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The Effect of Dialogic Reading on Early Literacy Outcomes for
Children with Autism Spectrum Disorders

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Abstract

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The incorporation of dialogic reading techniques in adult-child book reading has been effective in improving early literacy skills in children with language delays and those from at-risk populations. There is, however, limited research that examines the potential utility of dialogic reading strategies for children with disabilities such as Autism Spectrum Disorders (ASD). In this study, a multiple baseline design across participants with a wait list control was used to examine the effect of dialogic reading strategies on early literacy outcomes in 14 preschool students with ASD. School personnel who served as interventionists were able to learn dialogic reading techniques and appropriately apply the strategies in daily book reading with children. Results indicate that dialogic reading was effective in improving some components of early literacy skills for children with ASD, particularly oral language skills. Children with ASD showed improved outcomes in verbal participation, book-specific vocabulary, and listening comprehension skills during adult-child book readings that incorporated dialogic reading techniques compared to standard reading sessions. There were no differences found in phonological awareness and print knowledge. The results of this study suggest that dialogic reading is a promising practice that should be incorporated as a part of early literacy curriculum for children with ASD.

TABLE OF CONTENTS

	Page
List of Figures.....	ii
List of Tables	iii
Introduction.....	1
Emergent Literacy: Findings from Research on Typically Developing Children	3
Emergent Literacy: Considering Students with Autism Spectrum Disorders and Other Disabilities	6
Adult-Child Shared Reading in Early Childhood.....	16
Focus of the Present Study.....	27
Methods	29
Procedure	31
Measures	36
Coding Procedures.....	41
Results.....	45
Question #1: What is the effect of dialogic reading on children's performance on standardized assessments of emergent literacy knowledge?.....	45
Question #2: What is the effect of dialogic reading on student's knowledge of vocabulary specifically targeted in book readings?.....	47
Question #3: What is the effect of dialogic reading on measures of children's oral language during book readings?.....	48
Question #4: How do children's behaviors change during book reading as a result of repeated exposure to a book?	50
Question #5: How do interventionist behaviors differ between standard book reading and dialogic reading sessions?.....	52
Social Validity	54
Discussion.....	57
Summary of Findings.....	57
Implications	67
Limitations and Direction for Future Research	74
Practical Relevance.....	77
References.....	78
Appendix A: Weekly Vocabulary Response Form.....	92
Appendix B: Procedural Fidelity Form	93
Appendix C: Social Validity Form	94
Appendix D: Behavioral Coding Manual	96
Appendix E: Behavioral Coding Form	100
Appendix F: Verbal Participation Data for Individual Students.....	101

LIST OF FIGURES

Figure Number	Page
1. Research Design	32
2. Book-specific Vocabulary Knowledge	47
3. Verbal Participation during Book Reading	49
4. Effect of Repeated Reading on Multiple-word Responses	51
5. Effect of Repeated Reading on Multiple-word Initiations	51
6. Effect of Repeated Reading on Non-responses	52
7. Rate of Questions Asked by Interventionists in Wave 1	53
8. Rate of Questions Asked by Interventionists in Wave 2	53
9. Rate of Questions Asked by Interventionists in Wave 3	54

LIST OF TABLES

Table Number	Page
1. Student Information	29
2. School Personnel Information.....	30
3. Book Selection for Baseline and Intervention Readings	33
4. Description of CROWD and PEER Prompting Strategies	35
5. Summary of Assessments	36
6. Summary of Statistical Analyses	46
7. Social Validity Measure: Interventionists' Perceptions of Students' Experiences.....	55
8. Social Validity Measure: Interventionist Experiences.....	55

INTRODUCTION

The ability to read has large implications for both academic outcomes and personal quality of life indicators for people with and without disabilities. Learning to read is critical for academic success and experts suggest that emphasizing oral and written language skills at early ages can help prepare children to meet later academic challenges (Fey, Windsor, & Warren, 1995). Furthermore, reading is considered a *pivotal skill*; that is, the ability to read creates opportunities to develop other necessary life skills and improves access to the community (Koegel, Koegel, Harrower, & Carter, 1999; Pierce & Schreibman, 1997). For instance, the ability to read enables individuals to find phone numbers in a phone directory, access public transportation by being able to read bus routes, complete job applications, cook by following a recipe, following directions on medicine containers, and so forth.

Learning to read is necessary for individuals to be independent, contributing members of our current society; however, reading instruction for children with severe disabilities has historically been absent from educational programming or severely lacking in quality (e.g., sole focus on sight word instruction; Spector, 2011). Excluding individuals with severe disabilities from reading instruction was justified according to the reading readiness approach to learning which suggested that students' readiness to learn and their physical status were fundamental to beginning literacy instruction. Willams (1953) claims, "There is general agreement among educators and psychologists that readiness for reading is a developmental condition which is dependent upon a group of closely related factors" (p. 34). These factors are believed to be "responsible for school failure or success," including: physical readiness (visual acuity, hearing, intellectual readiness (measured by IQ and "reading readiness" tests), personal readiness (social maturity), language readiness (vocabulary, receptive language) and perceptual readiness. What

happens to those children who are not, or may never be, “developmentally ready” to learn how to read? According to the reading readiness model, many children with developmental disabilities would not receive literacy instruction on the basis that they were not “ready.” Because many individuals with disabilities did not attain the believed prerequisite skills that were supposed to be mastered before learning how to read and write, formal reading instruction was not included as part of the educational plan.

Within the reading readiness approach, literacy development fell under the domain of formal schooling; parents and early childhood educators had little involvement or influence in children’s reading development. We currently know, in large part to work initiated by Marie Clay (e.g., Clay, 1975), that children’s early experiences with literacy activities supports reading development. Whereas the reading readiness approach creates a clear distinction between pre-reading and reading, the emergent literacy approach conceptualizes literacy acquisition as a continuum beginning at birth. Under the emergent literacy approach, children’s literacy development is believed to begin long before children start formal instruction in elementary school. The term *emergent literacy* is used to describe the knowledge children gain through their interactions with literacy materials even though they are not able to read or write in the conventional sense. These informal literacy activities early in life can teach children a number of skills that support later reading achievement (Whitehurst & Lonigan, 1998). Accordingly, researchers studying emergent literacy have focused on understanding how children’s environments and experiences support the development of skills, knowledge, and attitudes related to reading development.

Adults play an instrumental role in supporting young children’s early literacy skill development by creating literacy-rich environments. The creation of supportive literacy

environments includes (a) adult-directed activities that expose children to literacy, such as reading to children, (b) opportunities for children to independently explore books and writing instruments, and (c) structuring the setting in a manner that allows both exposure and access to these aforementioned opportunities (e.g., displaying environmental print, creating book areas, writing centers) (Smith, Brady, Anastasopoulos, 2008). Literacy-rich early childhood environments give young learners ample opportunities to engage in meaningful literacy activities. By engaging in literacy activities, observing others engage in literacy activities, and through direct teaching, children gradually develop knowledge about language, print, and literacy (Teale & Sulzby, 1986). It is now understood that reading, writing, and oral language develop in a complementary way. Adults play an important role in interacting with children and structuring their environment in ways that can help them learn these skills long before they begin formal schooling.

Emergent Literacy: Findings from Research on Typically Developing Children

What early literacy skills predict conventional reading skills?

Early behaviors that are ubiquitous in early childhood, such as maintaining engagement in storybook reading, labeling and pointing to pictures in a familiar storybook, oral storytelling, and drawing and scribbling are all considered important aspects of emergent literacy (Clay, 1975; Kaderavek & Rabidoux, 2004). These behaviors support the development of other key early literacy skills: awareness of print, relationship of print to oral language, understanding the structure of texts, letter knowledge, the ability to use de-contextualized oral language, and phonological awareness (Smith & Dickenson, 2002). Clearly, there are a number of important behaviors and skills that children can learn from informal literacy activities, but these skills differ in their usefulness for predicting reading achievement in typically developing children.

In an effort to identify specific emergent literacy components that relate to reading achievement, the National Early Literacy Panel (NELP, 2008) conducted a meta-analysis of approximately 500 articles. All of the studies included in their report examined the relationship between preschool and kindergarten literacy skills to conventional reading, which was defined as decoding words, reading comprehension, and spelling. Consistent with previous research conducted by Snow, Burns, and Griffin (1998) and Whitehurst and Lonigan (1998), the precursory skills most commonly found to predict literacy outcomes fall into three general categories: (1) oral language; (2) print and letter knowledge; and (3) phonological awareness.

Oral language. A large body of research supports the importance of oral language ability to reading achievement. Several studies demonstrate a longitudinal relationship between oral language ability and reading proficiency in children who are typically developing, children with reading delays, and those with language delays (Bishop & Adams, 1990; Butler, Marsh, Sheppard, & Sheppard, 1985; Pikulski & Tobin, 1989; Scarborough, 1989). This is not surprising given the commonalities between spoken and written language. At a very basic level, writing is comprised of printed graphic sequences and patterns that represent oral sequences of language (Goodman, 1967). In other words, writing is oral language that is printed. Early readers tend to come from homes where rich language and an abundance of oral language are heard and used (Snow & Perlmann, 1985). Some aspects of oral language are more closely related to later literacy outcomes than others. The NELP report (2008) found that simple vocabulary knowledge is less strongly predictive of later decoding and reading comprehension whereas more complex aspects of oral language, such as grammar, definitional vocabulary (a measure that goes beyond labeling to identifying what words mean), and listening comprehension have more substantial predictive relations with later conventional reading skills.

Print and letter knowledge. A second component of emergent literacy that relates to reading development is a child's increasing knowledge of the forms and conventions of print and their knowledge of letters. Young children demonstrate print knowledge in several ways: understanding that print is read from left to right in the English language; knowing what a letter and word are and identifying them on a page; identifying letters by name; understanding letter-sound correspondence; identifying the cover and pages in a book; distinguishing between pictures and print on a page (Morrow, 1989; Whitehurst & Lonigan, 1998). Tunmer, Herriman, and Nesdale (1988) found that children's understanding of book conventions at the beginning of first grade predicted reading comprehension and decoding ability performance at the end of second grade. The findings from this study were corroborated by recent reviews of the literature, which found that early knowledge of concepts about print in preschool and kindergarten was strongly correlated with reading comprehension and moderately related to decoding and spelling (NELP, 2008). This same report also cited a strong relationship of alphabet knowledge to decoding and spelling; a moderate relationship was found between alphabet knowledge and reading comprehension.

Phonological awareness. Phonological awareness refers to an individual's awareness of the sound structure of spoken language. Research suggests that there is a developing progression from awareness of large sound segments (e.g., words in a sentence, syllables in words) to awareness of small sound elements (e.g., individual phonemes) (Goswami, 2002). Specifically, phonological awareness evolves from a child's ability to detect and manipulate sound differences first at the word level (e.g., school and teacher are separate words), followed by the syllable level (e.g., teacher has 2 syllables: "tea-cher"), then onset-rime (e.g., f-an makes the word "fan;" the onset refers to the initial sound and the rime is the vowel and remaining phonemes that come

after the vowel), and finally the individual phoneme level which is the smallest unit of sound that makes up words (e.g., “fan” is made up of 3 phonemes). In preschool and kindergarten, children demonstrate their developing knowledge of phonemic awareness by blending syllables into words, generating rhymes, segmenting syllables into onsets and rimes, and by identifying words that begin with the same sound (Skibbe, Behnke, & Justice, 2004). A child’s level of phonological awareness in preschool is highly predictive of reading success. For instance, Lonigan and colleagues (2000) found that children who are better at detecting syllables, rhymes, and phonemes more readily learn how to read. This relationship exists even after controlling for factors such as IQ, receptive vocabulary, memory, and socio-economic status.

Providing students access to and encouraging their involvement in early literacy activities prepares them for formal literacy instruction they will receive later in life. Specifically, research has identified that activities that target oral language skills, print and letter knowledge, and phonological awareness are especially supportive of later reading achievement. It is evident that opportunities to develop early literacy skills are important for all learners; however, the quantity and quality of early literacy experiences can differ across populations. The following section provides an overview of what is currently known about early literacy experiences for children with Autism Spectrum Disorders (ASD) and other severe disabilities.

Emergent Literacy: Considering Students with Autism Spectrum Disorders and Other Disabilities

In the emergent literacy approach to literacy development, *all* children, including those with disabilities, should be given opportunities to engage in activities that can support future reading success; however, the process of acquiring literacy for individuals with special needs is in need of further exploration. Although the research on conventional literacy skills in children

with ASD is growing (see Chiang & Lin, 2007 for a review), there is relatively little known about how literacy experiences early in life relate to reading outcomes for this population. There are no published studies that examine the relationship between emergent literacy skills and reading outcomes for individuals with ASD and other developmental disabilities.

Interactive-to-Independent Literacy Model

One reason for the absence of predictive studies may be because there is a lack of knowledge regarding what early literacy instruction and skills look like for students with severe disabilities. To help guide practitioners in designing appropriate literacy goals and interventions for children with atypical or severe levels of communication impairments, such as children with ASD, Kadaravek and Rabidoux (2004) developed the Interactive-to-Independent literacy model. According to this model, emergent literacy is conceptualized as two levels. The first level focuses on giving children opportunities and support to help them develop and maintain a joint focus of attention to a literacy event, such as books or other written/visual material that are meaningful to the child. At this stage, it is essential that the object of literacy focus reflect the child's interests. Example learning objectives at this level include: (a) maintaining attention to a book and literacy partner for a specified amount of time; (b) decreased off-task behaviors during storybook reading; (c) directing gaze at pictures, turning pages, and manipulating flaps in a lift-the-flap book; (d) motoric turn taking during shared book-reading; and (e) using emergent writing (e.g., scribbles, simple drawing) to tell a story or share an experience. The second level of the interactive-to-independent literacy model concerns the development and maintenance of interactive and communicative routines within a balanced exchange between the emergent reader and their literacy partner. The literacy partner (e.g., parent, teacher) builds on the child's communicative actions during literacy activities, whether it is physical actions such as pointing,

vocalizations, and/or verbalizations. The role of the adult is to follow and expand on the child's initiations. If the adult excessively directs the student, the balance in the interaction risks becoming lost. At this level, possible learning goals include: (a) student interacts with verbal, gestural, or signed communication within a shared literacy interaction; (b) student initiates communication during a literacy interaction; (c) student demonstrates a range of pragmatic communication skills (e.g., describing, requesting, responding) during a literacy interaction. This model emphasizes the importance of engagement and participation in literacy activities rather than solely focusing on the cognitive or symbolic nature of written language for students with disabilities who are in the early stages of reading development.

Literacy Opportunities for Students with Disabilities

The presence of a developmental disability has been associated with failures in learning to read (Landgren, Kjellman, & Gillberg, 2003). Given that children with special needs are at higher risk for reading difficulties because of impairments due to their disability, it is especially important that they receive repeated opportunities to participate and engage in literacy activities beginning in early childhood. Making simple environmental improvements by providing access to literacy opportunities and materials has positive implications for student engagement. For instance, Koppenhaver and Erickson (2003) introduced print materials, literacy activities, and writing materials in a preschool classroom containing three 3-year-old children with ASD. The researchers reported that the children engaged easily with the literacy materials and that their understanding and use of print materials improved in sophistication with minimal adult instruction.

While appropriate environmental arrangements and improved access to literacy activities and materials holds great promise for the development of early literacy skills, researchers have

repeatedly found that the norm is that children with disabilities have fewer opportunities to engage in meaningful literacy activities than their typically developing peers (Light & Smith, 1993; Marvin, 1994). In fact, children with disabilities frequently begin school with half of the exposure to print than typically developing children (van Kleeck et al, 1997; van Kleeck & Vanderwoude, 2003), have limited exposure to stimulating home literacy environments, are read to less often, and have less access to writing and drawing materials compared to typically developing peers (Light & Smith, 1993; Marvin, 1994). While there is no justification for excluding students with disabilities from literacy activities, there exist several barriers that educators face when attempting to provide appropriate literacy opportunities for students with disabilities. The following section summarizes barriers specific to ASD that may limit children's participation in literacy activities.

Barriers that Limit Literacy Opportunities for Children with ASD

Pufpaff (2008) proposes two main types of barriers that prevent students with disabilities from being included in the general education curriculum: access barriers and opportunity barriers. Although her work primarily focused on individuals who were non-speaking and used augmentative or alternative communication devices, Pufpaff's conception of barriers can be used to understand the experiences of many individuals with ASD.

Access barriers. Access barriers relate to child characteristics, such as student capabilities and attitudes that may prevent him or her from developing literacy skills. Students with ASD may be limited in their ability to access and learn from early literacy activities as they are traditionally structured due to (a) impairments in language and communication, and (b) social skill deficits.

Impairments in language and communication. Qualitative impairments in communication, both expressive and receptive and receptive are a defining characteristic of ASD (APA, 2000). Individuals with autism have a delay or lack of spontaneous speech. It is estimated that 33-50% of children with ASD do not use functional speech as their primary form of communication (Noens & van Berckelaer-Onnes, 2005). Those who develop speech demonstrate impairments related to the pragmatic aspects of language (Mundy & Markus, 1997; Rapin & Dunn, 2003), have difficulties initiating or sustaining a conversation, and exhibit stereotyped and repetitive use of language or idiosyncratic language (APA, 2000).

Justice and Pence (2005) claim, “language and literacy are separate constructs that develop in distinct yet overlapping and reciprocal ways” (p. 4). As previously stated, early language ability is strongly correlated to reading ability. Children with language impairment have been found to be at risk for future reading failure (Aram, Ekelman, & Nation, 1984; Catts, Fey, Tomblin, & Zhang, 2002; Justice, Kaderavek, Bowles, & Grimm, 2005). Children who have limited speech often communicate through the use alternative or augmentative communication systems, such as picture exchange systems and voice output systems. Research has shown that individuals who use augmentative or alternative communication systems consistently demonstrate lower levels of literacy skills when compared to their chronologically aged peers (Heller, Fredrick, & Diggs, 1999), their peers matched by reading level (Vandervelden & Siegel, 1999) and by intelligence (Sandberg & Hjelmquist, 1996). Many children with ASD have difficulty using communication to have their basic needs met (e.g., requesting items) and have problems using communication in social interactions. Because children with ASD have difficulty acquiring language for basic communicative functions, their ability to learn to manipulate language systems for literacy growth is at risk (Vogler-Elias, 2009).

Language and communication impairment is a diagnostic criterion for autism. This characteristic alone places children with autism at risk for reading difficulties.

Social skill deficits. Another benchmark criterion for autism is an impairment in social interactions, specifically (a) impairment in using non-verbal behaviors, such as eye gaze, facial expression, gestures to regulate social interaction; (b) failure to develop peer relationships appropriate to their developmental level; (c) lack of spontaneous seeking to share enjoyment, interests, or activities with other people; (d) lack of social or emotional reciprocity (APA, 2000). Impairments in social skills limit students' ability to participate and benefit from interactive activities.

The social theory of emergent literacy development claims that children learn through natural interactions with others (Kaderavek & Rabidoux, 2004). A "good" interactive book reading involves more than just the adult reading to a child. In addition to reading text, the adult should make comments about the illustrations and events in the story and invite the child to do the same by pausing and asking questions. Ideally, children will initiate comments of their own and the adult can follow the child's lead by expanding on their statements. Children with ASD lack many of the communication skills necessary to engage in such social interactions, such as commenting and using language to describe events. Furthermore, joint book reading requires that children sustain social interaction regarding a particular topic (the book), which can be challenging for many children with ASD. Because the design of many literacy activities incorporates a social component, students who lack basic social skills will have difficulty participating in, and benefiting from these activities (Kluth & Chandler-Olcott, 2008).

The impaired social skills that are characteristic of the population can be compounded by the lack of reinforcing properties in adult-child shared book reading experiences for children

with ASD. Participation in adult-child shared book reading, for most children, is naturally reinforced by social interaction with the adult. Many children are willing to participate in interactive book reading activities because it affords them the opportunity to spend time with a teacher or parent. Children who do not naturally find social interactions enjoyable may lack the desire to engage in prolonged social interactions that are necessary for quality adult-child book readings. Due to a lack of naturally reinforcing properties in interactive book reading, students' behavior may make it difficult for adults to read to them. Research indicates that a large percentage of children with disabilities do not show an early or continued interest in book reading. Some estimates suggest that as many as 40% of children with disabilities may actively resist storybook reading interactions (Kaderavek & Sulzby, 1998) and these behaviors may interfere with adult attempts to engage them in book reading activities. In spite of good intentions, parents and educators may be reluctant to read to children if their students have difficulty attending, or become aggressive, during book readings. Alternatively, adults may inadvertently limit children's literacy opportunities by reading only highly preferred books or in a routinized, often very rote manner, which is less likely to elicit oppositional behavior by children with ASD.

Opportunity barriers. Whereas access barriers originate from characteristics of the individual, opportunity barriers are limitations imposed upon individuals with disabilities by society or support systems (Pufpaff, 2008). Examples of barriers that limit literacy opportunities for students with ASD include: (a) attitudes held by school personnel and caregivers, (b) school practices, and (c) limited knowledge/skill related to addressing student needs.

School personnel/caregiver attitudes. Attitude barriers can be created when educators and other caregivers lower their expectations of students with autism because of their disability.

This often translates to negative, exclusionary, or prejudicial dispositions of individuals in a student's environment (Pufpaff, 2008). Although school personnel and parent attitudes towards literacy achievement for students with ASD have not been documented, they may be possible to extrapolate from research that has been conducted on severe disability populations in general. A survey of parents and teachers of students with severe disabilities (i.e., cerebral palsy, mental retardation, traumatic brain injury, visual impairment) revealed that parents tended to have much lower expectations of their children compared to teachers. Less than half of the parents (48%) who responded to the survey expected their children to reach some form of literacy for functional purposes (e.g., reading bus maps, following a cooking recipe). A small percentage (8%) of parents expected their children to learn reading and writing skills (Light, Koppenhaver, Lee, & Riffle, 1992). Although the teachers in this study had higher expectations of their students compared to parents, the inclusion of families in educational planning for students with disabilities is considered best practice (NRC, 2001) and mandated by law (IDEIA, 2004). As such, it is conceivable that when the multidisciplinary team is creating an educational plan for a student, instructional goals that have a greater value to parents may take precedence over literacy goals.

While attitude barriers are typically constructed by lowered expectations of educators and caregivers, having misinformed high expectations of students' skills can also limit students' literacy opportunities. For instance, hyperlexia is commonly associated with autism spectrum disorders (Nation, 1999; Grigorenko, et al., 2002), and is estimated to affect 5-10% of the population (Burd & Kerbeshan, 1985). Hyperlexia is a disorder characterized by the development of advanced word recognition skills in individuals who otherwise have pronounced cognitive and language deficits. Individuals with hyperlexia have an ability to read single words

that surpasses what would be expected of them given their cognitive ability and/or language skills, early onset of word recognition often occurring without formal instruction and prior to the development of expressive speech (Nation, 1999), and compulsive and indiscriminate reading behavior (Grigorenko, et al., 2002). Although a number of students with ASD develop the decoding skills necessary to read text fluently, many continue to have difficulties understanding what they read. Educators and caregivers may assume these students are literate and therefore may not insist that these students participate in interactive literacy activities or create specific literacy goals that build on their existing decoding skills.

School practices. Practice barriers are commonly accepted conventions that are not written policies, but are implemented as if they were (Pufpaff, 2008). An example of a policy barrier includes the location where individuals with disabilities receive services in the school setting. Many children with ASD qualify for a number of related services, including speech, occupational, and physical therapies. While some of these services can be delivered in a classroom setting, it is common practice for students to be removed from their classrooms to receive related services in other areas of the school. Compared to typically developing peers, students with severe speech and physical disabilities receive less instructional time within the school day (Koppenhaver & Yoder, 1992). Removing students from the classroom setting restricts opportunities for the students to learn in the larger classroom setting. In early childhood settings, opportunity for independent exploration of literacy materials (e.g., book area, art areas) usually occurs during free choice periods. Student removal during this period limits the amount of time spent exploring literacy materials, which can adversely impact literacy skill acquisition.

Limited knowledge/skill. Pufpaff (2008) suggested that a lack of literacy development in young children with disabilities is a result of absent or inappropriate instruction, rather than

characteristics associated with the disability. Knowledge and skill barriers result from a service provider's lack of information or skill regarding assessment and intervention options or support strategies to use with students who have special needs. Professionals responsible for teaching reading and writing to students with ASD may lack: (a) understanding of best literacy instructional practices; (b) resources to gain access to appropriate curricular materials, (c) an understanding of how to make adaptations to curriculum and materials that are necessary to teach literacy skills to students with special educational and behavioral needs (Fallon & Katz, 2007). The No Child Left Behind Act (NCLB; 2001) and the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) mandate that all children receive evidence-based reading instruction consistent with the National Reading Panel (NRP) recommendations (National Institute of Child Health and Human Development, 2000). Accordingly, educators are charged with the responsibility of exploring various approaches to support reading development for all students, including children with ASD; however, very few studies (e.g., O'Connor & Klein, 2004; Asberg & Sandberg, 2010; Whalon & Hanline, 2008) have examined the appropriateness and effectiveness of these recommended strategies for children with ASD. These aforementioned studies focused on conventional literacy skill instruction for students with ASD; even less is known about appropriate early literacy practices for the population.

Identifying appropriate literacy goals is only part of the problem; educators often lack the expertise and training to teach literacy to students who require specialized instruction. Providing appropriate academic instruction for this population can be challenging for educators due to social, communication, and cognitive differences, which can influence both the quantity and quality of instruction they receive (Miranda, 2003). This may result in teachers dismissing students with ASD from literacy activities because they do not know how to include or support

their participation in the activity (Kluth & Dermody-Latham, 2003). It is important that children with ASD have access to literacy experiences, beginning in early childhood and continuing through formal reading and writing instruction. To help educators accomplish this goal, research efforts should focus on determining effective literacy instructional strategies for students of all ages.

Adult-Child Shared Reading in Early Childhood

A common literacy practice valued by educators and early childhood professionals is reading aloud to children. Reading books to children gained popularity during the 1980's in large part because early childhood policy makers publicized that reading aloud was an excellent, developmentally appropriate instructional practice (Bredekamp, 1986). Several research efforts focused on the topic of parent-child book reading in the home environment (e.g., Heath, 1982; Teale, 1986) and emergent literacy instruction became increasingly common in kindergarten and first-grade curriculum (Teale, 2003). Reading aloud to children emerged as a key facet of family literacy programs and the central focus of several public library outreach efforts (e.g., the Carnegie Library's *Beginning to Read* program, Reading is Fundamental, Washington Learning Systems [see Segel & Friedberg, 1991; <http://www.rif.org/>; <http://www.wlearning.com>]). As a result of these efforts, adult-child shared reading practices (a parent reading a picture book with a toddler or a teacher reading a book to a class of preschoolers) gained popularity and continues to be widely recommended to promote language and other skills related to early literacy development.

Individuals advocating for reading to children often quote a line from *Becoming a Nation of Readers* in which Anderson and his colleagues (1985) refer to shared book reading as “the single most important activity for building the knowledge required for eventual success in

reading” (Anderson, Hiebert, Scott, & Wilkinson, 1985, p. 23). Wells (1985) found that the frequency of listening to storybook readings between ages 1-3 was significantly associated with both literacy and teacher ratings of oral language skill at age 5 and reading comprehension at age 7 in typically developing children. By reading aloud to children at early ages, adults facilitate the development of valuable skills that support later reading development, particularly print knowledge and oral language skills (Aram, et al., 1984; Catts, et al., 2002; Justice, et al., 2005). In their review of the adult-child shared reading literature, the National Early Literacy Panel corroborated these findings by reporting that the largest impact of shared reading was on oral language outcomes, with an average effect size of 0.73. This result means that, on average, children who received a shared reading intervention scored, on oral language, more than 0.7 of a standard deviation higher than children who had not received such instruction (NELP, 2008). Although there was no effect on young children’s phonological awareness or alphabet knowledge in their review, the committee cautions that a lack of statistically significant results could be due to the limited number of studies that examined these outcome measures.

The benefits of adult-child shared reading practices on children’s oral language skills is based on the premise that book reading allows children to hear adults use rich language and are then provided ample opportunities to practice using language. The seminal work of Betty Hart and Todd Risley (1995) emphasized the importance of early language experiences on children’s development outcomes. Their observations of professional, working class, and welfare-recipient family interactions with young children revealed that children from professional families heard more words per hour, resulting in larger cumulative vocabularies. By age three, the observed cumulative vocabulary for children in the professional families was about 1,100 words compared to 750 words for children from working class families and approximately 500 words for children

from welfare-recipient families. Clearly, exposure to language-rich environments early in life has a profound impact on children's language outcomes; adult-child book reading provides a developmentally appropriate activity in which adults can give children additional opportunities to hear rich language that can enrich their expressive and receptive vocabulary.

In addition to hearing language, children have opportunities to use language during interactive book reading. Adults can support children's participation in book reading by asking them questions about the book and encouraging them to ask their own questions or comment about the events and characters in the story. One factor that has been related to children's verbal participation is children's familiarity of the story. The act of repeated reading may support children's ability to verbally engage in the reading. Children's comments and questions increase and become more interpretive and evaluative when they have listened to repeated readings of a story (Roser & Martinez, 1985; Yaden, 1985). As children become more familiar with a text, they discuss more aspects of the text in greater depth, both in their comments and their responses to the reading (Snow, 1983; Snow & Goldfield, 1983). It is common for young children to request for adults to read the same preferred book on a number of occasions; the quantity and quality of children's verbal participation during reading is enhanced when adults oblige children's requests for repeated story reading.

Dialogic Reading

Simply reading to children does not ensure that children will make adequate gains in their oral language and print knowledge. Research conducted in the past few decades has stressed that the *quality* of book reading is more important than the *quantity* of book reading (e.g., Scarborough & Dobrich, 1994). The manner in which children are read to affects their engagement during book readings and what they take away from the experience. A situation in

which an adult simply reads the text on the page positions the child as a passive listener, rather than an active participant in the reading. Compare this to a book reading interaction that involves the adult describing illustrations and asking the child questions about what he or she sees and understands about the story. In this second scenario, the child has the opportunity to and is expected to engage with the text. The child becomes an active participant with the adult, the book, and the entire process of reading. In this scenario, the adult enhances the quality of the reading experience by encouraging the child to participate in the book reading. Through quality adult-child shared reading interactions, children not only gain access to a variety of books, but are also provided opportunities to develop a number of emergent literacy skills, specifically oral language.

It is believed that quality interactions around book reading facilitate early literacy skill acquisition in young learners; however, the manner in which adults naturally read to children may not result in optimal outcomes. Dickenson (2001) examined typical read aloud practices among preschool teachers. Their observations demonstrated that in preschool settings “rather few teachers seemed to approach book use in a carefully thought out, intentional manner. In some cases, teachers adopted effective reading styles but set aside relatively little time for books; in other cases, teachers allocated considerable time for books but failed to engage children fully in the book reading experience” (p. 200-201). Based on the premise that the ways in which teachers read to children make a difference, this study indicates that reading aloud does not come naturally to educators, and that early childhood educator can benefit from guidance on how to effectively read to their students.

Dialogic reading is a particular method of interactive reading in which the adult uses a variety of prompts to encourage children to talk during book readings, thereby optimizing oral

language development. The dialogic reading model is formulaic and thus can easily be learned by educators (Teale, 2003). Initially developed by Grover Whitehurst and colleagues (e.g., Whitehurst et al., 1988; Whitehurst et al., 1994; Lonigan & Whitehurst, 1998), parents and educators were taught to use the mnemonics “PEER” and “CROWD” to remember dialogic reading steps and specific question prompts, respectively. While reading to a child, the adult periodically *prompts* a child to verbally participate in the reading. Once the child responds to the adult prompt, the adult *evaluates* the accuracy of that response and *expands* on the child’s utterance. Lastly, the adult *repeats* the prompt. The specific types of prompts used in dialogic reading include completion, recall, open-ended, wh-, and distancing questions (see Table 4 for a description of PEER and CROWD dialogic reading prompts).

Consistent with research outcomes of adult-child shared reading practices, the research on dialogic reading boasts a number of positive outcomes for children, especially in terms of oral language development (Lonigan et al., 1999; Lonigan & Whitehurst, 1998; Wasik & Bond, 2001). Based on findings from the NELP report (NELP, 2008) the effect size of dialogic reading ($ES=.59$) is larger than that of non-dialogic reading practices ($ES=.42$), although both reached significance. The efficacy of dialogic reading on expressive language has been repeatedly documented across studies and has been identified as an intervention strategy that works for young children by the What Works Clearinghouse (U.S Department of Education). To provide an example of a dialogic reading study, Whitehurst et al. (1998) trained a group of mothers to read to their children using dialogic reading strategies. After four weeks, the children in the dialogic reading condition had greater expressive vocabulary scores than the control group of children who were read to in a customary fashion. Other benefits of dialogic reading include improved print knowledge and early reading/writing skills (Whitehurst, et al., 1994). Dialogic

reading studies have been implemented in a variety of settings, such as day care centers (Valdez-Menchaca & Whitehurst, 1992; Whitehurst, et al., 1994; Lonigan & Whitehurst, 1998), homes (Whitehurst et al., 1988; Arnold et al., 1994), and across different populations including children from low-income families (Valdez-Menchaca & Whitehurst, 1992) and children with language delays (Dale et al. 1996).

Conceptual Frameworks: Developing Language Skills Through Dialogic Reading

How do children learn early literacy skills, specifically oral language, through dialogic reading? Young children acquire a large amount of literacy and language knowledge and skills through informal and naturalistic interactions with adults. Interactive book reading, such as dialogic reading, is viewed as “one of the most potent and frequent contexts for incidental language and literacy learning of young children” (Justice & Pence, 2005, p.7-8). Language and literacy development through shared reading practices is most commonly explained by social learning approaches (e.g., Justice & Pence, 2005; Whitehurst & Lonigan, 1998). Despite the appeal and comprehensiveness of social learning approaches, this explanation of the learning process is seldom used to understand the learning that occurs with children with ASD. Rather, effective instructional practices for individuals with ASD are founded on a behavioral approach to learning (NRC, 2001). The following section provides a summary of both approaches to learning and an explanation of how each approach can be used to understand improvements in oral language that result from dialogic reading.

Social learning theory. According to social learning theory, it is through personal interactions that learning takes place. This theory underlies a number of different approaches to formal literacy instruction, most notably reciprocal teaching (Brown, Palinscar, & Armbuster, 1994), sociocultural models (Au, 1997), and literature-based discussions (Eeds & Wells, 1989;

Daniels, 2002). Vygotsky claims that “internal developmental processes that are necessary for learning are only able to develop when young children are interacting with people in their environment and in cooperation with their peers” (cited in Eeds & Wells, 1989, p.6). In homes, dialogic reading usually occurs in a 1:1 setting, between a parent and a child. In classrooms, however, dialogic reading sessions have been conducted in small groups ranging from 5-8 students (Whitehurst et al., 1994; Hargrave & Senechal, 2000). In any type of group configuration, children no longer assume the role of passive listener during dialogic book reading, rather the adult and child(ren) engage in fluid conversations about the book (e.g., characters, illustrations, how the content relates to their personal lives). Arnold and colleagues (1994) assert, “dialogic reading takes the traditional adult-child storybook reading to a higher level of interaction” (p.268). Quality interactions during dialogic reading are accomplished by: (1) the adult’s use of evocative techniques, such as asking questions and responding to children’s ideas about the story; (2) providing feedback in the form of expanding on children’s utterances, modeling language, or praising what the child has said; (3) progressive change, (4) the gradual release of responsibility to the child.

The last principle, progressive change, refers to teaching children within the child’s zone of proximal development – the adult provides supportive activities that are just slightly more difficult than what the child can accomplish alone. For instance, after the child independently demonstrates understanding of a key vocabulary word in a text (e.g., “hammer”), the adult’s next evocative prompt may focus on the function of the acquired word (e.g., “Yes, that is a hammer. What will he do with the hammer?”). With adult support, the child is able to talk about elements in a story with greater detail compared to what he or she would have done independently. Fountas and Pinnell (2001) stress the importance of social interaction to literacy instruction: “We

sometimes assume that [children's needs] can be met by just providing good books and encouraging children to explore them. In fact, what most young readers need cannot be found in books alone. The process of reading must be dynamically supported by an interaction of text reading and good teaching" (p.9).

One aspect of "good teaching," and another guiding principle in social learning theory, is the gradual release of responsibility by the adult. The ultimate goal when teaching any skill is for children to eventually independently demonstrate the skills that they have acquired with adult support: "The implication of this position is that literacy learning, like the learning of other mental functions from the interpsychological to the intrapsychological" (Au, 1997, p.183). The gradual release of responsibility can also be seen in dialogic reading as the adult reader initially assumes most of the responsibility in telling the story and using evocative prompts to encourage children to participate in a conversation about the story. Then with repeated storybook readings, children use more complex language to talk about the book and also begin to tell more of the story to the adult (Morgan & Meier, 2008).

Behavioral approach to learning. Social learning theory has commonly been used to explain learning that occurs during interactive book reading. This approach is rarely used to explain the learning process of children with ASD; rather, a behavioral approach to learning is most commonly used in the research (NRC, 2001). The behavioral perspective towards learning focuses on stimuli that evoke a response and the consequence that follows. The future probability of a behavioral response reoccurring depends on the consequence that occurs afterwards (Cooper, Heron, & Heward, 2007; Alberto & Troutman, 2009). In an adult-child book reading experience, simply opening a book or showing the child an interesting illustration may serve as a discriminative stimulus, which can signal a response from the child such as making a comment

or posing a question about what he or she sees. If the child does not engage in the desired verbal behavior during the book reading, an adult can prompt that behavior. In dialogic reading, adults prompt children's verbal behavior by asking a variety of questions or modeling an appropriate response. Once the child appropriately responds to the adult prompt, they receive positive feedback from the adult. Receiving positive feedback from the adult (e.g., affirmation of the response, smile, affection) will result in an increased likelihood that the child will continue to make similar comments on other pages or in future book reading, provided that the child is reinforced by the adult feedback.

Effectiveness of naturalistic milieu strategies in ASD. The behavioral theory of learning serves as the foundation for several current language intervention techniques (Lue, 2001), many of which have proven successful for improving language in children with ASD. The National Professional Development Center on Autism (NPDC, 2009) conducted a systematic review of intervention research and developed a list of 24 evidence-based strategies that are effective for individuals with ASD; included on this list of effective practices is naturalistic interventions. Naturalistic interventions are a collection of practices that include environmental arrangement, interaction techniques, and strategies of applied behavior analysis (Franzone, 2009). These strategies (e.g., incidental teaching, mand-model procedures) promote communication and social skills by using learners' interests to build more complex skills that are naturally reinforcing to the interaction.

By definition, naturalistic intervention is used in daily routines throughout the child's day (Franzone, 2009). If daily book reading is a routine practice in early childhood settings, educators may be able to use book readings as an opportunity to embed naturalistic strategy instruction. Allowing students to choose books gives them an opportunity to direct their learning.

Furthermore, choice-making increases the chances that the adult will be able to capture students' attention and motivate them to produce target behavior. Once children show interest in a book or illustration on a page, the adult follows their lead by responding to any verbal (e.g., child says "train") or nonverbal initiations (e.g., pointing) that are made. The adult gives children feedback and expands on their utterances (e.g., "Yes, it is a big train). For many children, simply engaging them in responsive interactions within a preferred book may result in successful demonstration of target verbal behavior. However, for many children with ASD, it will be necessary to use alternative strategies that provide additional supports to facilitate the use of verbal language during book reading interactions.

If the student fails to initiate comments or other verbal behavior during a book reading, alternative strategies based on Applied Behavioral Analysis techniques can easily be used to prompt and reinforce target verbal behaviors. The mand-model strategy (see Hancock & Kaiser, 2006) is based on behavioral principles and encompasses many of the same procedures used in dialogic reading. In mand-model procedures, the adult initiates a social interaction by posing a question (CROWD prompts), offering a choice, or giving a specific direction (mand) to the child during a shared activity. If the child responds correctly, the adult expands on the child's verbalization while providing a natural consequence. Within an adult-child shared book reading interaction, the natural consequence may include turning the page to see what happens next in the story. In the event of an incorrect response, the adult may choose to offer a different mand or provide a model of the appropriate verbalization. If the student successfully responds to this mand or model, the adult expands on the verbalization while providing the natural consequence.

Extending Dialogic Reading for Students with ASD

Previous research has shown that when children with disabilities participate in literacy activities, the quality of interaction during the activity tends to be poor. Specifically, adult-child shared book reading interactions with children with language impairments involve less active engagement by the child than do those involving typically developing children (Koppenhaver, Erickson, & Skotko, 2001; Light & Smith, 2001). Given that dialogic reading shares several of the same features used in mand-model strategies, which have proven to be effective for facilitating expressive language development for children with ASD, it would be of interest to extend the use of interactive reading strategies to this population in order to examine its effect on participation and engagement during adult-child shared book readings.

Only one published study to date has examined the effect of an adult-child shared reading intervention for students with autism. Bellon, Ogletree, and Harn (2000) conducted a case study to determine the effectiveness of adult-child shared reading with a 3-year old boy with autism. The authors employed an interactive storybook reading intervention, which included the use of scaffolding techniques (cloze procedures, binary choices, wh- questions, and expansions). Results suggest that adult scaffolding during storybook reading led to decreased echoic utterances and increased spontaneous speech. However, it should be noted that the level of experimental control could be questioned due to the timing of the intervention phase. Visual analyses suggest that measures of echoic speech were declining, concurrently with increases in spontaneous speech, prior to intervention implementation. One cannot confidently infer a functional relationship between the intervention and language outcomes.

Pamparo, Herriott, Hudson, and Schwartz (2010, submitted for publication) used a multiple baseline design across participants to examine the effects of reading style on measures of engagement for three preschoolers with autism. Compared to standard book readings (e.g.,

reading text with no elaborations or prompts), dialogic book reading resulted in increased rates of student verbalizations, improved on-task behavior during readings, and longer session durations spent engaged with printed materials. These results suggest that the use of dialogic reading strategies may be an effective strategy to improve the quality of literacy participation for students with ASD; however, whether or not similar improvements in other early literacy indicators has yet to be determined.

Focus of the Present Study

All children, especially those who are at risk for reading difficulties such as children with ASD, require high-quality, frequent opportunities to interact with written and oral language to foster their early and later achievements in language and literacy (Ezell & Justice, 2005). Merely providing literacy opportunities, however, may not be enough to improve literacy outcomes for children with ASD. Children with ASD could be at great risk for developing reading problems due to characteristics inherent to the disorder (e.g., communication and social impairment) as well as specific barriers that limit their opportunities to participate in quality literacy instruction (e.g., school practices, attitudes, school personnel preparation). If students with ASD are to benefit from literacy opportunities, educators must first be able to provide supports to help children appropriately participate in daily literacy activities, such as joint book reading.

Dialogic reading strategies share several features of mand-model procedures, which have been proven effective in facilitating expressive language development in children with ASD (Hancock & Kaiser, 2006). At present, the number of interactive reading studies in the literature that have examined specific groups of children (such as children from different SES backgrounds, different ethnicities, home languages, or living circumstances—i.e., rural versus urban) has not included children with ASD. The use of dialogic reading strategies has yet to be

adequately investigated with children with ASD. The proposed study extends the application of dialogic reading to children with ASD in an effort to further explore the benefits of the reading strategy on a wide range of early language and literacy outcomes. Specifically, the results from the study will be used to address the following research questions:

1. What is the effect of dialogic reading on children's performance on standardized assessments of emergent literacy knowledge, specifically (a) print concepts, (b) phonological awareness, (c) listening comprehension, (d) definitional vocabulary?
2. What is the effect of dialogic reading on children's knowledge of vocabulary specifically targeted in book readings?
3. What is the effect of dialogic reading on measures of children's oral language during book readings?
4. How does children's language change during book reading as a result of repeated exposure to a book?
5. How do interventionists' behaviors differ between standard book reading and dialogic reading sessions?

METHOD

Participants

A total of 14 preschool students participated in the study. To be eligible to participate in the study, students met the following inclusion criteria: (a) educational or medical diagnosis of autism spectrum disorder; (b) between the ages of 3-5; (c) achieve an age equivalent score of 2 years on standardized receptive and expressive assessments. Demographic information for all 14 students is presented in Table 1. The student demographic table includes information on student's gender, age, and measures of autism severity (Gilliam Autism Rating Scale; GARS-2), expressive language (Expressive One Word Vocabulary Test; EOWVT-R), and receptive language (Peabody Picture Vocabulary Test; PPVT-4).

Table 1
Student Information

Participant	Age (years.months)	Gender	GARS-2		PPVT		EOWVT	
			Autism Index	Description	SS	AE	SS	AE
UW1-01	4.6	Male	89	Very likely	86	3.06	93	3.11
UW1-02	4.8	Male	57	Unlikely	113	5.05	90	3.11
UW1-03	5.4	Male	74	Possibly	97	5.00	93	4.10
UW1-04	5.7	Female	124	Very likely	62	2.07	66	2.10
UW1-05	4.6	Male	109	Very likely	69	2.06	78	3.00
PL2-06	3.0	Male	89	Very likely	83	2.11	89	3.00
PL2-07	5.0	Male	74	Possibly	99	5.00	112	5.10
PL2-08	5.0	Male	64	Unlikely	78	3.06	87	3.11
PL2-09	4.4	Male	83	Possibly	92	3.10	93	3.08
PL2-10	3.0	Male	83	Possibly	97	2.10	104	3.03
PL3-11	4.10	Male	85	Very likely	88	4.00	81	3.05
PL3-12	5.3	Female	66	Unlikely	98	5.03	114	6.06
PL3-13	3.6	Male	87	Very likely	87	2.09	94	3.00
PL3-14	5.3	Female	94	Very likely	116	6.08	>145	10.03

Note. Reported age is the child's age at the beginning of the study. GARS-2 = Gilliam Autism Rating Scale, Second Edition; PPVT-4 = Peabody Picture Vocabulary Test, Second Edition; EOWVT-R = Expressive One-Word Vocabulary Test, Revised; SS = Standard Score; AE = Age Equivalent.

Thirteen classroom teachers and paraeducators served as interventionists in this study.

The classroom staff who regularly worked with the participating children at school were the staff who participated in this study. The ages of school personnel involved in the study ranged from

Procedure

Design

The effects of dialogic reading on emergent literacy outcomes were assessed through a multiple baseline design across participants with a wait list control. Classrooms were assigned to one of three groups: immediate treatment (wave 1), delayed control (wave 2), or wait list control (wave 3). Each wave consisted of 4-5 participants. Prior to the study, eligibility assessments were conducted to determine each participant's receptive and expressive language ability. Standardized assessments of student's emergent literacy skills and listening comprehension were conducted prior to intervention (pre-test), immediately following intervention (post-test) and four weeks after the conclusion of intervention (follow-up). For participants in Wave 1, dialogic reading intervention was immediately introduced and data were collected on student's participation during book reading and teacher reading behaviors. Concurrently, baseline data were collected on the same behaviors for participants in Wave 2 (5 weeks) and Wave 3 (8 weeks) followed by the intervention phase. Staggering the time of intervention serves as a measure of internal validity; a conclusion can be drawn about the effectiveness of the intervention if similar patterns of behavior change only occur when intervention procedures are in place.

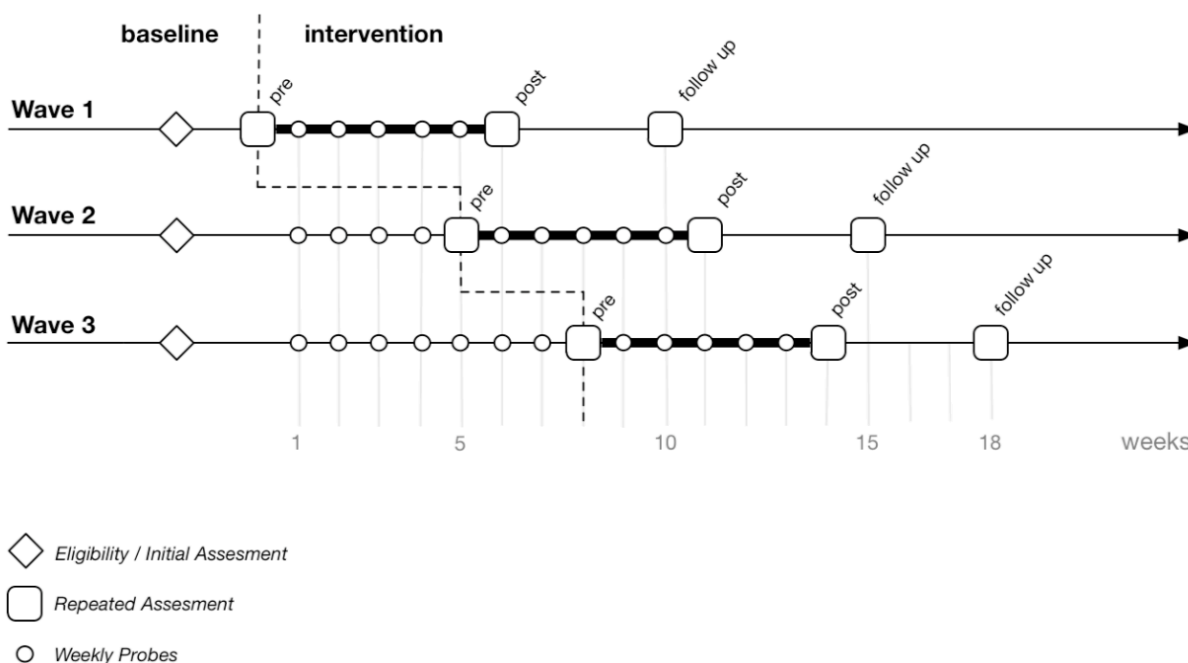


Figure 1. Research design

Book Selection

Read Together, Talk Together (Pearson) is a book set created to assist educators' and parents' use of dialogic reading techniques. Each kit includes 20 picture books, teacher and parent notes for each book, a program handbook, a teacher training video, and a parent training video.

Books from two kits were used in the study: toddler (ages 2-3) and preschool and kindergarten (ages 4-5). At the start of the study, the researcher randomly selected 10 books from the kits to serve as baseline books and 10 books to serve as dialogic reading books. Table 3 provides a list of books used during baseline and intervention sessions.

Baseline: Standard book reading

During baseline reading sessions, adults were instructed to “read to the students as you normally would.” School personnel read books to students 3-4 times per week individually or in pairs. Every week, the students were presented with a choice of 3 books and allowed to select a

book to be read during the session. The selected book was read for the entire week. Four weeks of baseline data were collected for Wave 1; seven weeks of baseline were collected for Wave 3. No baseline measures were collected on students in Wave 1.

Table 3
Book Selection for Baseline and Intervention Readings

Baseline	Dialogic Reading
<u>Road Builders</u> by B.G. Hennessy	<u>The Snowy Day</u> by Ezra Jack Keats
<u>The Dinosaur Who Lived in My Backyard</u> by B.G. Hennessy	<u>The Wolf's Chicken Stew</u> by Keiko Kasza
<u>A Whistle for Willie</u> by Ezra Jack Keats	<u>Oonga Boonga</u> by Frieda Wishinsky
<u>See How I Grow: Duck</u>	<u>Little Cloud</u> by Eric Carle
<u>Golden Bear</u> by Ruth Young	<u>The Father Who Had 10 Children</u> by Benedicte Guettier
<u>Over In The Meadow</u> by Ezra Jack Keats	<u>Pigs Aplenty, Pigs Galore</u> by David McPhail
<u>Fire Engines</u> by Anne Rockwell	<u>Good Night, Gorilla</u> by Peggy Rathman
<u>A Summery Saturday Morning</u> by Margaret Mahy	<u>See How I Grow: Kitten</u>
<u>The Day the Goose Got Loose</u> by Reeve Lindbergh	<u>Bunny Cakes</u> by Rosemary Wells
<u>Rabbits & Raindrops</u> by Jim Amoskly	<u>Peace at Last</u> by Jill Murphy

Intervention: Dialogic Reading (DR)

Dialogic Reading Training. All school personnel participating in the study were trained in using dialogic reading techniques prior to the intervention phase. School personnel attended a two-hour training in which the lead researcher provided: (1) an introduction dialogic reading techniques, (2) suggestions for some behavioral strategies to improve engagement and participation for children with ASD. School personnel watched a training video depicting examples of adults reading to students using the dialogic reading approach and were given an opportunity to practice using dialogic reading techniques. At least three times during the intervention phase, school personnel received feedback and coaching on their use of dialogic reading techniques.

Dialogic Reading Intervention. During the intervention phase, school personnel read individually or in pairs of students 3-4 times per week for 5 weeks. Similar to baseline procedures, the student(s) selected the weekly book from an array of three choices. One book was read for the entire week. School personnel used CROWD and PEER prompts during each book reading. (Refer to Figure 2 for a summary of prompting strategies). A typical dialogic reading session would adhere to the following structure:

Step #1: Prompt student participation. During book reading, the interventionist would *prompt* the student to speak by making a comment or asking a question about the characters or events in the story. Specifically, adults would ask the following types of questions:

- *Completion:* the adult reads the initial part of a repetitive phrase and allows the child to finish the phrase.
- *Recall:* adult asks questions about the characters or previous events in the story
- *Open-ended:* adult encourages the child to tell what is happening in a picture.
- *Wh-questions:* the adult asks “wh- questions” (what, where, who) about a picture
- *Distancing:* the adult asks questions that relate elements of the story to the child’s personal experiences
- *Special:* In the event that a student is unable to respond to one of the aforementioned questions, the adult asked a second question to help the student answer the question. Examples of special questions includes: providing a choice of two options, “yes/no” questions, request to point, request to repeat a word. *Note: Special prompts are not part of the original CROWD prompts and were added by the investigator based on her previous experience using this technique with children with ASD.*

Step #2: Evaluate student response. If the student responded to the prompt, the interventionist would *evaluate* the student response (e.g., appropriate or inappropriate response)

Step #3: Expand. The interventionist *expands* on the student response by adding more language to an appropriate comment or answer. If the student response was incorrect, or if the student does not respond, the adult would provide an appropriate response or use a *special* prompt.

Step #4: Repeat. The interventionist *repeats* the initial prompt if the student's initial response was incorrect.

Interventionists were instructed to prompt children to verbally participate at least once every 2-3 pages. If done properly, the interventionist should gradually read less, listen more, and use more higher level prompts to encourage the child to go beyond naming objects in the pictures to thinking more about what is happening in the pictures and how this relates to the child's own experiences as the child became increasingly familiar with the book.

Table 4
Description of CROWD and PEER Prompting Strategies

CROWD	PEER
Completion: the child fills in the blank at the end of a sentence	P: the adult <i>prompts</i> the child to say something about the book
Recall: the child answers questions based on events or details that occurred earlier in the book reading	E: the adult <i>evaluates</i> the child's response
Open-ended: the child answers questions about what they see in an illustration or predict will happen	E: the adult <i>expands</i> on the child's response
Wh-questions: the child answers wh-questions (what, where, who)	R: the adult <i>repeats</i> the prompt
Distancing: The child answers questions about how events in the book relate to his/her life	
Special: the child answers <i>yes/no</i> questions, selects an answer from a choice of responses, responds by pointing, or imitates adult models	

Note. Adapted from Whitehurst et al. (1988). *Special* prompts are not part of the original dialogic reading prompts.

Measures

A comprehensive battery of assessments was administered to determine the effects of dialogic reading on students' emergent literacy skills. The measures used in the study can be conceptualized as belonging to four general categories: (1) *eligibility or initial assessments*, which were administered once at the beginning of the study; (2) *repeated assessments*, which were administered at three points during the study; (3) *weekly probe measures*, in which skills were assessed weekly; (4) *additional measures*, which were administered intermittently or at the conclusion of the study. A complete summary of assessments can be found in Table 5.

Table 5
Summary of Assessments

Eligibility / Initial Assessments (prior to study)
Peabody Picture Vocabulary Test – 4 th edition (PPVT-4) Expressive One-Word Vocabulary Test, Revised (EOWVT-R) Gilliam Autism Rating Scale, Second Edition (GARS-2)
Repeated Assessments (Pre-Intervention, Post-Intervention, Follow-Up)
Test of Preschool Early Literacy (TOPEL) Oral and Written Language Scales (OWLS)
Weekly Probe Measures
Test of New Vocabulary (researcher developed) Teacher Reading Behavior (video) Student Participation (video)
Additional Measures
Implementation Fidelity (DR checklist) Social Validity

Eligibility/Initial Assessments

Previous research studies on dialogic reading have shown it to be effective for children who have poor expressive and receptive vocabulary, averaging below 8 months and 13 months behind chronological age, respectively (Hargrave & Senechal, 2000). To ensure that potential study participants have the necessary language skills to participate in dialogic reading, eligibility assessments were administered prior to the start of the study. Students scored an age equivalent

of at least 2.0 years on standardized measures of receptive and expressive vocabulary to be eligible to participate in the study.

Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4). The PPVT-4 is an untimed, norm-referenced instrument for measuring receptive (hearing) vocabulary of children and adults, ages 2 years 6 months to 90+ years. After administering training items, the examinee is shown four colored pictures on a page. For each item, the examiner says a word and the examinee responds by selecting (pointing or saying the number) the picture that best illustrates the word's meaning. Each test is individually administered and usually takes approximately 10-15 minutes to complete.

Expressive One-Word Vocabulary Test, Revised (EOWVT-R). The EOWVT is a norm-referenced test that provides an assessment of an individual's English speaking vocabulary. It is standardized for use with individuals ages 2-0 through 18-11. To administer the test, the examiner presents a series of illustrations depicting objects, actions, or concepts. The examinee is asked to name each illustration. The test begins at a point at which the examinee is expected to meet with success in naming each illustration. The examiner then presents items that become progressively more difficult. When the examinee is unable to correctly name a number of consecutive illustrations, testing is discontinued. Total time for administration and scoring is typically 15 to 20 minutes.

Gilliam Autism Rating Scale, Second Edition (GARS-2). The GARS-2 is a norm-referenced instrument that assists examiners in the assessment of individuals who have ASD. The instrument is comprised of three subscales – stereotyped behaviors, communication, social interaction - based on the definitions of autism described by the American Psychiatric Association (2000) and the Autism Society of America (2003). Each subscale has 14 items; the

rater evaluates the frequency to which the target individual engages in a behavior (never observed, seldom observed, sometimes observed, frequently observed). Scores are calculated for each subtest as well as an overall score, the Autism Index. Higher scores indicate more frequent observation of symptoms associated with ASD, and a greater probability of ASD. For the present study, the participant's classroom teacher completed the instrument. The instrument also has a parent interview, which was not administered for this study.

Repeated Assessments

Levels of emergent literacy knowledge and listening comprehension were assessed three times during the study using standardized measures. These assessments were conducted: (1) prior to the intervention phase, (2) directly after the intervention phase, and (3) 1 month following intervention

Test of Preschool Early Literacy (TOPEL). The TOPEL is designed to identify preschoolers who are at risk for literacy problems. The TOPEL has three subtests. Total time for administration is approximately 30 minutes. The subtest scores can be combined to determine a "composite score" that ultimately best represents a child's emergent literacy skills:

- Subtest 1: Print Knowledge — 36 items. Provides a measure of alphabet knowledge and early knowledge about written language conventions and form. The child is asked to identify letters and written words, point to specific letters, names specific letters, identify letters associated with specific sounds, and say the sounds associated with specific letters
- Subtest 2: Definitional Vocabulary — 35 items. Provides a measure of single-word oral vocabulary and definitional vocabulary (assesses both surface and deep vocabulary knowledge). The child is shown a picture and asked to tell what the picture is, and to describe one of its important features

- Subtest 3: Phonological Awareness — 27 items. Provides a measure of word elision and blending abilities. The child is asked to say a word, then say what is left after dropping out specific sounds (elision) for the first 12 items; the child is asked to listen to separate sounds and combine them to form a word (blending) for the remaining 15 items.

Oral and Written Language Scales (OWLS) – Listening Comprehension Scale. The Listening Comprehension Scale measures receptive language in 3- to -21 -year-olds. The test does not require the examinee to be able to read. The examiner reads a stimulus word printed on one side of the convenient easel, and the examinee responds by indicating one of four pictures on the other side. Administration time is approximately 5 to 15 minutes.

Weekly Probe Measures

Test of New Vocabulary. Student knowledge of vocabulary specific to the weekly book was assessed two times per week. A researcher-developed expressive vocabulary measure was created for each book. At the start of each week (prior to book reading) and at the end of the week (after 3-4 book readings), the researcher or researcher's assistant showed the student 10 illustrations in the book representing vocabulary targeted for the weekly book and asked him or her to provide the name that best describes each illustration. Student responses were scored as either correct or incorrect. Total administration time was less than 3 minutes (See Appendix A for example of weekly vocabulary response form).

Student Verbal Participation and Adult Reading Behavior. Students' verbal participation during book reading was assessed from video. Reading sessions were video recorded two times during the week, during first book reading and during final book reading. For each video, the researcher or trained researcher's assistant coded: (1) the types of questions posed by the adult reader (completion, recall, open-ended, wh-question, distancing, special); (2)

the type of response provided for the student (single word, multiple word); (3) any verbal initiations made by the student (comments, questions, echoic phrases). Coding procedure and definitions are described in the following section.

Reliability and Validity Assessments

Procedural Fidelity. A researcher-developed checklist was created to assess the extent to which the adult reader adhered to intervention guidelines. Fidelity measures were collected a minimum of two times for every reader/student dyad (See Appendix B for procedural fidelity observation form). The researcher or researcher's assistant observed the reading session and evaluated: (1) materials and student arrangement; (2) adult use of dialogic reading strategies; (3) other adult behaviors that promote student engagement such as reader affect, allowing the child to physically interact with the book, allowing the student opportunity to respond to questions. Procedural fidelity estimates were calculated by dividing number of correct teacher behaviors ("yes" or "sometimes") by the total number of items, and multiplying by 100. Estimates for procedural fidelity include the mean percentages (and range): 91% (76%-100%) for Wave 1; 95% (78%-100%) for Wave 2; 95% (76%-100%) for Wave 3. Interobserver agreement on procedure fidelity assessments was collected in 20% of observations (mean: 92%; range: 78%-100%).

Social Validity. In applied research, it is important to determine whether the focus of the study and the behavioral changes that take place during the study meet the values of the school community of which the students are a part (Wolf, 1978). A researcher-developed social validity measure was created to assess school personnel perceptions of the dialogic reading intervention. Items assessed the adult reader's opinion regarding their student's experiences during the book reading (e.g., I believe students talked more during dialogic reading) and their own experiences

(e.g., dialogic reading strategies were easy to incorporate into book readings). School personnel rated on a 7-point scale the extent to which they agreed to 11 statements (1= strongly disagree; 7 = strongly agree). One item asked the readers to rank the dialogic reading prompts according to perceived effectiveness in eliciting student responses. One item addressed difficulties experienced during book reading sessions. School personnel also had an opportunity to share any comments or suggestions they have for improving the intervention. Social validity measures were distributed to each adult reader at the conclusion of the study (See Appendix C for social validity questionnaire). Feedback on the ease of implementation and views of effectiveness reflect the acceptability of an intervention and has an impact on the extent teachers are willing to use a particular intervention.

Coding Procedures

Teacher and student behavior during baseline and dialogic book reading sessions were coded from videotape. Three main types of behaviors were evaluated: (1) questions posed by adult during reading (adult behavior), (2) children's responses to adult questions (child responses), (3) spontaneous initiations made by the child during the book reading (child verbal initiations). Complete definitions of behavioral codes can be found in Appendix D; behavioral coding forms can be found in Appendix E.

Training and reliability

The researcher and two research assistants conducted all video coding. After reviewing and discussing the definitions, coders watched two training videos together. While watching the video, the lead researcher narrated her observational codes. After discussing any inconsistencies or questions, the coders viewed additional videos and coded teacher and student behaviors independently. Training in the observational codes and definitions continued until all researchers

achieved a minimum of 80% agreement in each behavioral category (adult behavior, child responses, child verbal initiations) across 3 videos.

Reliability checks for observer drift were conducted for 25% of videos in each wave of the study. Reliability estimates were calculated using the point-by-point method in which the number of agreements was divided by total (agreements plus disagreements), and multiplied by 100. Agreement concerning overall number of “codable acts” (i.e., two observers recording that a behavior occurred, regardless of specific code) reached acceptable levels: 92% for Adult Behavior (range 76%-100%); 91% for Child Responses (range 76%-100%); 85% for Child Initiations (range 50%-100%). Reliability estimates concerning specific codes within agreed upon codable acts are: 89% for Adult Behavior (range 69%-100%); 91% for Child Responses (range 76%-100%); 98% for Child Initiations (range 50%-100%).

Definitions

Adult Behavior. Adult’s use of dialogic reading prompts to elicit children’s verbal behavior was observed. Coders observed the frequency and type of dialogic reading prompts used by the adult during a reading session. Adult directions to direct students’ nonverbal behavior (e.g., turn the page, sit down) were not counted.

- **C: Completion.** The adult asks the child to complete a phrase. The child completes the phrase based on previous knowledge (repetitive phrase) or based on information provided by the illustration (e.g., Adult: “Run run as fast as you can, you can’t catch me, I’m the ...” Child: “Gingerbread man!”).
- **R: Recall.** The adult asks the child to recall something about the character or the events in the book. The adult may ask the child to immediately recall information or after

reading several pages (e.g., Adult: “What did the hungry caterpillar eat?” Child: “apples, plums...”)

- **O: *Open-ended*.** The adult asks the child a general question about what they see in an illustration. Open-ended questions have several appropriate possible responses (e.g., “What do you see on this page?”).
- **W: *Wh-questions*.** The adult asks the child questions that target specific vocabulary in the book. Wh-questions have one correct answer (e.g., “What is that?” “What is he doing?”)
- **D: *Distancing*.** The adult asks questions that relate parts of the story to the child’s personal life. (e.g., In the story, the father made breakfast for his family. Adult: “what do you like to eat for breakfast?” Child: “Cereal”).
- **S: *Special prompts*.** There are times when the adult may modify the aforementioned prompts in order to elicit a response from the student. Special prompts are attempts the adult makes to facilitate student engagement. Typically (but not always) these prompts occur after one of the traditional prompts was unsuccessful (e.g., providing choices: “Is it a _____ or a _____;” request the child to point: “show me the _____;” yes/no questions: “Is that a cow?” Direct requests for the child to repeat a word are also considered special prompts (e.g., “say _____”).

Child Responses. The child’s response to adult prompts were be coded in terms of type of response (verbal, nonverbal, or no/aberrant response). Verbal responses were further classified as being a single word or multiple word response. It was not required that the child’s response be accurate to be considered, however the response needed to be on topic (e.g., Adult: points to the

cheetah and asks, “What is it?;” Child: “It’s a lion.” This would be coded as a multi-word verbal response).

- **Single Word.** The child verbally responds with one-word answer that is correct or on-topic (e.g., Adult: “What is it?” Child: “Cow”).
- **Multiple Word.** The child verbally responds with an answer containing 2 or more words that is correct or on topic (e.g., Adult: “What is it?” Child: “Two brown cows”). It is considered a multiple-word response if the child uses an article (a, an, the) before the noun (e.g., “a cow”).
- **Non-Verbal response.** The child responds to the adult prompt using non-verbal communication. (e.g., Adult: “Show me the clouds;” Child: points to the clouds in the book).
- **No/aberrant response.** The child does not verbally or non-verbally respond to the adult prompt. A no response was coded once the adult continued to read or provided another prompt (if 3-second has elapsed). Aberrant responses include responses that are clearly off-topic, such as a child scripting from a movie that is unrelated to the book.

Child Verbal Initiations. Child verbal initiations were defined as any instances in which the child made a comment related to the book in the absence of the adult prompt. All verbal initiations were categorized as a single word or multiple word phrases/sentence response. Only appropriate verbal initiations were counted. Perseverative language that was inappropriate was not coded.

RESULTS

Question #1: What is the effect of dialogic reading on children's performance on standardized assessments of emergent literacy knowledge?

Students' emergent literacy knowledge was assessed using standardized measures three times during the study – prior to the dialogic reading intervention (pre-test), immediately after intervention (post-test), and six-weeks following the conclusion of intervention (follow-up). Student knowledge of print concepts, phonemic awareness, and definitional vocabulary was assessed using the Test of Preschool Early Literacy (TOPEL). Listening comprehension was assessed using the Oral and Written Language Scales (OWLS). A summary of the results of the statistical analyses can be found in Table 6.

Print Concepts. A one-way repeated measures analysis of variance was performed relating the time of testing (pre-test, posttest, follow-up) on students' knowledge of print concepts. For an alpha of .05, the obtained F ratio was not found to be statistically significant, $F(2, 12) = .023, ns$. Student knowledge of print concepts did not differ between pretest ($M = 106.57; SD = 12.58$), posttest ($M = 106.85; SD = 11.79$), and follow up ($M = 107.00; SD = 12.87$) measures. The strength of the relationship, as indicated by Cohen's d , was small ($d = .02$).

Phonological Awareness. A one-way repeated measures analysis of variance was performed relating the time of testing (pre-test, posttest, follow-up) on students' phonological awareness. For an alpha of .05, the obtained F ratio was not found to be statistically significant, $F(2, 12) = .459, ns$. Student knowledge of phonological awareness did not differ between pretest ($M = 92.79; SD = 21.93$), posttest ($M = 96.00; SD = 18.74$), and follow up ($M = 95.36; SD = 19.42$) measures. The strength of the relationship, as indicated by Cohen's d , was small ($d = .10$).

Definitional vocabulary. The definitional vocabulary subtest of the TOPEL was used to measure students' knowledge of vocabulary. A one-way repeated measures analysis of variance was performed relating the time of testing (pre-test, posttest, follow-up) on vocabulary. For an alpha of .05, the obtained F ratio was not found to be statistically significant, $F(2, 12) = 2.26$, ns . Student vocabulary did not differ between pretest ($M = 84.64$; $SD = 20.42$), posttest ($M = 93.86$; $SD = 19.87$), and follow up ($M = 92.71$; $SD = 20.05$) measures. The strength of the relationship, as indicated by Cohen's d , was moderate ($d = .46$).

Listening Comprehension. A one-way repeated measures analysis of variance was performed relating the time of testing (pre-test, posttest, follow-up) on students' listening comprehension skills. For an alpha of .05, the obtained F ratio was found to be statistically significant, $F(2, 12) = 8.450$, $p < .01$. The strength of the relationship, as indicated by Cohen's d , was moderate ($d = .52$). Pairwise comparisons reveal that students performed significantly higher on the listening comprehension subtest of the OWLS after receiving the dialogic reading intervention ($M = 87.29$; $SD = 11.30$) and 6-weeks following intervention ($M = 86.07$; $SD = 13.32$) than before the intervention ($M = 80.50$; $SD = 14.79$). The means for post-intervention and follow-up performances did not significantly differ.

Table 6
Summary of Statistical Analyses

Domain (Test)	Pretest		Posttest		Follow-up		$F(2, 12)$	p	d
	M	SD	M	SD	M	SD			
Print concepts (TOPEL)	106.57	12.58	106.85	11.79	107.00	12.86	.02	.98	.02
Phonological awareness (TOPEL)	92.78	21.93	96.00	18.74	95.35	19.42	.46	.64	.10
Definitional vocabulary (TOPEL)	84.64	20.42	93.86	19.87	92.71	20.05	2.26	.15	.46
Listening comprehension (OWLS)	80.50	14.79	87.28	11.29	86.07	13.32	8.45	<.01	.52

Question #2: What is the effect of dialogic reading on student’s knowledge of vocabulary specifically targeted in book readings?

Students’ knowledge of book-specific vocabulary was assessed two times each week: (1) prior to reading the book and (2) end of each week after the student had read the book 3-4 times. The average amount of vocabulary change for each student can be found in Figure 2. Baseline data were not collected for students during Wave 1. Data indicate that dialogic reading resulted in increases in students’ knowledge of book specific vocabulary, except for one student (UW1-04). All students in Wave 2 and Wave 3 show greater improvement in vocabulary during intervention book readings compared to baseline readings.

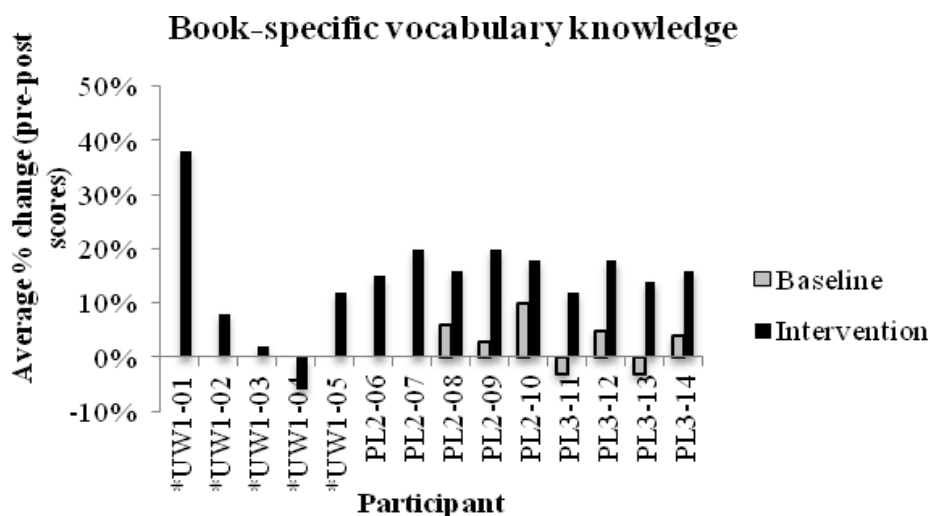


Figure 2. Mean difference values depicting the gains in book-specific vocabulary from initial book reading to final book reading. Participants in Wave 1 are marked with an asterisk (*). Baseline measures were not collected on students in Wave 1.

A correlated groups t test compared the mean vocabulary change for students during baseline and intervention conditions (Wave 2 and Wave 3). The alpha level was .05. This test was found to be statistically significant, $t(8) = -11.27$, $p < .001$, suggesting that students gained more knowledge of book-specific vocabulary when read to using dialogic reading strategies (M

= .166; $SD = .027$) than when they were read to a typical manner ($M = .024$; $SD = .043$). The strength of this effect is moderate ($d = .52$).

Question #3: What is the effect of dialogic reading on measures of children's oral language during book readings?

The amount of time interventionists and students spent reading together varied across sessions. Baseline reading sessions lasted an average of 313 seconds (5.12 minutes; range 101-707 seconds); dialogic reading intervention sessions lasted an average of 515 seconds (8.59 minutes; range 214-1050 seconds). A rate of verbalizations (number of verbalizations/minute) was calculated in order to address variability in book reading duration when comparing the effect of reading style on student's verbal participation. Converting the data into a rate eliminates the possibility that an increase in verbalizations result from longer session duration during intervention book reading. Student's oral language during reading sessions was coded from videotape. Student verbalizations were coded as being a single word (SW) response or multiple word (MW) response (e.g., phrases, sentences).

Figure 3 displays the total average rate of verbalizations for each wave of the study. Baseline observations show low levels of verbal responding (Wave 1 = .19 SW; .25 MW; Wave 2 = .39 SW; .37 MW) followed by increased overall responding during intervention reading sessions (Wave 1 = 1.07 SW; 1.58 MW; Wave 2 = 1.47 SW; 2.47 MW). Baseline measures were not collected for students in Wave 1; however, observational data show that the rate of SW responses during intervention reading sessions were comparable to that of Wave 2. MW responses for students in Wave 1 were lower than that of the other two groups.

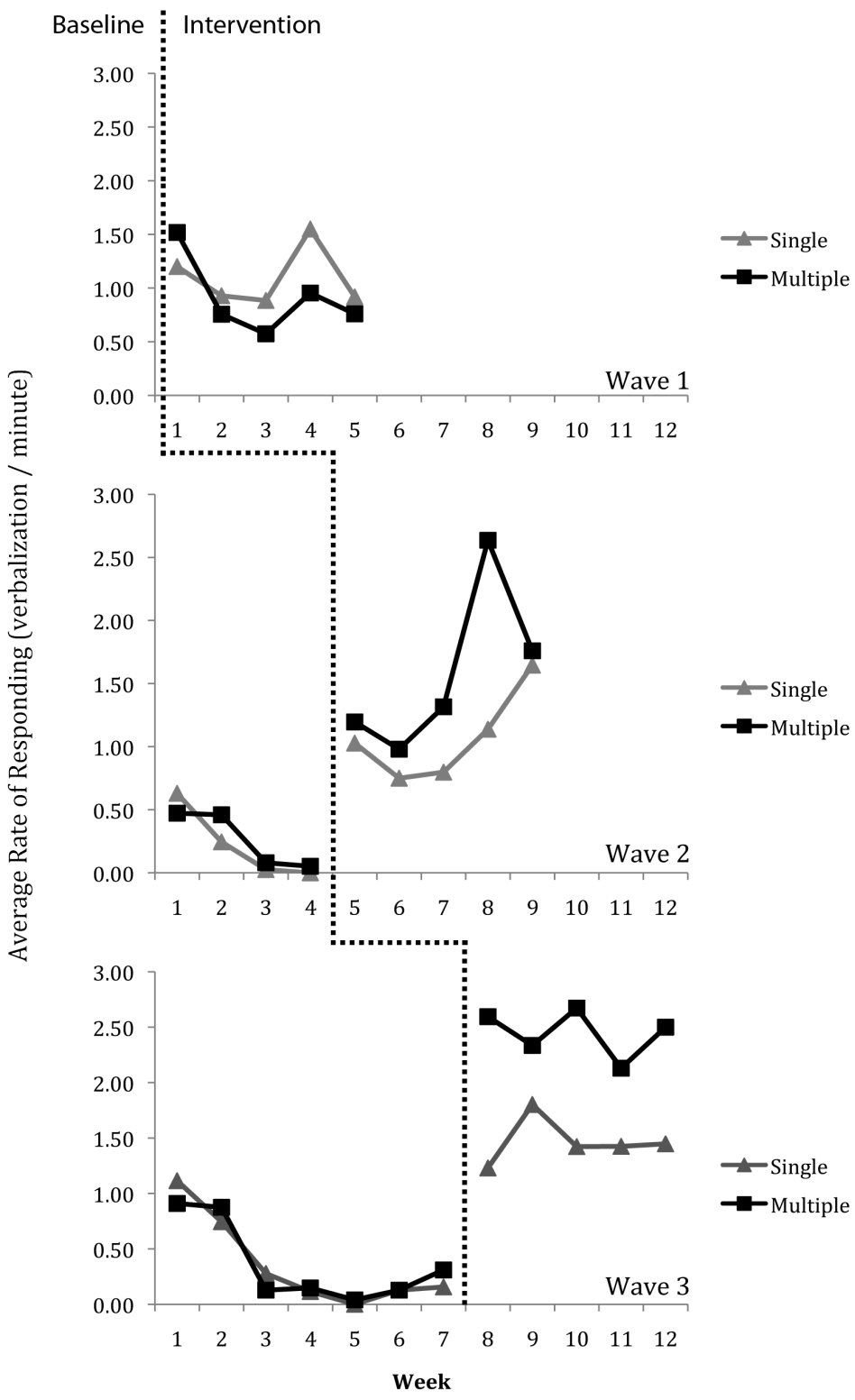


Figure 3. Effect of reading style on children’s average weekly verbal participation during book reading.

Reading sessions were videotaped twice weekly. Data from these reading sessions were analyzed for individual students. A similar trend of low verbal responding during baseline measures followed by an increase in responding was found across all participants. Graphed data for individual students can be found in Appendix F. To simplify these results for presentation purposes, a weekly average was calculated and displayed by group. Figure 3 shows the weekly average rate of verbalizations during reading sessions for each group of students. Visual inspection of Wave 2 and Wave 3 show low levels of verbal responding with a decreasing trend during baseline reading, followed by an immediate change in level and increasing trend (Wave 2) or stable trend (Wave 3) of responding during intervention reading. The percentage of non-overlapping data points is 100%.

Question #4: How do children's behaviors change during book reading as a result of repeated exposure to a book?

The average rate of student participation (multiple word student responses, multiple word comments, and non-responses) during initial book reading was subtracted from the average rate of student participation during final readings, after the student had read the book 3-4 times. A positive value indicates that students engaged more in a target response after repeated readings, whereas a negative value indicates that students engaged less in the behavior after repeated readings.

Multiple word responses. The average change in students' use of multiple words in response to interventionist questions can be found in Figure 4. Data indicate that repeated reading resulted in increased use of multiple word responses in some students ($n = 7$). Other students ($n = 7$) used more multiple word responses during the initial reading session compared to the final reading session.

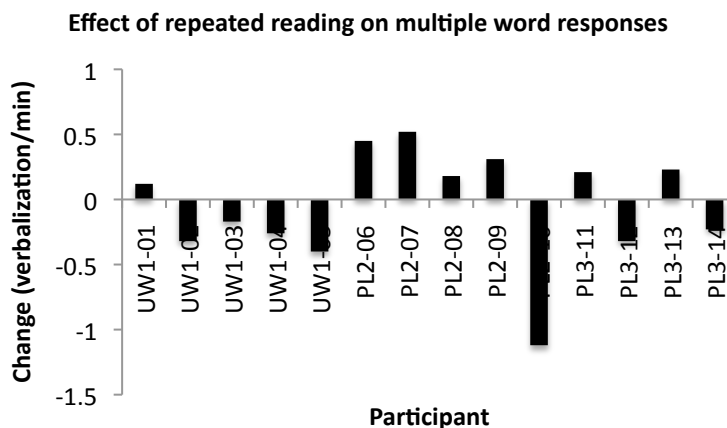


Figure 4. Mean difference values depicting change in student's use of multiple words in response to interventionist questions observed during initial book reading and final book reading during dialogic reading.

Multiple word comments initiated by students. The average change in students' use of multiple words to initiate comments during readings can be found in Figure 5. Data indicate that some students ($n = 7$) engaged in more multiple word comments after repeated exposure to book reading compared to initial book reading, while others ($n = 6$) used more multiple word comments during the initial reading session compared to the final reading session. One student (PL2-06) did not differ in the frequency of comments after repeated exposure to a book.

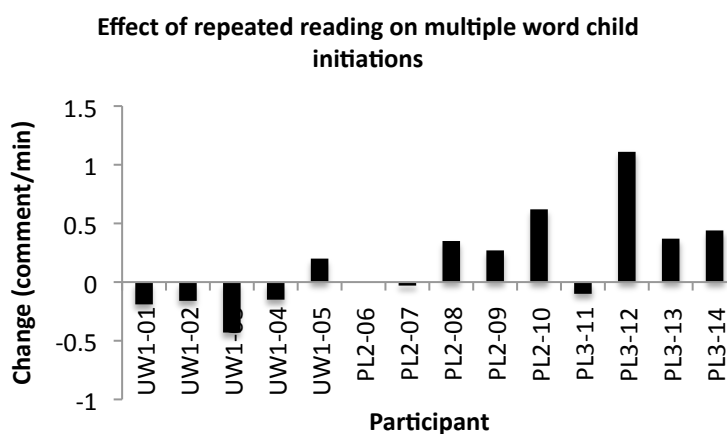


Figure 5. Mean difference values depicting change from initial book reading and final book reading in student's use of multiple words to initiate comments during dialogic reading sessions.

Non-response to interventionist questions. The average change in students' non-response to interventionist questions during readings can be found in Figure 6. The majority of students ($n = 8$) engaged in less non-response behavior after repeated exposure to the book compared to initial reading. Six students (UW1-01, UW1-02, UW1-04, PL2-06, PL2-08, PL2-10) were less responsive to interventionist questions after repeated readings compared to the initial book reading.

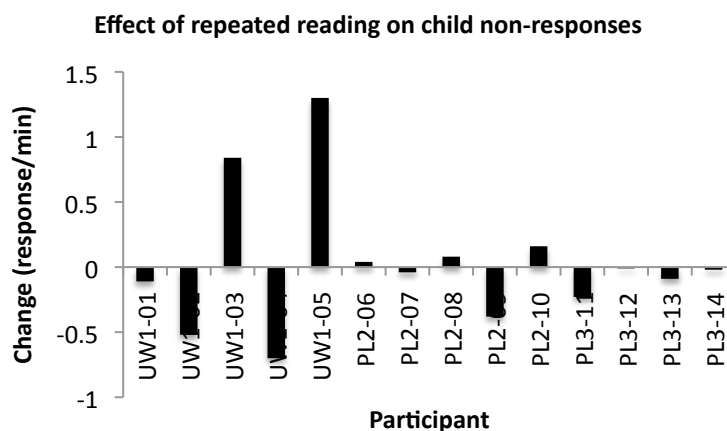


Figure 6. Mean difference values depicting change from initial book reading and final book reading in student's non-response to interventionist questions during dialogic book reading.

Question #5: How do interventionist behaviors differ between standard book reading and dialogic reading sessions?

The number and type of questions asked by interventionist readers was coded from videotape. The average rate of question type asked per minute for Wave 1, Wave 2, and Wave 3 reading sessions are depicted in Figure 7, Figure 8, and Figure 9, respectively.

In Wave 2 and Wave 3, interventionists asked their students a variety of questions during baseline sessions. During the dialogic reading intervention, the interventionists continued to ask a variety of questions but at a higher frequency than during baseline sessions. An overall pattern

emerged across the two waves of participants. During baseline and dialogic reading sessions, the most common type of question posed to students were *wh-questions*, and the second most commonly used question used by interventionists were *special prompts*. Although baseline measures were not collected in Wave 1, a similar pattern of interventionist questioning is found during intervention reading sessions.

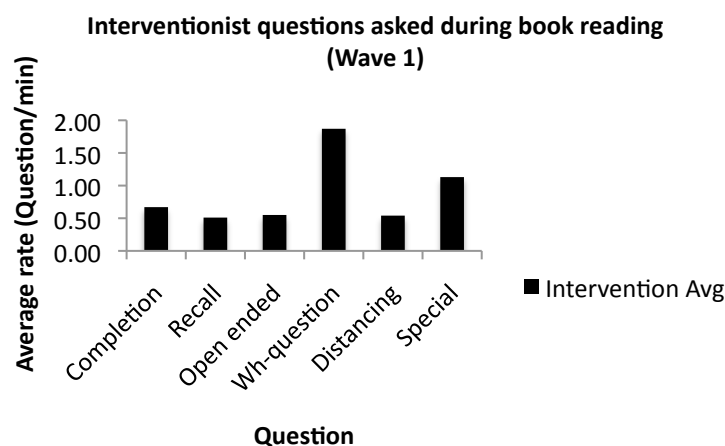


Figure 7. Average rate of interventionist questions asked during baseline and dialogic reading sessions in Wave 1. Baseline measures were not collected on students in Wave 1.

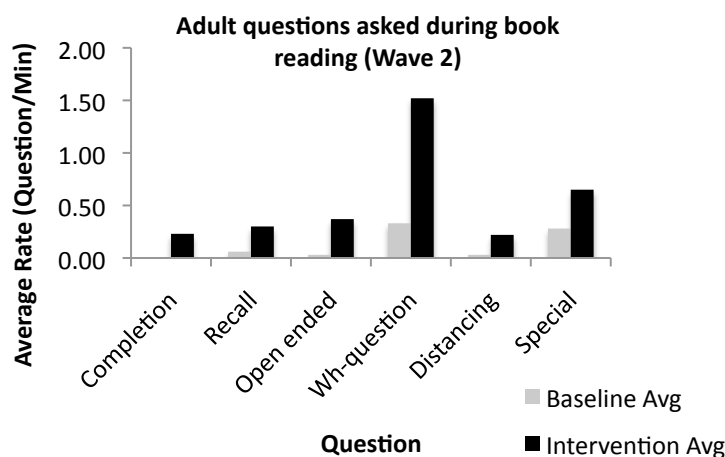


Figure 8. Average rate of interventionist questions asked during baseline and dialogic reading sessions in Wave 2.

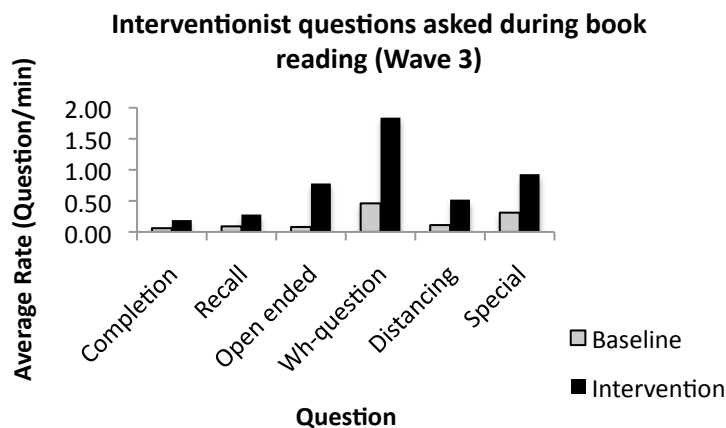


Figure 9. Average rate of interventionist questions asked during baseline and dialogic reading sessions in Wave 3.

Social Validity

School personnel who served as interventionists in the study were asked reported on their perceptions of students' experiences and their personal experiences during the study. At the conclusion of the study, interventionists completed a questionnaire that addressed four main components: (1) interventionist's perceptions of their student's experiences during reading sessions; (2) interventionist's experiences during the study; (3) perceived effectiveness of dialogic reading prompts; (4) difficulties experienced during the study. A total of 11 out of 13 questionnaires were returned.

Student experiences. Interventionists were asked to think about the average student experience during reading sessions and rate the extent to which they agreed to statements on a 7-point scale (1=strongly disagree; 7=strongly agree). A full range of responses was represented in the feedback, and overall impression of the benefits of dialogic reading for students was above average. The average response (mean), range, and most frequently cited response (mode) for each statement are depicted Table 7.

Table 7
Social Validity Measure: Interventionists' Perceptions of Students' Experiences

Statement	Mean	Range	Mode
I believe that students' attention was better during dialogic reading compared to traditional book reading sessions	4.8	1-7	5
Students enjoyed reading more during dialogic reading sessions compared to traditional book reading	4.6	1-7	5
I believe that students talked more during dialogic reading	5.8	2-7	6
I believe that students learned some new vocabulary	5.5	4-7	6
I believe that students are more interested in books because of this study	4.4	2-6	4
I believe that dialogic reading should be included as part of students' academic programs	5.9	4-7	7

School personnel experiences. School personnel who served as interventionists were asked to think about their own experiences during the study. Respondents rated the extent to which they agreed to statements on a 7-point scale (1=strongly disagree; 7=strongly agree). Responses represented the upper range on the scale (4-7) with overall favorable reports from the interventionists regarding their training preparation and ability to use dialogic reading strategies. The average response (mean), range, and most frequently cited response (mode) for each statement are depicted Table 8.

Table 8
Social Validity Measure: Interventionist Experiences

Statement	Mean	Range	Mode
I believe I had sufficient training prior to starting dialogic reading sessions	6.7	5-7	7
I believe I had sufficient support during the study	6	5-7	6
Dialogic reading strategies were easy to incorporate into book readings	5.9	4-7	7
I enjoyed reading to students during dialogic reading sessions	5.5	4-7	6
I will continue to use dialogic reading strategies in the future	6.4	4-7	7

Effectiveness of dialogic reading prompts. Interventionists were asked to rank the effectiveness of each type of dialogic reading prompt (1 = most effective; 5 = least effective) in terms of eliciting verbal participation from students. The most frequently cited prompts in order of most effective to least effective are as follows: (1) Wh-questions, (2) open-ended and completion prompts, (3) recall questions, and (4) distancing questions.

Difficulties experienced during the study. Interventionists were asked to report any difficulties they experienced during the study. A list of prepared options was provided; respondents also had an opportunity to describe any problems that were not on the list. The most frequently cited difficulties reported were that students engaged in challenging behavior during reading sessions (n=5), it was difficult to find time during the day to read to students (n=5), and that students were not interested in reading books (n=4).

DISCUSSION

The present study examined the effect of dialogic reading on early literacy skill development for preschoolers with ASD. Changes in students' skill and interventionists' behavior were measured through a combination of formal and informal assessments. This section is divided into four parts: (1) a summary of the study's findings, (2) possible implications of dialogic reading for children with ASD, (3) a discussion of study limitations and direction for future research, and (4) practical relevance.

Summary of Findings

Changes in Interventionists' Reading Behavior

Adults naturally differ in how they read to children. One objective of this study was to determine what "traditional" reading looks like in early childhood programs. During baseline reading sessions, the school personnel who served as interventionists were instructed to "read as they typically do to children." Observations during baseline reading sessions indicate that interventionists participating in this study did not strictly adhere to the text when reading to students. In the absence of training, they still made attempts to engage children in book reading by asking questions. After dialogic reading training, however, they continued to ask a variety of questions but at a greater frequency. The manner in which children are read to influences the skills they develop through book reading. In the present study, dialogic reading was effective in improving a number of oral language skills in children with ASD, specifically vocabulary knowledge (book-specific and definitional vocabulary), verbal participation during book reading, and listening comprehension.

Training school personnel in dialogic reading was effective in changing their reading behavior. Although interventionists used some of the prompting strategies during baseline

sessions, a dramatic increase in the use of prompting strategies was observed during dialogic reading intervention sessions. Increasing the frequency of prompts while reading afforded students more opportunities to engage in a verbal interaction during a book reading. Whereas typically developing children may spontaneously comment about what they see in book illustrations or readily respond to adult questions, children with ASD may require support to engage in these same verbal interactions. Questions posed by interventionists during book reading set the occasion for students to verbally participate in the activity. By asking questions, the children understood that verbal participation (in the form of responding to questions) was appropriate and expected.

Wh-questions and *special* prompts (e.g., yes/no questions, providing choices, etc.) were used most frequently in each wave of the study. Although the effectiveness of specific prompt types was not analyzed in this study, the high frequency of *wh-questions* and *special* prompts suggest that these prompts were particularly effective in eliciting verbal responses from students. If an interventionist notices that students respond to specific types of questions more consistently than other types of prompts, it is likely that the interventionist will continue to use the same strategies in future book readings. In other words, if the interventionist observes that their student is able to successfully respond to *wh-questions* and *special* prompts, he or she is likely to use those same prompts during their next reading session. Responses from the social validity questionnaire, which was administered at the conclusion of the study, support this hypothesis. *Wh-questions* were perceived by interventionists to be the most effective prompt type out of all the traditional dialogic reading prompting strategies.

The Effect of Reading Style on Children's Oral Language Skill and Knowledge

Vocabulary knowledge. Vocabulary is one component of oral language ability. Research suggests that measures of definitional vocabulary (going beyond labeling items to identifying the function of the word) may be more informative in predicting reading outcomes than simple measures of vocabulary alone (NELP, 2008). In the present study, vocabulary knowledge was assessed in two ways: (1) students' knowledge of vocabulary that was targeted in books; (2) formal assessment of students' knowledge of definitional vocabulary.

Book-specific vocabulary knowledge. In the present study, children demonstrated greater gains in book-specific vocabulary that when they were read to using dialogic reading strategies compared to traditional book reading. The high frequency of *wh-questions* may explain the students' improvement in book specific vocabulary knowledge as a result of dialogic reading. *Wh-questions* (e.g., "what is that called?") help students focus on key vocabulary words. Adults are able to draw children's attention to key words in a book by asking them to specifically label objects, characters, and attributes on a page. Children not only have the opportunity to say key vocabulary words, but also hear the adult model more elaborate language that includes the key word. Results indicate that some students demonstrated a gain in vocabulary knowledge during baseline reading sessions. For these students, simply having repeated exposure to rich language that included key vocabulary words was enough to improve vocabulary knowledge. However, compared to baseline observations, all of the students showed even larger gains in vocabulary during dialogic reading sessions. It seems that dialogic reading prompting strategies may have added a certain level of explicitness benefitting all of the students.

Definitional vocabulary. The results of the present study indicate that dialogic reading had a moderate effect ($d = .46$) on students' knowledge of definitional vocabulary. Although the recorded performances in definitional vocabulary knowledge failed to reach statistical

significance, this is not surprising given the small sample size. Prior to intervention, the average standard score on the definitional vocabulary subtest of the TOPEL was 84.64, compared to 93.86 after the intervention. As previously discussed, components of oral language, including vocabulary, are related to conventional reading outcomes. The National Early Literacy Panel (2008), however, suggests that more complex measures of vocabulary (e.g., definitional vocabulary) are more useful in predicting reading achievement compared to simple measures of vocabulary (e.g., expressively labeling items). Despite a lack of statistical significance, the observed improvement in definitional vocabulary is promising.

Verbal participation during book reading. The observed increase in verbal participation during dialogic reading sessions may be attributed to the use of interventionist prompts, specifically *special* prompts. The use of *special* prompts was integral in supporting students' ability to respond to questions posed by interventionists. Although *special* prompts are not included as part of Whitehurst's traditional dialogic strategies, their inclusion may be necessary for this population. Based on mand-model procedures that are effective in improving communication for children with ASD (e.g., Hancock & Kaiser, 2006), if a student fails to respond to an initial mand or question, the adult provides additional support to the student by following up with a different prompt.

During initial training and coaching sessions, interventionists were instructed to use *special* prompts if a student failed to respond to the initial CROWD prompt. When using *special* prompts, the interventionist may provide the student with a choice of responses, pose yes/no question) or by model the appropriate response (e.g., it's a ____). Based on the analysis of interventionist behavior during reading sessions, *special* prompts were the second most common prompt type used in the study, which may imply that interventionists found these prompts to be

effective in supporting students' verbal participation during readings. *Special* prompts provide additional scaffolding that enables students with ASD to participate in verbal interactions around a book topic. This data suggests that students with ASD may require the use of additional prompts that are not included as part of the CROWD procedure if they are to participate in book reading to their fullest potential.

An alternative explanation for the frequent use of *special* prompts observed during reading sessions could be attributed to interventionists' background and training. Prior to the study, all interventionists were already employed by schools and had been trained to work in extended day programs that provide systematic, explicit instruction for children with ASD. An important training feature for personnel working in these classes is an emphasis on differentiating instruction for individual needs. Given the training that interventionists in the study may have previously received, it is possible that many of them were familiar with techniques such as *special* prompts that are designed to support student responding. Further exploration is needed to determine whether the interventionists used *special* prompts frequently because it is part of their natural interactions with students or if students actually required additional support to verbally engage with the text.

Listening comprehension. Proficiency in oral language ability involves not only using expressive language, but also understanding spoken language (Carrow-Woolfolk, 2008). In listening comprehension measures, such as the OWL, the child listens to the adult read a phrase or sentence(s) and appropriately identify picture. To be successful in this task, the child must be able to comprehend oral information provided by the adult and use that information to identify salient features in the illustration. The results of the present study indicate that dialogic reading produced moderate improvements ($d = .52$) in children's listening comprehension skills. By

engaging in daily book reading, the children in this study were given repeated opportunities to hear adults' use language that varied in complexity. Furthermore, the inclusion of dialogic reading prompts during reading gave these children practice in applying their listening comprehension skills by answering interventionists' questions.

The Effect of Reading Style on Other Components Emergent Literacy

Phonological awareness. Dialogic reading had a small effect ($d = .10$) on students' phonological awareness. This is not surprising in light of previous research on adult-child shared reading intervention studies that also failed to find differences in this component of emergent literacy (NELP, 2008). Children who have developed phonological awareness are able to hear, identify, and manipulate phonemes, which are the smallest unit of sound that have meaning. The phonological awareness subtest of the TOPEL measures elision and blending abilities. In elision tasks, the child is instructed to say a target word after dropping sounds (e.g., say "cat" without "c"). Blending tasks require the child to combine separate sounds into a word (e.g., "what word does this make c-a-t"). It is possible that dialogic reading was not effective in improving students' phonological awareness skills because of a lack of phonology-focused interactions. Justice and Pence (2005) suggest that children's achievements in phonological awareness are highly contingent upon children's "high-quality and sensitive exposure to explicit, phonology-focused interactions with more capable peers, such as parents and teachers" (p.41). These researchers suggest several sources in which these phonology-focused interactions can occur, such as nursery rhymes, playing sound games, or being read books that feature salient phonological patterns.

While instruction in phonological awareness can occur during book reading, it is likely that it did not take place in the current study due to book selection and the types of interactive

prompts used by interventionists. Most of the books selected for the current study did not feature salient phonological patterns, such as rhyming phrases. Furthermore, dialogic reading prompts were not designed to specifically draw out salient phonological features of a text. Examples of adult prompts that effectively direct students' attention to phonological features of a text include: "Let's look for things that rhyme with *bag*;" "let's look for things that start/end with /p/ sound." If students are expected to make progress in phonological skills, more attention would need to be given to book selection and training school personnel in methods beyond dialogic reading prompts that highlight phonological features of the text.

Print concepts. In the present study, no differences were found between students' pre-intervention and post-intervention knowledge of print concepts. Interactive book reading can be an appropriate activity in which children develop knowledge about print concepts but this usually requires the adult to engage children in conversations that involve referencing the print within books (e.g., "Let's read the *title* of the book;" pointing to the text during reading). It should be expected that improvements in print knowledge did not occur because the use of specific print referencing techniques were not used in this study.

It is possible, given everything we know about how children with ASD learn, that these children will require more explicit instruction in print concepts than was afforded by dialogic reading techniques. Specifically, the use of print referencing techniques can guide students' attention to important aspects of the text, which promotes children's development of print concepts, concept of word, and alphabetic knowledge. Zucker, Ward, and Justice (2009) summarize the beneficial outcomes associated with print referencing. When adults strategically and deliberately highlight print during story reading, young children begin to develop an understanding that print has meaning and serves a function (e.g., provides information). Children

also develop an understanding of book and print organization, such as page order, title, top and bottom of the page, print direction, and the author's role in the story. Furthermore, children begin to understand concepts pertaining to letters (names of letters, upper/lower case letters) and words (concept of word in print, short versus long words, differentiate between letters and words, word identification).

Based on the results of the current study, dialogic reading, in and of itself, was not effective in improving children's understanding of print concepts. This result is not surprising given that the focus of dialogic reading is on promoting language use and comprehension during the interactive book reading sessions. While the students in the present study may have benefited from the inclusion of print referencing techniques coupled with dialogic reading prompts, it is also possible that including additional targets might dilute the positive effects found on vocabulary and listening comprehension.

Effect of Repeated Reading on Children's Language

An important aspect of several learning theories is the gradual withdrawal of adult support in instructional interactions. Social learning theorists refer to this as the Gradual Release of Responsibility; behaviorists refer to this as fading of prompts. Regardless of terminology, the end result of instruction is for the child to independently demonstrate a behavior they have been taught. In dialogic reading, the adult should fade their prompts and gradually release some of the "reading" responsibility to the learner. Because these students are not yet reading conventionally, "reading" at this stage would involve the child telling more parts of the story (either from memory or by referring to illustrations). In the present study, the adult-child dyad selected one book to read for the entire week. Initially, it was expected that the interventionist assume the primary role as reader. It was also expected that the interventionist would need to frequently

prompt students' verbal participation through the use of dialogic reading prompts. As the week progressed and the student gained familiarity with the story through repeated readings, it was expected that the child begin to take on more responsibilities as the "reader," which entails using more elaborate language in their responses, initiating comments, and decreasing non-responses to adult questions.

Behavioral observations conducted at the beginning and end of each week were analyzed in order to determine the effect of repeated exposure to books on students' multiple-word responses, multiple-word initiations (comments), and non-responses. If students were assuming more "reading responsibility" after repeated story readings, it would be expected that students' use of multiple word responses and comments would increase by the end of the week; conversely, it would be expected that frequency of students' non-responses would decrease by the end of the week. Results indicate no pattern of responding or initiating. Half of the sample demonstrated behaviors that were consistent with expectations; behavioral observations of the remaining students indicate a pattern that is counter to expectations. This lack of consistency could be attributed to the manner in which interventionists were trained and coached in dialogic reading strategies. The initial training primarily focused on describing dialogic reading, modeling reading using dialogic reading prompts, and practicing dialogic reading. Although, it was recommended that interventionists allow children to "become the reader," there was little instruction on how to accomplish this. Furthermore, the coaching that occurred during intervention primarily focused on school personnel's preparation of materials and student arrangement, ability to appropriately use dialogic reading prompts while reading, and feedback to address behavioral concerns. In summary, it is likely that the student-adult interactions during dialogic reading sessions did not support students in assuming increased responsibility of the

reading role. School personnel did not consistently “gradually release responsibility” or “fade prompts” because they did not receive adequate instruction on how to accomplish this.

Upon closer examination of individual performances, it is interesting that Wave 1 (UW1-01 to UW1-05) comprised the majority of students whose behavioral patterns were counter to expectations. Four out of five of these students used multiple word responses and initiated comments less often at the end of the week after having repeated exposure to a book. It is possible that the number of adults who read to students each week had an influence on these outcomes. The classroom that served as the site for Wave 1 had seven school personnel who were trained in dialogic reading procedures. Classrooms that served as sites for Wave 2 and Wave 3 had four and three trained school personnel, respectively. In those sites, adult-child reading pairs stayed consistent through most of the study. In Wave 1, an attempt was made to maintain some consistency with adult-child pairings, but periodically other adults trained in dialogic reading read to students. At one extreme, student UW1-05 had three different interventionists read to him in one week. While a high level of staff involvement in instruction is appropriate for optimizing skill generalization (Alberto & Troutman, 2009), it may have had a negative impact on interventionist’s ability to release control to the students due to a lack of consistency. Interventionists received coaching throughout the study; however, the feedback they received from coaching may not have been applied if they did not read to the student for several days. Furthermore, having several readers makes it difficult for interventionists to systematically fade their prompts during book reading. All of the interventionists involved in reading sessions would need to know how the others read to the student, the prompts used, and the level of student response. In this situation, a high level of communication amongst all involved personnel would be needed to coordinate release of responsibility to the student.

Implications

It is important to note that a discussion of any implications of this study is constrained by our limited understanding of how literacy develops in children with ASD. Specifically, we know very little about whether early literacy skills predict conventional reading outcomes for this population. Because of our limited knowledge around literacy development for children with ASD, all inferences will be based on our understanding of literacy development in typically developing populations. Our knowledge of typical literacy development indicates that the literacy and language skills children develop early in life relates to later reading achievement. The strongest known predictors of reading achievement include oral language skills, print and letter knowledge, and phonological awareness (NELP, 2008). It is currently believed that engagement in informal literacy activities and interaction with literacy-rich environments at early ages are essential in helping children develop these important early literacy skills. Reading aloud to children is a common practice in many homes and early childhood settings. The use of interactive techniques during reading, such as dialogic reading, is especially supportive of children's oral language development and knowledge of print concepts.

The current study found that interventionists were able to learn and apply the use of dialogic reading techniques when reading books to children with ASD. The appropriate implementation of these techniques resulted in improved oral language skill and knowledge in preschoolers with ASD. Through the use of dialogic reading prompts, children with ASD had the opportunity to engage verbally with adults around a shared text. Compared to baseline measures, the children in the current study talked more when they were read to using dialogic reading procedures. Furthermore, children showed greater improvement in listening comprehension, book-specific vocabulary, and general definitional vocabulary. Although the improvement in

definitional vocabulary did not reach statistical significance, the observed change was in the expected direction. It is reasonable to conclude that dialogic reading was effective in improving aspects of oral language for children with ASD. This is an important accomplishment given that language and communication delays are characteristic of ASD that place this population at particular risk for reading difficulties. The impact that this improvement in oral language will have on later conventional reading skills, however, is yet to be determined.

Oral language is one of three general components that are predictive of reading achievement. The remaining two components, print and letter knowledge and phonological awareness, were not affected by this reading intervention. These findings suggest that students with ASD may require more explicit instruction on these concepts than what is afforded through dialogic reading techniques. Given that children with ASD generally require systematic and explicit instruction to learn (NRC, 2001), they will not naturally learn these early literacy skills through dialogic reading alone. The improvement in oral language most likely occurred because dialogic reading prompts are specifically designed to elicit and reinforce oral language participation from the students. If we are to expect similar improved outcomes in the areas of print concepts and phonological awareness, we must tailor our instructional techniques to highlight related features.

This suggestion does not only apply to children with ASD. Some experts advocate for the use of explicit instruction for typically developing children. The National Early Literacy Panel's (2008) review of literature on interventions for emergent literacy found that interventions that directly teach code related skills, such as phonological skills, alphabet knowledge, and concepts about print have proven efficacious. Book reading may provide a developmentally appropriate context in which to embed direct instruction on these skills. In addition to dialogic reading

strategies, school personnel must also use print referencing techniques that highlight specific features of print. Furthermore, the inclusion of books that offer more opportunities to experience and talk about phonological aspects of language, such as rhyming books or texts that use alliteration, may have a positive impact on students' phonological skill development.

Given the ubiquity of both the practice and recommendation for adult-child shared reading in early childhood settings, it is reassuring that some of the benefits associated with dialogic reading were replicated for children with ASD. Although improvements in early literacy were limited to the area of oral language (e.g., verbal participation, listening comprehension, vocabulary), the results of the current study suggest that dialogic reading is a promising practice for this population. In any intervention, it is important to collect feedback from those implementing the intervention regarding their experiences and how well the intervention procedures fit with the context of the settings. Interventions that are well received by school personnel will likely be implemented in the curriculum; in contrast, interventions that do not fit well within the school context, are difficult to implement, and/or are not well received by school personnel will likely not be used regardless of its efficacy. Fortunately, the current study received overall strong social validation by school personnel who served as interventionists. School personnel reported overall positive experiences regarding their role in the intervention, specifically that dialogic reading strategies were easy to incorporate into book readings, they enjoyed reading to students, and they plan to continue using dialogic reading strategies in the future.

Comprehensive Programs for Children with ASD: Including Emergent Literacy Activities

An important question educators must initially ask themselves when they plan instruction for a student is “what am I going to teach?” We now know that the preparation for reading

success begins early in life. Given the general assumption that students with disabilities require more frequent opportunities to learn skills, it is especially important that a focus on early literacy skills become a component of early intervention curriculum. In the past decade, research on literacy experiences and achievement for individuals with disabilities has grown. Developing an understanding of how to effectively include children with disabilities in literacy instruction is becoming a higher priority for parents and educators. This sentiment was expressed by school personnel's responses to the social validity questionnaire in the present study. Although the importance of providing literacy instruction to students with ASD is valued by early childhood educators, many special educators and caregivers for students with disabilities require guidance for selecting appropriate literacy goals that will meet children's individual needs.

Previous research has made recommendations of what skills should be targeted to promote early literacy outcomes for children with severe communication disabilities (Kaderavek & Rabidoux, 2004) as well as what should be included in early intervention programming for children with ASD in general (Dawson & Osterling, 1997). In the Interactive-to Independent approach to literacy, Kaderavek and Rabidoux (2004) suggested that children who are emergent readers be given instruction that helps them attend, respond, and engage in communicative turn-taking within literacy interactions. In their review of eight model early intervention programs for children with ASD, Dawson & Osterling (1997) found that the curriculum content of effective programs also focused on teaching children to attend to elements of the environment that are essential to learning especially other people, comprehend and use language, and socially interact with others. Additionally, effective programming for children with ASD included instruction on imitating others and appropriately playing with toys or materials.

With appropriate planning, educators can embed instruction on many of these skills within dialogic reading activities. For instance, children must learn to attend to individuals and stimuli in the learning environment as they maintain their engagement in a book reading task. Using dialogic reading techniques, adults support students' comprehension of language and use of language as they verbal participate in the book reading. Children have the opportunity to respond to adult prompts and the inclusion of *special prompts* in the current study may require students to verbally imitate a word, phrase, or sentence. In participating in the book reading activity, children can learn how to use books as adults model appropriate book reading behaviors (e.g., book orientation, turning pages). Furthermore, and perhaps most importantly, book reading becomes a social activity that requires the child and adult to interact around a shared topic. The inclusion of interactive book reading activities, particularly dialogic reading, in early childhood special education programs provides a developmentally appropriate activity in which educators can plan and embed instruction on skills that are recommended for children with ASD.

Supporting Student Engagement During Book Reading

Once educators decide on what they will teach to their students, the following question that presents itself is "How will I teach the skill?" Despite overall positive feedback that was received from school personnel in the present study, there were some problems that occurred over the course of the study. Based on their responses to the social validity questionnaire, the most commonly cited problems related to student engagement. Almost half of school personnel who responded to the social validity questionnaire reported that the students were not interested in book reading and/or engaged in challenging behaviors during reading sessions. While more information is needed to make confident hypotheses regarding cause and function of challenging behavior, it is possible that these two behaviors are related; that is, students engaged in

challenging behavior because they were not interested in the activity. A lack of student engagement is not unique to this study. Previous research has shown that students with disabilities are less engaged in book reading activities (Koppenhaver, Erickson, & Skotko, 2001; Light & Smith, 2001) and may actively avoid book reading (Kaderavek & Sulzby, 1998). While the use of dialogic reading prompts was effective in eliciting verbal participation from all students, more consideration will need to be devoted to planning reading activities to reduce instances of challenging behavior and improve students' motivation to participate in book reading.

One suggestion for improving student engagement in book reading activities is creating an environment that supports engagement in literacy activities, including making daily reading a part of the child's daily routine. A common characteristic exhibited by individuals with ASD is insistence on sameness and adherence to routines (APA, 2000). Problem behaviors can arise when students are presented with an unexpected change to their routine. In the current study, interventionists reported that it was often difficult to find time to read to the students, which resulted in some teachers fitting dialogic reading sessions whenever they had free time during the day. This lack of consistency in the child's routine may have triggered the presentation of challenging behaviors. These challenging behaviors may be prevented or reduced by making daily book reading part of the child's daily routine. The use of routines can help children with ASD better adapt to their environment by establishing consistency and predictability (Kunce & Mesibov, 1998). The daily routine can be effectively communicated to students using visual schedules, which indicate where the student should be at any given time during the day through the use of objects, photographs, icons, or words (Hume, 2010). The environment for students with ASD should be carefully arranged so that the child is able to focus on the reading task.

Adults can create a comfortable learning environment for their students by segmenting a specific space for reading that is free from visual or auditory distractions.

A second suggestion for improving student engagement in book reading is carefully selecting books that align with students' interests. Students with ASD typically have focused interests, but the design of the study did not enable school personnel to fully take advantage of students' special interests. The number of book options was limited in the present study because the researcher preselected books that would be used in the reading sessions. Efforts should be made to ensure that the child's initial experiences are particularly enjoyable. Books that feature favorite characters or revolve around preferred topics may be reinforcing in and of themselves, thereby increasing the likelihood that the child will be willing to participate in future joint book readings. After a few pleasurable book readings, the adult should gradually introduce new books to expand on the child's interests.

If children with ASD are expected to participate in interactive reading activities, such as dialogic reading, some modifications may need to be made to reading procedures. In the present study, interventionists were trained to read to students using standard dialogic reading techniques as originally designed by Whitehurst and colleagues. However, in addition to the traditional CROWD prompts, interventionists were trained to use *special* prompts in the event that the original dialogic reading prompts were not effective in eliciting student responses. These *special* prompts included *yes/no* questions, choices, requests to point to key vocabulary, and direct modeling of an appropriate answer. Although student responses to *special prompts* may result in language that is less rich in quality compared to those produced from traditional dialogic reading prompts, it may be argued that modifying the prompts is necessary depending on the skills of

individual students. A limited response (e.g., one word, non-verbal) is better than no response at all.

A final suggestion for supporting student engagement during book reading is providing reinforcement for appropriate behavior. During book reading, the adult should periodically give the child feedback for engaging in appropriate behaviors. Many adults find it easiest (and more natural) to provide social reinforcement for behaviors, such as praise, hugs, tickles, and other signs of affection. Given the social deficits associated with ASD, it is probable that many students with ASD may not find this type of feedback enjoyable. In this case, adults may need to pair social feedback with another type of reinforcement, such as tangibles or edibles. In the present study, one interventionist found that providing tangible or edible reinforcement interrupted the pace of reading. It was suggested that she consider implementing a token system. Throughout the book reading, the student earned tokens for engaging in appropriate behavior. At the end of the session, these tokens were exchanged for a preferred item or activity. The use of a token system enabled the interventionist to provide the student feedback with minimal interruptions to the literacy activity.

Limitations and Direction for Future Research

Previous studies of dialogic reading (e.g., Lonigan et al., 1999; Lonigan & Whitehurst, 1998; Wasik & Bond, 2001) measured changes in early literacy skill development through formal measures. The purpose of this study was to extend previous research on dialogic reading to include children with ASD. For this reason, formal assessments were also included in the present study even though the validity of formal assessments for individuals with ASD has been questioned because of their heavy reliance on oral language skills. Edelson and colleagues (1998) argued two reasons why individuals with ASD are disadvantaged when being assessed

through formal measures: first, instructions are given verbally; second, the student is expected to respond verbally in many assessments. These facets of formal measures would impact individuals with significant language deficits, raising the possibility that language ability rather than the targeted constructs were being measured. In this study, it is possible that children's performances on standardized measures do not accurately reflect their emergent literacy skill knowledge, but that rather their scores may be a reflection of their oral language skills and/or test taking ability.

Another limitation, related to the use of formal measures, is how the results of standardized assessments were analyzed. When using descriptive or inferential statistics, groups have to be large enough to detect a significant difference in treatment outcomes when it occurs. The current study included a relatively small group of children ($n = 14$) for these types of analyses. Because of the size of this group, the difference in treatment outcomes has to be large in order to show a statistically significant effect. Also, the great heterogeneity of the sample potentially led to some biases in interpreting results. For example, performances on the definitional vocabulary subtest of the TOPEL ranged from standard scores as low as 56 indicative of profound impairment to high-average standard scores of 117. While some natural variability in performances is expected, the amount of variability in formal measures in this study was highly divergent. Extreme variability on test measures can obscure treatment differences if the sample size is not sufficiently large (Cohen, 1988).

The present study is also limited by the short duration of the intervention. While the entire study lasted six months, the actual length of intervention for each wave of students was five weeks. It is appropriate to note that previous dialogic reading studies on other populations ranged in duration, lasting six-weeks (Lonigan & Whitehurst, 1998; Wasik & Bond, 2001;

Whitehurst et al., 1994) to thirty-weeks (Zevenbergen et al., 2003; Crain-Thoreson & Dale, 1999). Although the length of the intervention phase was relatively short, the intervention was intensive in that adult-student dyads read everyday. It is quite remarkable that improvements in students' oral language skills were found, given the duration of the study. If dialogic reading could be included as a part of children's daily routine, it would be feasible to extend the length of the study to cover an entire school year. It would be interesting if simply extending the duration of the dialogic reading intervention would have a positive impact in other areas of early literacy skill development.

The final limitation of the study has previously been mentioned but is worth repeating. The design of the current study does not allow researchers to examine the relationship between early literacy and later reading outcomes for this population. The field would benefit greatly from longitudinal studies to determine whether the oral language skills children develop from dialogic reading have any influence on conventional reading skills. Because we do not have any information regarding the predictive value of early literacy skills for children with ASD, we are left to draw inferences based on what we know about literacy development for typically developing children and those with other disabilities such as language impairments.

Unfortunately, we do not know whether the same early literacy skills that have strong predictive relationships to conventional reading apply to children with ASD. Longitudinal research is needed to follow children with ASD from preschool through elementary school to determine the extent to which specific skills can predict reading achievement. Having a better understanding of precursory skills that support literacy development for children with ASD would enable educators and researchers to focus intervention and instruction on those skills that are most likely to lead to later success in reading.

Practical Relevance

According to recent research, the prevalence rate of ASD is 1:88 (CDC, 2012). In other words, more than 1% of children in the United States are diagnosed with ASD. Now, more than ever, we are in need of effective, sustainable, and acceptable strategies that will help children learn to communicate and succeed in school. Much has been written about the relationship between literacy experiences early in life and their correlation with school achievement. There is growing awareness that interventions targeting early literacy skills should be included in preschool curriculum for young children who are at risk for reading problems, such as children with disabilities (Dickenson, McCabe, & Essex, 2006). Researchers and educators are charged with the responsibility of developing strategies to effectively teach literacy to this population, beginning in early childhood through formal schooling.

The results of the present study suggest that dialogic reading is a socially valid and effective strategy for improving oral language outcomes for children with ASD. Despite these positive findings, much remains to be determined: the intervention was not successful in improving other components of early literacy, and we do not know whether improvements in oral language ability will predict later reading achievement for this population. Further studies are clearly needed; however, these preliminary results suggest that including dialogic reading as a part of a comprehensive preschool curriculum may be a promising early literacy practice for young children with ASD.

REFERENCES

- Alberto, P.A., & Troutman, A.C. (2009). *Applied behavior analysis for teachers* (8th ed.). Upper Saddle River, NJ: Merrill/Pearson.
- American Psychiatric Association. (2000). Autistic disorder. *Diagnostic and statistical manual of mental disorders* (4th ed. text revision, pp. 70-75). Washington, D.C.: Author.
- Anderson, R.C., Hiebert, E.H., Scott, J.A., & Wilkinson, I.A.G. (1985). *Becoming a nation of readers: The report of the commission on reading*. Washington, DC: National Institute of Education.
- Aram, D.M., Ekelham, B.L., & Nation, J.E. (1984). Preschoolers with language disorders: 10 years later. *Journal of Speech and Hearing Research*, 27, 232-244.
- Arnold, D.H., Lonigan, C.J., Whitehurst, G.J., & Epstein, J.N. (1994). Accelerating language development through picture book reading: Replication and extension to a videotaped training format. *Journal of Educational Psychology*, 86, 235-243.
- Asberg, J., Dahlgren, S., & Dahlgren Sandberg, A. (2008). Basic reading skills in high-functioning swedish children with autism spectrum disorders or attention disorder. *Research in Autism Spectrum Disorders*, 2(1), 95-109. doi:10.1016/j.rasd.2007.03.006
- Au, K., H. (1997). A Sociocultural model of reading instruction: The Kamehameha Elementary Education Program. In S. Stahl, A. & D. A. Hayes (Eds.), *Instructional Models in Reading*. Mahwah, N.J.: Lawrence Erlbaum Associates.
- Bellon, M. L., Ogletree, B. T., & Harn, W. E. (2000). Repeated storybook reading as a language intervention for children with autism: a case study on the application of scaffolding. *Focus on Autism and Other Developmental Disabilities*, 15(1), 52-58.
- Bishop, D.V.M. & Adams, C. (1990). A prospective study of the relationship between specific \

- language impairment, phonological disorders and reading retardation. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 31, 1027-1050.
- Bredenkamp, S. (1986). *Developmentally appropriate practice*. Washington, D.C.: National Association for the Education of Young Children.
- Brown, A.L., Palinscar, A.S., & Armbuster, B.B. (1994). Instructing comprehension-fostering activities in interactive learning situations. In R. Ruddell and H. Singer (Eds.) *Theoretical Models and Processes in Reading* (4th edition). Newark, NJ: International Reading Association.
- Burd, L., & Kerbeshian, J. (1985). Hyperlexia and a variant of hypergraphia. *Perceptual and Motor Skills*, 60, 940-942.
- Butler, S.R., Marsh, H.W., Sheppard, M.J., & Sheppard, J.L. (1985). Seven-year longitudinal study of the early prediction of reading achievement. *Journal of Educational Psychology*, 77, 349-361.
- Carrow-Woolfolk, E. (2008). *Oral and written language scales*. Los Angeles, CA: Western Psychological Services.
- Catts, H. W., Fey, M. E., Tomblin, J., & Zhang, X. (2002). A longitudinal investigation of reading outcomes in children with language impairments. *Journal of Speech, Language, and Hearing Research*, 45(6), 1142-1157.
- Chiang, H., & Lin, Y. (2007). Reading comprehension instruction for students with autism spectrum disorders: A review of the literature. *Focus on Autism and Other Developmental Disabilities*, 22(4), 259-267. doi:10.1177/10883576070220040801
- Centers for Disease Control and Prevention (2012, March 29). Autism more common than

- previously thought: CDC report shows one in 54 boys identified. *ScienceDaily*. Retrieved April 17, 2012, from [http://www.sciencedaily.com /releases/2012/03/120329142630.htm](http://www.sciencedaily.com/releases/2012/03/120329142630.htm)
- Clay, M. (1975). *What did I write?* Auckland, New Zealand: Heinemann.
- Cohen, J. (1988). *Statistical Power Analysis for the Behavioral Sciences*, 2nd ed. New York: Academic Press.
- Cooper, J., Heron, T., & Heward, W. (2007). *Applied behavior analyses* (2nd ed.). Upper Saddle River, NJ: Merrill/Prentice Hall
- Crain-Thoreson, C., & Dale, P. S. (1999). Enhancing linguistic performance: parents and teachers as book reading partners for children with language delays. *Topics in Early Childhood Special Education*, 19(1), 28-39.
- Dale, P.S., Crain-Thoreson, C., Notari-Syverson, A., & Cole, K. (1996). Parent child book reading as an intervention technique for young children with language delays. *Topics in Early Childhood Special Education*, 16, 213-235.
- Daniels, H. (2002). *Literature circles: Voices and choice in book clubs and reading groups*. Portland, ME: Stenhouse Publishers.
- Dawson, G., & Osterling, J. (1997). Early intervention in autism: Effectiveness and common elements of current approaches. In Guralnick (Ed.) *The effectiveness of early intervention: Second generation research*. (pp. 307-326) Baltimore: Brookes.
- Dickenson, D.K. (2001). Book reading in preschool classrooms: Is “recommended practice” common? In D.K. Dickenson & P.O. Tabors (Eds.), *Beginning literacy with language* (pp. 175-204). Baltimore: Brookes.
- Dickenson, D., McCabe, A.A., & Essex, M.J. (2006). A window of opportunity we must open to

- all: The case for preschool with high-quality support for language and literacy. In S.B. Neuman & D.K. Dickinson (Eds.), *Handbook of early literacy research* (2nd ed., pp.11-28). New York: Guilford Press.
- Eeds, M., & Well, D. (1989). Grand conversations: An exploration of meaning construction in literature study groups. *Research in the Teaching of English*, 23(1), 4-29.
- Edelson, M.G., Schubert, D.T., & Edelson, S.M. (1998). Factors predicting intelligence scores on the TONI in individuals with autism. *Focus on Autism and Pervasive Developmental Disorders* (Vol. 1, pp. 42-69). Hoboken, NJ: John Wiley & Sons, Inc.
- Ezell, H.K., & Justice, L.M. (2005). *Shared storybook reading*. Baltimore, MD: Brookes
- Fallon, K.A., & Katz, L.A. (2007). Written language and AAC in the schools: A national survey. Poster presented at: ASHA National Conference, 2007; Boston, MA
- Fey, M.E., Windsor, J., & Warren, S.F. (1995). *Language intervention: Preschool through the elementary years*. Baltimore, MD: Paul Brooks.
- Fountas, I. C., & Pinnell, G. S. (1996). *Guided reading*. Portsmouth, N.H.: Heinemann.
- Franzone, E. (2009). *Overview of naturalistic Intervention*. Madison, WI: National Professional Development Center on Autism Spectrum Disorders, Waisman Center, University of Wisconsin.
- Goodman, K.S. (1967). Reading: A psycholinguistic guessing game. *Journal of the Reading Specialist*, 4, 126-135
- Goswami, U. (2002). Early phonological development and the acquisition of literacy. In S.B. Neuman & D.K. Dickenson (Eds.), *Handbook of early literacy research* (pp. 111-125). New York: The Guilford Press.
- Grigorenko, E. L., Klin, A., Pauls, D. L., Senft, R., Hooper, C., & Volkmar, F. (2002). A

descriptive study of hyperlexia in a clinically referred sample of children with developmental delays. *Journal of Autism & Developmental Disorders*, 32(1), 3-12.

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<http://search.ebscohost.com/login.aspx?direct=true&db=hch&AN=11305659&site=ehost-live>

Hancock, T. B., & Kaiser, A. P. (2006). Enhanced milieu teaching. In McCauley R.J. & Fey, M.E. (Ed.), *Treatment of language disorders in children* (pp. 203-229). Baltimore: Paul H. Brooks Publishing.

Hargrave, A.C., & Senechal, M. (2000). A book reading intervention with preschool children who have limited vocabularies: The benefits of regular reading and dialogic reading. *Early Childhood Research Quarterly*, 15(1), 75-90.

Hart, B., & Risley, T.R. (1995). *Meaningful differences in the everyday experience of young American children*. Baltimore: Brookes.

Heath, S.B. (1982) What no bedtime story means: Narrative skills at home and school. *Language in Society*, 11, 49-76.

Heller, K.W., Fredrick, L. D., & Diggs, C. A. (1999). Teaching reading to students with severe speech and physical impairments using the NonVerbal Reading Approach. *Physical Disabilities: Education and Related Services*, 18, 3-34

Hume (2010). Effective instructional strategies for students with autism spectrum disorders: Keys to enhancing literacy instruction. In C. Carnahan & P. Williamson (Eds.), *Quality Literacy Instruction for Students with Autism Spectrum Disorders*. Shawnee Mission, KS: Autism Asperger Publishing Co.

Individuals with Disabilities Education Improvement Act, 20 U.S.C. § 1400 *et seq.* (2004)

- Justice, L.M., Kaderavek, J., Bowles, R., & Grimm, K. (2005). Language impairment, parent child shared reading, and phonological awareness: A feasibility study. *Topics in Early Childhood Special Education, 25*(3), 143-156.
- Justice, L. M., & Pence, K. (2005). *Scaffolding with Storybooks: A Guide for Enhancing Young Children's Language and Literacy Achievement*. Newark: International Reading Association.
- Kaderavek, J. N., & Rabidoux, P. (2004). Interactive to independent literacy: a model for designing literacy goals for children with atypical communication. *Reading & Writing Quarterly: Overcoming Learning Difficulties, 20*(3), 237-260.
- Kaderavek, J., & Sulzby, E. (1998). Emergent literacy issues for children with language impairment. In L.R. Watson, T.L. Layton, & E.R. Crais (Eds.), *Handbook of early language impairments in children. Volume II: Assessment and treatment*. New York: Delmar.
- Kluth, P. & Chandler-Olcott, K. (2008). *A land we can share: Teaching literacy to students with Autism*. Baltimore, MD: Paul H Brookes Publishing.
- Kluth, P., & Darmody-Latham, J. (2003). Beyond Sight Words: Literacy Opportunities for Students with Autism. *The Reading Teacher, 56*(6).
- Koegel, L., Koegel, R.L., Harrower, J., & Carter, C. (1999). Pivotal response intervention I: Overview of approach. *Journal of the Association for Persons with Severe Handicaps, 24*, 174-185.
- Koppenhaver, D.A. & Erickson, K.A. (2003). Natural emergent literacy supports for preschoolers with autism and severe communication impariments. *Topics in Language Disorders, 23*(4), 283-292.

- Koppenhaver, D. A., Erickson, K. A., & Skotko, B. G. (2001). Supporting communication of girls with Rett syndrome and their mothers in storybook reading. *International Journal of Disability, Development and Education*, 48(4), 395-410.
- Koppenhaver & Yoder (1992). Literacy issues in persons with severe speech and physical impairments. In R. Gaylord-Ross (Ed.), *Issues and research in special education, vol.2* (pp. 156-201). New York: Columbia University Teachers College Press
- Kunce, L., & Mesibov, G.B. (1998). Educational Approaches to high-functioning autism and Asperger syndrome. In E. Schopler, G.B. Mesibov, & L.J. Kunceet (Eds.), *Asperger syndrome or high-functioning autism* (pp. 227-261). New York: Plenum Press.
- Landgren, M., Kjellman, B., & Gillberg, C. (2003). “A school for all kinds of minds”. The impact of neuropsychiatric disorders, gender and ethnicity on school related tasks administered to 9–10 year old children. *European Child and Adolescent Psychiatry*, 12, 162–171.
- Light, J., & Smith, A. K. (1993). Home literacy experiences of preschoolers who use AAC systems and of their nondisabled peers. *AAC: Augmentative and Alternative Communication*, 9, 10-25.
- Light, J., Koppenhaver, D., Lee, E., & Riffle, L. (1992). The home and school literacy experiences of students who use AAC systems. In Light, J. & McNaughton, D. (1993). Literacy and augmentative and alternative communication (AAC): The expectations and priorities of parents and teachers. *Topics in Language Disorders*, 13(2), 33-46
- Lonigan, C.J., Burgess, S.R., & Anthony, J.L. (2000). Development of emergent literacy and early reading skills in preschool children: Evidence from a latent-variable longitudinal study. *Developmental Psychology*, 36(5), 596-613.

- Lonigan, C.J., & Whitehurst, G.J. (1998). Relative efficacy of parent and teacher involvement in a shared reading intervention for preschool children from low-income backgrounds. *Early Childhood Research Quarterly, 13*, 263-290.
- Lonigan, C.J., Anthony, J.L., Bloomfield, B.G., Dyer, S.M., & Samwel, C.S. (1999). Effects of two shared-reading interventions on emergent literacy skills of at-risk preschoolers. *Journal of Early Intervention, 22*, 306-322.
- Lue, M.S. (2001). *A survey of communication disorders for the classroom teacher*. Needham Heights, MA: Allyn & Bacon.
- Marvin, C. (1994). Home literacy experiences of preschool children with single and multiple disabilities. *Topics in Early Childhood Special Education, 14*, 436-454.
- Mirenda, P. (2003). "He's not really a reader...": Perspectives on supporting literacy development in individuals with autism. *Topics in Language Disorders, 23(4)*, 271-282.
- Morgan, P.L., & Meier, C.R. (2008). Dialogic reading's potential to improve children's emergent literacy skills and behavior. *Preventing School Failure, 52(4)*, 11-16.
- Morrow, L.M. (1989). *Literacy development in the early years: Helping children read and write*. Englewood Cliffs, NJ: Prentice Hall.
- Mundy, P., & Markus, J. (1997). On the nature of communication and language impairment in autism. *Mental Retardation and Developmental Disabilities, 3*, 343-349.
- Nation, K. (1999). Reading skills in hyperlexia: A developmental perspective. *Psychological Bulletin, 125(3)*, 338-355.
- National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel*. Washington, DC: National Institute for Literacy.
- National Institute of Child Health and Human Development (2000). *Report of the National*

- Reading Panel, Teaching children to read: An evidence-based assessment of the scientific research literature on reading and its implications for reading instruction* (NIH Publication No. 00-4769). Washington DC: Government Printing Office
- National Professional Development Center on Autism Spectrum Disorders. Retrieved from <http://autismpdc.fpg.unc.edu/>
- National Research Council (U.S.). (2001). *Educating children with autism*. Washington, DC: National Academy Press.
- No Child Left Behind Act, 20 U.S.C. 70 § 6301 *et seq.* (2001)
- Noens, I., van Berckelaer-Onnes, I. (2005). Captured by details: Sense-making, language and communication in autism. *Journal of Communication Disorders*, 38, 123-141.
- O'Connor, I. M., & Klein, P. D. (2004). Exploration of strategies for facilitating the reading comprehension of high-functioning students with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 34(2), 115-127. doi:0162-3257/04/0400-0115/0
- Pamparo, V., Herriott, S., Hudson, R., & Schwartz, I. (2010). Improving Adult-Child Book Reading Experiences for Children with Autism Spectrum Disorder. Manuscript submitted for publication.
- Pierce, K. & Schreibman, L. (1997). Multiple peer use of pivotal response training to increase social behaviors of classmates with autism: Results from trained and untrained peers. *Journal of Applied Behavior Analysis*, 30, 157-160.
- Pikulski, J.J., & Tobin, A.W. (1989). Factors associated with long-term reading achievement of early readers. In S. McCormick, J. Zutell, P. Scharer, & P. O'Keefe (Eds.), *Cognitive and social perspectives for literacy research and instruction*. Chicago: National Reading Conference.

- Pufpaff, L. A. (2008). Barriers to participation in kindergarten literacy instruction for a student with augmentative and alternative communication needs. *Psychology in the Schools*, 45(7), 582-599. doi:10.1002/pits.20311
- Rapin, I., & Dunn, M. (2003). Update on the language disorders of individuals with autistic spectrum. *Brain & Development*, 25, 166-172.
- Reading is Fundamental (n.d.). Retrieved from <http://www.rif.org/>
- Roser, N., & Martinez, M. (1985). Roles adults play in preschoolers' response to literature. *Language Arts*, 62, 485-490.
- Sandberg, A. D., & Hjelmquist, E. (1996). Phonologic awareness and literacy abilities in non speaking preschool children with cerebral palsy. *Augmentative and Alternative Communication*, 12 (2),138-153.
- Scarborough, H.S., (1989). Prediction of reading dysfunction from familial and individual differences. *Journal of Educational Psychology*, 81, 101-108.
- Scarborough, H. S., & Dobrich, W. (1994). On the efficacy of reading to preschoolers. *Developmental Review*, 14(3), 245-302.
- Segel, E. & Friedberg, J.B. (1991). "Is today liberry day?": Community support for family literacy. *Language Arts*, 68, 654-657.
- Skibbe, L., Behnke, M., & Justice, L.M. (2004). Parental scaffolding of children's phonological awareness skills: Interactions between mothers and their preschoolers with language difficulties. *Communication Disorders Quarterly*, 25(4), 189-203.
- Smith, M.W. & Dickenson, D. (2002). Early Language and Literacy Classroom Observation (ELLCO) Toolkit, Research Edition. Newton, MA: Paul H. Brookes Publishing
- Snow, C.E. (1983). Literacy & Language: Relationships during the preschool years. *Harvard*

- Educational Review*, 53, 165-189.
- Snow, C., Burns, M.S., & Griffin, P. (1998). Preventing reading difficulties in young children. Washington, D.C.: National Academy Press.
- Snow, C.E., & Goldfield, B.A. (1983). Turn the page, please: Situation specific language acquisition. *Journal of Child Language*, 10, 535-549.
- Snow, C., & Perlman, R. (1985). Assessing children's knowledge about bookreading. In L. Galda and A. Pelligrini (eds.), *Play, language, and stories*. Norwood, N.J.: Ablex Publishing Corporation.
- Spector, J. E. (2011). Sight word instruction for students with autism: An evaluation of the evidence base. *Journal of Autism and Developmental Disorders*, 41(10), 1411-1422.
- Teale, W.H. (1986). Home background and young children's literacy development. In W.H. Teale & E. Sulzby (Eds.), *Emergent literacy: Writing and reading* (pp. 173-206). Norwood, NJ: Ablex Publishing Corporation.
- Teale, W.H. (2003). Reading aloud to children as a classroom instructional activity: Insights from research and practice. In A. van Kleeck, S.A. Stahl, & E.B., Bauer (Eds.), *On reading books to children: Parents and teachers* (pp. 114-139). Mahwah, NJ: Lawrence Erlbaum Associates, Publishers.
- Teale, W., & Sulzby, E. (1986). *Emergent literacy: Writing and reading*. Norwood, NJ: Ablex Publishing Corporation.
- Tunmer, W.E., Herriman, M.L., & Nesdale, A.R. (1988). Metalinguistic abilities in beginning reading. *Reading Research Quarterly*, 23(2), 134-158

- Valdez-Menchaca, M.C., & Whitehurst, G.J. (1992). Accelerating language development through picture book reading: A systematic extension to Mexican day-care. *Developmental Psychology, 28*, 1106-1114.
- van Kleeck, A., Gillam, R. B., Hamilton, L., & McGrath, C. (1997). The relationship between middle-class parents' book-sharing discussion and their preschoolers' abstract language development. *Journal of Speech & Hearing Research, 40*(6), 1261-1271.
- van Kleeck, A., & Vander Woude, J. (2003). Book sharing with preschoolers with language delays. In A. van Kleeck, S. A. Stahl & E. Bauer (Eds.), *On reading to children: parents and teachers* (pp. 58-92). Mahwah: Erlbaum.
- Vandervelden, M., & Siegel, L. (1999). Phonological processing and literacy in AAC users and students with motor speech impairments. *Augmentative and Alternative Communication, 15*, 191-211.
- Vogler-Elias, D. (2009). *A parent-implemented shared storybook reading intervention for preschoolers with autism spectrum disorders*. (Ph.D., State University of New York at Buffalo). *ProQuest Dissertations and Theses*, Retrieved from <http://search.proquest.com/docview/305094109?accountid=14784>. (MSTAR_305094109)
- Vygotsky, L.S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.
- Washington Learning Systems (2010). Retrieved from <http://www.wlearning.com/>
- Wasik, B.A., & Bond, M.A. (2001). Beyond the pages of a book: Interactive book reading and language development in preschool classrooms. *Journal of Educational Psychology, 92*, 243-250.

- Wells, G. (1985). *Language development in the preschool years*. New York: Cambridge University Press.
- Whalon, K., & Hanline, M. F. (2008). Effects of a reciprocal questioning intervention on the question generation and responding of children with autism spectrum disorder. *Education and Training in Developmental Disabilities, 43*(3), 367-387. Retrieved from <http://search.ebscohost.com/login.aspx?direct=true&db=eric&AN=EJ804651&site=ehost-live>; <http://www.dddcec.org/etmrdv/TOC/tblecontents.htm>
- What Works Clearinghouse. (2007). *WWC intervention report: Dialogic reading*. Washington, DC: U.S. Department of Educational Institute of Education Sciences. Retrieved from ies.ed.gov/ncee/wwc/interventionreport.aspx?sid=135
- Whitehurst, G.J., Falco, F.L., Lonigan, C., Fischel, J.E., DeBaryshe, B.D., Valdez-Menchaca, M.C., & Caulfield, M. (1988). Accelerating language development through picture book reading. *Developmental Psychology, 24*, 552-558.
- Whitehurst, G. J., Arnold, D. H., Epstein, J. N., Angell, A. L., Smith, M., & Fischel, J. E. (1994). A picture book reading intervention in daycare and home for children from low-
- Whitehurst, G. J., & Lonigan, C. J. (1998). Child development and emergent literacy. *Child Development, 69*(3), 848-872.
- Williams, G. (1953). What does research tell us about readiness for beginning reading? *The Reading Teacher, 6*, 34-40.
- Wolf, M.M. (1978). Social validity: The case for subjective measurement. *Journal of Applied Behavior Analysis, 11*, 203-214.
- Yaden, P. (1985, December). Preschoolers' spontaneous inquiries about print and books. Paper presented at the annual meeting of the National Reading Conference, San Diego, CA.

- Zevenbergen, A.A. & Whitehurst, G.J. (2003). Dialogic reading: A shared picture book reading intervention for preschoolers. In A. van Kleeck, S.A. Stahl, & E.B. Bauer (Eds.). *On reading books to children: Parents and teachers* (pp. 177-200). Mahwah, NJ: Lawrence Erlbaum Associates.
- Zucker, T.A., Ward, A.E., & Justice, L.M. (2009). Print referencing during read-alouds: A technique for increasing emergent readers' print knowledge. *The Reading Teacher*, 63, 62-72.

APPENDIX A
Weekly Vocabulary Response Form (Example)

Little Cloud by Eric Carle

Student ID _____

Week # _____

Directions: Throughout the book, point to the target pictures and ask, “**What is it?**”/ “**What is this called?**” Record student responses as correct (+) or incorrect/no response (-).

Pretest (<i>before 1st reading</i>)			Posttest (<i>after 4th reading</i>)		
Date:		Examiner:	Date:		Examiner:
Page #	Target Word	Response (+/-)	Page #	Target Word	Response (+/-)
1-2	Cloud		1-2	Cloud	
3-4	House(s)		3-4	House(s)	
3-4	Tree(s)		3-4	Tree(s)	
7-8	Sheep		7-8	Sheep	
7-8	Tail		7-8	Tail	
9-10	Airplane/Plane		9-10	Airplane.Plane	
11-12	Shark		11-12	Shark	
15-16	Rabbit		15-16	Rabbit	
15-16	Whiskers		15-16	Whiskers	
19-20	Clown		19-20	Clown	

Notes:

APPENDIX B Procedural Fidelity Form

Student(s): _____ Teacher: _____ Your Initials _____

Date: _____ Book/ Session: _____

A. Materials and Arrangement				
1. Adult has book(s) available at the start of the session	Y		N	
2. The child(ren) is seated close to the adult (within arms-reach)	Y		N	
3. The child(ren) are able to view pages of the book	Y	S	N	
B. Adult use of dialogic reading strategies				
4. Adult <i>prompts</i> the child to respond at least <u>one time every 2-3 pages</u>	Y		N	
5. Adult asks the child to <i>complete</i> a repetitive sentence or phrase (e.g., "I'll huff, and I'll puff and ...")	Y		N	
6. Adult asks the child to <i>recall</i> information about the events or characters in the story (e.g., "what was the boy looking for?")	Y		N	
7. Adult asks <i>open-ended</i> questions (e.g., "what do you think will happen?")	Y		N	
8. Adult asks <i>wh-questions</i> (e.g., what, who)	Y		N	
9. Adult asks <i>distancing</i> questions that requires the child to relate parts of the story to his/her life (e.g., "have you ever made a snowman?")	Y		N	
10. Adult provides opportunities for the student to respond by giving appropriate wait time (5 seconds) after asking a question or making a comment	Y	S	N	
11. Adult <i>evaluates</i> student's responses by giving feedback/praise (e.g., "that's called a fire hydrant," "You're right, good observation")	Y	S	N	
12. Adult <i>expands</i> on the child's responses/comments (e.g., Child: "It's a dog;" Adult "It's a BIG dog")	Y	S	N	
13. Adult asks the child to <i>repeat</i> new/unfamiliar vocabulary (e.g., "Can you say fire hydrant?")	Y	S	N	NA
C. Other adult behaviors				
14. If the child reaches, the adult allows the child to turn pages, hold, or touch the book Y N	Y	S	N	NA
15. Adult engages the child in the story, <i>visually</i> (e.g., directing the student's attention to details in the illustration)	Y		N	
16. Use of well-modulated, dramatic voice, silly behaviors or sounds	Y	S	N	
17. Positive affect (e.g., use of praise, smiling, minimal reprimands)	Y	S	N	
18. In group settings, the adult provides opportunities for <i>all</i> students to respond (e.g., asking questions to all the students in the group, preventing one student from dominating)	Y		N	NA
Total				
% fidelity = #Yes / (18 - #NA)				

For categories containing "Y," "S," "N":

Y =Yes (80%-100% of opportunities); S = Sometimes (50%-80% of opportunities); N=No (<50% of opportunities)

APPENDIX C

Social Validity Form

Social Validity Measure

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DEC 10 2010

UW

Early Childhood Literacy Project

We know that there is a relationship between a child's early literacy experiences, such as adult-child book reading, and later literacy achievement. However, our knowledge about the literacy experiences of children with disabilities is limited. In this project, you have helped us reach a better understanding how dialogic reading may improve early literacy outcomes for children with Autism. We would like to get your impressions about how effective dialogic reading has been for the students you have worked with and your experiences with the study.

The survey should take 5-10 minutes to complete. Thank you for your participation.

NOV 12 2010

Student Experiences. Think about the students that you read to as part of this project. Please answer the following questions as they pertain to the *average* student experience during dialogic reading sessions.

To what extent do you agree with each of the following? (Circle one)	Strongly Disagree						Strongly Agree
1. I believe that the students' attention was better during dialogic reading compared to traditional book reading sessions (e.g., sitting, looking at pages)	1	2	3	4	5	6	7
2. Students enjoyed reading more during dialogic reading sessions compared to traditional book reading	1	2	3	4	5	6	7
3. I believe that students talked more during dialogic reading	1	2	3	4	5	6	7
4. I believe that students learned some new vocabulary	1	2	3	4	5	6	7
5. I believe that students are more interested in books because of this study	1	2	3	4	5	6	7
6. I believe that students dialogic reading should be included as part of students' academic programs	1	2	3	4	5	6	7

Your Experience. Now we would like to get your feedback about the study. Please answer the following questions as they pertain to your *overall* experience during dialogic reading sessions.

To what extent do you agree with each of the following? (Circle one)	Strongly Disagree						Strongly Agree
7. I believe I had sufficient training prior to starting dialogic reading sessions	1	2	3	4	5	6	7
8. I believe I had sufficient support during the study (e.g., questions answered, feedback given)	1	2	3	4	5	6	7
9. Dialogic reading strategies were easy to incorporate into book readings	1	2	3	4	5	6	7
10. I enjoyed reading to students during dialogic reading sessions	1	2	3	4	5	6	7
11. I will continue using dialogic reading strategies in the future	1	2	3	4	5	6	7

Social Validity Measure

12. Please rank the effectiveness of following dialogic reading prompts (e.g., students were able to respond) beginning with a "1" for the prompt that is most effective, and a "5" for the prompt that is least effective for students

- ___ Completion (student completes the phrase)
___ Recall (student remembers elements about the story or characters)
___ Open-ended questions
___ Wh- questions (What, where, who, what, when questions)
___ Distancing (relating themes in asking questions about how book elements relate to students)

13. **What difficulties, if any, did you experience during dialogic book reading sessions?** (check all that apply)

- Student was not interested in books
 Student preferred to read by him/herself
 Student engaged in challenging behavior
 It was difficult to find time to read to the student
 Other (please describe) _____
 Other (please describe) _____

Please feel free to share any other comments or suggestions in the space below:

Thank you! Your input is extremely valuable to us. If you have any questions, please contact
Veronica Pamparo, vpamparo@uw.edu

APPENDIX D Behavioral Coding Manual

GENERAL RULES

All coding will be done from videotape

It is recommended that you pause the video as needed in order to code behaviors

3-second rule: A minimum of 3-seconds must elapse behaviors to be coded as separate entities. In the event that two prompts occur within 3 seconds of each other, only code the LAST prompt.

Example:

Adult: "What is that?"

Adult: (1 second) "Is that a square or a circle?"

3 seconds did not elapse between prompts. Only code the last prompt (S=special)

In readings containing 2 or more children: Focus on one child at a time. Any adult questions directed toward the group (e.g., not targeted for a specific individual) should be counted.

Child verbalizations that are incoherent/incomplete phrases should not be coded.

ADULT BEHAVIOR: use of dialogic reading prompts to elicit VERBAL behavior

Note: adult directions to direct behavior (e.g., turn the page, sit down) are NOT counted.

C: Completion. The adult asks the child to complete a phrase. The child completes the phrase based on previous knowledge (repetitive phrase) or based on information provided by the illustration.

Example:

Adult: "Run run as fast as you can, you can't catch me, I'm the ..."

Child: "Gingerbread man!"

R: Recall. The adult asks the child to recall something about the character or the events in the book. This can be *immediate recall* (after finishing the page) or *delayed recall* (at the end of the book).

Hint: If the answer requires the child to think back about the details of the story, or use previous information to answer the question, it is considered recall.

Example:

Adult: "What did the hungry caterpillar eat?"

Child: "apples, plums..."

O: Open-ended. The adult asks the child questions that do not have one correct answer

Hint: Think about the number of possible responses. If the question can be answered a number of different ways, then it is considered open-ended.

Examples: “What do you see on this page?”
 “What do you think will happen?”

W: *Wh-questions*. The adult asks the child questions about new vocabulary in the book. Wh-questions have one correct answer. **Adult requests to have the child repeat or imitate a word should be counted as a *special prompt***

Hint: Think about the number of possible responses. If there is only ONE answer, then it is considered a wh-question

Examples: “What is that?”
 “What is he doing?”
 “Say _____”

D: *Distancing*. The adult asks questions that relate parts of the story to the child’s personal life.

Example:
 In the story, the father made breakfast for his family
 Adult: “what do you like to eat for breakfast?”
 Child: “Cereal”

S: *Special prompts*. There are times when the adult may modify the aforementioned prompts in order to elicit a response from the student. Special prompts are attempts the adult makes to facilitate student engagement. Typically (but not always) these prompts occur after one of the traditional prompts were unsuccessful. Requests to repeat a word or phrase are considered special prompts

Hint: Ask yourself, is the adult adding extra support to help the child answer the question.

Examples:
 Providing choices (“Is it a _____ or a _____”)
 Request the child to point (“show me the _____”)
 Yes/No questions (“Is that a cow?”)
 “What is it? It’s a yellow _____”
 Say _____.

CHILD RESPONSES to adult prompts

The child’s response to adult prompts will be coded in terms of *type* of response (verbal, nonverbal, or no/aberrant response). Verbal responses will be classified by *length of utterance* (single word or multiple word).

Responses do not need to be correct in order to be coded; however, they should be on topic.

Example (incorrect, but on-topic)
 Adult: points to the cheetah and asks, “What is it?”
 Child: “It’s a lion”

Code as *multit-word response*

Example (incorrect, and off-topic)

Adult: points to the cheetah and asks, “What is it?”

Child: “A, B, C, D, E ...” (sings the alphabet song)

Code as *no/aberrant response*

Single Word. The child verbally responds with one-word answer

Example:

Adult: “What is it?”

Child: “Cow”

Multiple Word. The child verbally responds with an answer containing 2 or more words. It is considered a multiple-word response if the child uses an article (a, an, the) before the noun (e.g., “a cow”).

Example:

Adult: “What is it?”

Child: “Two brown cows”

Non-Verbal response. The child responds to the adult prompt using non-verbal communication.

Example:

Adult: “Show me the clouds”

Child: points to the clouds in the book

Example:

Adult: While reading the Three Little Pigs, the adult asks, “what’s the wolf doing to the house?”

Child: makes a blowing sound with her lips

No/aberrant response. The child does not verbally or non-verbally respond to the adult prompt. A no response should be coded once the adult continues reading or provides another prompt (if 3-second has elapsed). Aberrant responses include responses that are clearly off-topic, such as a child scripting from a movie that is unrelated to the book.

CHILD VERBAL INITIATIONS

Child verbal initiations are defined as any instances in which the child makes a comment, asks a question, or independently repeats a phrase in the absence of the adult prompt. All verbal initiations will be defined as single word or multiple word phrases/sentences (refer to the definition in Child Responses section).

APPROPRIATE Language: Do not code perseverative language that is inappropriate. Look at the context to decide whether something is appropriate.

Comment: The child independently makes a statement or comment related to the book

Example:

Child: "Look, the dinosaur is coming!"

Question: The child independently asks the adult a question about the characters or events in the book

Example:

Child: "Why is he sad?"

Echoics: The child independently repeats a word or phrase that had been previously stated by the adult. Verbal repetition occur without the adult asking the child to "Say _____."

Example:

Adult: reading the text, "That night, he had a stomach ache"

Child: "stomach ache"

APPENDIX E Behavioral Coding Form

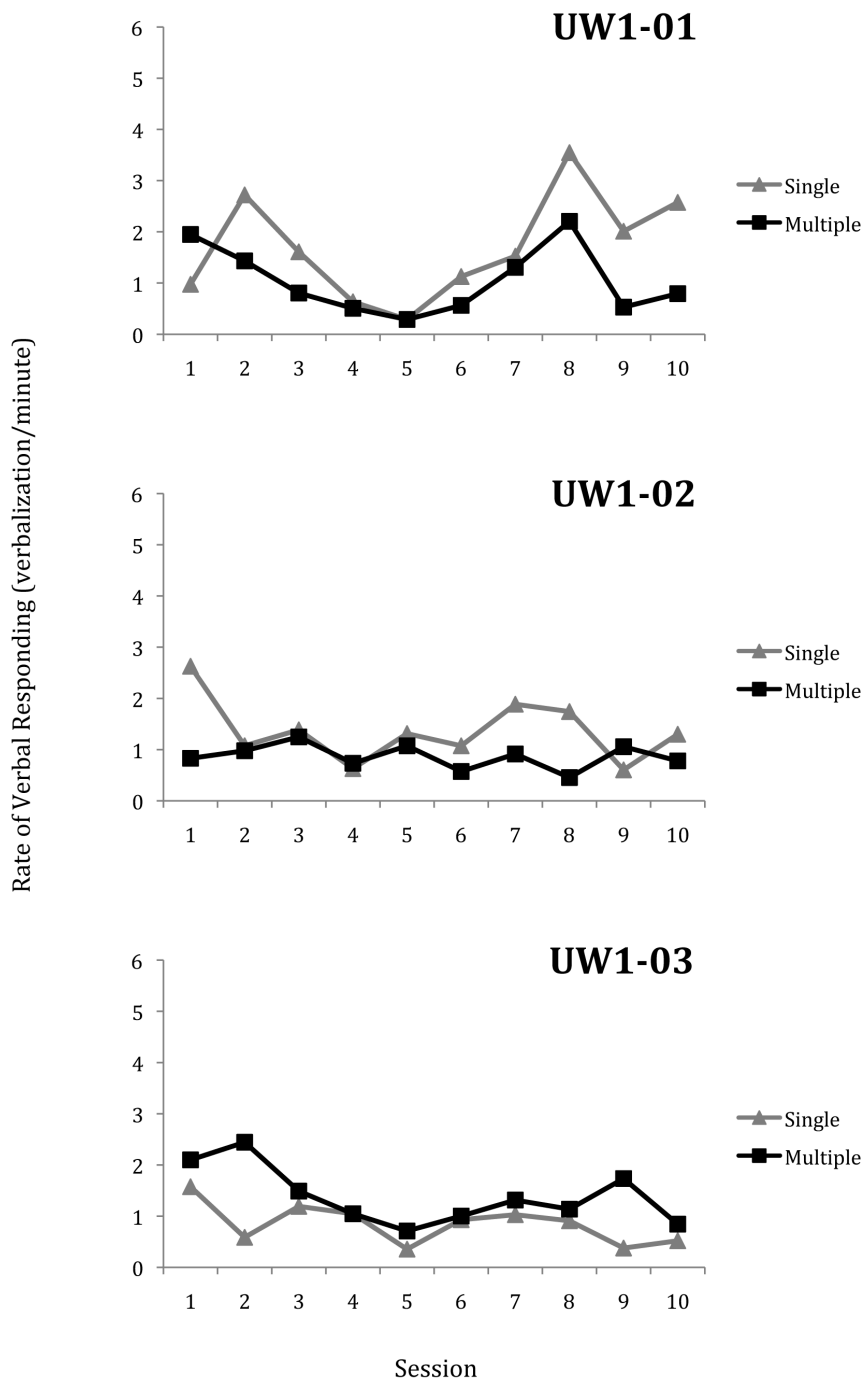
Prompt	Adult Behavior (prompt type)						Child Response			
	C	R	O	W	D	S	Single Word	Multi word	Non-Verbal	No/aberrant response
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
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25										
Total										

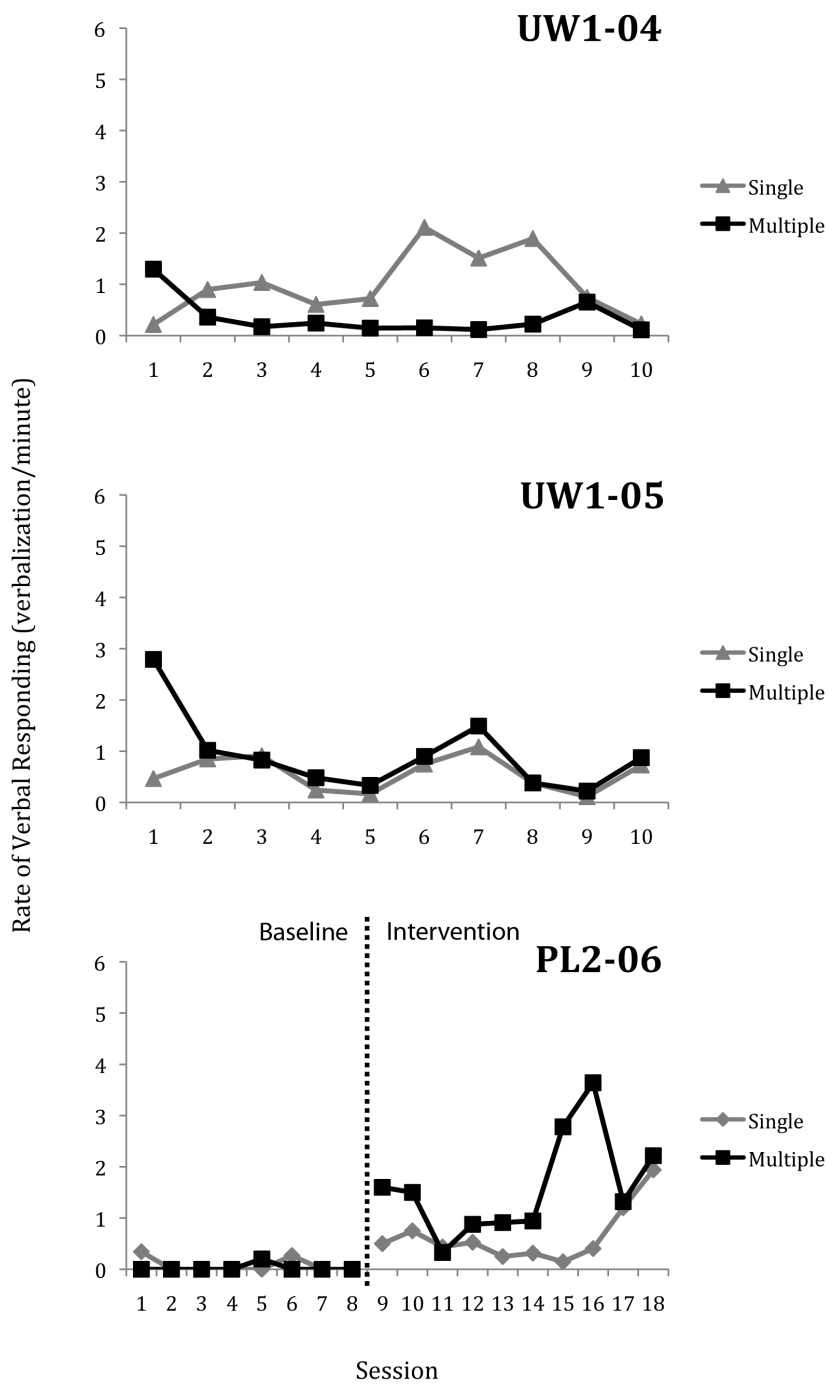
C = Completion; R= Recall; O= Open-ended; W= “Wh” questions; D= Distancing; S=Special

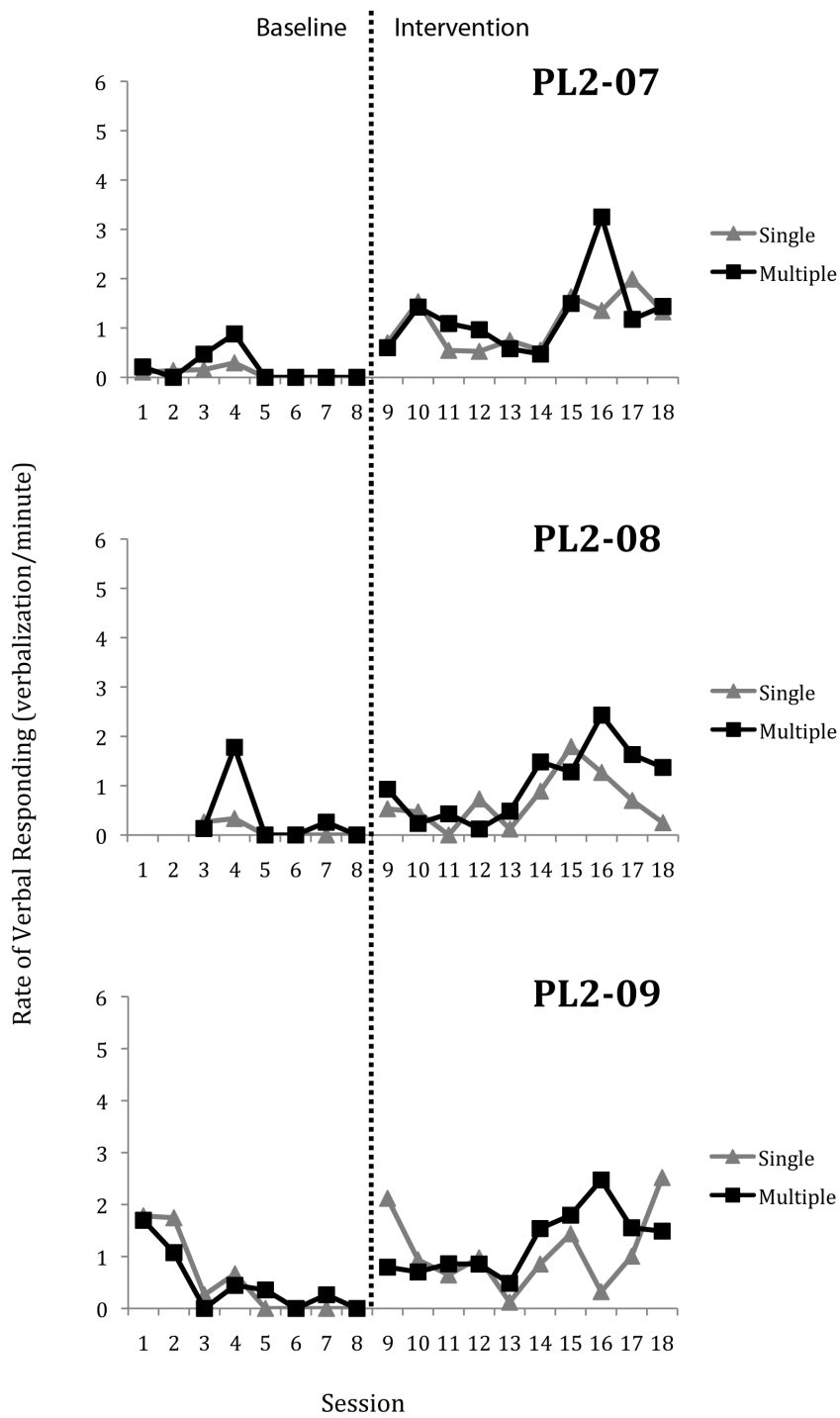
Child Verbal Initiations (Tally)

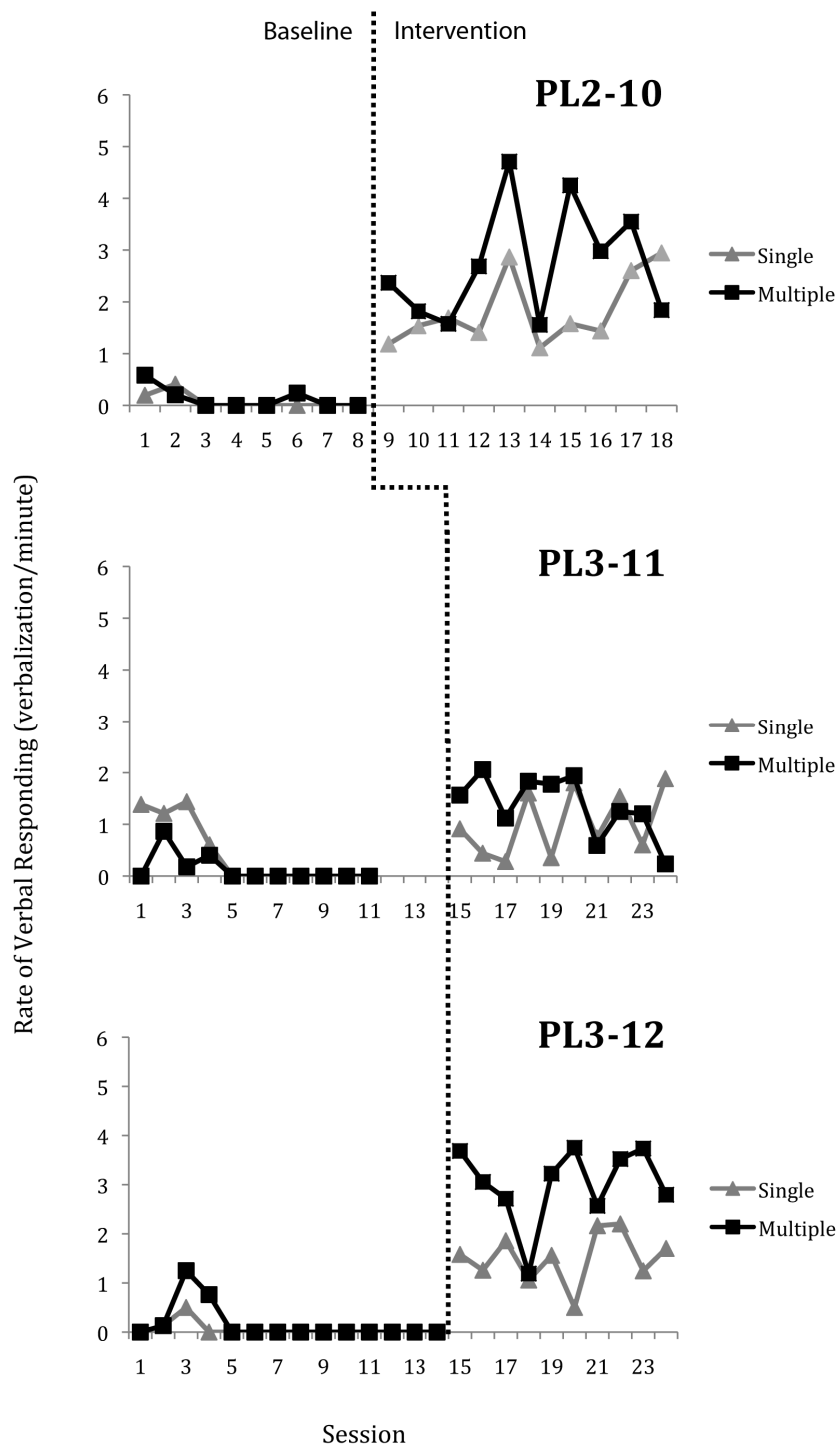
Comment		Question		Echoics	
Single Word	Multi Word	Single word	Multi word	Single word	Multi word
Total:					

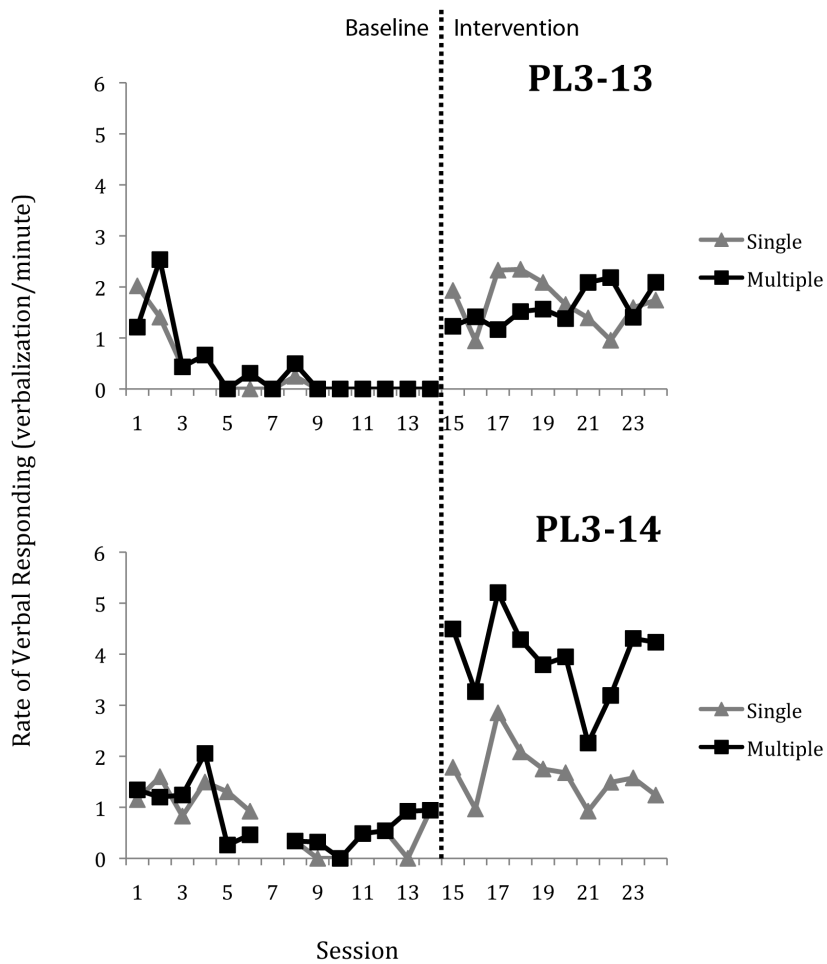
APPENDIX F
Verbal Participation Data for Individual Students











VITA

Veronica Pamparo was born in Seattle, Washington. She earned a Bachelor of Arts degree in Psychology from Scripps College and a Master of Education in Early Childhood Special Education from the University of Washington. In 2012 she earned a Doctor of Philosophy at the University of Washington.