartz (2013) selected three children with a diagnosis of ASD to participate in dialogic reading sessions with teachers in their classrooms. Nine reading sessions were conducted across a 5-week period. During the dialogic reading sessions, the teachers would prompt the child to speak by asking a question about the story following Zevenbergen and Whitehurst (2003) CROWD questioning. Results from this study demonstrated there was no change in child time on task from baseline to intervention phases. There was however, an increase in child verbalizations during the
intervention phase. The study was beneficial in demonstrating the usefulness of dialogic reading upon children with ASD’s oral language during a reading task. It did however have its limitations in that the children were highly heterogeneous with regards to diagnosis, IQ, and adaptive skills. Additionally, the single case design methodology did not meet all of What Works Clearinghouse design standards for a multiple baseline design (Kratochwill, Hitchcock, Horner, Levin, Odom, Rindskopf, & Shadish (2013). One of these standards for a multiple baseline design that was not met was the requirement of having a stable baseline before beginning an intervention and at least three data points separating the onset of the intervention phase across participants (Kratochwill et al., 2013).

**Influence of ASD Related Symptomatology**

Diagnostically, the language and communication deficits of children with ASD may include a delay or absence of spoken language, difficulty in initiating and sustaining conversation, and/or using idiosyncratic words or phrases (APA, 2000). Some social features that distinguish children with ASD from typically developing children include: lack of eye gaze, inflexibility with facial expression, difficulties with social interaction, decreased joint attention, and lack of social-emotional reciprocity (Constantino, Findling, Hardan, & Eng, 2003; Landa, Holman, & Garrett-Mayer, 2007). Aggression, destructive behavior, tantrums, self-injury, and stereotypies are considered common challenging behaviors displayed by children with ASD (Horner, Carr, Strain, Todd, & Reed, 2002). Often these are not core to a diagnosis of ASD, yet they cause major disruption to activities, socialization, and learning, thus putting these children at risk for developing
further problem behaviors (Horner et al., 2002; Matson & Nebel-Schwalm, 2007). Additionally, studies have shown that children with more severe social deficits also have more challenging behaviors (Lord & Risi, 1998).

There is no single behavior that is present or absent for all individuals with autism; however, social skill deficits are considered to be of the greatest concerns to most parents (e.g., Constantino et al. 2003; Lord & Risi, 1998). The severity of a child’s communication deficit is also considered a powerful predictor of future outcomes (Lord & Risi, 1998). Typically developing children are able to use communication in order to satisfy their needs and specify their intentions within their first year, despite limited language skills (Wetherby, Watt, Morgan & Shumay, 2007). These social and communication skills overlap and typically developing children learn how to interpret various social and pragmatic cues that are reflective of the communicative intentions of other people. However, children with ASD often have difficulties distinguishing these higher order language and social skills (Lord & Risi, 1998; Siller & Sigman, 2008). For example, if a child lacks joint attention skills, he or she is often at risk for developing a language delay because language input is contingent upon ongoing interactions (Siller & Sigman, 2008).

In Sigman and colleagues’ early research (1986), social interaction measures demonstrated that young children with ASD, both typically developing children (TD), and children with intellectual disabilities (ID), between 34 and 75 months had, on average, significantly decreased frequencies of shared attention and initiations of social interaction with their caregiver. Siller and Sigman (2008) further demonstrated in a
longitudinal study of preschoolers with ASD that those children who were more responsive to their mother’s prompts of joint attention, subsequently gained language at a faster rate than those who were initially less responsive.

Especially noteworthy are the social communication deficits (e.g., showing, initiating joint attention), which are considered to be universal across ASD, despite the heterogeneity of oral language skills (Tager-Flusberg, Joseph, & Folstein, 2001; Wetherby, et al., 2007). For example, when young children are developing language, those with ASD typically demonstrate a reduced frequency of expressive language skills (e.g., word combinations, and complex babbling), as well as social communication related to requesting (e.g., gestures and pointing) (Landa, 2007; Sigman, Mundy, Sherman, & Ungerer, 1986; Stone, Ousley, Yoder, Hogan, & Hepburn, 1997; Wetherby, Woods, Allen, Cleary, Dickinson, & Lord, 2004). Specifically, research has shown the following behaviors were responsible for significant group differences between those with and without ASD: pointing, giving or showing to be social, and giving as a means to ask for help (Sigman et al., 1986).

When there is a reduced frequency of shared experience in objects and/or activities, there is a greater risk for missing critical social opportunities (Landa, 2007; Sigman, Dijamco, Gratier, & Rozga, 2004; Wetherby et al., 2004). Children with ASD often use fewer social initiations (with both parents and peers) in expressing their wants and needs, as well as during instances requiring social communication. The resulting deficits in “on topic” engagement with others and decreased flexibility in speech, may further impede the frequency and social input from others (Landa, 2007). This social
communication skill is of specific concern for developing and maintaining social learning opportunities, such as shared reading, as well as engagement with others in learning and play activities (Landa et al., 2007).

Another area of difficulty in communication for children with ASD centers on conversation. These children frequently lack the understanding that communicating does not consistently entail a literal meaning of what is said, but instead abstract interpretations can and should be drawn from the words that are spoken (Happe, 1993; Tager-Flusberg et al., 2001). While these children may be able to describe, in excessive detail, a person’s emotions and social conventions, they are often unable to reciprocate the appropriate emotional and social conventions of a social interaction (Klin, McPartland, & Volkmar, 2005). In literacy related activities past the early stage of identifying the words and pictures, children are encouraged to predict what is going to happen, understand why the character looks a certain way, and even grasp what the entire book was about. Thus, the dialogue that typically occurs during a book reading activity in the parent-child interaction with a child with ASD may be missing, and these children are not gaining the opportunity to get the “bigger picture” found in many children’s stories (Happe & Booth, 2008).

In addition to the core diagnostic symptoms, children with ASD often have serious behavior problems including aggression, tantrums, and self-injurious behavior that are used as inappropriate, yet functional responses to environmental demands (Hastings & Brown, 2002). Children with limited communication skills, and/or poor social development are at an increased risk for developing problem behaviors because
they are unable to appropriately communicate their needs (Horner et al., 2002; Koegel, Koegel, & Surratt, 1992). For children with autism, behavior problems often arise from difficulties with both lack of insight into self and particularly others’ social cues. They are typically unable to anticipate changes in the environment, thus leading to socially inappropriate outbursts which may reinforce and maintain the behavior (Hasting & Brown, 2002; Klin et al., 2005). These behavior problems are independent to children with ASD alone. In a study between children with and without intellectual disabilities (ID), Floyd, Harter, and Costigan (2004) found that children with behavior problems had twice as many negative exchanges with their parents as compared to the children without behavior problems regardless of a disability. Further research by Carcani-Rathwell, Hasketh-Rabe, and Santosh (2006) compared groups of individuals with ASD and average intelligence, those with ASD and ID, and those with ID only. While the occurrence of challenging behaviors was high in all groups, nearly all of the repetitive and stereotyped behaviors were higher in those with ASD (with or without ID) than those without ASD. This suggests that restrictive and repetitive behaviors as well as challenging behaviors for students with ASD have major impediments upon learning. When disability was compounded by behavior problems, the level of positive interaction tended to be lower; thus child behavior has a substantial impact on the reactions and responsiveness of parents.

While not all children with ASD have an intellectual disability, the social and behavioral deficits are still of concern. The effect of behavior problems of children with ASD on parents was shown to mediate the relationship of parent self-efficacy and parent
anxiety or depression (Hastings & Brown, 2002). Therefore, the effect of behavior problems of children with ASD upon a shared parent-child reading activity is likely to be influential.

**Parenting Behavior for Children with ASD**

Often the parents’ role in the parent-child dyad is studied in order to explain the effect that parents behavior has upon the child. A bi-directional view has led to an increase in understanding of how child characteristics can influence parenting and how parenting, in turn, can predict a child’s socio-emotional functioning (Blacher, Baker, & Kaladjian, 2012; Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000; Fenning, Baker, Baker, & Crnic, 2007). As children’s behaviors impact parenting strategies, the parents’ behavior can affect future childhood behavior patterns, thus creating a cycle. Importantly, delays and problems in development may actually alter parenting styles as demonstrated in past research in children with varying intellectual disabilities (Collins et al., 2000; Fenning et al., 2007; Floyd & Philippe, 1993). Floyd and Philippe (1993) demonstrated that behavior management struggles increased with a child with developmental delays because of limitations in adaptive and cognitive functioning. They observed that due to these behavioral difficulties, there were fewer positive interactions between the child and his/her parent. Because children with ASD, with and without developmental delays, frequently display difficult behaviors, there is an increasing need for research that examines parenting behaviors and the resulting interactions in both structured and unstructured activity with children with ASD.
Primary areas of interest in the parent-child relationship are conversation and social interaction. Severe limitations in the social reciprocity and communication of children with ASD may be a strong influence in parent-child interactions (Lord & Risi, 1998). Parents can play the role of a teacher with their child by asking open-ended questions, adding information to text, and eliciting abstract language (Lonigan & Whitehurst, 1998; Roberts, Jurgens, & Burchinal, 2005). Two general principles for parents in stimulating language include evocative techniques in which the parent stimulates language by asking questions that require specific and detailed responses, as well as feedback techniques, which should be used frequently and provide the child an understanding of how they are doing (Hart & Risley, 1992; Whitehurst et al., 1988). However, parents may need to use these strategies in differential ways when the child has significant limitations in social communication skills. Lemanek, Stone, and Fishel (1993) found that in a sample of preschool children, parents of children with ASD differed significantly in social behavior from groups of parents whose children had language impairments, had ID, or were typically developing (TD). Parents of children with ASD used the most structure and attention-getting behaviors, increased their physical proximity, and used more non-verbal prompts in order to gain compliance during the activities (Lemanek et al., 1993). During a structured book reading activity, it is unknown how parents of children with ASD will use similar or different behaviors than those demonstrated in the research of shared book reading with TD children. Parents of children with ASD face specific challenges in parenting, partly due to the behavioral challenges that their children commonly present. Apart from the skills every parent
teaches his or her child (i.e., learning new words), a parent of a child with ASD may also need to teach his/her child to engage in joint attention, use appropriate eye contact, as well as scaffold their interactions with their child, in order to prevent communication breakdown (Klin et al., 2005).

Parents of children with and without disabilities may utilize strategies or express different characteristics while teaching their child. Common behavioral strategies or interactive behaviors used by parents to make adaptations to a child’s level of functioning include the expression of warmth and responsiveness (Calkins, Smith, Gill, & Johnson, 1998; National Institute of Child Health & Human Development, Early Child Care Research Network [NICHD ECCRN], 2002; Roberts et al., 2005). A longitudinal study of mothers’ behaviors towards their children from birth to four years old found that maternal sensitivity and responsiveness, including stimulating and supportive behavior, was the single strongest predictor of children’s oral language and pre-academic skills at entry to kindergarten (NICHD ECCRN, 2002). Thus, it would be expected that a responsive, sensitive, organized, and positive parent facilitates language and early literacy skills, especially during a book reading activity. For example, a parent may ask an open-ended question about ‘why’ the man looks sad but when the child fails to respond, the parent may model an answer and ask a ‘yes/no’ question to see if the child understands. Thus, maternal responsivity can influence language development, which is crucial for all children, but is especially important for those with developmental disabilities such as autism (Baker, Messinger, Lyons, & Grantz, 2010).
Baker and colleagues (2010) found that in a sample of 18-month old children, 24 who were at risk for ASD, maternal sensitivity differed as a function of child risk status (for ASD). Results revealed that maternal sensitivity was positively associated with expressive language growth by age three. Interestingly, maternal sensitivity predicted fewer behavior problems for children without ASD but predicted more behavior problems for children with ASD. This study hypothesized that parents were more sensitive to children with increased behavioral needs, and traditional sensitivity may not be as beneficial as it is for those children without ASD. Thus, it is possible that a more structured approach would better address behavioral needs of a child with ASD (Baker et al., 2010; Landry, Smith, Swank, & Miller-Loncar, 2000; Roberts et al., 2005).

Another component related to positive parenting includes following the child’s lead, while maintaining the child’s engagement (Landry, Smith, & Swank, 2006; Steelman, Assel, Swank, Smith, & Landry, 2002). This suggests that mothers who are more responsive to their children’s social attempts may also encourage language development, thus fostering pro-social development and more frequent social interactions (Steelman et al., 2002). In addition, by maintaining control and attention, parents can help to scaffold their child’s social development (Roberts et al., 2005; Ruble et al., 2008). For instance, Ruble and colleagues (2008) emphasized six aspects that represent parent responsiveness: contingency, directiveness, affect, initiations, establishing proximity, and scaffolding joint attention, all of which were selected from previous research on parent-child interactions and developmental approaches used in intervention. Thirty-five parents and children with autism (mean age= 4.5 years) were asked to play freely for ten minutes
and their interactions were observed and coded for parent levels of responsiveness. Results revealed no significant association between parental interaction style and the child’s cognitive level; however, parental responsiveness was significantly associated with the child’s ability to initiate social interactions with adults. Thus, this study underscored the link between parent responsivity and child social interaction development.

Responsive parenting of typically developing children, as well as those with developmental delays and ASD, has demonstrated growth in cognitive, language, and social-emotional outcomes (Landry et al., 2006; Ruble et al., 2008; Siller & Sigman, 2002). Siller and Sigman (2002) were among the first researchers able to demonstrate longitudinal development of children with ASD compared with typical children and children with developmental delays. All children were matched on mental age (m=24.2-26.8 months), language skills, and maternal education. In this study, they were able to test the predictive relationship between responsive parenting and language development in children with ASD. Parents who were more responsive to their child’s focus of attention during play had children with greater language gains over time. While it was more difficult for parents of children with ASD to acquire joint attention, those who could were more successful in focusing their child’s play and increasing the opportunities for modeling language. This study however was during play-based activities and should be replicated in order to understand the predictive relationship in academic, or structured, activities.
In previous research with parents and their children with developmental delays (DD), interactions with parents were determined to be asynchronous when compared to the interactions with parents and TD children. Specifically, dyads with a child with DD are observed to demonstrate less mutual enjoyment and positive reciprocity during their interactions (Floyd & Phillippe, 1993). In addition to less reciprocity, parents were also observed to use more directives, or behavior management attempts, with their children than parents of TD children (Floyd et al., 2004; Floyd & Phillippe, 1993). In a sample of families with a child between the ages of 6 and 18 with ID, with a chronic illness, or was TD, Floyd and colleagues (2004) sought to compare the parent-child interactions in problem-solving activities. This research revealed that mothers of a child with ID demonstrated frequent use of directives and persistent controls to limit the cycle of negative exchanges. Many of the directives used were in response to children’s difficulties attending to and participating in activities, thus demonstrating the parent’s ability to adapt and engage their child.

In examining successful interactions between parents and children with ASD, Chandler-Olcott and Kluth (2008) provided a qualitative review of autobiographies of individuals with autism who discussed their struggles in learning to read. This review led to an increased knowledge of parenting strategies that resulted in sharing positive parent-child interactions and increased outcomes in literacy-related activities. The findings suggested three effective strategies parents used to increase their child’s success with reading: following small cues during reading activities; using reading to make social codes, or nuances, more explicit; and providing strategic support, or scaffolding, during
reading activities. In understanding these strategies, this research will aim to quantify and identify supports that parents can provide to increase positive parent-child interactions in shared book reading activities.

**Limitations of Past Research**

Much of the seminal research in shared book reading has been conducted with TD children prior to grade school entry (Hart & Risley, 1992; Reese & Cox, 1999; Whitehurst et al., 1988; Whitehurst et al., 1994a; Whitehurst et al., 1994b). Similarly, much of the previous research has been conducted with low income families (Hart & Risley, 1992; Whitehurst et al., 1998; Whitehurst et al., 1994a; Whitehurst et al., 1994b). Often the outcomes of intervention for children who are highly disadvantaged are vast, as they have the most room to grow, academically speaking. However, other research has found a positive impact on vocabulary and story comprehension in middle to high SES families involved in shared book reading (Haden et al., 1996; Reese & Cox, 1999). In order to understand how the dialogic reading model will work for children of all economic backgrounds, this study will seek to include a sample varied in terms of SES, i.e., not all low income. Nevertheless, the original focus of the dialogical reading intervention used in the Whitehurst et al., 1998 study has not been validated as a two factor theory for parenting strategies (to elicit language and provide feedback), nor has it been used with a sample of children with ASD. On the basis of existing literature in children with ASD, heterogeneity in performance is expected (Nation et al., 2006; Newman et al., 2007; Whalon & Hart, 2011). Unfortunately, little has been done to extend this research in order to identify how the characteristics of a child with ASD
might affect the parents’ interaction during book reading activities. The combination of a well-research model of dialogic reading techniques and parent-child interactions strategies (e.g., warmth and responsiveness) has also not been studied in children with ASD.

Most research of the parent-child dyad focuses on child outcomes based on parental behaviors; however, past research has demonstrated that child characteristics do influence the parents’ role in the interaction (Baker et al., 2010; Lord & Risi, 1998; Ruble et al., 2008). Furthermore, the study of parents as facilitators of interactions is not well understood in children with ASD. Prior research that measured parenting behavior included the effect of parents with TD children and those with ID (Collins et al., 2000; Fenning et al., 2007; Floyd & Phillippe, 1993). More specifically, Roberts and colleagues (2005) found significant correlations between mothers’ use of responsive and sensitive parenting with increases in children’s receptive vocabulary; however, other predictor variables were not measured, nor were the child social or behavioral influences considered. These results are also limited to a sample of low income, African American families who were specifically recruited from a child care program. While this study was important for observing the impact of parenting behaviors, it was limited by a sample of convenience from one population and needs to be replicated and/or extended.

Another previous study compared groups of children who were TD (N=115) with a sample of children with ASD (N=12), Downs syndrome (N=10), cerebral palsy (N=9), and undifferentiated developmental disabilities (N=37) (Blacher et al., 2012). While this research examined parenting behaviors longitudinally, analyses revealed group status
differences in negative parenting behaviors, whereby mothers with children with ASD displayed more negative parenting behaviors in the context of structured activities. However, the sample of children with ASD was small; furthermore literacy outcomes were not examined. The current study will connect two areas of previous research: (1) child characteristics will be examined in relation to parent behavior, and (2) parenting behaviors that facilitate and support interactions with a child with ASD will be observed.

**Rationale for the Study**

Parenting behavior and support provide a foundation for development of children prior to grade school entry, as parents can be their children’s primary models for language and literacy-related activities. Despite assumptions that children learn about print and decoding skills through shared book reading, some parents focus not just on the text, but more on the storyline and/or broader context and illustrations within the text (Evans et al., 2008). Children are able to learn broader literacy conventions and develop novel storylines with picture books in which parents and children must develop the story together (Ganea, Pickard, & DeLoache, 2008; Teale, 1988). The use of pictures in storybooks provides children with a means of developing picture-referent relations to understand the story (Ganea et al., 2008). As children develop language at different rates, especially children with ASD with various levels of word decoding skills, using picture books eliminates the variance of reading skill upon the activity and places more important upon the parent-child interaction.

Prior research with TD children has shown that shared book reading activities with higher parental engagement have resulted in increases in children’s early language
and literacy skills (Anderson et al., 2010; Bus et al., 1995; Wood, 2002). However, recent research has not yet addressed parenting behaviors during shared book reading involving a child with ASD. This study combined the principles of dialogic reading (e.g., evocative techniques and feedback; Whitehurst et al., 1988) and sensitivity to the child’s development by utilizing the parent-child interaction coding system (PCIRS; Belsky, Crnic, & Gable, 1995). This study identified, through a shared book reading activity, how parents of children with ASD may use different parenting behaviors than parents of TD children as identified in previously published research (Anderson et al., 2010; Hart & Risley, 1992; Snow et al., 1991; Whitehurst et al., 1988). Furthermore, this research demonstrated the unique contributions of ASD related behaviors that influenced parent-child interactions.

**Purpose of Present Study**

The purpose of this study was to examine parent and child behaviors during a shared book reading activity with young children on the autism spectrum. The following research questions were examined:

- **Research Question 1a:** Do observed aspects of evocative and feedback strategies validate a two factor model of parent language elicitation techniques when used with children with ASD?
- **1b:** To what extent do children’s spoken language, behavior problems, and social skills relate to parents’ shared literacy task strategies as identified from the factor analysis?
• **Research Question 2a:** How do observed aspects of positive or negative parenting correlate with each other as well as with child and family variables?

• **2b:** To what extent do children’s spoken language, behavior problems, and social skills relate to aspects of positive parenting?

• **2c:** How do children’s spoken language, behavior problems, and social skills relate to aspects of negative parenting?

• **Research Question 3:** Were there any within-group differences in child behavior problems or parenting behaviors?

**Methods**

**Participants**

Participants were selected from a larger two-year project working with families with children on the autism spectrum. Participating families were from urban and suburban locations in the greater Los Angeles and greater Boston regions. This larger study investigated the factors involved in the transition to school for children with ASD. The project recruited families with children (ages 4-7) diagnosed with ASD by either a school or private evaluation. All participants’ children were required to meet criteria for ASD on the Autism Diagnostic Observation Schedule (ADOS; Lord, Rutter, DiLavore, & Risi, 2008). For children for whom a previous diagnosis had not been made by a reliable source, the Autism Diagnostic Interview-Revised (ADI-R; Rutter, Le Couteur, & Lord, 1993) was administered. At the time of data collection, the participants for the current project were determined eligible for the project based on the American Psychological

An additional requirement for project eligibility was that all children have a minimum intelligence quotient (IQ) of at least 55 as measured by a short form of the Wechsler Preschool and Primary Scales of Intelligence-3 (WPPSI-3; Wechsler, 2002). This three subtest version, though abbreviated, has demonstrated predictive validity (r=.90) and adequate reliability ($r_{xx}=.95$) as an indicator of cognitive ability (Sattler & Dumont, 2004). Thus, children were included in the larger study if they met the following criteria: (a) history of ASD diagnosis from a school and/or private evaluation, (b) confirmed ASD diagnosis with the ADOS and/or ADI-R, (c) chronological age between 4 and 7 years 3 months at time of enrollment, (d) functional verbal ability of three words or more in order to complete school based project activities, and (e) intelligence score (IQ) greater than or equal to 55. The selection criteria for this study were important in understanding the influence of ASD-related child characteristics upon the parent-led shared book reading activities. At the preschool and early elementary ages, these children were often still developing critical pre-academic skills and with continued support and development were often integrated into regular education programs.

The current study included families for whom primary data were complete across the eligibility visit and one subsequent lab visit (N=111; Table 1). A power analysis for multiple regressions with three predictors revealed that given an effect size of .80, which is considered to be a large effect size (Cohen, 1988), an alpha level of .05, and a recommended desired power of .80, the total sample size for the project needed to include
43 participants. The current (child) participants were predominantly male (82.9%) with an average IQ in the typically developing range (70% were ≥ 85 FSIQ). Most children had received early intervention (90.1%) and special education services (i.e., speech, occupational therapy, special day class; 89.2%).

The current parent participants consisted of primarily mothers (84.7%), who ranged in age from 24-52 with a median of 38 years of age. While most of the parents were highly educated, with a majority having had at least a four-year college degree (71.7%), many of the participating parents were not employed (42.2%). However, this was not surprising given the level of child care demands Child ASD-related behaviors are included in the Table 1; a significant percentage of participants had clinical level problem scores in the areas of behavior problems, social skills, and social communication skills. Specifically, the clinical cut-off for the Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001) is a T-score ≥ 64. In this sample, 45% of children had internalizing behavior problems in the clinical range, 36.9% had externalizing behavior problems in the clinical range, and 55.9% had total level of behavior problems in the clinical range.

**Procedure**

At time of project recruitment and eligibility, the participating parents received a packet that was mailed to their home prior to the scheduled visit. The packet contained measures of social skills, communication, and behavior; parents were instructed to complete these prior to the visit and to bring them to the child development center. Any questions about a measure were answered before the session began. Graduate students then administered the ADOS for eligibility. These students were trained from reliable
ADOS personnel, and cross-site reliability was at 80% agreement. All training was completed, and directed by from the ADOS trainers; staff met certification for research training using the ADOS.

All families from the larger project were asked to participate in a shared-book reading activity at a second lab visit. During this activity, the parent and child were instructed to sit next to each other and were given four storybooks. The storybooks were all written and illustrated by Mercer Meyer and were all related stories about a frog. The books had no words in order to reduce the variance of child reading ability during this activity. Parents were directed to “read” the books to their children in whatever manner they felt comfortable, and to read the books in numerical order from one to four during the allotted time. The parent and child were then left alone to read the stories for eight minutes. During this observation, the parent-child interactions were videotaped for later coding of the eight minutes.

Whitehurst Literacy Coding. As previously described, Whitehurst and colleagues (1988) developed an observational system used to observe parental language elicitation strategies demonstrated during a shared reading activity. The observational system was utilized for this study as a coding system to determine whether parents of children with ASD demonstrated the same evocative and feedback techniques as parents of children who were typically developing. This project was testing whether parents used the following skills as they interacted with their child without direct intervention. In Whitehurst et al., (1988), the average intraclass correlation for the 12 parent codes was .86, and was high for all observed categories except expansion (.58), where a low-
frequency and less stable reliability estimate was observed. All 12 items utilized in the Whitehurst et al. coding system (1988) were used in this study (i.e., Yes/No Questions, Simple What Questions, Function/Attribute Questions, Open Ended Questions, Reading/Conversation, Labeling, Basic Repetition, Repetition with Expansion, Imitative Direction, Criticism/Correction, Praise/Confirmation). The parent behaviors were measured as a frequency count. An exploratory factor analysis was then conducted to identify if a two factor model sufficiently measured parents interaction during a shared literacy activity based on the two techniques taught in Whitehurst et al. (1999): evocative techniques which encouraged the child to talk (e.g., ‘what’ questions), and feedback provided to the child (e.g., praise/confirmation). See Appendix, Figure 1 for the coding dictionary.

**Results of Pilot Testing the Whitehurst Coding System**

Prior to submitting the proposal for this study, a pilot test of the Whitehurst coding system was conducted since the original article (Whitehurst et al., 1988) contained very limited information. In order to confirm whether the observational coding scheme described in the article was applicable and used naturally without training in this sample, 10 parent-child dyads were randomly selected from the larger longitudinal study, representing 9.1% of the total sample available.

The pilot sample was randomly selected from the larger study to include eight male children, and nine of the 10 parents were mothers. There were five 4-year-olds, one 5-year-old, one 6-year-old, and three 7-year-olds. Of this selected sample, all but one were of Caucasian decent.
The description of the original coding system was limited to a one-sentence explanation and one example for each code provided. Upon reaching the first author of the article (G. Whitehurst, personal communication, November, 21, 2012), there were no further details about the coding system available. In order to expand upon the original observational coding scheme, each description was expanded here and examples provided. In pilot testing the original coding system with children with ASD, 12 of the 14 parent behaviors and accompanying codes were found to be relevant for the current sample. The two items, “pointing request” and “other talk not directed to the child” were not present. This is similar to the original article in which the same 12/14 items used in the article were also observed in this sample. Thus, without direct intervention, the sample of parents for this study demonstrated the 12 skills naturally during shared book reading. In summary, this pilot testing of the Whitehurst literacy measure indicated that it was appropriate for use with parents and their children with ASD.

Parent Child Interaction Rating System (PCIRS; Belsky, Crnic, & Gable, 1995). The PCIRS is an observational coding system used to code parent and child behaviors during the shared book reading activity. Each parent, child, and dyadic behavior observed was rated on a 5-point Likert scale (1= not at all characteristic, 5=highly characteristic) that considered both the frequency and intensity of the expressed affect or behavior. This study used six dimensions of parenting: mother positivity, negativity, sensitivity, intrusiveness, detachment, and stimulation of cognition, as these were hypothesized to most closely relate to parents’ relationships with their child. Consistent with previous research, factor analyses have comprised two composite scores
that will be used to create total score variables of positive parenting (positivity +
sensitivity + stimulation of cognition – detachment) and negative parenting (negativity +
intrusiveness) (Aber, Belsky, Slade, & Crnic, 1999; Baker, Neece, Fenning, Crnic, &
Blacher 2010; Blacher, Baker, & Kaladjian, 2012; Fenning et al., 2007). Previous
research suggests that the PCIRS is a reliable and valid measure of naturalistic parent-
child interactions and is relatively stable over time (Aber et al., 1999; Crnic, Gaze, &
Hoffman, 2005). In a sample of children with ASD, the PCIRS yielded a two-factor
model with high internal consistency with positive (a=.78) and negative parenting (a=.80)
(Blacher et al., 2012).

**Inter-rater agreement.** Prior to coding the parent-child activity, a lead coder and
two project staff were required to meet adequate inter-rater reliability on the two coding
systems. Observers were trained by watching videotaped lab observations until reliability
was established. Coding criteria for the shared literacy task was set at 80% exact
agreement with the master coder. Twenty percent of the total videotapes were coded in
order to check inter-rater reliability. Reliability was met and maintained at 89% exact
agreement. The Parent Child Interaction Rating System (PCIRS) utilized a system of
qualitative global codes, where the reliability criteria were set at 70% exact agreement
with the master coder and 95% agreement within one scale point with the master coder.
This is consistent with other studies utilizing this measure (e.g., Baker, Neece, Fenning,
Crnic, & Blacher 2010; Blacher, Baker, & Kaladjian, 2012; Fenning et al., 2007). Twenty
percent of the total videotapes were coded by the master coder in order to evaluate inter-
rater reliability. Reliability was met and maintained at 80% exact agreement and 99% within 1 scale point.

**Autism Diagnostic Observation Schedule (ADOS; Lord et al., 2008).** The ADOS consists of standard activities that allow an examiner to observe behaviors that have been identified as important to the diagnosis of autism spectrum disorders. The ADOS is validated for use across all developmental levels and ages with varying modules of assessment, selected according to the child’s language level. The ADOS has adequate inter-rater reliability > .80 for exact agreement on scoring. The intraclass correlations of two subscales and total scores ranged from .79-.98. At the time of the initial phase of recruitment, the DSM-IV criteria and ADOS were the current assessment standards. The DSM-5 criteria, with two as opposed to three core diagnostic features, were utilized in subsequent analyses, as appropriate for comparing child behaviors.

**Autism Diagnostic Interview-Revised (ADI-R; Rutter et al., 1993).** The ADI-R is a semi-structured interview with the child’s primary caregiver to elicit accurate and detailed descriptions of behavior, social skills, and developmental functioning. The ADI-R has intraclass correlation coefficients > .90. Discrimination between autism spectrum versus non-autistic subjects is almost perfect with sensitivity =1.0, and specificity > .97.

**Achenbach Child Behavior Checklist (CBCL; Achenbach & Rescorla, 2001).** The CBCL is a norm-referenced questionnaire that assesses behavior problems in children with or without developmental delays. The appropriate aged version of the CBCL (1-5.11 and 6-18), was completed by parents with items that described specific behavioral and emotional problems. The respondent indicated, for each item, whether it
was not true (0), somewhat or sometimes true (1), or very true or often true (2), now or within the past 6 months. The CBCL parent report form has alpha coefficients from .69 to .97 and reliability from .82 to.94 (Achenbach & Rescorla, 2001). The present study used the total CBCL problem behavior score for regression analyses, which has a mean = 50 and SD = 10. The risk cut-off was a T score greater than or equal to 64, indicating levels of behavior problems were in the clinically significant range.

This measure was chosen as it provides a reliable measure of childhood behavior problems. Since at such a young age, parents are often the most aware of the problem behaviors present in their child, they are the most accurate reporters of their child.

**Social Skills Inventory System (SSIS; Gresham & Elliott, 2008).** The SSIS is a norm-referenced questionnaire that provides a broad assessment of social skills, problem behaviors, and academic competence. Parents completed the parent form (ages 3-18), which has 79 total items. The total social skills scale was used for the present study, which included ratings of the child’s responsibilities, cooperation, self-control, empathy, and assertiveness. Scores on social skills were converted to standard scores with M = 100 and SD = 15. For the parent report form, Cronbach’s alpha = .95 for social skills and test-retest reliability for parent report .84.

This measure was chosen because it provides a reliable measure of childhood social skills, critical for understanding interactions with a child with autism. Similar to understanding childhood behavior problems, parents are the most accurate reporters for children at this young of an age. This measure is useful for understanding how child
social skills, or lack thereof, can be influential upon the parent-child interaction during shared book reading.

**Social Responsiveness Scale (SRS; Constantino & Gruber, 2005).** The SRS is a 65-item norm-referenced questionnaire that covers dimensions of interpersonal behavior, communication, and repetitive/stereotypic behaviors that are characteristic of autism spectrum disorders. The parent rating form (ages 4-18) was completed; Cronbach’s alpha = .94. Receiver operator characteristic (ROC) analyses demonstrated that the SRS total raw score of 75 is associated with a sensitivity of .85 and specificity of .75 for a child with ASD. The total raw score of 75 was used for subsequent analyses. This measure was chosen because of the high reliability that the total raw score of social-communication provided to understand autism-related deficits.

**Children’s Communication Checklist-2 (CCC-2; Bishop, 2006).** The CCC-2 (aged 4.0-16.11) is a rating scale completed by parents with 70 items divided into 10 subscales. All items are rated on a Likert scale from 0 = *less than once a week (or never)* to 3 = *several times (more than twice a day or always)*. Four scales address specific speech difficulties, four scales address pragmatic aspects of communication, and two scales assess behaviors commonly impaired in children with ASD. Interpretation is based on a Global Communication Composite (GCC) and the Social Interaction Difference Index (SIDI). A significantly depressed communicative competence score, coupled with a score of less than -11 on the SIDI, suggests a profile of ASD and the need for further evaluation. Thus, the SIDI score and communicative competence score (M = 100, SD = 15) were used for this study. The CCC-2 reports a sensitivity value of .89 and a
specificity value of .97 for identifying children with autistic symptomatology and social impairment. Reliability coefficients on the CCC-2 parent report form range from .86 to .96 and the composite score reliability ranges from .94 to .96.

This measure was chosen to measure children’s communication skills. The parent report of the children’s language skills provided an understanding of the child’s typical language used at or around home.

**Comprehensive Assessment of Spoken Language, 2nd Edition (CASL-2; Carrow-Woolfolk, 2008).** The CASL-2 is an orally administered, standardized assessment of language skills in children aged 3-21 years. The CASL-2 provides an assessment of semantic, syntactic, and pragmatic language. The CASL-2 has good construct validity and strong reliabilities of .90-.96 on each of the three indices (M = 50, SD = 10); this measure has been widely used among children with autism, as well as children with language delays, aphasia, and intellectual disabilities. The pragmatic judgment subscale was used in analyses, as it most differentiates for children with ASD.

This measure was chosen because it provides an objective comparison to the parent reported levels of children’s language skills. This measurement is also highly reliable and will be used for determining whether children’s spoken language will influence the parent-child interaction during shared book reading.

**Results**

**Design**

Multiple regression analyses were employed in order to relate child characteristics to parenting behaviors used during the shared book activity. The utility of this design
allowed the investigator to examine the effect of several variables upon a single outcome, i.e., the child characteristics of social communication and behavior problems were used in determining strategies for eliciting language (Pedhazur, 1997).

**Research Question 1a.** The primary focus of this question was to determine how many reliable and interpretable factors could be extracted from the system of strategies that parents used during shared book reading to elicit child language and provide feedback. Because previous research has identified the extent to which parents use these types of strategies with typically developing children (Hart and Risley, 1992; Whitehurst et al., 1988), this research question was included to determine if parents of children with ASD used the same techniques. Parent use of language elicitation strategies, pursuant to the development of literacy, was determined by an exploratory factor analysis (EFA). The intent was to determine the underlying factors that explained the patterns of data from this coding system.

A factor analysis was conducted on the 12-item shared literacy task (SLT) with oblique rotation. Raykov and Marcoulides (2008) recommend oblique rotations when using the maximum likelihood method (which was the case in this analysis) because the factors are assumed to be correlated to some extent (Whitehurst et al., 1988) and the oblique rotation maximizes the factor loadings for each factor.

The Kaiser-Meyer Olkin measure verified the sampling adequacy for the analysis, with KMO=.75 (‘good’ according to Kaiser’s criteria, 1974), and Bartlett’s test of Sphericity was significant ($\chi^2$ (66) = 348.49, $p<.05$). An initial analysis was run to obtain eigenvalues for each factor in the data. Four factors had eigenvalues over Kaiser’s
criterion of 1. In combination, the 4 factors explained 62.8% of the variance. The scree plot showed inflections that would justify retaining either 3 or 4 factors (Appendix, Figure 2). Due to the relatively large sample size for research with this population (N=111), and agreement of the scree plot with Kaiser’s criterion of 4 factors, all four factors were retained. (See Figure 2 for scree plot.) To determine if the model was a good fit, the chi-square test statistic was used; it was non-significant ($\chi^2=.27$), indicating that the model is a good fit as the chi-square test statistic should be greater than or equal to 0.05 (Raykov & Marcoulides, 2008).

The pattern matrix showing the factor loadings after rotation is displayed in Table 2. The structure matrix is provided in Table 3; this provides the correlation coefficients between each variable and factor. Only loadings greater in absolute value than .3 were included. The factor pattern matrix provides factor loadings after rotation for each variable on each factor. The items that clustered on the same factors suggested that factor 1 represented “clarification techniques” (i.e., questions about functions/attributes and praise/confirmation); factor 2 represented “feedback techniques” (i.e., giving directions, reading and criticism/corrections); factor 3 represented “teaching techniques” (i.e., basic repetition, repetition with expansion, and simple what questions); and factor 4 represented “evocative techniques” (i.e., open ended questions, yes/no questions, and imitative directions). One item did not load onto any factor and was removed from the model: labeling. This item was used infrequently across all participants. As the factor pattern and structure matrix (Table 3) revealed, the hypothesized two factors from Whitehurst et al. (1988) were not observed in the sample with parents of children with
ASD. While the original article was an intervention study that sought to teach both evocative and feedback techniques, this factor analysis revealed a more complex understanding of the instructional techniques parents utilized, in the absence of any intervention as part of this study. Factor 1 was a highly correlated factor with eight of the variables correlating with clarification techniques. Factor 2 was the least correlated factor with only four of the variables correlated with feedback techniques. Factor 3 had seven correlated variables with teaching techniques and factor 4 had six correlated variables with evocative techniques. Due to the high inter-correlations, the oblique rotation proved the most appropriate to maximize factor loadings.

The descriptive statistics for items on the Shared Literacy Task (SLT) is provided in Table 4 followed by the descriptive table for the newly created factors shown in Table 5. As parents were not given direct instruction on how to read with their child, Table 4 provides the coded items that parents did naturally. The items demonstrated that of parents who used the item more than one time (i.e., by chance), the highest used item was that of reading/having a conversation (100%). The lowest used item was that of imitative direction (27.9%; i.e., is he happy or surprised?) There were no observable outliers in the item level scores of the SLT task or on the newly created factors. The descriptives of the newly created factors (Table 5) indicated that three of the four factors were normally distributed, all except for the ‘feedback’ factor which was positively skewed. This factor consisted of two items in which some parents provided a lot of reading/conversation with their child (up to 58 times) or a high level of directions to their child (up to 57 times). As the other three factors were normally distributed, the item levels also demonstrated a
smaller range of use. Internal consistency for each factor was examined using Cronbach’s alpha. The alpha’s were moderate with clarification techniques having the highest (3 items, alpha=.71) and evocative techniques having the lowest (3 items, alpha=.41). Based on the resulting factor structure of the shared literacy task (Clarification Techniques, Feedback Techniques, Teaching Techniques, and Evocative Techniques), the logic model is included in the Appendix, Figure 3.

Finally, Pearson correlations were used to identify any significant correlations among the four factors and to child and parent demographic variables. Three of the four factors were positively but very modestly correlated with the demographic variable of parent education level: clarification (r=.21, p<.05), teaching (r=.22, p<.05) and evocative (r=.19, p<.05). Additionally, the Child IQ variable correlated with the feedback factor (r=-.33, p<.01). The correlation matrix is provided in Table 6.

**Research Question 1b:** This research question addressed the relationship among child characteristics and the parent elicitation strategies from the shared literacy task. Specifically, this question investigated the extent to which child communication, behavior, and social skills related to parent literacy strategies. Factors that correlated with child related characteristics were: factor 1 (clarification techniques) and factor 2 (feedback techniques). The clarification factor was positively correlated with child social interaction difference (CCC-2 SIDI; r=.20, p<.05). The feedback factor was negatively correlated with child pragmatic judgment (CASL; r=-.23, p<.05). The correlation matrix is provided in Table 7.
As determined by hierarchical regression, the variables of parent education and child social interaction difference (CCC-2 SIDI) related to parents’ use of clarification techniques during a shared literacy task. The first block included only parent education and the second block included the CCC-2 social interaction difference. The final regression model demonstrated that both factors accounted for significant variance (p<.05) in parent clarification techniques and the model accounted for 10% of the variance (R^2=.10, F= 5.55, p<.01). The regression analysis can be found in Table 8.

In a second hierarchical regression, the variables of child IQ and child pragmatic judgment (CASL; social communication) related to parents’ use of feedback techniques during a shared literacy task. Child IQ was entered into the first block and the CASL pragmatic judgment scale was entered into the second. The regression demonstrated that when both were entered into the model, only child IQ was significantly related to parent feedback techniques (p<.05). The model accounted for 8% of the variance (R^2=.08, F= 4.95, p<.01). The regression analysis can be found in Table 8.

**Research Questions 2a.** The primary focus of this question was on relations among positive and negative parenting strategies displayed during shared book reading and child and parent demographic variables. First the descriptive statistics were run to understand the items and subscales of the PCIRS. Each item had a possible range of 1-5 likert score. The positive subscale has a larger range (8-18) as this subscale is comprised of four items (positive affect + sensitivity + (-) detached + stimulation of cognitive development). The negative subscale is comprised of two items with a smaller range (2-7; intrusiveness + negative affect). This table is provided in Table 9. The correlation matrix
is shown in Table 10 between the PCIRS variables and the demographic variables of both child and parent. Positive parenting was correlated with child IQ (r=.24, p<.05) and parent education (r=.25, p<.01). Children with a lower IQ had parents with more negative parenting (r=-.41, p<.01). These items were controlled for in subsequent analyses.

**Research Question 2b:** This research question addressed the relations among child characteristics more reflective of ASD and positive parenting. Specifically, this question investigated the extent to which child communication, behavior problems, and social skills affected positive parenting. First, correlations among possible child factors were examined to identify those that correlated with the positive parenting variable; Table 11. None of the child related characteristics correlated with positive parenting. Thus, the regression was conducted only with the correlated demographic variables (Table 10; child IQ and parent education). Both demographic variables were significantly related to positive parenting (p<.05), and the regression accounted for 11% of the variance (R² = .11, F = 6.71, p<.01). The results of this analysis can be found in Table 12.

**Research Question 2c:** The final component of this research question addressed the relations among child characteristics more reflective of ASD and negative parenting. Specifically, this question investigated the extent to which child communication, behavior problems, and social skills affected negative parenting. One child characteristic correlated with negative parenting; the CASL pragmatic judgment subscale (Table 11; r=-.28, p<.01). Thus, in the regression model, the correlated demographic variables were entered first (Child IQ) and then pragmatic judgment. The final regression model
accounted for 12% of the variance ($R^2 = .12, F= 6.79, p<.01$), with only child IQ remaining significant at the trend level ($p<.10$). The regression can be found in Table 12. When child IQ was entered alone (omitting other child variables), it was significantly related at $p<.001$.

**Research Question 3:** An additional examination of within-sample differences was conducted by using Chi-square analyses to determine to compare the child and parent-related variables. Child characteristics from the CCC-2, CBCL, SSIS, and SRS were examined further, as none of these were significantly correlated with the parenting behavior scores.

There was considerable within-group variability on the CBCL. The internalizing behavior problems subscale had a mean of 62.28 (SD = 9.90); the externalizing behavior problems subscale had a mean of 59.27 (SD = 10.06); and the total score had a mean of 63.45 (SD = 10.12). Since a large proportion of the sample (56%) had clinically significant behavior problems (T-scores > 64), the CBCL scores were then dichotomized in a “0/1” fashion at the clinical cutoff for T-scores at 64, a more conservative split than using the borderline cutoff at ‘60’ (Clinically significant = 1; Non-clinically significant = 0). With this split, 45% of the sample was included in the clinically significant group for internalizing problems, 37% was included for externalizing problems, and as noted, 56% was included for total problems. It is important to note the high percentage of this sample that had elevated risk levels for both internalizing and externalizing behavior problems.

Scores on the PCIRS were similarly examined. A specific finding from the positive affect subscale revealed that a smaller portion of the sample was only minimally
positive during the interaction (28.8%), while the remaining portion of the sample was moderately or very positive during the interaction (71.2%). This subscale was then dichotomized in a “0/1” fashion for parents who were minimally positive (0) and moderately/very positive (1). A Chi-square analysis, which utilized the CBCL and PCIRS dichotomized variables, was conducted, and results showed that children who had clinically significant externalizing behavior problems had parents who demonstrated fewer positive parenting behaviors (43.90%; $X^2 = 7.20, p < .01$).

**Discussion**

This study sought to examine how child characteristics influenced the strategies that parents, mostly mothers, used during a shared book reading activity. Past research has identified how parents direct and lead shared book reading and the outcomes this has upon children (e.g., Buhs et al., 2011; Ruble et al., 2008; Whitehurst & Lonigan, 1998). Specifically, with parent-supported reading and daily practice, children can increase their vocabulary (Teale, 1988; Wood, 2002). Furthermore, when children learn to enjoy reading, they are more likely to continue reading alone without parental support (Whitehurst & Lonigan, 1998). Previous research primarily focused on the child outcomes of shared book reading as evidenced by two meta-analyses which quantified shared book reading research from the 1960’s to 2007 (Mol et al., 2008; Scarborough & Dobrich, 1994). The most pertinent findings revealed considerable variance in child outcomes, such that the link between parent-child reading and developmental outcomes may not be linear. This was particularly the case when the child was not a responsive reading partner, suggesting little impact on child-related outcomes (Scarborough &
Furthermore, when restricted to studies that assessed child language outcomes, not only did the shared book reading task impact the behavior of the child, but the parent was viewed as an active and quality facilitator, capable of producing greater language development in the child (Mol et al., 2008). Interestingly, in decades of research using shared book reading, studies focused merely on the mother as a reading facilitator, rather than on her parenting or affective behavior.

Parents of children with autism spectrum disorders often face challenges with varying levels of child social skills, behavior problems, and communication deficits. Children with ASD struggle with comprehension and inference skills that are required during stories, and they may experience challenges in interpreting the ongoing social interaction that occurs during shared book reading (Siller & Sigman, 2008; Sigman et al., 2004). Especially difficult for children on the autism spectrum, is getting the ‘big picture’; in part because many children with ASD focus on the specific details when reading. This can make attending to the story quite challenging (e.g., joint attention, shared interaction) (Happe & Booth, 2008; McDuffie & Yoder, 2010). The shared reading activity provides a context for demonstrating how child behaviors can influence parenting strategies, and perhaps vice-versa. Delays in child development, as well as increased levels of problem behavior, may alter parenting styles as parents adjust to meet their particular child’s needs (Blacher et al., 2012; Fenning et al., 2007). Typically, parents of children with ASD must use more attention-seeking behaviors and non-verbal prompts in order to provide a teaching context appropriately matched to the child’s level of functioning (Calkins et al., 1998; Lemanek et al., 1993). Interestingly, when pilot
testing the Whitehurst et al., (1988) coding structure for this study, the item of “pointing request” was not observed, and thus dropped from the final coding system. This item would be a typical teaching behavior for gaining or directing a child’s joint attention, but one that these parents were not observed to do spontaneously. Had parents demonstrated more joint attention behaviors, children may have had the opportunity to be more responsive during the shared reading task.

**Evocative and Feedback Techniques**

The first research question focused on extending past shared literacy research in order to explicitly define a factor structure for the shared literacy paradigm, used here in a natural setting with a different child population. Past research was intervention focused (e.g., Fleury et al., 2013; Whitehurst et al., 1988; Whitehurst et al., 1994a; Whitehurst et al., 1994b; Zevenbergen & Whitehurst, 2003), with the interventions aimed at teaching parents strategies for reading with young children. The focus included two primary aims: (1) evocative techniques to elicit language, and (2) feedback techniques to structure and develop a child’s reading. To guide the current study, observations to identify what parents of children with ASD did naturally during shared book reading activity were coded, and an exploratory factor analysis (EFA) was used to determine if this two- (or more-) factor concept of reading was present in a shared literacy task. Based on the descriptive statistics of what parents did naturally in this study demonstrated that the majority of time was spent reading or having a conversation about the story (median use = 34 times), and using simple yes/no questions (median use = 15 times). As these storybooks had no words, parents and children had to make up the story so that context
allowed for parents and children to expand and create in whatever way felt natural. Furthermore, the descriptive statistics revealed that very few parents provided a criticism or correction to their child (median use = 2 times), provided an imitative direction (median use = 1 time), or labeled a picture (median use = 1 time).

The results of this factor analysis identified a four-factor model of shared literacy—clarification techniques, feedback techniques, teaching techniques, and evocative techniques. While many parents asked questions of the child to elicit language perhaps in an attempt to clarify or teach, not all parents provided equal amounts of feedback. Thus, this factor (Feedback) appeared to be skewed towards a subsample of parents who provided more directions to their child (range 0-57 times) and/or reading/conversation (range 5-58 times). As this study did not provide explicit reading instructions, as dialogic reading interventions typically do, this activity demonstrated the role that parents of children with ASD might take in more naturalistic shared book reading, that is, sitting with their child and a book, without explicit instructions on “how” to read.

In this study, the techniques parents used were varied depending on the needs of their child. Some parents focused most of their effort on teaching, in order for their child to gain a greater vocabulary or richer understanding of the story, consistent with findings in previous research (Tannock et al., 1992; Venker et al., 2012). Other parents focused on simply reading the story to their child and checking for understanding as means of being responsive and following the child’s lead (Landry et al., 2006). Without explicit instruction or intervention as to how to read with their child, parents were allowed to read
in a manner that felt natural to them. This study’s four factor structure provided a
direction for a possible future intervention by parsing out various teaching steps that
parents’ could use to read with a child, specifically a child with autism, who may require
more direction and a more individualized pace. By incorporating teaching, feedback,
evocative techniques, and clarification, parents may naturally target story comprehension,
which is a core deficit among reading skills in ASD (Frith & Snowling, 1983; Newman et
al., 2007). Since the storybooks in this study did not have text, parents and children
worked together to target the conceptual skill of understanding a storyline. This, in
combination with the parents being active listeners, served as a means of promoting the
child’s storytelling abilities (Lanter et al., 2013; Whitehurst et al., 1994a).

**Factor Correlates.** The four parenting technique factors were correlated with
demographic variables as well as with child related variables (i.e., child social skills,
behavior problems, and communication skills). Three of the factors correlated positively
with parent level of education (clarification, teaching, and evocative techniques). All of
these factors corresponded to aspects of parent-led reading to expand upon what the child
said or did during the reading activity. These techniques required the parent to ask open-
ended questions in order to elicit more language than the child offered initially. That
parent education was positively correlated with three of the factors is consistent with
other studies that have found that parent education is often related to a socio-economic
advantage which in turn promotes access to resources (Blacher et al., 2012; Hodapp,
syndrome often have fewer behavior problems than children with other intellectual
disabilities, and that their parents had an increased understanding of symptomatology, particularly the older parents. As a result of this pattern, the phrase “Down Syndrome advantage” was coined (Seltzer, Abeduto, Wyngaarden Krauss, Greenberg, & Swe, 2004). In a longitudinal study involving mothers and children with ASD, Down syndrome, cerebral palsy, undifferentiated delays, or typically developing children, Blacher and colleagues (2012) found that mothers with higher education had lower negative parenting scores. Similarly, mothers who were more educated were more positive with their child in a structured teaching context, regardless of child delay status. In both correlational and intervention-based research, more variance was accounted for by various SES indices than by differences in shared book reading alone, suggesting that the broader home literacy environment, family background, and parent education were contributing factors (Scarborough & Dobrich, 1994) and provided an “advantage” regardless of behavioral phenotype.

In regard to the present study focused on families and autism, access to resources and knowledge about ASD is quite prevalent, as autism is perhaps the most discussed disability of this decade, with a 1,148% growth rate (Autism Society, 2013). Perhaps, the increased knowledge of the more educated and advantaged parents impacted parenting behaviors in this study, where the majority of parents demonstrated sensitivity and positivity with their child. It is important to note that in the present sample, 75.2% of parents made above $50,000 and 71.7% of parents had a four-year college degree.

In a qualitative study, Chandler-Olcott & Kluth (2008) found that effective reading strategies for youth with ASD included the provision of small cues during a
reading activity as a means of making social nuances more explicit, as well as the provision of examples and strategic support (i.e., scaffolding) to help with reading. Even in the original work by Hart and Risley (1995), parents of children who were lower functioning provided more support during reading tasks, and they also served as a model to their children. In our sample, most participants’ IQs were in the average range (70% > 85), theoretically requiring less structure and scaffolding. To underscore the point, in this study, child IQ was negatively correlated with parenting feedback, so that children with lower IQ’s received more feedback. Thus, for a child with a lower IQ, parent support is needed to structure the activity through scaffolding techniques (Chandler-Olcott & Kluth, 2008; Pellegrini et al., 1985; Roberts et al., 2005).

In order to identify the extent to which child ASD symptomatology related to parents shared literacy strategies, the newly created factors were used as outcome variables in hierarchical regression analyses. First, the clarification factor was significantly related to child social interaction scores on the CCC-2. Both parent education and child social interaction skills were found to be significantly related to parent’s use of clarification techniques during the shared literacy task. For children who had better social interaction skills in terms of social communication, parents were able to expand and clarify the child’s language as a means of fine-tuning their reading and conversation. Social communication deficits are universal to ASDs; however, when a child is able to attend to the task, the social interaction skills can be taught and practiced (Sigman et al., 1986; Tager-Flusberg et al., 2001). Children in this study whose parents spent the time fine-tuning reading skills through expansion and clarification, had the opportunity to
practice language and story development, and to gain the social and emotional control necessary to attend and maintain the social interaction required by the activity (Bus et al., 1995; Evans et al., 2008; Ruble et al., 2008).

When parenting feedback techniques were used in a regression analysis, child pragmatic judgment skills were negatively correlated with feedback and entered into the regression along with child IQ. When both were entered into the model, only child IQ was a significantly related to the feedback skills demonstrated by the parents.

**Positive and Negative Parenting**

Both positive and negative aspects of parenting were examined during the same structured reading activity. The descriptive statistics of the PCIRS items were examined to provide an understanding of the composite positive/negative subscales. These results demonstrated that there were few parents who demonstrated negative behaviors while being observed in a structured setting. Correlation analyses indicated that child IQ and parent education were significantly related to parenting behaviors, although IQ was negatively correlated with negative parenting. No variables related to communication, behavior problems, or social skills were found to be correlated with either positive or negative parenting. The regression analysis for positive parenting demonstrated that child IQ and parent education level only accounted for 11% of the variance. Thus, in this study, only a modest amount of variance in parenting behaviors of mothers of young children with ASD could be accounted for by child characteristics. Dimensions of mother-related characteristics were not taken into account such as parents’ optimism, mental health, and/or their realistic expectations of their child’s behavior. Ellingsen, Baker, Blacher, and
Crnic (2013) found that in a sample of three-year old children, with and without developmental delay, higher levels of education plus parent optimism were protective factors when faced with high levels of child behavior problems, developmental delay status, and low family income. The authors went on to demonstrate that resilient parenting was more likely when mothers had higher levels of education and demonstrated more positive parenting behaviors. These mothers used more effective parenting skills when they perceived rated their child as having more difficult behavior problems (Ellingsen et al., 2013).

In the regression model of negative parenting, child pragmatic judgment was negatively correlated with negative, possibly more intrusive, parenting. In other words, children who lacked social competence were more likely to experience negative parenting behaviors. Child IQ was strongly associated with parenting skills, and it is conceivable that parents adjusted their behavior strategies dependent upon the child’s level of functioning and language skills (Baker et al., 2010; Calkins et al., 1998; Siller & Sigman, 2002). Given the nature of the task, and the fact that parents were being observed and videotaped, it may be that parents were less likely to demonstrate harsh and negative parenting behaviors that may be more typical during a difficult parent-child interaction. As Christensen (2013) demonstrated in research with parent and child interactions with youth with oppositional defiant disorder (ODD), the PCIRS was a useful measure for observing how parents and children handle conflicts, but failed to provide a robust measure of parent negativity.
Child Influences

Contrary to hypotheses, few child characteristics were related to parenting (positive or negative). Previous studies with typically developing or at-risk children, demonstrated significant relationships between child behavior problems and positive or negative parenting (e.g., Belsky et al., 1998; Crnic et al., 2005; Blacher et al., 2012). Blacher and colleagues (2012) demonstrated that across various diagnostic groups, behavior problems produced a significant main effect and were subsequently co-varied in models of both positive and negative parenting. The current sample demonstrated a significantly higher proportion of children with clinical levels of behavior problems than the expected spread or normal distribution, of 10% in the clinical range (Lowe, 2005). Forty percent of the children in this sample had clinically significant levels of behavior problems, resulting in less variance in the observed behaviors during the shared reading task activity. As Floyd and Philippe (1993) demonstrated, an increase in child behavior problems can lead to less positive interaction and often parents provide more directives (i.e., negative teaching strategies) with difficult children (Floyd et al., 2004). Based on the parent ratings of the CBCL, children with more externalizing behavior problems had parents who demonstrated fewer positive parenting behaviors.

Limitations and Implications

As in every study, there are limitations to consider when interpreting the results. This study did not include child observational measures of behavior problems, social skills. The measures of child social skills, and behavior problems were all completed by parents, thus raising the possible issue of shared method variance. Due to the nature of
the sample included in this study, many of the children had elevated levels of problems behaviors or significant social skill deficits; thus, it’s possible that some parents enrolled in this study simply to seek additional support. As shown in the demographic table, more than 50% of our sample had clinically significant problem behaviors or social skill deficits (i.e., more than two standard deviations above or below the mean, respectively). Thus, there was less variance in scores, reducing the significance in some analyses. Socio-demographic characteristics were also restricted, as many parents had higher education backgrounds and income above $50,000. Due to the constrained fashion in which the shared reading paradigm took place, in a lab-based setting, parents may have demonstrated behaviors deemed more socially desirable than when managing a child with limited social, communication, or pro-social behavioral skills at home. Additionally, the constraints imposed by the project required the same books to be used for all children rather than based on child choice, and that the time provided for reading was kept to eight minutes, in order to keep all observations as similar as possible. However, as noted, the same books used here have been used in other studies with children with autism.

Interestingly, this sample of children with significant problem behaviors and skill deficits, did elicit parenting behaviors that were more typical than originally expected. There was a difference between previous research on shared book reading impact on child-related outcomes and the findings in the current study. Two meta-analyses provided a summary of the shared book reading research for over 30 years, and demonstrated that children demonstrate significant increases in language (i.e., vocabulary development) and pre-academic skills from shared book reading activities. Specifically, when parents are
more active facilitators in the interaction, children display larger gains in language development (Mol et al., 2008). However, when the child is not a responsive and active reading partner, results demonstrate limited child-related outcomes (Scarborough & Dobrich, 1994). This research did not measure child-related outcomes as in other shared book reading studies; rather it focused on the impact of parenting behaviors in the context of ASD-related child characteristics. Bi-directionality could be the focus of future studies. Parents of children with ASD typically used more behaviors directed at soliciting their child’s attention, along with more non-verbal prompts, to address their child’s level of functioning (Klin et al., 2005; Lemanek et al., 1993; Wetherby et al., 2004). Interestingly in this sample, parents did not often use the behavioral strategy, “pointing request,” as a means of increasing joint attention.

Previous research has shown that delays in child development and high levels of problem behavior can alter parenting styles (Calkins et al., 1998; Fenning et al., 2007; Floyd & Philippe, 1993). Within this sample, child IQ and child social communication skills were the only significant factors that directly contributed to parents’ positivity and negativity in parenting, as well as to parents’ teaching techniques during shared book reading. With a majority of the current sample of children in the average IQ range, the children required less structure and scaffolding, allowing parents to use more strategies such as expanding and “fine tuning” their child’s language. This finding was in line with Hart and Risley’s (1995) research in which lower functioning children had parents who provided more structure in the activities. Also, parents in this study adjusted their behavior strategies dependent upon the child’s level of functioning and language skills,
both of which are associated with child IQ (Baker et al., 2010; Calkins et al., 1998; Siller & Sigman, 2002).

The subset of children who had elevated problem behaviors and parents who exhibited less positivity in parenting is educationally significant. This group underscored potential difficulties in parenting, and highlighted the need for intervention. Delays in development and problem behavior have been shown to actually alter parenting behavior in children with and without developmental disabilities (Collins et al., 2000; Fenning et al., 2007; Floyd & Philippe, 1993). Does less positive parenting impact children with heightened problem behaviors, or does it impact the parents’ own perceptions of externalizing problems? Or, do children with ASD with elevated levels of problem behaviors impact the parents’ ability to demonstrate positive parenting skills during parent-child interactions? As Floyd and Philippe (1993) demonstrated, an increase in child behavior problems can lead to less positive interaction and often parents provide more directives (i.e., negative teaching strategies) with difficult children (Floyd et al., 2004). Based on the parent ratings of the CBCL, children with more externalizing behavior problems had parents who demonstrated fewer positive parenting behaviors. While not measured directly in this study, parent-child relationships do impact both child and parental well-being. The daily hassles of parenting with children on the spectrum may induce stress (upon the parent) which may decrease positivity in parent-child interactions, which in turn can contribute to increased negativity and conflict (Crnic et al., 2005).
Finally, at the time of participant recruitment for this study, autism was defined using the criteria of DSM-IV. The revised DSM-5 definition of ASD specifies deficits in two domains: social communication and restricted, repetitive behaviors (APA, 2013). In this study, the regression models indicated that child social communication skills were most influential for parent clarification and feedback techniques during shared book reading. Similarly, child social communication skills influenced parents’ negativity during shared book reading. Thus, the new definition of ASD more closely matched these findings, where the combined behavioral category of “social interaction/social communication deficits” most related to parent behaviors.

**Future Directions**

Future research focusing on parenting behaviors in the context of ASD should incorporate the use of a wider range of activities with children with autism. This might afford greater sampling of parental behavior in a variety of contexts, e.g., home and lab-based settings as well as both academic (reading) and social (play-based) tasks. Observations of a variety of interactions would provide a more realistic picture of how parents and children typically interact. Since research on shared book reading is well-documented with typically developing (TD) children, a TD comparison group was not necessary here. Perhaps future studies could involve a comparison group of children comprised of a different disability, as well as a group of children with a range of developmental skills and ASD-related behaviors. This might facilitate study of parenting behaviors in relation to variations in adaptive and cognitive skills (Floyd & Philippe, 1993; Floyd et al., 2004).


Chandler-Olcott, K., & Kluth, P. M. (2008). “Mother’s voice was the main source of learning”: Parents’ role in supporting the literacy development of students with autism. *Journal of Literacy Research, 40*(4), 461-492. doi: 10.1080/10862960802659152


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Table 1.
Demographics (N=111)

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<th>Variable</th>
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<td>89.93 (17.15)</td>
<td>90</td>
<td>52-123</td>
</tr>
<tr>
<td>Child Race White</td>
<td>65.8%</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Early Intervention</td>
<td>90.1%</td>
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<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Special Edu Services</td>
<td>89.2%</td>
<td>--</td>
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<td>--</td>
</tr>
<tr>
<td>CBCL Int. ≥ 64</td>
<td>45%</td>
<td>62.28 (9.90)</td>
<td>63</td>
<td>34-93</td>
</tr>
<tr>
<td>CBCL Ext. ≥ 64</td>
<td>36.9%</td>
<td>59.27 (10.06)</td>
<td>60</td>
<td>32-88</td>
</tr>
<tr>
<td>CBCL Total ≥ 64</td>
<td>55.9%</td>
<td>63.45 (10.12)</td>
<td>64.50</td>
<td>36-87</td>
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<tr>
<td>SSIS Total ≥ 2 SD</td>
<td>75.7%</td>
<td>77.9 (15.14)</td>
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</tr>
<tr>
<td>SRS Raw &gt; 75</td>
<td>76.4%</td>
<td>95.01 (29.42)</td>
<td>93.50</td>
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<tr>
<td>CASL PJ. ≥ 2 SD</td>
<td>33.3%</td>
<td>81.62 (18.41)</td>
<td>82</td>
<td>43-142</td>
</tr>
<tr>
<td>CCC-2 SIDI % ≤ -11</td>
<td>25.2%</td>
<td>-4.27 (10.15)</td>
<td>-4</td>
<td>(-)26-21</td>
</tr>
<tr>
<td>CCC-2 GCC ≥ 2 SD</td>
<td>40.5%</td>
<td>73.81 (12.48)</td>
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</tr>
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<td><strong>Parent Demographic Variables</strong></td>
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</tr>
<tr>
<td>Parent Age</td>
<td>--</td>
<td>38.30 (5.50)</td>
<td>38</td>
<td>24-52</td>
</tr>
<tr>
<td>Parent Bio-Mom</td>
<td>84.7%</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Family Income &gt; 50k</td>
<td>75.2%</td>
<td>--</td>
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</tr>
<tr>
<td>Unemployed</td>
<td>43.2%</td>
<td>--</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>4yr. College Degree +</td>
<td>71.7%</td>
<td>--</td>
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</table>

Table 2.

*Pattern Matrix based on an Exploratory Factor Analysis with Oblique Rotation for the Shared Literacy Task (N = 111).*

<table>
<thead>
<tr>
<th>Questions Function/Attribute</th>
<th>Clarification</th>
<th>Feedback</th>
<th>Teaching</th>
<th>Evocative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Praise/Confirmation</td>
<td>1.01</td>
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<td>Directions</td>
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<tr>
<td>Reading/Conversation</td>
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<td>.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criticism/Correction</td>
<td>.47</td>
<td></td>
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<td>.80</td>
<td>.36</td>
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<td>Repetition with Expansion</td>
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</tr>
<tr>
<td>Questions Simple What</td>
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<td>.37</td>
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<tr>
<td>Questions Open Ended</td>
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<td></td>
<td>.51</td>
<td></td>
</tr>
<tr>
<td>Questions Simple Yes/No</td>
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<td></td>
<td>.46</td>
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</tr>
<tr>
<td>Imitative Direction</td>
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<td></td>
<td>.45</td>
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<tr>
<td>Labeling (dropped)</td>
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</table>

*Note: Factor loadings < .3 are suppressed*
Table 3.

Structure Matrix

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<th>Factor 3</th>
<th>Factor 4</th>
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</thead>
<tbody>
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<td>.36</td>
<td></td>
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<tr>
<td>Praise/Confirmation</td>
<td>.57</td>
<td>.30</td>
<td>.34</td>
<td></td>
</tr>
<tr>
<td>Directions</td>
<td></td>
<td>.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reading/Conversation</td>
<td>.32</td>
<td>.54</td>
<td>.35</td>
<td></td>
</tr>
<tr>
<td>Criticism/Correction</td>
<td></td>
<td>.39</td>
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<td></td>
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<tr>
<td>Repetition Basic</td>
<td>.46</td>
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<td>.49</td>
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<td>Repetition with Expansion</td>
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<tr>
<td>Questions Simple What</td>
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<td>.53</td>
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<td>Questions Open Ended</td>
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<tr>
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<td>Imitative Direction</td>
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</table>

Note: The structure matrix provides the correlation coefficients between each variable and factor.
Table 4.

Descriptive Statistics for the Shared Literacy Task Items (N=111)

<table>
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<tr>
<th>Items</th>
<th>Percentage Used &gt; 1</th>
<th>M (sd)</th>
<th>Median</th>
<th>Range</th>
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<tr>
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<td></td>
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<td>Questions Function/Attribute</td>
<td>81.1%</td>
<td>9.76 (7.62)</td>
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</tr>
<tr>
<td>Praise/Confirmation</td>
<td>89.2%</td>
<td>8.22 (6.56)</td>
<td>7</td>
<td>0-33</td>
</tr>
<tr>
<td>2 (Feedback)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Directions</td>
<td>89.2%</td>
<td>11.59 (10.48)</td>
<td>8</td>
<td>0-57</td>
</tr>
<tr>
<td>Reading/Conversation</td>
<td>100%</td>
<td>33.50 (10.68)</td>
<td>34</td>
<td>5-58</td>
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<td>Criticism/Correction</td>
<td>59.5%</td>
<td>2.60 (2.50)</td>
<td>2</td>
<td>0-11</td>
</tr>
<tr>
<td>3 (Teaching)</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Repetition Basic</td>
<td>76.6%</td>
<td>5.85 (4.80)</td>
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<tr>
<td>Repetition w/ Expansion</td>
<td>67.6%</td>
<td>3.70 (3.37)</td>
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</tr>
<tr>
<td>Questions Simple What</td>
<td>93.7%</td>
<td>11.09 (7.76)</td>
<td>10</td>
<td>0-39</td>
</tr>
<tr>
<td>4 (Evocative)</td>
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</tr>
<tr>
<td>Questions Open Ended</td>
<td>79.3%</td>
<td>5.84 (4.76)</td>
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<td>Questions Simple Yes/No</td>
<td>99.1%</td>
<td>17.74 (10.62)</td>
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<td>1.18 (1.77)</td>
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<td>0-10</td>
</tr>
<tr>
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<td>33.3%</td>
<td>1.52 (2.19)</td>
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Table 5.

*Descriptive Statistics for the Four Shared Literacy Task Factors*

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<th>Kurtosis</th>
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Table 6.

Correlation Matrix of Factor Analyzed SLT and Demographic Variables

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<th>FAC2</th>
<th>FAC3</th>
<th>FAC4</th>
<th>Child Age</th>
<th>Child Sex</th>
<th>Child IQ</th>
<th>Child Race</th>
<th>Early Int.</th>
<th>Sp Ed</th>
<th>Parent Edu</th>
<th>Job Status</th>
<th>Income</th>
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</tbody>
</table>

Note: *p<.05, **p<.01, ***p<.001

FAC1=Clarification Techniques, FAC2= Feedback Techniques, FAC3= Teaching Techniques, FAC4= Evocative5 Techniques, Early Int= Early intervention, SpEd =Special education services
### Table 7.

**Correlation Matrix of Factor Analyzed SLT and Child Related Variables**

<table>
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<tr>
<th></th>
<th>FAC1</th>
<th>FAC2</th>
<th>FAC3</th>
<th>FAC4</th>
<th>CBCL</th>
<th>SSIS</th>
<th>SRS</th>
<th>CASL</th>
<th>SIDI</th>
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<tr>
<td>GCC</td>
<td>-.03</td>
<td>.08</td>
<td>-.00</td>
<td>.08</td>
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<td>-.63**</td>
<td>.33**</td>
<td>-.30**</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note: *p<.05, **p<.01, ***p<.001

FAC1 = Clarification Techniques, FAC2 = Feedback Techniques, FAC3 = Teaching Techniques, FAC4 = Evocative Techniques, CBCL = Total behavior problems, SSIS = Social Skills Total, SRS = Social Responsiveness Total Raw Score, CASL = Pragmatic Judgment subscale, SIDI = CCC-2 Social Interaction Difference Index; GCC = CCC-2 Global Communication Composite
### Table 8.

*Hierarchical Linear Regressions of Parent Techniques during Shared Literacy Task*

<table>
<thead>
<tr>
<th>Block</th>
<th>Clarification</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R²</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Parent’s Education</td>
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<td>.08</td>
<td>.22*</td>
<td>.05</td>
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<tr>
<td>2</td>
<td>CCC-2; SIDI</td>
<td>.02</td>
<td>.01</td>
<td>.22*</td>
<td>.10</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Block</th>
<th>Feedback</th>
<th>B</th>
<th>SE B</th>
<th>β</th>
<th>R²</th>
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<tbody>
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<td>.01</td>
<td>-.29**</td>
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</tr>
<tr>
<td>2</td>
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<td>.01</td>
<td>-.08</td>
<td>.08</td>
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</tbody>
</table>

*Note: *p<05, **p<.01

CASL PJ = Pragmatic Judgment subscale, SIDI = CCC-2 Social Interaction Difference Index
Table 9.

Descriptive Statistics for the PCIRS (N=111)

<table>
<thead>
<tr>
<th>Item</th>
<th>M (sd)</th>
<th>Median</th>
<th>Range (1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect</td>
<td>3.11 (.89)</td>
<td>3</td>
<td>1-5</td>
</tr>
<tr>
<td>Negative Affect</td>
<td>1.20 (.46)</td>
<td>1</td>
<td>1-4</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>3.67 (8.47)</td>
<td>4</td>
<td>2-5</td>
</tr>
<tr>
<td>Intrusiveness</td>
<td>1.48 (.66)</td>
<td>1</td>
<td>1-4</td>
</tr>
<tr>
<td>Detached</td>
<td>1.12 (.40)</td>
<td>1</td>
<td>1-3</td>
</tr>
<tr>
<td>Stimulation Cog. Dev.</td>
<td>3.30 (1.02)</td>
<td>3</td>
<td>1-5</td>
</tr>
<tr>
<td>Positive Subscale</td>
<td>13.95 (2.40)</td>
<td>14</td>
<td>8-18</td>
</tr>
<tr>
<td>Negative Subscale</td>
<td>2.68 (.93)</td>
<td>2</td>
<td>2-7</td>
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</table>
Table 10.

Correlation Matrix of Parenting Skills (PCIRS) and Demographic Variables

<table>
<thead>
<tr>
<th></th>
<th>PosP</th>
<th>NegP</th>
<th>Child Age</th>
<th>Child Sex</th>
<th>Child IQ</th>
<th>Child Race</th>
<th>Early Int.</th>
<th>SpEd Edu</th>
<th>Parent Edu</th>
<th>Job Status</th>
<th>Income</th>
<th>P</th>
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<td></td>
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<td></td>
<td></td>
<td></td>
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<td>NegP</td>
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<td>.01</td>
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<td></td>
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<td>Child Sex</td>
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<td>-.0</td>
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<td></td>
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<td>-.41**</td>
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<td>-.04</td>
<td>.07</td>
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<tr>
<td>Early Int.</td>
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<td>.11</td>
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<td>-.26**</td>
<td>-.01</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>SpEd Edu</td>
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<td>.00</td>
<td>.08</td>
<td>-.07</td>
<td>-.27**</td>
<td>-.00</td>
<td>.47**</td>
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<tr>
<td>Parent Edu</td>
<td>.25**</td>
<td>-.12</td>
<td>-.08</td>
<td>.04</td>
<td>.10</td>
<td>-.26**</td>
<td>.07</td>
<td>.19</td>
<td>1</td>
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<tr>
<td>Job Status</td>
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<td>.08</td>
<td>.01</td>
<td>.17</td>
<td>.13</td>
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<td>-.03</td>
<td>-.10</td>
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<td>-.04</td>
<td>.08</td>
<td>.12</td>
<td>-.28**</td>
<td>.05</td>
<td>.17</td>
<td>.42**</td>
<td>-.12</td>
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<tr>
<td>Parent Age</td>
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<td>.01</td>
<td>.08</td>
<td>.18</td>
<td>.09</td>
<td>-.04</td>
<td>-.07</td>
<td>-.15</td>
<td>.19</td>
<td>-.13</td>
<td>.21*</td>
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</table>

Note: *p<.05, **p<.01

PosP = Positive Parenting, NegP = Negative Parenting; Early Int = Early intervention, SpEd = Special education services
Table 11.

**Correlation Matrix of Parenting Skills (PCIRS) and Child Related Variables**

<table>
<thead>
<tr>
<th></th>
<th>PosP</th>
<th>NegP</th>
<th>CBCL</th>
<th>SSIS</th>
<th>SRS</th>
<th>CASL</th>
<th>SIDI</th>
<th>GCC</th>
</tr>
</thead>
<tbody>
<tr>
<td>PosP</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NegP</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SSIS</td>
<td>0.11</td>
<td>-0.13</td>
<td>-0.43**</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SRS</td>
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<td>0.09</td>
<td>0.73**</td>
<td>-0.57**</td>
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<td></td>
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<td></td>
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<tr>
<td>CASL</td>
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<td>-0.28**</td>
<td>-0.03</td>
<td>0.20*</td>
<td>-0.16</td>
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<td></td>
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</tr>
<tr>
<td>SIDI</td>
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<td>-0.13</td>
<td>-0.03</td>
<td>-0.05</td>
<td>-0.42**</td>
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</tr>
<tr>
<td>GCC</td>
<td>0.04</td>
<td>-0.08</td>
<td>-0.50**</td>
<td>0.39**</td>
<td>-0.63**</td>
<td>0.33**</td>
<td>-0.30**</td>
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</tr>
</tbody>
</table>

*Note: *p* < .05, **p* < .01


*GCC*= CCC-2 Global Communication Composite
Table 12.

Hierarchical Linear Regressions of Positive and Negative Parenting (PCIRS)

<table>
<thead>
<tr>
<th>Block</th>
<th>Positive</th>
<th></th>
<th></th>
<th></th>
<th>R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Child IQ</td>
<td>0.03</td>
<td>0.01</td>
<td>0.22*</td>
<td>0.11</td>
</tr>
<tr>
<td></td>
<td>Parent's Edu</td>
<td>0.45</td>
<td>0.18</td>
<td>0.23*</td>
<td>0.11</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Block</th>
<th>Negative</th>
<th></th>
<th></th>
<th></th>
<th>R^2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Child IQ</td>
<td>-0.02</td>
<td>0.00</td>
<td>-0.33**</td>
<td>0.11</td>
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<td></td>
<td>CASL: PJ</td>
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<td>0.01</td>
<td>-0.25(*)</td>
<td>0.12</td>
</tr>
</tbody>
</table>

Note: (*) p<.10, *p<.05, **p<.001
CASL PJ = Pragmatic Judgment subscale
Appendix

Figure 1. Shared Literacy Task Coding Conventions

**Questions Simple Yes/No:** Yes/No Questions. Child expected to give yes/no response. Ex: Huh? Right? K? You think this is X?

**Questions Simple What:** What is it? The questions are simple expressive questions to elicit a simple label from the book. Ex: Who is this? Where are they? Usually used with a point and referencing a single correct response from the book. Can include time delay/pause.

**Questions Function/Attribute:** What is he doing? How does he feel? These questions are more complex and help the child to explain what is going on in the story. Requires a specific answer with an answer from the book. Can include time delay/pause.

**Questions Open Ended:** What is going to happen next? These questions are complex and encourage any imaginative response. These questions happen before the page is turned as a prediction Ex: “Now what’s happening?” WHY? HOW? “What did he say?” Can include time delay prompt from parent.

**Reading/Conversation:** Reading from the parent not requiring a comment or response from the child. Code this not per sentence but per chunk. May be in response to a child’s question about the story. Ex: “And then the frog jumped over the milk”. “I think we’re going to find out.”

**Labeling:** Parent labeling of a person or object in the story. Not intended to continue the story line but just to identify a picture on the page. Often combined with a point. Ex: “Here is a boy.”


**Repetition with Expansion:** Parent builds upon what the child says. They may repeat what the child has said with some build upon what the child has said, or rephrasing of what the child has said. Child: Dog. Mother: Big Dog.

**Imitative Direction:** Parent labels a picture with some prompt or indication for the child to echo or imitate the phrase. Mom: Giraffe? Child: Giraffe! Models two possible responses and child is supposed to repeat one back Ex: Is he happy or surprised? *Echolalia does not count.

**Criticism/Correction:** Parent provides disapproval or correction of the child’s response. Ex: “That’s not quite right.” No that isn’t a dog, it’s a cat”.

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**Praise/Confirmation:** Parent provides praise or confirmation of the child’s utterance. Repeats child response with tone to indicate agreement. Ex: “Yes that’s right”. “Great idea.” Head nodding does not count unless the child is directly faces/seeing the confirmation.

**Directions:** Parent request for a nonverbal action from the child. Child’s behavior is *expected*. Ex: “Stop.” “Turn the page.” “Get the Book.” “Wait.” “Can you come here”.
Figure 2. Scree Plot
Figure 3. Exploratory Factor Analysis Logic Model